TeSys

Catalogue 2020
Innovative and connected solutions for motor starters



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Life Is On Schneider Electric

TeSys

Enter in your CATALOGUE

TeSys is an innovative motor control and management solution from the global market leader.
TeSys offers connected, efficient products and solutions for switching and protection of motors and electrical loads in compliance with all major global electrical standards.







ASSEMBLED MOTOR STARTERS

FULLY COORDINATED

A1 Enclosed switch-disconnectors and motor starters — Enclosed starters

A2 **TeSys** Open pre-cabled motor starters — Open pre-cabled motor starters

A3 **TeSys** H Ultra-compact starters — TeSys H

A4 **TeSys** U All-in-one motor starters — TeSys U

A5 **TeSys** Integral 63 All-in-one motor starters — Integral 63

A6 Complementary technical information: coordination and standards — Coordination and standards

COMPONENTS
FOR CUSTOMER MADE SOLUTIONS

B1 **Linergy** BZ, HK Busbar systems — Power busbar systems

B2 **TeSys** GV, LAD, U
Motor starter wiring systems — Wiring systems

B3 **TeSys** Vario
Switch-disconnectors — Switch-disconnectors

B4 **TeSys** DF, LS, GK
Fuse carriers — Fuse carriers

B5 **TeSys** GS
Switch-disconnector fuses — Switch-disconnectors fuses

B6 **TeSys** GB, GV
Circuit breakers — Circuit breakers

B7 **TeSys** SK, K, D
Control relays — Control relays

B8 **TeSys** D, SK, K, SKGC, GC, GY, GF
Contactors — Contactors

B9 **TeSys** F
High power contactors — High power contactors

B10 **TeSys** B
Bar mounted contactors — Bar mounted contactors

B11 **TeSys** LR, RM1X, LRD
Overload relays — Overload relays

COMPONENTS
FOR MOTOR MANAGEMENT SYSTEMS

C1 **TeSys** U, T
Motor management — Motor management devices

C2 **TeSys** island
Digital management — Control and monitoring island



Start smart. Run smart. With **TeSys** motor controls.

Stay smart with the world's best-selling motor control solutions from the inventor of the world's first contactor - Schneider Electric™.

For almost a century, **TeSys** motor controls have driven the industry with innovations in motor protection, monitoring, and control.

It started with the introduction of the industry's first BAR contactor in 1924, and today, the legacy of innovation is built into every **TeSys** motor control device.

Best-in-class safety and reliability, plug-and-play architecture, and flexible functionality mean **TeSys** motor control solutions can meet your requirements across a wide range of applications, from the most common to the most advanced.

Wherever you are and anywhere your projects come together, you can trust Schneider Electric and **TeSys** contactors, circuit breakers, relays, and switches for unmatched reliability, complete compatibility with international standards, and the robust support of the Schneider Electric global supply network.

Start smart, run smart and stay smart with **TeSys** motor controls.



1st BAR Contactor	1st Enclosed Motor Starter	1st Modular Contactor	**TeSys** D Contactor	1st Modular 3 in 1 Motor Starter	GV3 MSP with EverLink	**TeSys** D Green	**TeSys** Island
1924	1935	1973	2000	2004	2008	2016	2019

Superior safety for all industries

TeSys motor controls come with all of the isolation, protection and emergency handling you need to comply with international codes. High-contrast covers identify safety-critical devices to prevent inadvertent manual operation. Every **TeSys** contactor is both mechanically linked and equipped with mirror contacts for safety applications and wherever auxiliary contact state reliability is critical.



HVAC

Ensure 24/7 availability of your HVAC system with reliable products that can reach high ambient temperatures without derating.



Conveying

Decentralize the control cabinet of your conveyor line and benefit from up to 80% space reduction.



Genset

Make certain your generator starts even in the harshest conditions with robust **TeSys** solutions.



Pumping

Optimize single or multi-drive boosters for industry or infrastructure with energy and cost-effective solutions.



Packaging

Keep pace with the most demanding, high-end packing applications with solutions that can perform 30 million AC53a electrical cycles, like **TeSys H**.



Oil and Gas

Keep your employees and assets safe and improve uptime in onshore and offshore applications: pipeline operations: LNG and natural gas processing: and refining and petrochemical applications.



Water and Wastewater

Optimize the treatment and delivery of safer water by reducing energy usage and lowering operating costs.



Food and Beverage

Serve your customers with environmentally friendly products to improve sustainability, efficiency, and flexibility, allowing you to adapt to changing customer habits.

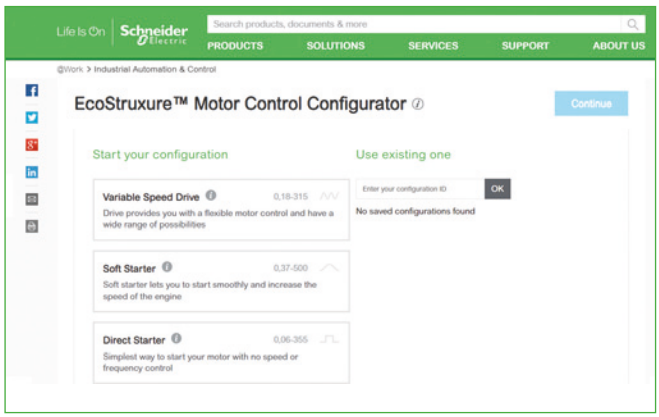
Online selection tool

EcoStruxure™ Motor Control Configurator

For Direct-On-Line and Star-Delta starters, motor circuit breakers with advanced protection, motor management relays, configurations for total coordination, drives, and soft starters.

No matter what kind of starting method you need, our online **EcoStruxure™ Motor Control Starter Configurator** will help you to quickly and easily select the optimal combination of components to ensure maximized motor safety, protection, and uptime.

Scan or click on the QR code





Green Premium™

An industry leading portfolio of offers delivering sustainable value

Green Premium™

More than 75% of our product sales offer superior transparency on the material content, regulatory information and environmental impact of our products:

- RoHS compliance
- REACh substance information
- Industry leading # of PEP's*
- Circularity instructions

Discover what we mean by green
Check your products!

The Green Premium program stands for our commitment to deliver customer valued sustainable performance. It has been upgraded with recognized environmental claims and extended to cover all offers including Products, Services and Solutions.

CO_2 and P&L impact through… Resource Performance

Green Premium brings improved resource efficiency throughout an asset's lifecycle. This includes efficient use of energy and natural resources, along with the minimization of CO_2 emissions.

Cost of ownership optimization through… Circular Performance

We're helping our customers optimize the total cost of ownership of their assets. To do this, we provide IoT-enabled solutions, as well as upgrade, repair, retrofit, and remanufacture services.

Peace of mind through… Well-being Performance

Green Premium products are RoHS and REACh compliant. We're going beyond regulatory compliance with step-by-step substitution of certain materials and substances from our products.

Improved sales through… Differentiation

Green Premium delivers strong value propositions through third-party labels and services. By collaborating with third-party organizations we can support our customers in meeting their sustainability goals such as green building certifications.

*PEP: Product Environmental Profile (i.e. Environmental Product Declaration)

TeSys

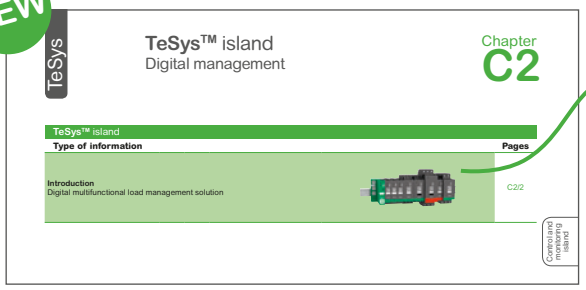
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Colour images…
for a better reflection of the reality

Your products images are now printed in colour, depicting the realistic look and feel.

NEW

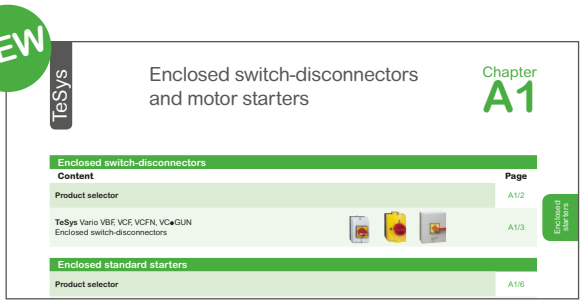




Digital management
available in a new Part C, introducing **TeSys** Island

Complete details on **TeSys Island** from its dedicated catalog available as Hyperlink in **chapter C2**.

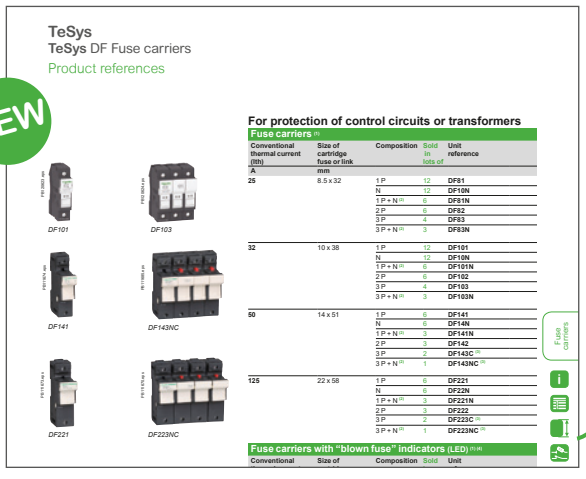
NEW



Easier selection in reorganized chapter A1
'Enclosed switch-disconnectors and motors starters'

Products are presented in selection tables and described in details in dedicated pages.

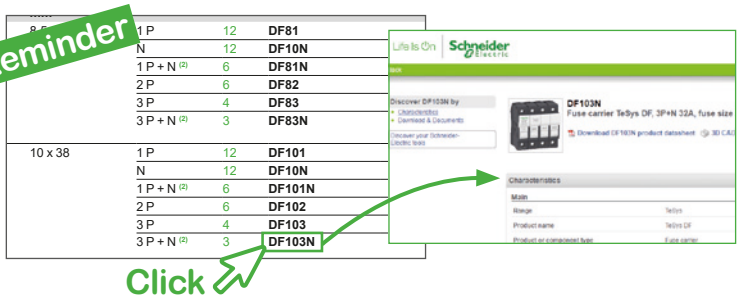
NEW



Faster browsing in each chapter thanks to tabs 'Introduction', 'Characteristics', 'Dimensions', 'Schemes'…

Click on to each hyperlink icons to quickly browse various sections of a given chapter.

Reminder



Quick access to online datasheets
thanks to hyperlink for references.

Click on to each product reference to get online product datasheet, product selectors…

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Part A

ASSEMBLED MOTOR STARTERS

FULLY COORDINATED

Enclosed switch-disconnectors and motor starters
From 0.25 to 40 kW  A1/1

TeSys
Open pre-cabled motor starters
From 0.06 to 315 kW  A2/1

TeSys H
Ultra-compact starters
Up to 3 kW
From 9 A to 32 A  A3/1

TeSys U
All-in-one motor starters
From 0.09 to 18.5 kW  A4/1

TeSys Integral 63
All-in-one motor starter
Up to 32 kW
Up to 63 A  A5/1

Complementary technical information:
coordination and standards
A6/1

Enclosed switch-disconnectors and motor starters

Enclosed switch-disconnectors

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TeSys Vario VBF, VCF, VCFN, VC●GUN Enclosed switch-disconnectors	A1/3



Enclosed standard starters

Product selector	A1/6
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Enclosed safety starters

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Enclosed Motor Starter Solution Guide

The software to help you to select intuitively your enclosed motor starter solution.

The new Enclosed Motor Starter Solution Guide software is available for both PC and iPad.



TeSys
TeSys Vario enclosed switch-disconnectors
Introduction & selection table



Range of pre-assembled casings with handle and their rotary switch

They can be fixed on a wall, a panel, or on the chassis of a machine. For simple isolation and/or control of an electrical circuit. Red/yellow handle provides a clear indication of the device safety function (1), while black handle is usually dedicated to ON/OFF control.

(1) Conforming to IEC 60947-4-1 and IEC 60204.

With numerous advantages to meet OEM's most common needs

- IEC or UL
- Multiple ratings and sizes
- IP65
- Additional poles
- Replaceable switch bodies

Selection in 2 steps

1 Identify your need (1 line one or more) in the **Selection criteria** area (example.: Load 5 kW– Emergency Stop - IEC)

2 Choose your enclosed switch-disconnector in the **Solutions** area, note the radical of the product references

Selection criteria								Solutions				
Ithe (A)	Load power (kW)	Circuit isolation	Emergency stop	IP55	IP65	IEC	UL & CSA					See page
10...140	4...45 (400 V)	●			●	●		VBF				A1/3
10...140	4...45 (400 V)	●	●		●	●			VCF			A1/3
10...32	4...15 (400 V)	●	●	●		●				VCFN		A1/3
32...175 (Ithe IEC) 20...115 (Ith UL)	10...50 HP (480 V)	●	●		●	●	●				VC●GUN	A1/4

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PB121471.eps



VCF0GE

PB121220.eps



VCF3GE

PB121472.eps



VCF5GEN

PB121473.eps



VCFN12GE

PB121223.eps



VBF0GE

PB121474.eps



VBF6GEN

Control + Disconnection (IEC)

Enclosed switch-disconnectors, ready to be fixed on workshop wall or directly on the machine and wired to main supply circuit and to load.

Functions / Range / Specificities:
- Direct Control: ON/OFF of 3-phase motor (black handle) or ON/Emergency Stop (red handle)
- 23 IEC motor starters, for 3P motors from 4 to 45 kW (10 to 140 A)
- 6 UL motor starters for 3P motors from 5 to 30 HP (240 V)
- Padlockable handle (1 to 3 padlocks – not included)
- Sealable, lockable cover when handle in position 1 (up to 63 A rating).

Included:
- rotary switch-disconnector body
- handle.

Enclosures for ON / Emergency Stop – IP65 – conforming IEC 60947-4-1 IEC 60204 (1)

Operator		Ithe	Power AC-23 at 400 V	Incorporated switch body	Possible attachments (2)	With ground plate	Reference (3)	Weight	Overall dimensions (4) WxHxD
Handle	Front plate Dim.								
	mm	A	kW					kg	mm
Red, standard, padlockable with up to 3 padlocks (Ø 4 to Ø 8 shank)	Yellow 60 x 60	10	4	V02	2	No	**VCF02GE**	0.400	90x146x131
						Yes	**VCF02GEGP**	0.460	90x146x131
		16	5.5	V01	2	No	**VCF01GE**	0.400	90x146x131
						Yes	**VCF01GEGP**	0.460	90x146x131
		20	7.5	V0	2	No	**VCF0GE**	0.400	90x146x131
						Yes	**VCF0GEGP**	0.460	90x146x131
		25	11	V1	2	No	**VCF1GE**	0.400	90x146x131
						Yes	**VCF1GEGP**	0.460	90x146x131
		32	15	V2	2	No	**VCF2GE**	0.500	90x146x131
		50	22	V3	3	No	**VCF3GE**	0.930	157x180x152
		63	30	V4	3	No	**VCF4GE**	0.930	157x180x152
Red, long, padlockable with up to 3 padlocks (Ø 4 to Ø 8 shanks)	Yellow 90 x 90	100	37	V5	1	No	**VCF5GEN**	2.190	241x291x190.5
		140	45	V6	1	No	**VCF6GEN**	2.190	241x291x190.5

Protection of sensitive equipment: ground plate available for VCF02GE…VCF1GE – see page A1/5.

Enclosures for ON / Emergency Stop – IP65 - conforming IEC 60947-4-1 (1)

Operator		Ithe	Power AC-23 at 400 V	Incorporated switch body	Possible attachments (2)	Reference (3)	Weight	Overall dimensions (4) WxHxD
Handle	Front plate Dim.							
	mm	A	kW				kg	mm
Red padlockable, either by 1 (Ø 8 shank) or by 3 padlocks (Ø 6 shank)	Yellow 60 x 60	10	4	VN12	2	**VCFN12GE**	0.422	82.5x131x106
		16	5.5	VN20	2	**VCFN20GE**	0.422	82.5x131x106
		20	7.5	V0	0	**VCFN25GE**	0.512	82.5x131x106
		25	11	V1	0	**VCFN32GE**	0.512	82.5x131x106
		32	15	V2	0	**VCFN40GE**	0.512	82.5x131x106

Enlosures for ON/OF F– IP65 – conforming IEC 60947-4-1 IEC 60204 (1)

Black, standard, padlockable with up to 3 padlocks (Ø 4 to Ø 8 shank)	Black 60 x 60	10	4	V02	2	**VBF02GE**	0.500	90x146x131
		16	5.5	V01	2	**VBF01GE**	0.500	90x146x131
		20	7.5	V0	2	**VBF0GE**	0.500	90x146x131
		25	11	V1	2	**VBF1GE**	0.500	90x146x131
		32	15	V2	2	**VBF2GE**	0.500	90x146x131
		50	22	V3	3	**VBF3GE**	0.930	90x146x131
		63	30	V4	3	**VBF4GE**	0.930	90x146x131
Black, long, padlockable with up to 3 padlocks (Ø 4 to Ø 8 shank)	Black 90 x 90	100	37	V5	1	**VBF5GEN**	2.190	241x291x190.5
		140	45	V6	1	**VBF6GEN**	2.190	241x291x190.5

(1) For characteristics of switch-disconnectors, please consult your Regional Sales Office.
(2) Number of add-on modules that can be attached.
(3) Enclosure not suitable in atmosphere contaminated with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).
(4) Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.
***Note:** For VCF and VBF enclosures from 02GE to 2GE, only one auxiliary contact block VZ7 or VZ20 can be mounted.*

Dimensions:
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Schemes:
page A1/37

PB107201.eps



VC1GUN

PB107202.eps



VC3GUN

PB121472.eps



VC5GUN

Control + Disconnection (UL)

ON / Emergency Stop – IP65
Conforming UL508 CSA22.2 n° 14, IEC 60947-4-1, IEC 60204 (1)

Operator		Rating		Standard power ratings of UL motors			Incorporated switch body	Possible attachments	Reference (2)	Weight	Overall dimensions (1) WxHxD
Handle	Front plate Dim.	IEC (Ith)	UL								
			600 V	240 V	480 V	600 V					
	mm	A	A	HP	HP	HP				kg	mm
Red, standard, padlockable with up to 3 padlocks (Ø 4 to Ø 8)	Yellow 60 x 60	32	20	5	10	10	V1	2	**VC1GUN**	0.500	121x164x132.1
		40	25	5	10	15	V2	2	**VC2GUN**	0.500	121x164x132.1
		63	45	10	20	30	V3	2	**VC3GUN**	0.930	164x193x132.1
		80	63	15	30	40	V4	2	**VC4GUN**	0.930	164x193x132.1
Red, long, padlockable with up to 3 padlocks (Ø 4 to Ø 8)	Yellow 90 x 90	125	100	25	50	50	V5	1	**VC5GUN**	2.190	241x291x190.5
		175	115	30	50	60	V6	1	**VC6GUN**	2.190	241x291x190.5

Additional modules for Vario switch bodies

Enclosed switches include a Vario VZ switch body. Additional modules can be plugged on 1 or 2 sides of the switch body to provide additional contacts or extra connectivity.

580589.eps



VZ0
Main pole

580594.eps



VZ11
Neutral pole

580595.eps



VZ15
Earthing terminal

580596.eps



VZ20
Auxiliary contacts

Common modules for enclosed switch disconnectors – with exceptions (3)

Description	Rating	Reference
	A	
Main pole module (mounted in enclosure)	10	**VZ02** (not for VCxGUN starters)
	16	**VZ01** (not for VCxGUN starters)
	20	**VZ0** (not for VCxGUN starters)
	25	**VZ1**
	32	**VZ2**
	50	**VZ3**
	63	**VZ4**
Neutral pole modules with early make and late break contacts	10 to 32	**VZ11**
	50 and 63	**VZ12**
	100 and 140	**VZ13**
Earthing modules	10 to 32	**VZ14**
	50 and 63	**VZ15**
	100 and 140	**VZ16**
Description	**Type of contacts**	**Reference**
Auxiliary contact block modules with 2 auxiliary contacts	N/O + N/C (4)	**VZ7**
	N/O + N/O	**VZ20**

(1) For characteristics of switch-disconnectors, please consult your Regional Sales Office.
(2) Enclosure not suitable in atmosphere contaminated with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).
(3) Not compatible with V●F5GEN, V●F6GEN, VC5GUN, VC6GUN, VCFN12GE, VCFN20GE.
(4) Late make N/O, early break N/C contacts.

Dimensions:
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Schemes:
pages A1/37 and A1/38

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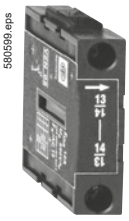
Product references



VZN11



VZN14



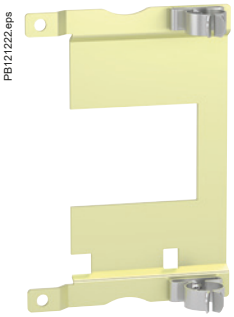
VZN05

Additional modules for Vario switch bodies

Specific modules for VCFN12GE and VCFN20GE

Description	Rating	Reference
	A	
Main pole modules	10	**VZN12**
	16	**VZN20**
Neutral pole module with early make and late break contacts	10 and 16	**VZN11**
Earthing module	10 and 16	**VZN14**

Description	Type of contacts	Reference
Auxiliary contact block modules	1 N/O late make contact	**VZN05**
	1 N/C early break contact	**VZN06**



VGP1



VGPCLIP1

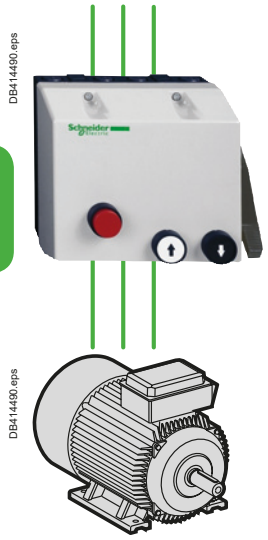
Accessories for Vario enclosed switch-disconnectors

Ground plate and accessories for VCF02GE, VCF01GE, VCF0GE, VCF1GE

Metallic ground plate, for shielded cables connection. To be installed between back of Vario enclosed switch-disconnectors, 2 fixing screws. Cable shield grounding ensured by 2 clamps, clamping from Ø11 to 14 mm

For switch body	Reference
Ground plate + 2 clamps + 2 screws	**VGP1**
2 clamps + 2 screws	**VGPCLIP1**

Schemes:
page A1/37



Range of pre-assembled motor starters, with pushbuttons, selectors, protection and control components in a robust casing

They can be fixed on a wall, on a panel, or on the chassis of a machine. They provide an operator with an easy access with visual simplicity

Numerous advantages to meet OEM's most common needs

- IEC
- Multiple ratings and sizes
- IP55, IP65
- IK08, IK09
- Totally or partially pre-wired

Standard starters

They are used to isolate a circuit, to protect and/or to control a motor

Customized protection

TeSys enclosed starter offer is available in fully pre-equipped and pre-wired enclosures, also in partially pre-equipped enclosures to be completed with protective components of the required rating

Accessories

Additional accessories provide reinforced sealing, padlock locking, additional contacts...

Selection in 2 steps

1 Identify your need (1 line one or more) in the **Selection criteria** area (example: Load 5 kW – ON/OFF control with overload protection)

2 Choose your starter in the **Solutions** area by adding column contents, note the radical of the product references (example: LE1D + LRD)

Selection criteria							Solutions					
Load Power (kW) / 400V	Circuit isolation	Direct starter - ON/OFF	Reverser ON/REVERSE/OFF	Short circuit protection	Overload protection	Star - delta					Protection device to be added by customer (of appropriate rating)	See page
0.25..7.5		●			●		LE1M35				 LRD	A1/7
4 … 30									LE1D			A1/8
0.02… 30		●		●				GV2PC GV3PC			 GV2L	A1/9 + A1/10
0.02… 30								GV2PC GV3PC			 GV2P	A1/9 + A1/10
0.06… 11		●		●	●			GV2MC GV3MP			 GV2ME	A1/11
2.2 … 15										LE4K LE4D	LR2K LRD	A1/12
2.2 … 30			●		●				LE2K LE2D		LR2K LRD	A1/13
2.2 … 15			●	●	●					LE8K LE8D	 LR2K LRD	A1/14
7.5...30		●			●	●			LE3D		LRD	A1/15
7.5...18.5		●	●	●	●	●				LE6D	LRD	A1/16

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PB121458.eps



LE1M35●●●●

Control + Protection against Overloads

- Direct Control: ON/OFF of 3-phase motor
- Motor protection: motor OFF in case of overload – manual reset with the red pushbutton.
- Indication: yellow light activated with the contactor coil.
- The LE1M35 starter, combined with short-circuit protection components, provides type 1 or type 2 coordination, depending on the type of devices used.

Range:
- 10 IEC motor starters, for 3P motors from 0.25 to 7.5 kW (400V AC)
- Configurable pushbuttons: impulse or latched
- Conforming to IEC 60947-4-1 standard
- Degree of protection IP65 , according IEC 60529
- Ambient air temperature in operation -5 to +40°C
- Operating position: same as TeSys K series contactors
- Material: self extinguishing ABS.

Included (standard version):
- 1 TeSys contactor LC1 K●● (1)
- 1 TeSys thermal overload relay LR2 K (2)
- 1 green Start button “I”,
- 1 red Stop/Reset button “O/R”,
- 1 yellow operating indicator
- earth + neutral terminals at bottom of enclosure.

For supply voltages between 380 and 440 V (codes Q7, V7, N7 or R7) the control circuit is pre-wired between phases. For other supply voltages, the control circuit must be wired by the customer.

Direct-on-line starters

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3				Setting range of thermal overload relay LR2K	Basic reference, to be completed by adding the voltage code (3)	Overall dimensions (4) WxHxD
220 V 230 V	240 V	380 V 400 V	415 V			
kW	kW	kW	kW	A		mm
0.12	0.12	0.25	0.25	0.54…0.8	**LE1M35●●05**	78x160x108
0.18	0.18	0.37	0.37	0.8…1.2	**LE1M35●●06**	78x160x108
0.25	0.25	0.55	0.55	1.2…1.8	**LE1M35●●07**	78x160x108
0.37	0.37	1.1	0.75	1.8…2.6	**LE1M35●●08**	78x160x108
0.55	0.55	1.5	1.5	2.6…3.7	**LE1M35●●10**	78x160x108
1.1	0.75	2.2	2.2	3.7…5.5	**LE1M35●●12**	78x160x108
1.5	1.1	3	3	5.5…8	**LE1M35●●14**	78x160x108
2.2	2.2	4	4	8…11.5	**LE1M35●●16**	78x160x108
3	3	5.5	5.5	10…14	**LE1M35●●21**	78x160x108
3.7	4	7.5	7.5	12…16	**LE1M35●●22**	78x160x108
Replacement contactor					**LC1K●●A80**	-

Coil voltage codes

Volts ~ 50/60 Hz	24	110	220	230	240	380	400	415	440
Code	B7	F7	M7	P7	U7	Q7	V7	N7	R7

(1) TeSys K contactor characteristic: refer to chapter B8.
(2) TeSys LR2K overload relay characteristics: refer to chapter B11.
(3) Remove the 2 last numbers if the thermal overload relay is not required. Example: LE1M35B7 instead of L1M35B714.
(4) Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.

Dimensions: page A1/39
Schemes: page A1/39

TeSys LE1D enclosed standard starters / DOL / to be completed with LRD (1) overload relay

Product references



LE1D●●



LRD●●

Control + Protection against Overloads

■ ON/OFF motor starters: 1-way rotation control of 3-phase motor, by green & red pushbuttons
■ Motor protection against overload: manual reset with the red pushbutton or remotely.

Range:
■ 8 direct-on-line starters for 3P motors from 4 to 30 kW (9 to 65 A AC-3)
■ Choice of up to 12 AC coil voltages for control supply circuit (depending on starter rating).

Enclosures characteristics:
■ Conforming to IEC 60947-4-1 standard
■ Degree of protection according IEC 60529:
□ IP65,
□ IK07 for LED09…D35,
□ IK09 for LE1D40A…D65A
■ Ambient air temperature in operation -5 to +40°C
■ Operating position: same that as contactors
■ Material: LE1D09… D35 polycarbonate (2)
■ LE●D40A… D65A steel sheet.

Included:
■ 1 pre-wired LC1D contactor
■ 2 Harmony XB5 pushbuttons.
An LRD overload relay of the required rating must be ordered separately and wired at bottom of the contactor.

Direct on-line starters

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3						Max. current I the up to	Basic reference, to be completed by adding the voltage code	Weight	Overall dimensions (3) WxHxD
220 V 230 V	380 V 400 V	415 V	440 V	500 V	660 V 690 V				
kW	kW	kW	kW	kW	kW	A		kg	mm
2.2	4	4	4	5.5	5.5	**9**	**LE1D09●●**	0.920	88x166x128.5
3	5.5	5.5	5.5	7.5	7.5	**12**	**LE1D12●●**	0.920	88x166x128.5
4	7.5	9	9	10	10	**18**	**LE1D18●●**	1.015	101x201x153.5
5.5	11	11	11	15	15	**25**	**LE1D25●●**	1.015	101x201x153.5
7.5	15	15	15	18.5	18.5	**35**	**LE1D35●●**	4.320	101x201x153.5
11	18.5	22	22	22	30	**40**	**LE1D40A●●**	4.820	200x300x158.5
15	22	25	30	30	33	**50**	**LE1D50A●●**	4.850	200x300x158.5
18.5	30	37	37	37	37	**65**	**LE1D65A●●**	4.850	200x300x158.5

Variants (pre-assembled)

Description	Available variants for starter	Suffix to be added to the starter reference (4)
No pushbuttons on cover	LE1D09…D65A●●	**A04**
1 blue Reset button “R”	LE1D09…D65A●●	**A05**
1 3-position stay put selector switch (“I”-“O”-“II”) (“I”: Automatic Start; “O”: Stop; “II”: Manual Start) 1 blue Reset button “R”	LE1D09…D25●●	**A09**
1 2-position stay put selector switch “O”-“I” (“O”: Stop; “I”: Manual Start) 1 blue Reset button “R”	LE1D09…D25●●	**A13**
Mounting of an LC1D09 contactor in an enclosure identical to LE1D18	LE1D09P7 LE1D09P7A13	**T**

Coil voltage codes (4)

Volts ~ 50/60 Hz	24	48	110	115	120	220	230	240	380	400	415	440
LE1D09 to D35	B7	E7	F7	FE7	G7	M7	P7	U7	Q7	V7	N7	R7
LE1D40A to D65A	–	–	–	FE7	–	–	P7	–	Q7	–	–	–

(1) TeSys LRD overload relay selection: product reference page A1/33, more details in chapter B11.
(2) Avoid placing this material in contact with harsh substances (detergents, chlorine solvents ketones, alcohol, aromatic hydrocarbons).
(3) Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.
(4) Some combinations of variants / control voltage may not be available. Please consult us.

Dimensions: page A1/44
Schemes: page A1/45

TeSys GV2PC, GV3PC enclosed standard starters / DOL / to be completed with GV2L, GV3L (1) circuit breaker

Product references



GV2PC01



GV2L



GV3PC02



GV3L

Control + Isolation + Protection against Short circuits

2 solutions according to the required current rating.
GV2PC + GV2L > up to 23 A (Ithe)
GV3PC + GV3L > up to 55 A (Ithe)
The GV2L or GV3L circuit breaker of the required rating must be ordered separately.

- Circuit isolation
- ON/OFF motor starters: 1-way rotation control of 3-phase motor
- Padlocking:
  - in ON or OFF position (PGV2PC01, GV3PC01),
  - in OFF position (GV2PC02, GV3PC02).

Suitable circuit breakers:
- GV2L - 12 ratings (3P motors from 0.09 to 11 kW - 400/415 V AC)
- GV3L - 3 ratings (3P motors from 18.5 to 30 kW - 400/415 V AC).

Enclosures characteristics:
- Conforming to IEC 60947-2
- Degree of protection according IEC 60529:
  - IP65, IK08 (for GV2PC),
  - IK09 (for GV3PC)
- Ambient air temperature in operation -5 to +40°C
- Operational voltage (Ue): 690V
- Material: GV2PC polycarbonate (2), GV3PC steel sheet.

Included:
- GV rotary handle.

Enclosures fitted with padlockable rotary handle

Composition	Type	Reference	Overall dimensions (3) WxHxD
			mm
■ Insulating enclosure ■ Black handle, padlockable in ON/OFF position	Surface mounting For GV2L	**GV2PC01**	88x166x163
■ Insulating enclosure ■ Red handle on yellow background, padlockable in OFF position	Surface mounting For GV2L	**GV2PC02**	88x166x163
■ Metal enclosure ■ Black handle, padlocking in ON/OFF position ■ Circuit breaker/handle adapter	Surface mounting For GV3L	**GV3PC01**	200x300x200
■ Metal enclosure ■ Red handle, padlocking in OFF position ■ Circuit breaker/handle adapter	Surface mounting For GV3L	**GV3PC02**	200x300x200

GV2L, GV3L product references: add code to product reference (4)

Ithe (A)	0.4	0.63	1	1.6	2.5	4	6.3	9	13	17	21	23
GV2L codes	03	04	05	06	07	08	10	14	16	20	21	22
Ithe (A)	**35**	**41**	**55**									
GV3L codes	40	50	65									

(1) TeSys GV2, GV3 circuit breaker not included - characteristics: refer to chapter B6.
(2) Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).
(3) Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.
(4) Example: for Ithe 17 A, magnetic circuit breaker is GV2L20.

Dimensions: page A1/41
Schemes: page A1/41

TeSys GV2PC, GV3PC enclosed standard starters / DOL / to be completed with GV2P, GV3P (1) circuit breaker

Product references

PB112219.eps



GV2PC01

PB121221.eps



GV2P

PB112222.eps



GV3PC02

PB121226.eps



GV3P

Control + Isolation + Protection against Short circuits and Overloads

For OEM, 2 solutions according to the required current rating.
GV2PC + GV2P > up to 23 A (Ithe)
GV3PC + GV3P > up to 55 A (Ithe)The enclosure includes a rotary handle.
The GV2P or GV3P circuit breaker of the required rating must be ordered separately.

- Circuit isolation
- ON/OFF motor starters: 1-way rotation control of 3-phase motor
- Padlocking:
  - in ON or OFF position (GV2PC01, GV3PC01),
  - in OFF position (GV2PC02, GV3PC02).

Suitable circuit breakers:
- GV2P - 14 ratings (3P motors from 0.06 to 11 kW - 400/415 V AC)
- GV3P - 2 ratings (3P motors from 18.5 to 30 kW - 400/415 V AC).

Enclosures characteristics:
- Conforming to IEC 60947-2
- Degree of protection according IEC 60529: IP65, IK08 (for GV2PC), IK09 (for GV3PC)
- Ambient air temperature in operation -5 to +40°C
- Operational voltage (Ue) 690V
- Material: GV2PC polycarbonate (2), GV3PC steel sheet.

Included:
- GV rotary handle.

Enclosures fitted with padlockable rotary handle

Composition	Type	Reference	Overall dimensions (3) WxHxD
			mm
■ Insulating enclosure ■ Black handle, padlockable in ON/OFF position	Surface mounting For GV2L	**GV2PC01**	88x166x163
■ Insulating enclosure ■ Red handle on yellow background, padlockable in OFF position	Surface mounting For GV2L	**GV2PC02**	88x166x163
■ Metal enclosure ■ Black handle, padlocking in ON/OFF position ■ Circuit breaker/handle adapter	Surface mounting For GV3L	**GV3PC01**	200x300x200
■ Metal enclosure ■ Red handle, padlocking in OFF position ■ Circuit breaker/handle adapter	Surface mounting For GV3L	**GV3PC02**	200x300x200

GV2P, GV3P product references: add code to product reference (4)

Ithe (A)	**0.16**	**0.25**	**0.4**	**0.63**	**1**	**1.6**	**2.5**	**4**	**6.3**	**9**	**13**	**17**	**21**	**23**
GV2P codes	01	02	03	04	05	06	07	08	10	14	16	20	21	22
Ithe (A)	**35**	**41**	**55**											
GV3P codes	40	50	65											

(1) TeSys GV2, GV3 circuit breaker not included - characteristics: refer to chapter B6.
(2) Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).
(3) Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.
(4) Example: for Ithe 17 A, magnetic circuit breaker is GV2P20.

Dimensions: page A1/41
Schemes: page A1/41

TeSys GV2MC, GV2MP enclosed standard starters / DOL / to be completed with GV2ME (1) circuit breaker

Product references



GV2MC02, GV2MC03



GV2ME



GV2MP01, GV2MP02



GV2ME

Control + Isolation + Protection against Short circuits and Overloads

For OEM, 2 solutions, according to the enclosure installation mode:
GV2MC surface mounting enclosure for GV2ME circuit breaker
GV2MP flush mounting enclosure for GV2ME circuit breaker.
The GV2ME circuit breaker of the required rating must be ordered separately.

- Circuit isolation
- ON/OFF motor starters: 1-way rotation control of 3-phase motor
- Short-circuit and adjustable overload protection
- Padlocking in OFF position.

Suitable circuit breakers:
- GV2ME - 14 ratings (3P motors from 0.06 to 11 kW - 400/415 V AC).

Enclosures characteristics:
- Conforming to IEC 60947-2; IEC 60947-4-1
- Degree of protection according IEC 60529: refer to selection chart
- Operational voltage (Ue) 690 V
- Material: polycarbonate (2).

Included:
- GV2E01 or GV2E02 sealing kit (fixed on the front plate).

Enclosures for thermal-magnetic circuit breakers GV2 ME

Type	Degree of protection	Possible no. of side mounting auxiliary contact blocks on GV2ME		Reference	Weight	Overall dimensions (3) WxHxD
		LH side	RH side		kg	mm
Surface mounting, double insulated with protective conductor. Sealable cover	IP41	1	1	**GV2MC01**	0.290	93x147x84
	IP55	1	1	**GV2MC02**	0.300	93x147x84
				or **GV2MCK04** (4)	0.420	93x147x145.5
	IP55 for temperature < +5 °C	1	1	**GV2MC03**	0.300	93x147x84
Flush mounting, with protective conductor	IP41 (front face)	1	1	**GV2MP01**	0.115	106.5x140x83
	IP41 (front face reduced flush mounting)	–	1	**GV2MP03**	0.115	106.5x140x98
	IP55 (front face)	1	1	**GV2MP02**	0.130	106.5x140x83
	IP55 (front face reduced flush mounting)	–	1	**GV2MP04**	0.130	106.5x140x98

GV2ME product references: add code to product reference (5)

Ithe (A)	0.16	0.25	0.4	0.63	1	1.6	2.5	4	6.3	9	13	17	21	23
GV2ME codes	01	02	03	04	05	06	07	08	10	14	16	20	21	22

GV2MC, GV2MP enclosures with complementary circuit breaker and mushroom head pushbutton allow the construction of safety direct-on-line starters conforming INRS and VDE0113.
Surface and flush mounting enclosures, mushroom heads, circuit breakers and undervoltage release cover a large number of applications.

*(1) Characteristics of TeSys **GV2ME** circuit breakers and additives: refer to page A1/32.*
(2) Enclosure not suitable in atmosphere contaminated with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).
(3) Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light
*(4) Enclosure **GV2MCK04** is fitted with a **GV2K04** mushroom head Emergency stop pushbutton as standard.*
*(5) Example: for Ithe 17 A, magnetic circuit breaker is **GV2ME20.***

Enclosed starters

Dimensions: page A1/42
Schemes: page A1/43

TeSys LE4K, LE4D enclosed standard starters / DOL / to be completed with LR2K, LRD (1) overload relay

Product references

PB121460.eps



LE4K●●●●

+

PB121461.eps



LR2K●●

PB121463.eps



LE4D●●●●

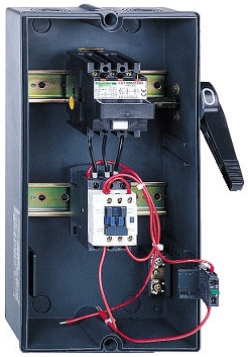
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PB121219.eps



LRD●●

PB121464.eps



LE4D●●●●

Control + Isolation + Protection against Short circuits and Overloads

■ ON/OFF motor starters: 1-way rotation control of 3-phase motor, by green & red pushbuttons
Option: no pushbutton on cover
■ Circuit disconnection by side black handle
■ Protection against short circuits by NFC fuses type aM (to be ordered separately)
■ Motor protection against overload – manual reset with the red pushbutton or remotely. Option: cover with just a “Reset” blue pushbutton.
An LR2K or LRD overload relay of the required rating must be ordered separately and wired at bottom of the contactor (1).

Ranges:
■ 8 partially pre-equipped enclosures to build-up 3P motor starters from 2.2 to 15 kW (6 to 35 A AC-3)
■ Choice of 5 coils for LE4K●●, 12 coils for LE4D●●, for control with different AC voltages.

Enclosures characteristics:
■ Conforming to IEC 60947-4-1 standard
■ Degree of protection according IEC 60529:
□ IP65, IK09 for LE4KIP65,
□ IK07 for LE4D,
■ Ambient air temperature in operation -5 to +40°C
■ Operating position: same that as contactors
■ Material: LE4K and LE4D polycarbonate (2).

Included:
■ 1 fuse carrier with external side handle
■ 1 pre-wired LC1K or LC1D contactor
■ 2 Harmony XB5 pushbuttons.

Direct-on-line starters

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3						Max. current I the up to	Fuses to be fitted by the customer		Basic reference, to be completed by adding the voltage code (3) (4)	Weight	Overall dimensions (5) WxHxD
220 V 230 V	380 V 400 V	415 V	440 V	500 V	660 V 690 V		Size	Type aM			
kW	kW	kW	kW	kW	kW	A		A		kg	mm
1.5	2.2	2.2	3	–	–	**6**	10 x 38	10	**LE4K065●●**	1.450	206x165x146
2.2	4	4	4	–	–	**9**	10 x 38	12	**LE4K095●●**	1.450	206x165x146
									or **LE4D09●●** (6)	1.960	217x348x175.5
2.2	4	4	4	5.5	–	**9**	10 x 38	12	**LE4D09●●**	1.960	217x348x175.5
3	5.5	5.5	5.5	7.5	–	**12**	10 x 38	16	**LE4D12●●**	1.960	217x348x175.5
4	7.5	9	9	10	–	**18**	10 x 38	20	**LE4D18●●**	2.200	217x348x175.5
5.5	11	11	11	15	–	**25**	10 x 38	25	**LE4D25●●**	2.200	217x348x175.5
7.5	15	15	15	18.5	18.5	**35**	14 x 51	32	**LE4D35●●**	5.190	217x348x175.5

Voltages code (4)												
Volts ~ 50/60 Hz	24	48	110	115	120	220	230	240	380	400	415	440
LE4D	B7	E7	F7	FE7	G7	M7	P7	U7	Q7	V7	N7	R7
LE4K	–	–	–	–	–	M7	P7	U7	Q7	V7	–	–

Supply voltages between 380 and 440 V (codes Q7, V7, N7 or R7): pre-wired control circuit between phases.
Other supply voltages: control circuit must be wired by the customer.

(1) TeSys LR2K, LRD overload relay selection: product references page A1/33, more details in chapter B11.
(2) Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons.
(3) LE4D●●● (with P7 and V7 coil) with no pushbutton on cover: add “A04” to product reference (example: LE4D25V7A04).
LE4D●●● (with P7 and V7 coil) with overload “Reset” blue pushbutton only on cover: > add “A05” to full product reference.
(4) Some combinations of variants / control voltage may not be available. Please consult us.
(5) Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light .
(6) Selection according to dimensions and the number of operating cycles, please consult your Regional Sales Office.

Dimensions: page A1/46
Schemes: page A1/47

TeSys LE2K, LE2D enclosed standard starters / Reverser / to be completed with LR2K, LRD (1) overload relay

Product references

PB121465.eps



LE2K09●●●

PB121461.eps



LR2K●●

PB112274.eps



LE2D12●●●

PB121219.eps



LRD●●

Reverse Control + Isolation + Protection against Overloads

■ ON/REVERSE/OFF motor starters: 2-way rotation control of 3-phase motor
□ by black I-II position spring return selector, red STOP/RESET pushbuttons for LE2K●● starters
□ by black ON ↑ , ON ↓ pushbuttons, red STOP/RESET pushbutton for LE2D●● starters
■ Motor protection against overload: manual reset with the red pushbutton or remotely.
An LR2K or LRD overload relay of the required rating must be ordered separately and wired at bottom of the contactor.

Ranges:
■ for 3P motors from 4 to 30 kW (9 to 65 A AC-3), in 11 ranges of reverser starters
■ Choice of up to 7 AC coils voltages (depending on starter) for control supply circuit.

Enclosures characteristics:
■ Conforming to IEC 60947-4-1 standard
■ Degree of protection according IEC 60529: IP65, IK07 for LED09●●●D35, IK09 for LE2K and LE●D40A●●●D65A,
■ Ambient air temperature in operation -5 to +40°C
■ Operating position: same that as contactors
■ Material: LE2K and LE●D09●●●D35 polycarbonate (2)
■ LE●D40A●●● D65A steel sheet.

Included:
■ 2 pre-wired LC1K or LC1D contactor
■ 3 Harmony XB5 pushbuttons - or -1 Harmony XB5 pushbutton + 1 Harmony XB5 switch.

Reversing starters

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3						Maximum current I the up to	Basic reference, to be completed by adding the voltage code (3)	Weight	Overall dimensions (4) WxHxD
220 V 230 V	380 V 400 V	415 V	440 V	500 V	660 V 690 V				
kW	kW	kW	kW	kW	kW	A		kg	
1.5	2.2	2.2	3	–	–	**6**	**LE2K065●●**	1.080	175x165x146
2.2	4	4	4	–	–	**9**	**LE2K095●●**	1.080	175x165x146
							LE2D09●● (5)	2.100	101x201x153.5
–	–	–	–	5.5	5.5	**9**	**LE2D09●●**	2.100	101x201x153.5
3	5.5	5.5	5.5	7.5	7.5	**12**	**LE2D12●●**	2.100	101x201x153.5
4	7.5	9	9	10	10	**18**	**LE2D18●●**	2.410	101x201x153.5
5.5	11	11	11	15	15	**25**	**LE2D25●●**	2.570	101x201x153.5
7.5	15	15	15	18.5	18.5	**35**	**LE2D35●●**	4.100	101x201x153.5
11	18.5	22	22	22	30	**40**	**LE2D40A●●**	5.270	200x300x174
15	22	25	30	30	33	**50**	**LE2D50A●●**	5.470	200x300x174
18.5	30	37	37	37	37	**65**	**LE2D65A●●**	5.470	200x300x174

Coil voltage codes (3)												
Volts ~ 50/60 Hz	**24**	**48**	**110**	**115**	**120**	**220**	**230**	**240**	**380**	**400**	**415**	**440**
LE2D40A to D65A	–	–	–	FE7	–	–	P7	–	Q7	–	–	–
LE2D09 to D35	B7	–	–	–	–	M7	P7	U7	Q7	V7	N7	–
LE2K	–	–	–	–	–	M7	P7	U7	Q7	V7	–	–

(1) TeSys LR2K, LRD overload relay selection: product references page A1/33, more details in chapter B11.
(2) Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons.
(3) Some combinations of variants / control voltage may not be available. Please consult us.
(4) Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.
(5) Selection according to dimensions and the number of operating cycles, please consult your Regional Sales Office.

Enclosed starters

Dimensions: page A1/44
Schemes: page A1/45

TeSys LE8K, LE8D enclosed standard starters / DOL / to be completed with LR2K, LRD (1) overload relay

Product references

PB121466.eps



LE8K●●●●

PB121461.eps



LR2K●●

PB112301.eps



LE8D●●●●

PB121219.eps



LRD●●

Reverse Control + Isolation + Protection against Short circuits and Overloads

■ ON/REVERSE/OFF motor starters: 2-way rotation control of 3-phase motor
□ LE8K●●starters, by white ↑, black ↓, red Stop/Reset pushbuttons
□ LE8D●● starters, by black I-II position spring return selector, red Stop/Reset pushbutton
□ Option: no pushbutton on cover
■ Circuit disconnection by side black handle
■ Protection against short circuits by NFC fuses type aM (to be ordered separately)
■ Motor protection against overload: manual reset with the red pushbutton or remotely. LE8D option: cover with just a "Reset" blue pushbutton.
An LR2K or LRD overload relay of the required rating must be ordered separately and wired at bottom of a the contactor.

Ranges:
■ 8 partially pre-equipped enclosures to build-up 3P motor reversers from 2.2 to 15 kW (6 to 35 A AC-3)
■ Choice of 3 coils for control with different AC voltages.

Enclosures characteristics:
■ Conforming to IEC 60947-4-1 standard
■ Degree of protection according IEC 60529: IP65, IK09 for LE8KIP65, IK07 for LE8D
■ Ambient air temperature in operation -5 to +40°C
■ Operating position: same that as contactors
■ Material: LE8K and LE8D09●●●D35 polycarbonate (2).

Included:
■ 1 fuse carrier with external side handle
■ 2 pre-wired LC1K or LC1D contactors
■ 3 Harmony XB5 pushbuttons - or -1 Harmony XB5 pushbutton + 1 Harmony XB5 switch.

PB121467.eps



LE8D●●●●

Reversing starters

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3						Maximum current I the up to	Fuses to be fitted by the customer			Basic reference, to be completed by adding the voltage code (3) (4)	Weight	Overall dimensions (5) WxHxD
220 V 230 V	380 V 400 V	415 V	440 V	500 V	660 V 690 V		Size	Type aM				
kW	kW	kW	kW	kW	kW	A		A			kg	
1.5	2.2	2.2	3	–	–	**6**	10 x 38	10		**LE8K065●●**	1.600	206x165x146
2.2	4	4	4	–	–	**9**	10 x 38	12		**LE8K095●●**	1.600	206x165x146
									or	**LE8D09●●** (6)	3.550	217x348x182
–	–	–	–	5.5	–	**9**	10 x 38	12		**LE8D09●●**	3.550	217x348x182
3	5.5	5.5	5.5	7.5	–	**12**	10 x 38	16		**LE8D12●●**	3.550	217x348x182
4	7.5	9	9	10	–	**18**	10 x 38	20		**LE8D18●●**	3.700	217x348x182
5.5	11	11	11	15	–	**25**	10 x 38	25		**LE8D25●●**	4.670	217x348x182
7.5	15	15	15	18.5	18.5	**35**	14 x 51	32		**LE8D35●●**	5.800	217x348x182

Voltage codes (4)												
Volts ∼ 50/60 Hz	**24**	**48**	**110**	**115**	**120**	**220**	**230**	**240**	**380**	**400**	**415**	**440**
LE8 K, LE8 D	–	–	–	–	–	–	P7	–	Q7	V7	–	–

(1) TeSys LR2K, LRD overload relay selection: product references page A1/33, more details in chapter B11.
(2) Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons.
(3) LE8K●●●●●, LE8D●●●● (with P7 and V7 coil) with no pushbutton on cover: add "A04" to product reference (example: LE8K095P7A04, LE8D25V7A04) LE4D●●●● (with P7 and V7 coil) with only one pushbutton on cover: overload "Reset" blue pushbutton > add "A05"to full product reference.
(4) Some combinations of variants / control voltage may not be available. Please consult us.
(5) Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.
(6) Selection according to dimensions and the number of operating cycles, please consult your Regional Sales Office.

Dimensions: page A1/46
Schemes: page A1/47

Life Is On Schneider Electric

TeSys LE3D enclosed standard starters / Star-delta / to be completed with LRD (1) overload relay

Product references

105552_SE.eps



LE3D

+

PB121219.eps



LRD●●

PB121468.eps



LE3D

Star-delta Control + Protection against Overload

■ Star-delta starting of 3-phase motor: ON by green pushbutton, OFF by red pushbutton. Option: no pushbutton on cover
□ Maximum operating rate: 30 starts/hour.
□ Maximum starting time: 30 seconds.
□ Delay of 40 ms ±15 ms at changeover by LAD S2 timer on delta contactor to provide sufficient time for star contactor to break.
■ Motor protection against overload: manual reset with the red pushbutton or remotely.
An LRD overload relay of the required rating must be ordered separately and wired at bottom of the contactor.

Range:
■ 4 partially pre-equipped enclosures to build-up 3P motor starters from 7.5 to 30 kW. Choice of 7 coils for control with different AC voltages.

Enclosures characteristics:
■ Conforming to IEC 60947-4-1 standard
■ Degree of protection according IEC 60529: IP65, IK07
■ Ambient air temperature in operation -5 to +40°C
■ Operating position: same that as contactors
■ Material: polycarbonate (2).

Included:
■ 3 pre-wired LC1D contactors
■ 2 Harmony XB5 pushbuttons.

Star-delta starters

Standard power ratings of squirrel cage motors Mains voltage - delta connection				Basic reference, to be completed by adding the voltage code (3) (4)	Weight	Overall dimensions (5) WxHxD
220 V	380/400 V	415 V	440 V			
kW	kW	kW	kW		kg	
4	7.5	7.5	7.5	**LE3D09●●**	3.650	186x348x175.5
5.5	11	11	11	**LE3D12●●**	3.650	186x348x175.5
11	18.5	22	22	**LE3D18●●**	3.750	186x348x175.5
15	30	30	30	**LE3D35●●**	5.160	186x348x175.5

Voltage codes (4)							
Volts ∼ 50/60 Hz	**24**	**220**	**230**	**240**	**380**	**400**	**415**
LE3 D	B7	M7	P7	U7	Q7	V7	N7

(1) TeSys LRD overload relay selection: product references page A1/33, more details in chapter B11 - Select appropriate overload relay for setting at 0.58 of the full load rated motor current.
(2) Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).
*(3) LE3D●●●● (with P7 and V7 coil) with no pushbutton on cover: add "**A04**"to product reference (example: LE3D18P7A04).*
(4) Some combinations of variants / control voltage may not be available. Please consult us.
(5) Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.

Enclosed starters

Dimensions: page A1/48
Schemes: page A1/48

TeSys LE6D enclosed standard starters / Star-delta / to be completed with LRD (1) overload relay

Product references

PB121469.eps



LE6D●●●●

PB121219.eps



LRD●●

Star-delta Control + Disconnection + Protection against Short circuits and Overloads

■ Star-delta starting of 3-phase motor: ON by green pushbutton, OFF by red pushbutton. Options: no pushbutton, “Reset” pushbutton only
□ Maximum operating rate: 30 starts/hour.
□ Maximum starting time: 30 seconds.
□ Delay of 40 ms ±15 ms at changeover by LAD S2 timer on delta contactor to provide sufficient time for star contactor to break.
■ Circuit disconnection by side black handle
■ Protection against short circuits by NFC fuses type aM (to be ordered separately)
■ Motor protection against overload: manual reset with the red pushbutton or remotely.
An LRD overload relay of the required rating must be ordered separately and wired at bottom of the contactor.

Range:
■ 4 partially pre-equipped enclosures to build-up 3P motor starters from 7.5 to 30 kW choice of 7 coils for control with different AC voltages.

Enclosures characteristics:
■ Conforming to IEC 60947-4-1 standard
■ Degree of protection according IEC 60529: IP65, IK07
■ Ambient air temperature in operation -5 to +40°C
■ Operating position: same that as contactors
■ Material: polycarbonate (2).

Included:
■ 1 fuse carrier with external side handle
■ 3 pre-wired LC1D contactors
■ 2 Harmony XB5 pushbuttons.

Star-delta starters

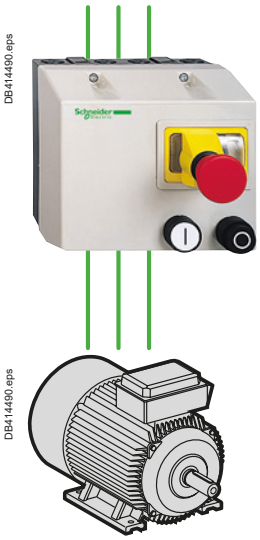
Standard power ratings of squirrel cage motors Mains voltage - delta connection				Fuses to be fitted by the customer		Basic reference, to be completed by adding the voltage code (3)	Weight	Overall dimensions (4) WxHxD
220 V	380/400 V	415 V	440 V	Size	Type aM			
kW	kW	kW	kW				kg	
4	7.5	7.5	7.5	10 x 38	20	**LE6D09●●**	3.900	217x348x175.5
5.5	11	11	11	10 x 38	25	**LE6D12●●**	3.900	217x348x175.5
11	18.5	22	22	14 x 51	40	**LE6D18●●**	4.850	217x348x175.5

Voltage codes			
Volts ~ 50/60 Hz	**24**	**230**	**400**
LE6 D	B7	P7	V7

(1) TeSys LRD overload relay selection: product references page A1/33, more details in chapter B11 - Select appropriate overload relay for setting at 0.58 of the full load rated motor current.
(2) Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).
(3) Some combinations of variants / control voltage may not be available. Please consult us.
(4) Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.

Dimensions: page A1/40
Schemes: page A1/40

Introduction & selection table



Range of pre-assembled safety motor starters, with mushroom pushbuttons, protection and control components in a robust casing

They can be fixed on a wall, on a panel, or on the chassis of a machine. They provide the operator with safety machine controls complying with IEC 60204-1.

With numerous advantages to meet OEM's most common needs

- IEC
- Multiple ratings and sizes
- IP55
- IK07
- Pre-wired

Safety starters

They provide similar functions as standard starters but also include emergency stops to comply with IEC 60204-1 machine safety standards.

Selection in 2 steps

1 Identify your need (on a single line) in the **Selection criteria** area (example: Load 5 kW – Visible circuit isolation, ON/OFF control with short circuit / overload protection)

2 Choose your **Solutions** by adding column contents, note the radical of the product references (example: LG1D)

Selection criteria							Solutions						
Load Power (kW) / 400 V supply	Direct starter ON/OFF	Reverser ON/REVERSE/OFF	Short circuit / overload protection	Power circuit isolation	Visible isolation by rotary switch	Isolated control circuit by transfo							See page
0.06...4	●		●	●			LG7K						A1/18
4 ... 9							LG7D						A1/18
0.06... 4	●		●	●	●			LG1K					A1/19
4... 9								LG1D					A1/19
0.06... 4	●		●	●		●			LJ7K				A1/20
0.06... 5.5		●	●	●						LG8K			A1/21
0.06 ... 4		●	●	●		●					LJ8K		A1/22
0.06 ... 15	●		●	●								GV2MCK04 GV2ME GV2AX	A1/23

PB121470.eps



LG7K06

PB111886.eps



LG7K09, LG7D●●

For Control + Isolation + Short circuit / Overload Protection

Enclosed safety motor starters complying with IEC 60204-1 “Safety of machinery” standards.

- ON/OFF motor starters: 1-way rotation control of 3-phase motor
- Emergency stop
- Electrical circuit isolation, lockable (from LG7K09) with up to 3 padlocks
- Short circuit protection
- Overload protection
- Undervoltage protection (LG7K06: with additional undervoltage release module).

Switching back on power supply after tripping must be a deliberate action.

Range:
- 12 pre-equipped enclosed safety starters from 0.06 to 9 kW.

Enclosures characteristics:
- Conforming to IEC 60947-1, IEC 60204-1
- Degree of protection according IEC 60529: IP55, IK07
- Ambient air temperature in operation -5 to +40°C
- Operational voltage (Ue) 690 V
- Operating position: same that as contactors
- Material: polycarbonate (1).

Included:
- 1 GV2ME thermal magnetic circuit breaker (with mushroom emergency stop with LG7K06) (2)
- 1 LC1K or LC1D pre-wired contactor
- 1 Harmony emergency stop pushbutton (from LG7K09)
- 2 Harmony XB5 pushbuttons.
- 1 GVAX undervoltage release module (from LG7K09).

Additional GVAX●● undervoltage release module for LG7K06 – to be ordered separately.
Additional GV2SN●● Indicator light – to be ordered separately.

Non-reversing starters (with pushbutton control of isolation)

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3			Circuit breaker	Dust & damp protected starter	Weight	Overall dimensions (4) WxHxD
220/ 230 V	400/ 415 V	440 V	Setting range of thermal trips	Basic reference, to be completed by adding the voltage code (3)		
kW	kW	kW	A		kg	
–	0.06	0.06	0.16…0.25	**LG7K06●●02**	1.300	175x165x177
0.06	0.09	0.12	0.25…0.40	**LG7K06●●03**	1.300	175x165x177
–	0.18	0.18	0.40…0.63	**LG7K06●●04**	1.300	175x165x177
0.12	0.25	0.37	0.63…1	**LG7K06●●05**	1.300	175x165x177
0.25	0.55	0.55	1…1.6	**LG7K06●●06**	1.300	175x165x177
0.37	0.75	1.1	1.6…2.5	**LG7K06●●07**	1.300	175x165x177
0.75	1.5	1.5	2.5…4	**LG7K06●●08**	1.300	175x165x177
1.1	2.2	3	4…6.3	**LG7K06●●10**	1.300	175x165x177
1.5	4	4	6…10	**LG7K09●●14**	1.450	175x165x177
3	5.5	5.5	9…14	**LG7D12●●16**	1.600	175x165x177
4	7.5	9	13…18	**LG7D18●●20**	1.630	175x165x177
4	9	9	17…23	**LG7D18●●21**	1.630	175x165x177

Voltage codes (3)						
Volts ∼ 50/60 Hz	24	220/ 230	230	380/ 400	400	400/415 for LG7K)
LG7K, LG7D	B7	M7	P7	Q7	V7	N7

(1) Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).
*(2) **LG7K09, D12, D18:** the Emergency Stop function is performed by an undervoltage trip module acting on the circuit breaker. This circuit breaker is always pre-wired for use on 380/400/415 V 50 Hz supply.*
For a 60 Hz supply, please consult your Regional Sales Office.
(3) Some combinations of variants / control voltage may not be available. Please consult us.
(4) Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.

Dimensions: page A1/50
Schemes: page A1/51

PB111894.eps



LG1K065

For Control + Visible Isolation + Short circuit / Overload Protection

Enclosed safety motor starters complying with IEC 60204-1 “Safety of machinery” standards.

- ON/OFF motor starters: 1-way rotation control of 3-phase motor
- Emergency stop
- Electrical circuit isolation, lockable with up to 3 padlocks
- Short circuit protection
- Overload protection
- Undervoltage protection (with additional undervoltage release module).

Switching back on power supply after tripping must be a deliberate action.

Range:
- 12 pre-equipped enclosed safety starters from 0.06 to 9 kW.

Enclosures characteristics:
- Conforming to IEC 60947-1, IEC 60204-1
- Degree of protection according IEC 60529 : IP55, IK07
- Ambient air temperature in operation -5 to + 40°C
- Operational voltage (Ue) 690 V
- Operating position: same that as contactors
- Material: polycarbonate (1)
- Enclosure cannot be opened when energized in position “I”.

Included:
- 1 GV2ME thermal magnetic circuit breaker
- 1 LC1K (LG1K starters) or LC1D (LG1D starters) pre-wired contactor
- Switch with rotary red/yellow handle for isolation and emergency
- 2 Harmony XB5 pushbuttons.

Additional GVAX●● undervoltage release module – to be ordered separately.
Additional GV2SN●● indicator light – to be ordered separately.

Non-reversing starters (with rotary operator for control of isolation)
Enclosure cannot be opened when energised in position “I”.

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3			Circuit breaker Setting range of thermal trips	Dust & damp protected starter Basic reference, to be completed by adding the voltage code (2)	Weight	Overall dimensions (3) WxHxD
220/ 230 V	400/ 415 V	440 V				
kW	kW	kW	A		kg	
–	0.06	0.06	0.16…0.25	**LG1K065●●02**	0.970	175x165x165
0.06	0.09	0.12	0.25…0.40	**LG1K065●●03**	0.970	175x165x165
–	0.18	0.18	0.40…0.63	**LG1K065●●04**	0.970	175x165x165
0.12	0.25	0.25	0.63…1	**LG1K065●●05**	0.970	175x165x165
0.25	0.55	0.55	1…1.6	**LG1K065●●06**	0.970	175x165x165
0.37	0.75	1.1	1.6…2.5	**LG1K065●●07**	0.970	175x165x165
0.75	1.5	1.5	2.5…4	**LG1K065●●08**	0.970	175x165x165
1.1	2.2	3	4…6.3	**LG1K065●●10**	0.970	175x165x165
1.5	4	4	6…10	**LG1K095●●14**	1.120	175x165x165
3	5.5	5.5	9…14	**LG1D122●●16**	1.270	175x165x165
4	7.5	9	13…18	**LG1D182●●20**	1.290	175x165x165
4	9	9	17…23	**LG1D182●●21**	1.290	175x165x165

Voltage codes (2)					
Volts ∼ 50/60 Hz	220/ 230	230	380/ 400	400	400/415 (for LG1K)
LG1K, LG1D	M7	P7	Q7	V7	N7

(1) Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).
(2) Some combinations of variants / control voltage may not be available. Please consult us.
(3) Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.

Dimensions: page A1/50
Schemes: page A1/51

PB111880.eps



LJ7K06

For Control + Isolation + Short circuit / Overload Protection, with isolated 24 V control circuit

Enclosed safety motor starters complying with IEC 60204-1 “Safety of machinery” standards.

- ON/OFF motor starters: 1-way rotation control of 3-phase motor
- Emergency stop (1)
- Electrical circuit isolation, lockable on LJ7K09 with up to 3 padlocks
- Short circuit protection
- Overload protection
- Protection against voltage drops for LJ7K09● For LJ7K06, a GVAX●● undervoltage trip may be added
- Possible signaling with GV2SN●● indicator (to be ordered separately). Switching back on power supply after tripping must be a deliberate action.

Range:
- 9 pre-equipped enclosed safety starters from 0.06 to 4 kW.

Enclosures characteristics:
- Conforming to IEC 60947-1, IEC 60204-1
- Degree of protection according IEC 60529: IP55, IK07
- Ambient air temperature in operation -5 to +40°C
- Operational voltage (Ue) 690 V
- Operating position: same that as contactors
- Material: polycarbonate (2).

Included:
- 1 GV2ME thermal magnetic circuit breaker with mushroom emergency stop (release on ¼ turn),
- 1 LC1K pre-wired contactor
- 2 Harmony XB5 pushbuttons
- 1 Integral transformer: 400/24 V, 25 VA
- 1 GVAX undervoltage release module (with LJ7K09).

Additional GVAX●● undervoltage release module for LJ7K06 - to be ordered separately.
Additional GV2SN●● indicator light – to be ordered separately.
- Terminal allowing the connection of a volt-free contact, if required, in the control circuit.

Non-reversing motor starters with integral transformer, pre-wired for operation on a 3-phase 380 to 400 V 50 Hz supply (with pushbutton control of isolator function)

Standard power ratings of 3-phase motors 50 Hz in category AC-3	Circuit breaker	Dust and damp protected starter	Weight	Overall dimensions (5) WxHxD
380/400 V	Setting range of thermal trips	Reference (3) (4)		
kW	A		kg	
0.06	0.16…0.25	**LJ7K06Q702**	2.270	175x165x177
0.09	0.25…0.40	**LJ7K06Q703**	2.270	175x165x177
0.18	0.40…0.63	**LJ7K06Q704**	2.270	175x165x177
0.25	0.63…1	**LJ7K06Q705**	2.270	175x165x177
0.55	1…1.6	**LJ7K06Q706**	2.270	175x165x177
0.75	1.6…2.5	**LJ7K06Q707**	2.270	175x165x177
1.5	2.5…4	**LJ7K06Q708**	2.270	175x165x177
2.2	4…6.3	**LJ7K06Q710**	2.270	175x165x177
4	6…10	**LJ7K09Q714**	2.270	175x165x146

(1) **LJ7K06***: the mushroom head type Emergency Stop acts mechanically on the circuit breaker.*
LJ7K09*: the Emergency Stop function is performed by an undervoltage trip* **GVAX385***, acting on the circuit breaker. This circuit breaker is always supplied pre-wired for use on 380/400 V 50 Hz.*

(2) Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

(3) In the reference, the voltage code **Q7 (380/400 V) indicates the power supply voltage** *to which the starter will be connected, it being assumed that the contactor has a ∼ 24 V coil (see control circuit scheme).*

(4) Some combinations of variants / control voltage may not be available. Please consult us.

(5) Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.

(6) Example: **LJ7K06Q705A04***.*

(7) Delete the last 2 digits of the selected starter reference. Example: **LJ7K06Q705** *becomes* **LJ7K06Q7***.*

(8) Circuit breaker to be ordered separately. References GV2ME: see chapter B6 “Circuit breakers”.

Variants (pre-assembled) (4)

Description	Variants available for starter	Suffix to be added to the starter reference (6)
With Emergency Stop No control pushbuttons	LJ7K06Q705...K09Q714	**A04**
With padlocking facility (fitted as standard on LJ7 K09)	LJ7K06Q705...K06Q710	**A29**
Without circuit breaker (8) (or undervoltage release voltage)	LJ7	(7)
Without circuit breaker (8) With Emergency Stop No control pushbuttons	LJ7K09Q7	**A04**
Without circuit breaker (8) Without Emergency Stop (if the emergency stop is on the machine)	LJ7K09Q7	**A39**
Without circuit breaker (8) Without Emergency Stop No control pushbuttons	LJ7K09Q7	**A04A39**

Dimensions:
page A1/52

Schemes:
page A1/53

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LG8K06

PB111699.eps



LG8K09

For Control + Isolation + Short circuit / Overload Protection

For OEM, the enclosed safety motor reverser starters comply with IEC 60204-1 “Safety of machinery” standards.

- ON/REVERSE/OFF motor starters: 2-way rotation control of 3-phase motor
- Emergency stop (1)
- Electrical circuit isolation, lockable on LG8K09 and LG8K12 with up to 3 padlocks
- Short circuit protection (switching back on power supply after tripping must be a deliberate action)
- Overload protection
- Protection against voltage drops for LG8K09, LG8K12. For LG8K06, a GVAX●● undervoltage trip may be added.
- Possible signaling with GV2SN●● indicator (to be ordered separately).

Range:
- 10 pre-equipped enclosed safety inverter starters from 0.06 to 5.5 kW.

Enclosures characteristics:
- Conforming to IEC 60947-1, IEC 60204-1 (1)
- Degree of protection according IEC 60529: IP55, IK07
- Ambient air temperature in operation -5 to +40°C
- Operational voltage (Ue) 690 V
- Operating position: same that as contactors
- Material: polycarbonate (2) .

Included:
- 2 LC1K prewired contactors
- 1 GV2ME thermal magnetic circuit breaker with mushroom emergency stop (release on ¼ turn)
- 1 “Stop” black pushbutton + 1 2-position spring return selector switch “I – II”
- 1 GVAX undervoltage release module with LG8K09, LG8K12 (to be ordered separately for LG8K06).

Reversing starters (with pushbutton control of isolation)

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3			Circuit breaker	Dust & damp protected starter	Weight	Overall dimensions (4)
220/ 230 V	400/ 415 V	440 V	Setting range of thermal trips	Basic reference, to be completed by adding the voltage code (3)		WxHxD
kW	kW	kW	A		kg	
–	0.06	0.06	0.16…0.25	**LG8K06●●02**	1.640	175x165x177
0.06	0.09	0.12	0.25…0.40	**LG8K06●●03**	1.640	175x165x177
–	0.18	0.18	0.40…0.63	**LG8K06●●04**	1.640	175x165x177
0.12	0.25	0.25	0.63…1	**LG8K06●●05**	1.640	175x165x177
0.25	0.55	0.55	1…1.6	**LG8K06●●06**	1.640	175x165x177
0.37	0.75	1.1	1.6…2.5	**LG8K06●●07**	1.640	175x165x177
0.75	1.5	1.5	2.5…4	**LG8K06●●08**	1.640	175x165x177
1.1	2.2	3	4…6.3	**LG8K06●●10**	1.640	175x165x177
1.5	4	4	6…10	**LG8K09●●14**	1.640	175x165x177
3	5.5	5.5	9…14	**LG8K12●●16**	1.640	175x165x177

Voltage codes (3)			
Volts ∼ 50/60 Hz	220/ 230	380/ 400	400/ 415
	M7	Q7	N7

(1) **LG8K06***: the mushroom head type Emergency Stop acts mechanically on the circuit breaker.*
LG8K09, LG8K12*: the Emergency Stop function is performed by an undervoltage trip, acting on the circuit breaker.*
This circuit breaker is always supplied pre-wired for use on 380/400/415 V 50 Hz.
For a 60 Hz supply, please consult your Regional Sales Office.
(2) Avoid allowing the material to come into contact with strong bases (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).
(3) Some combinations of variants / control voltage may not be available. Please consult us.
(4) Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.

Dimensions:
page A1/50
Schemes:
page A1/51

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LJ8K06

PB111899.eps



LJ8K09

For Control + Isolation + Short circuit /Overload Protection, with isolated 24 V control circuit

For OEM, the enclosed safety motor reverser starters comply with IEC 60204-1 “Safety of machinery” standards.

- ON/REVERSE/OFF motor starters: 2-way rotation control of 3-phase motor
- Emergency stop (1)
- Electrical circuit isolation, lockable on LJ8K09 with up to 3 padlocks
- Short circuit protection (switching back on power supply after tripping must be a deliberate action)
- Overload protection
- Protection against voltage drops for LJ8K09. For LJ8K06, a GVAX●● undervoltage trip may be added
- Possible signaling with GV2SN●● indicator (to be ordered separately).

Range:
- 9 pre-equipped enclosed safety inverter starters from 0.06 to 4 kW.

Enclosures characteristics:
- Conforming to IEC 60947-1, IEC 60204-1
- Degree of protection according IEC 60529: IP55, IK07
- Ambient air temperature in operation -5 to +40°C
- Operational voltage (Ue) 690 V
- Operating position: same that as contactors
- Material: polycarbonate (2).

Included:
- 2 LC1K prewired contactors
- 1 GV2ME thermal magnetic circuit breaker with mushroom emergency stop (release on ¼ turn)
- 1 Integral transformer: 400/24 V, 25 VA
- 1 “Stop” black pushbutton + 1 2-position spring return selector switch “I – II”
- 1 GVAX undervoltage release module with LJ8K09 (to be ordered separately for LJ8K06).
- Terminal allowing the connection of a volt-free contact, if required, in the control circuit.

Reversing motor starters with integral transformer, pre-wired for operation on a 3-phase 380 to 400 V 50 Hz supply (with pushbutton control of isolator function)

Standard power ratings of 3-phase motors 50 Hz in category AC-3	Circuit breaker	Dust and damp protected starter	Weight	Overall dimensions (5)
	Setting range of thermal trips	Reference (3) (4)		WxHxD
380/400 V				
kW	A		kg	
0.06	0.16…0.25	**LJ8K06Q702**	2.650	175x165x177
0.09	0.25…0.40	**LJ8K06Q703**	2.650	175x165x177
0.18	0.40…0.63	**LJ8K06Q704**	2.650	175x165x177
0.25	0.63…1	**LJ8K06Q705**	2.650	175x165x177
0.55	1…1.6	**LJ8K06Q706**	2.650	175x165x177
0.75	1.6…2.5	**LJ8K06Q707**	2.650	175x165x177
1.5	2.5…4	**LJ8K06Q708**	2.650	175x165x177
2.2	4…6.3	**LJ8K06Q710**	2.650	175x165x177
4	6…10	**LJ8K09Q714**	2.650	175x165x146

Variants (pre-assembled) (4)

Description	Variants available for starter	Suffix to be added to the starter reference
Without circuit breaker (7) (or undervoltage release voltage)	LJ8	(6)

(1) **LJ8 K06***: the mushroom head type Emergency Stop acts mechanically on the circuit breaker.* **LJ8K09***: the Emergency Stop function is performed by an undervoltage trip* **GVAX385***, acting on the circuit breaker. This circuit breaker is always supplied pre-wired for use on 380/400 V 50 Hz.*
(2) Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).
(3) In the reference, the voltage code **Q7 (380/400 V) indicates the power supply voltage** *to which the starter will be connected, it being assumed that the contactor has a ∼ 24 V coil (see control circuit scheme).*
(4) Some combinations of variants / control voltage may not be available. Please consult us.
(5) Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.
(6) Delete the last 2 digits of the selected starter reference. Example: **LJ8K06Q702** *becomes* **LJ8K06Q7**.
(7) Circuit breaker to be ordered separately. References GV2ME: see chapter B6 “Circuit breakers”.

Dimensions: page A1/52
Schemes: page A1/53

TeSys GV2MCK04 enclosure for safety starters / DOL / to be completed with GV2ME, GVAX

Product references



GV2MCK04



GV2ME●●



GVAX●●●

GV2MCK04 enclosure is fitted with a mushroom pushbutton.
It allows, with addition of a circuit breaker and undervoltage trip, the construction of a safety direct-on-line starter conforming INRS and VDE0113.

Enclosures characteristics:
- Conforming to IEC 60947-2; IEC 60947-4-1
- Degree of protection according IEC 60529: refer to selection chart
- Operational voltage (Ue) 690 V
- Material : polycarbonate (1).

Enclosure

Enclosure for thermal-magnetic circuit breakers GV2ME

Type	Degree of protection	Possible no. of side mounting auxiliary contact blocks on GV2ME		Reference	Weight	Overall dimensions WxHxD
		LH side	RH side		kg	
Surface mounting, double insulated with protective conductor. Sealable cover	IP55	1	1	**GV2MCK04**	0.420	93x147x145.5

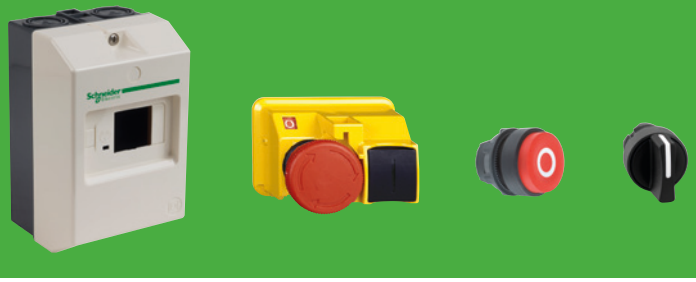
GV2ME circuit beaker, GVAX undervoltage trip
Product references: page A1/32.

(1) Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

Dimensions: page A1/42
Schemes: page A1/43

TeSys

Enclosures, components, for customer assemblies Spare parts



Product references

PB121229.eps



VCFXGE4

PB121230.eps



VBFXGE2

Empty enclosures with rotary handle

IP65 enclosure with red padlockable handle operator and yellow front plate
(for mounting a main or Emergency Stop switch-disconnector)

Ithe	For switch body	Nb. of possible add. module attachments	Reference (1)	Weight
A	A			kg
10…32	VN12, VN20 V02…V2	2	**VCFXGE1**	0.340
10…32	V02…V2	4	**VCFXGE4**	0.660
50…63	V3 - V4	3	**VCFXGE2**	0.660
100.... 140	V5 - V6	1	**VCFXGE6**	1.04

IP65 enclosure with black padlockable handle and black front plate
(for mounting a main switch-disconnector)

10…32	VN12, VN20 V02…V2	2	**VBFXGE1**	0.340
10…32	V02…V2	4	**VBFXGE4**	0.660
50…63	V3-V4	3	**VBFXGE2**	0.660
100.... 140	V5 - V6	1	**VBFXGE6**	1.04

Switch bodies to fit VCFX, VBFX enclosures (2)

Standard applications

Description	Rating	Reference	Weight
	A		kg
3-pole switch-disconnectors	10	**VN12**	0.110
	16	**VN20**	0.110

High performance applications

Description	Rating	Reference	Weight
	A		kg
3-pole switch-disconnectors	10	**V02**	0.200
	16	**V01**	0.200
	20	**V0**	0.200
	25	**V1**	0.200
	32	**V2**	0.200
	50	**V3**	0.500
	80	**V4**	0.500
	125	**V5**	0.900
	175	**V6**	0.900

PB121231.eps



V0

PB121232.eps



V4

(1) Enclosure not suitable in atmosphere contaminated with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).
(2) For characteristics of switch-disconnectors, please consult your Regional Sales Office.

Dimensions:
page A1/36

Schemes:
page A1/37

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TeSys LE1GVMEK enclosures for DOL starters / To be completed with GV2ME, LC1K

Product references

PB112286.eps



LE1GVMEK, LE1GVMEKA59

Empty enclosures with sealing device

Composition	Reference
Insulating enclosure with GV2E01 sealing device	**LE1GVMEK**
Insulating enclosure with GV2E01 sealing device, neutral terminal	**LE1GVMEKA59**

Direct-on-line starters characteristics

(based on LE1GVMEK enclosure + GV2ME circuit breaker + LC1K contactor assemblies)

Functions / range / specificities:
- ■ Circuit Isolation
- ■ Protection against short circuit
- ■ Motor protection: motor OFF in case of overload – manual reset with the black pushbutton.
- ■ ON/OFF motor control
- ■ Functions can be completed with optional components: remote control, signaling.

Enclosures characteristics:
- ■ Conforming to IEC 60947-4-1 standard
- ■ Degree of protection IP55 , according IEC 60529
- ■ Ambient air temperature in operation -5 to +40°C
- ■ Operating position: same as TeSys K series contactors
- ■ Material: polycarbonate (1).

■ 6 ratings of direct-on-line starters from 0.37 to 5.5 kW (400 V AC) can be realized, based the combinations of circuit breaker + contactor to be ordered separately:
- □ GV2ME thermal magnetic circuit breaker, of the required rating (see below)
- □ LC1K contactor, of the required rating (see below)
- □ optional accessories (indicating light, On pushbutton, sealing kit…).

Circuit breakers + contactors - Type 1 coordination (2)

Standard power ratings of 3-phase motors 50/60 Hz in AC-3			Setting range of thermal trips	Fixed magnetic current 13 Irth	For customer assembly	
400/ 415 V	440 V	500 V			Motor circuit breaker Reference	Contactor Reference to be completed with the coil voltage code
kW	kW	kW	A	A		
0.37 0.55 -	0.37 0.55 -	0.37 0.55 0.75	1...1.6	22.5	**GV2ME06**	**LC1K0610●●**
0.75 -	0.75 1.1	- 1.1	1.6...2.5	33.5	**GV2ME07**	**LC1K0610●●**
1.1 1.5	- 1.5	1.5 2.2	2.5...4	51	**GV2ME08**	**LC1K0610●●**
2.2 -	2.2 3	- 3	4...6.3	78	**GV2ME10**	**LC1K0610●●**
3 4	- 4	4 5.5	6...10	138	**GV2ME14**	**LC1K0910●●**
5.5	5.5	7.5	9...14	170	**GV2ME16**	**LC1K1210●●**

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GV2ME●●

106151_SE.eps



LC1K0610●●

Coil voltage codes

Volts	24	110	220/230	230	230/240	380/400
∿ 50/60 Hz	B7	F7	M7	P7	U7	Q7
⎓	BW3	-	-	-	-	-

BW3 coil: low consumption (1.5 W), wide range (0.7...1.3 Uc) with integral suppression device as standard.

(1) Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).
(2) Extract from Coordination tables see chapter A6.

Dimensions: page A1/49
Schemes: page A1/49

TeSys DE1DS empty enclosures for standard starters

Product references

PB112264.eps



DE1DS1A04

PB112269.eps



DE1DS1A05

PB112259.eps



DE1DS1

PB112275.eps



DE1DS1A13

Empty enclosures for starters without isolating device

Head(s) mounted on cover	Designed for use with	Reference
Without	LE1D09 and D12	**DE1DS1A04**
	LE1D18...D35	**DE1DS2A04**
	LE2D09...D35	**DE1DS2A04**
1 flush blue head “R”	LE1D09 and D12	**DE1DS1A05**
	LE1D18...D35	**DE1DS2A05**
	LE2D09...D35	**DE1DS2A05**
1 flush green head “I” 1 projecting red head “O”	LE1D09 and D12	**DE1DS1**
	LE1D18...D35	**DE1DS2**
1 flush blue head “R” 1 switch with 3 fixed positions	LE1D18...D35	**DE1DS2A09**
1 flush blue head “R” 1 switch with 2 fixed positions	LE1D09 and D12	**DE1DS1A13**
	LE1D18...D35	**DE1DS2A13**

Dimensions:
page A1/44

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Product references

PB111891.eps



DE1KS217A06

PB111886.eps



DE1KS217A06A37

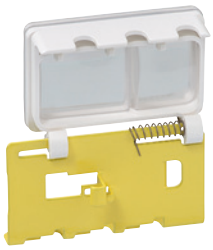
Empty enclosures for security starters

Designed for use with	Head(s) mounted on cover	Add-on blocks	Reference
LG7	Without		**DE1KS217A04**
	1 flush white head “I” 1 projecting black head “O”		**DE1KS217A06**
	1 flush white head “I” 1 projecting black head “O” 1 head emergency stop	Padlocking devices	**DE1KS217A06A37**

Dimensions:
page A1/50

Product references

PB111915.eps



GV2V01

PB112390.eps



GV2K011

PG113130.eps



GV2K021

8274.eps



GV2K031

PB112393.eps



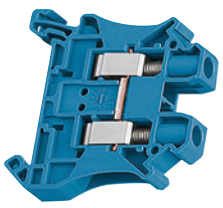
GV2K04

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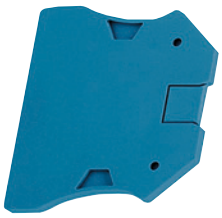
GV2E01 – GV2E02

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NSYTRV62BL

PB502246.eps



NSYTRAC22BL

PB112218.eps



GV2CP21

Accessories

Description			Sold in lots of	Unit reference	Weight kg
Padlocking device [6] for GV2ME operator (padlocking is only possible in the "O" position)		1 to 3 padlocks Ø 4 to 8 mm	1	**GV2V01**	0.075
Mushroom head pushbutton Ø 40 mm, red, IP55	Spring return [2]		1	**GV2K011**	0.052
	Emergency stop Latching [2]	Key release, key n° 455	1	**GV2K021**	0.160
		Turn to release	1	**GV2K031**	0.115
		Turn to release, padlockable	1	**GV2K04** [1]	0.120
Sealing kit	For enclosures and front plate	IP 55 for temperature between +5 °C and +40 °C	10	**GV2E01**	0.012
		IP 55 for temperature between -20 °C and +40 °C	10	**GV2E02**	0.012
Linergy passthrough neutral terminal block – 6 mm² 41 A single-level 1x1 screw			50	**NSYTRV62BL**	0.015
End cover for Linergy screw single-level terminal block			50	**NSYTRAC22BL**	0.003

*(1) Circuit breaker to be ordered separatly. Commercial references of **GV2ME01** to **M22**: see chapter B6 "Circuit breakers".*
*(2) Supplied with IP55 **GV2E01** sealing kit. To be fitted with enclosure **GV2M●01**.*
(3) Padlockable in "O" position using Ø 4 to 8 mm shank padlocks.

Separate front plate for GV2ME

Provides a sealing cover to GV2ME circuit breaker, on any kind of front panel.

Front plate			
Description		**Reference**	**Weight kg**
For direct control, through a panel, of a chassis mounted GV2ME	IP55	**GV2CP21**	0.800

Product references

PB121233.eps



ZB5AA331

PB121234.eps



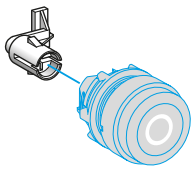
ZB5AL432

PB121235.eps



LAD9091

DB403452.eps



PF141168.eps



ZB5AD●

PB121236.eps

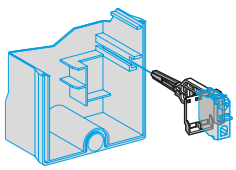


ZENL1111

PB121237.eps



DB403455.eps



LAD90909

Heads for Start and Stop/Reset pushbuttons

Description	For use on	Unit reference
Flush, green “I” (1)	LE1, LE3, LE4, LE6 D09...D35	**ZB5AA331**
Projecting, red “O” (1)	LE●D09...D35	**ZB5AL432**
Adaptation kit for head ZB5AL432	LE1D09 and D12	**LAD9091**
	LE1D18...D35, LE2D09...D35	**LAD91810**
	LE3, LE4, LE6 and LE8 D09...D35	**LAD9T4**

Heads for Reset pushbuttons

Flush, blue “R” (2)	LE●D09...D35	**ZB5AA0**
		+ **ZBA639** (3)
Adaptation kit for head ZB5AA0 + ZBA639	LE1D09 and D12	**LAD9092**
	LE1D18...D35, LE2D09...D35	**LAD91810**
	LE3, LE6, LE4 and LE8D09...D35	**LAD9T4**

Heads for selector switches

3-position stay put	LE1D09...D35●●A09	**ZB5AD3**
2-position stay put	LE1D09...D35●●A13	**ZB5AD2**
3-position spring return to centre	LE2D09...D35 LE8D09...D35	**ZB5AD5**

Contact blocks

1 N/O spring return	LE●D09...D35	**ZENL1111**
1 N/C spring return	LE●D09...D35	**ZENL1121**
Mounting for contact block	LE1D09 and D12	**LAD90909**
	LE1D18...D35, LE2, LE3, LE4, LE6 and LE8D09...D35	**LAD91809**

(1) Remember to order adaptation kit LAD9091 or LAD91810 or LAD9T4, depending on size.
(2) Remember to order adaptation kit LAD9092 or LAD91810 or LAD9T4, depending on size.
(3) Sold in lots of 10.

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GV2ME●●

Thermal magnetic circuit breakers, with screw clamp terminals

GV2ME with pushbutton control

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Setting range of thermal trips (2)	Magnetic tripping current Id ± 20 %	Reference
400/415 V			500 V			690 V					
P	Icu	Ics (1)	P	Icu	Ics (1)	P	Icu	Ics (1)			
kW	kA	%	kW	kA	%	kW	kA	%	A	A	
–	–	–	–	–	–	**–**	–	–	0.1…0.16	1.5	**GV2ME01**
0.06	★	★	–	–	–	–	–	–	0.16…0.25	2.4	**GV2ME02**
0.09	★	★	–	–	–	–	–	–	0.25…0.40	5	**GV2ME03**
0.12	★	★	–	–	–	**0.37**	★	★	0.40…0.63	8	**GV2ME04**
0.18	★	★	–	–	–	**–**	–	–			
0.25	★	★	–	–	–	**0.55**	★	★	0.63…1	13	**GV2ME05**
0.37	★	★	**0.37**	★	★	**–**	–	–	1…1.6	22.5	**GV2ME06**
0.55	★	★	**0.55**	★	★	**0.75**	★	★			
–	–	–	**0.75**	★	★	**1.1**	★	★			
0.75	★	★	**1.1**	★	★	**1.5**	3	75	1.6…2.5	33.5	**GV2ME07**
1.1	★	★	**1.5**	★	★	**2.2**	3	75	2.5…4	51	**GV2ME08**
1.5	★	★	**2.2**	★	★	**3**	3	75			
2.2	★	★	**3**	50	100	**4**	3	75	4…6.3	78	**GV2ME10**
3	★	★	**4**	10	100	**5.5**	3	75	6…10	138	**GV2ME14**
4	★	★	**5.5**	10	100	**7.5**	3	75			
5.5	15	50	**7.5**	6	75	**9**	3	75	9…14	170	**GV2ME16**
–	–	–	**–**	–	–	**11**	3	75			
7.5	15	50	**9**	6	75	**15**	3	75	13…18	223	**GV2ME20**
9	15	40	**11**	4	75	**18.5**	3	75	17…23	327	**GV2ME21**
11	15	40	**15**	4	75	**–**	–	–	20…25	327	**GV2ME22** (3)

GV2ME technical characteristics: see in chapter B6.

PB111876.eps



GVAX●●●

Undervoltage trip, INRS (can only be mounted on GV2ME)
Safety device for dangerous machines conforming to INRS and VDE0113

Side (1 block on RH side of circuit breaker GV2 ME)	110…115 V	50 Hz	**GVAX115**
		60 Hz	**GVAX116**
	127 V	60 Hz	**GVAX115**
	220…240 V	50 Hz	**GVAX225**
		60 Hz	**GVAX226**
	380…400 V	50 Hz	**GVAX385**
		60 Hz	**GVAX386**
	415…440 V	50 Hz	**GVAX415**
	440 V	60 Hz	**GVAX385**

GVAX technical characteristics: see in chapter B6.

(1) As % of Icu.
(2) The thermal trip setting must be within the range marked on the graduated knob.
*(3) Maximum rating which can be mounted in enclosures **GV2MC** or **MP**, please consult your Regional Sales Office.*
★ > 100 kA.

PB121461.eps



LR2K●●

Thermal overload relays - selection table

LR2K thermal overload relays can be mounted on all 3P LC1K contactors with screw clamp connectors.

Relay setting range	Fuses to be used with selected relay Maximum rating Type			Reference
	aM	gG	BS88	
A	A	A	A	
Class 10 A (the standard specifies a tripping time of between 2 and 10 seconds at 7.2 In)				
0.11…0.16	0.25	0.5	–	**LR2K0301**
0.16…0.23	0.25	0.5	–	**LR2K0302**
0.23…0.36	0.5	1	–	**LR2K0303**
0.36…0.54	1	1.6	–	**LR2K0304**
0.54…0.8	1	2	–	**LR2K0305**
0.8…1.2	2	4	6	**LR2K0306**
1.2…1.8	2	6	6	**LR2K0307**
1.8…2.6	4	8	10	**LR2K0308**
2.6…3.7	4	10	16	**LR2K0310**
3.7…5.5	6	16	16	**LR2K0312**
5.5…8	8	20	20	**LR2K0314**
8…11.5	10	25	20	**LR2K0316**
10…14	16	32	25	**LR2K0321**
12…16	20	40	32	**LR2K0322**

LRD thermal overload relays can only be mounted on LC1D contactors of same size ratio and with screw clamp connectors.

PB121219.eps



LRD●●

Relay setting range (A)	Fuses to be used with selected relay			For use with contactor LC1	Reference
	aM (A)	gG (A)	BS88 (A)		
Class 10 A (1) for connection by screw clamp terminals or connectors					
0.10…0.16	0.25	2	–	D09…D38	**LRD01**
0.16…0.25	0.5	2	–	D09…D38	**LRD02**
0.25…0.40	1	2	–	D09…D38	**LRD03**
0.40…0.63	1	2	–	D09…D38	**LRD04**
0.63…1	2	4	–	D09…D38	**LRD05**
1…1.6	2	4	6	D09…D38	**LRD06**
1.6…2.5	4	6	10	D09…D38	**LRD07**
2.5…4	6	10	16	D09…D38	**LRD08**
4…6	8	16	16	D09…D38	**LRD10**
5.5…8	12	20	20	D09…D38	**LRD12**
7…10	12	20	20	D09…D38	**LRD14**
9…13	16	25	25	D12…D38	**LRD16**
12…18	20	35	32	D18…D38	**LRD21**
16…24	25	50	50	D25…D38	**LRD22**
23…32	40	63	63	D25…D38	**LRD32**
30…38	40	80	80	D32 and D38	**LRD35**

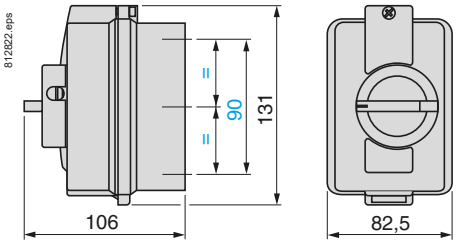
Technical Data for Designers

Contents

Switch-disconnectors ..... A1/36 to A1/38
Direct-on-line starters ..... A1/39, A1/41 to A1/47
.....and A1/49
Star-delta starters ..... A1/40 and A1/48
Starters for safety applications ..... A1/50 to A1/53

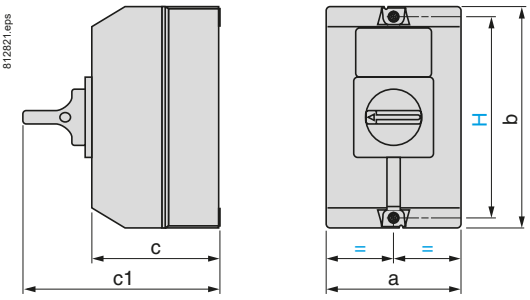
Dimensions

VCFN12GE to VCFN40GE



Cable glands: 2 x 16 P top and bottom.

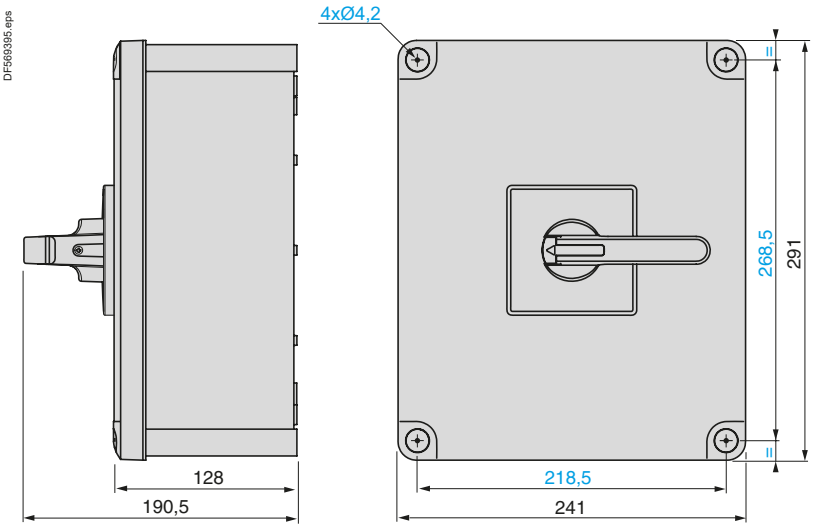
VCF or VBF02GE to 4GE, VCF••GEGP and VCF•GEGP, VCFX or VBFXGE1 to GE4



	a	b	c	c1	H
V•F02GE to V•F2GE, V•FXGE1 VCF••GEGP and VCF•GEGP (1)	90	146	85	131	130
V•F3GE and **V•F4GE** (2)	157	180	107	152	164
V•FXGE2 and **V•FXGE4** (2)	157	180	107	152	164

(1) Cable glands: 2x ISO 16 rear, 4x ISO 20/25 top and bottom.
(2) Cable glands: 4x ISO 25/32 rear, 4x ISO 25/32 top and bottom.

VCF or VBF5GEN and 6GEN

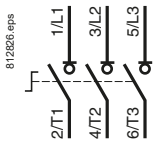


References:
pages A1/3 and A1/26
Schemes:
page A1/37

Schemes

Schemes

Switch-disconnectors

Enclosed or switch bodies	Main pole module	Neutral pole module
		

Auxiliary contact blocks

VZ7	VZ20	VZN05	VZN06
			

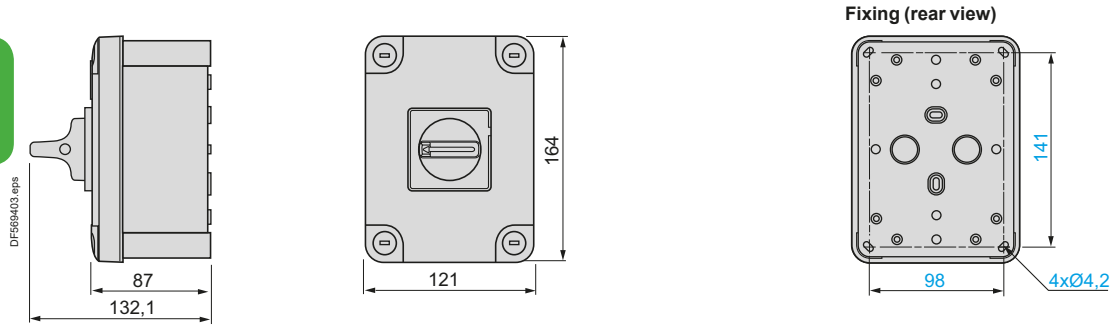
References:
pages A1/3 and A1/26

Dimensions:
page A1/36

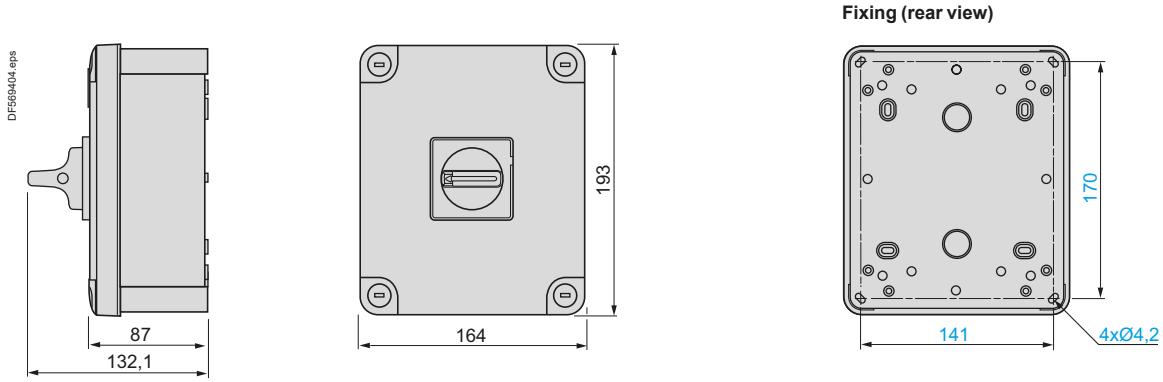
Dimensions, schemes

Dimensions

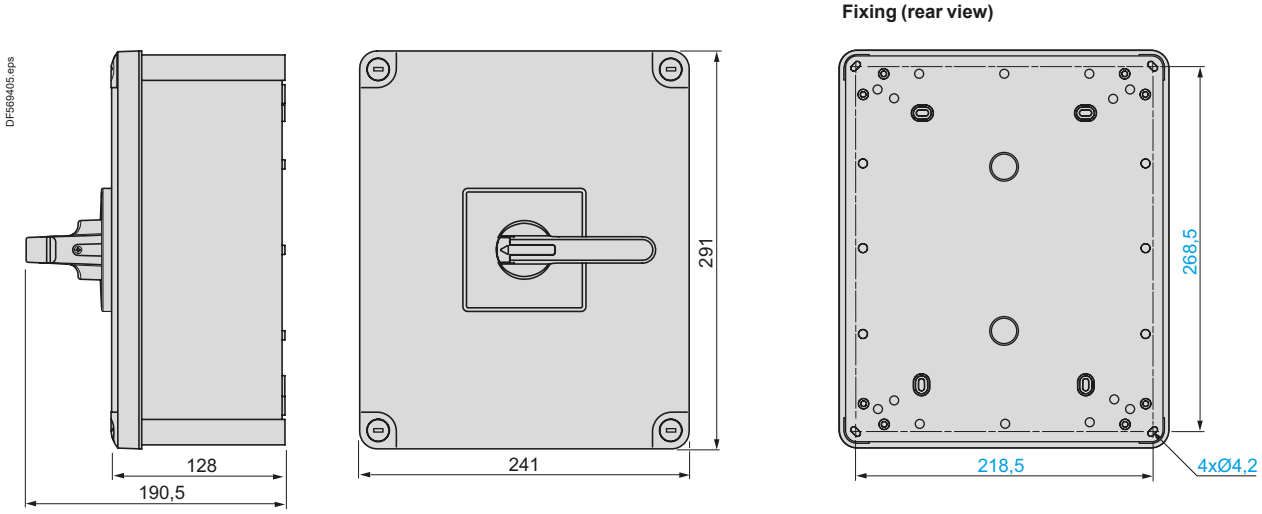
VC1GUN and VC2GUN



VC3GUN and VC4GUN



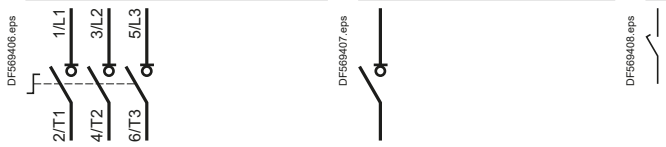
VC5GUN and VC6GUN



Schemes

Switch-disconnectors

Enclosed switch-disconnectors or switch bodies	Main pole module	Neutral pole module



Auxiliary contact block modules

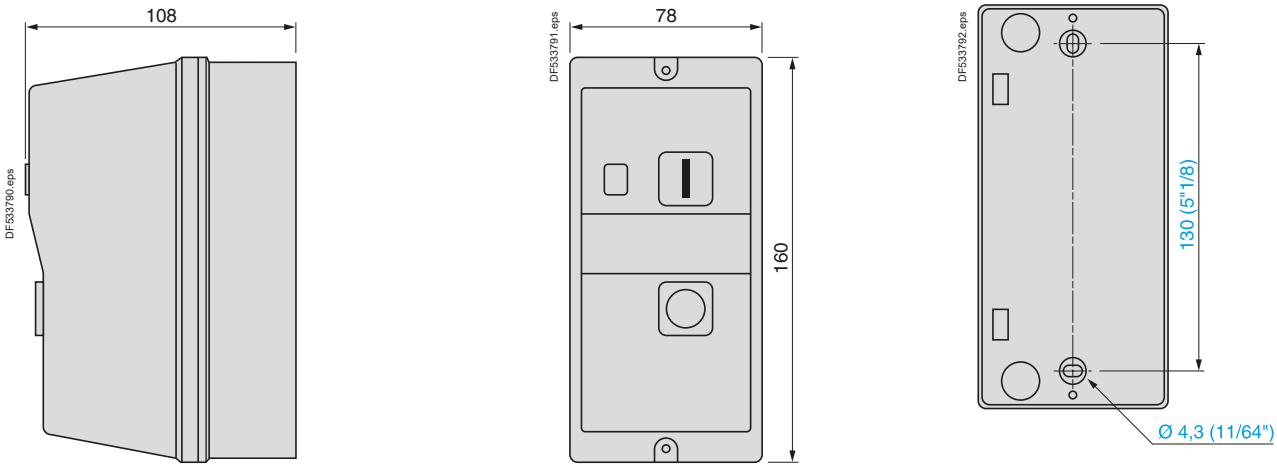
VZ7	VZ20



References:
page A1/4

Dimensions

LE1M35 (1)



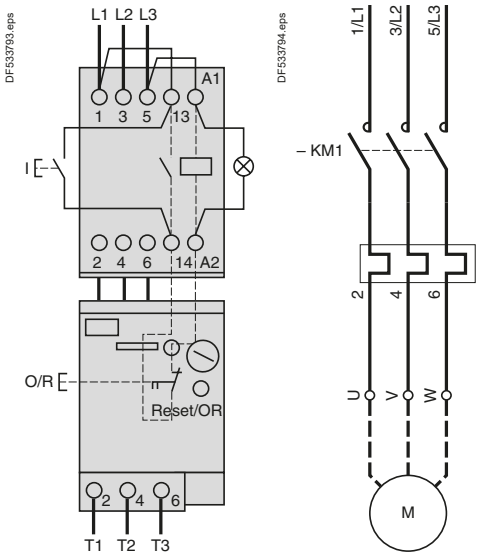
Knock-outs or blanking plugs for cable glands

Enclosure type	At top		At bottom	
	PG	ISO	PG	ISO
LE1 M	2 x 13 to 2 x 21	2 x 20 or 2 x 25	2 x 13 to 2 x 21	2 x 20 or 2 x 25

(1) Can be mounted on machine panel or frame. Knock-outs for 4 x 13 P cable glands.

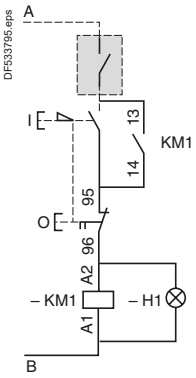
Schemes

LE1M35

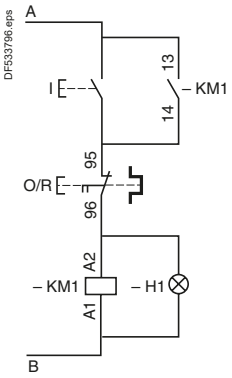


Choice of type of control built into the product

Control by latching pushbuttons



Control by spring return pushbuttons



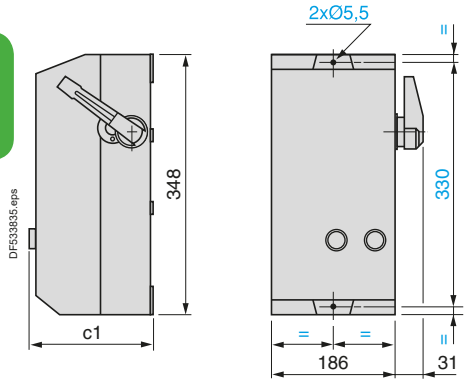
Connections

Power voltage	Control circuit voltage	A	B
380 V, 400 V, 415 V, 440 V	220 V, 230 V, 240 V	L3	Neutral
	380 V, 400 V, 415 V, 440 V	L3	L1
	Other voltages	For customer assembly	
Other voltages	All voltages (440 V max)	For customer assembly	

References:
page A1/7

Dimensions

LE6D09...D18



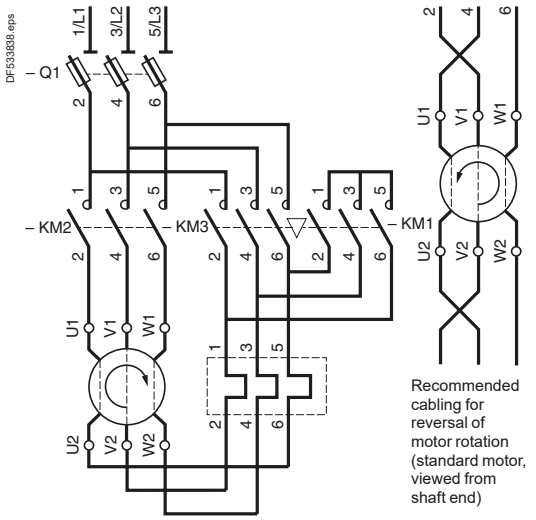
	c1
Standard version	175.5
Variant A04	167
Variant A05	175.5

Knock-outs or blanking plugs for cable glands

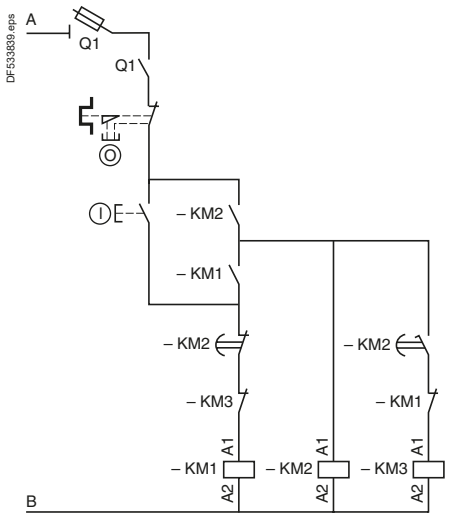
Type of enclosure	At top		At bottom	
	PG	ISO	PG	ISO
LE6D09...D18	–	2 x 20 or 2 x 25 or 2 x 32 or 2 x 40	–	2 x 20 or 2 x 25 or 2 x 32 or 2 x 40

Schemes

LE6D09...D18



Recommended cabling for reversal of motor rotation (standard motor, viewed from shaft end)



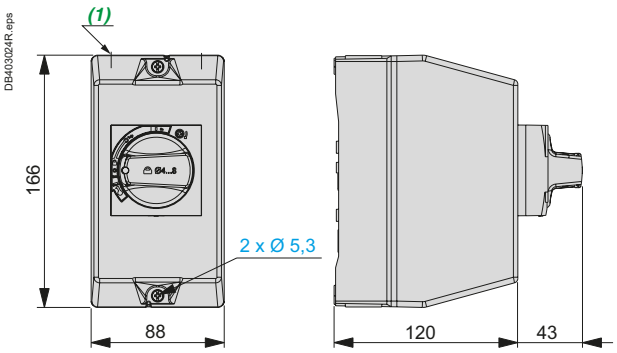
Connections

Power voltage	Control circuit voltage	A	B
380 V, 400 V, 415 V, 440 V	220 V, 230 V, 240 V	L3	Neutral terminal
	380 V, 400 V, 415 V, 440 V	L3	L1
	Other voltages	Terminal 1	Terminal 2
Other voltages	All voltages (600 V max)	For customer assembly	

References:
page A1/16

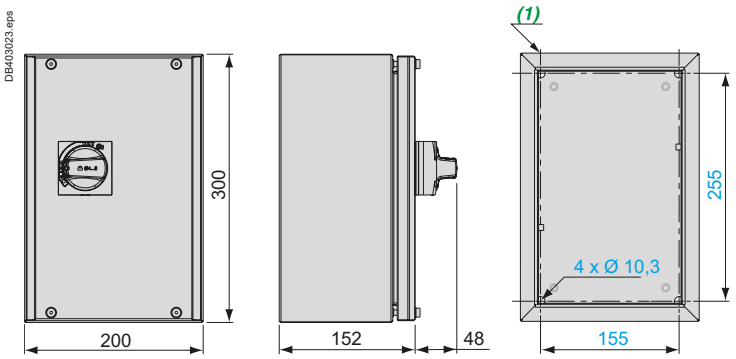
Dimensions

GV2PC●●



(1) Top face: 2 knock-outs for ISO20 cable glands.
Bottom face: 2 knock-outs for ISO20 cable glands.

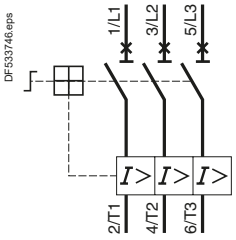
GV3PC●●



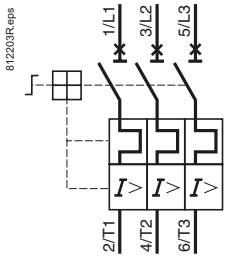
(1) Top face: 1 blanking plug for ISO32 cable gland.
Bottom face: 2 blanking plugs for ISO32 cable gland + 1 blanking plug for ISO20 cable gland.

Schemes

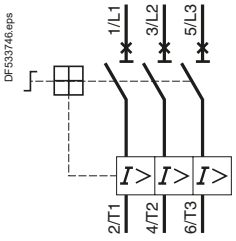
GV2L



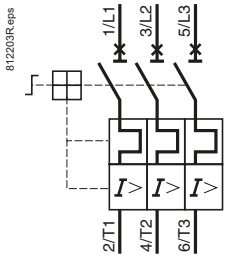
GV2P



GV3L



GV3P

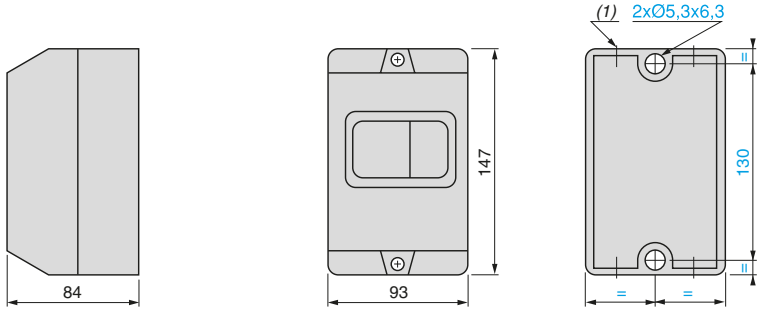


References:
pages A1/9 to A1/10

Dimensions

Surface mounting enclosure GV2MC0●

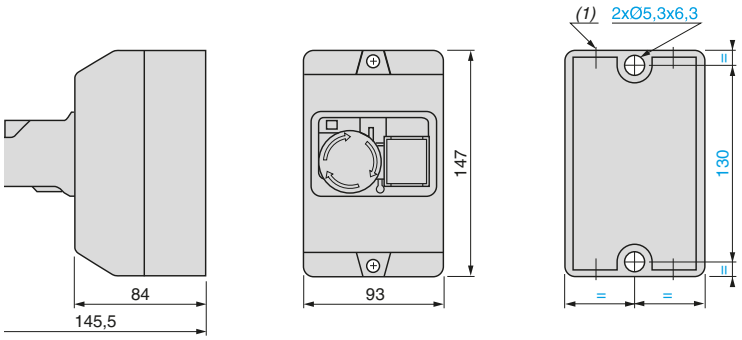
DF523443.eps



(1) Top face: 2 knock-outs for ISO20/25 cable glands or Pg16 or 16mm conduits.
Bottom face: 2 knock-outs for ISO20/25 cable glands or Pg16 or 16mm conduits.

Surface mounting enclosure GV2MCK04

DF523444.eps



Ref.

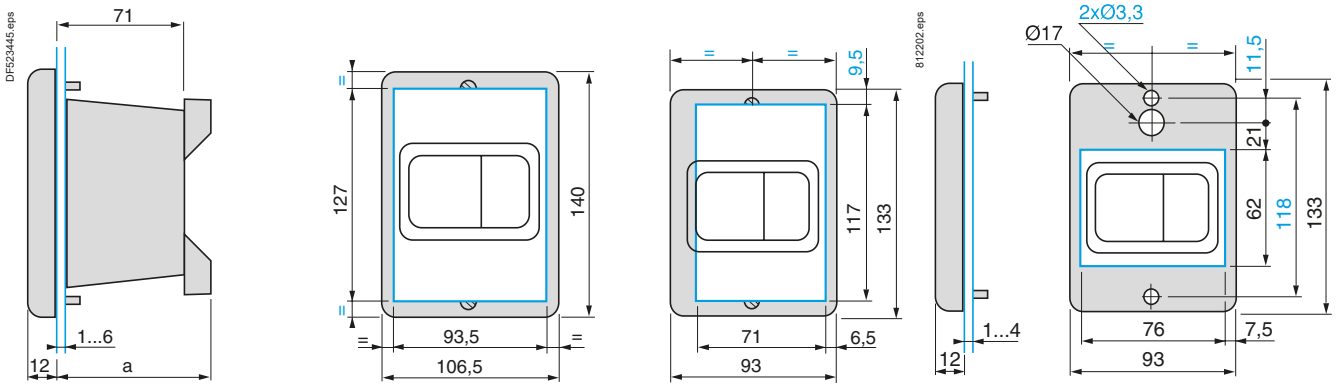
(1) Top face: 2 knock-outs for ISO20/25 cable glands or Pg16 or 16mm conduits.
Bottom face: 2 knock-outs for ISO20/25 cable glands or Pg16 or 16mm conduits.

Mounting

Flush mounting enclosures GV2MP0● (panel cut-out)

GV2MP0● | **GV2MP01, MP02** | **GV2MP03, MP04** | **Front plate GV2CP21**

DF523445.eps



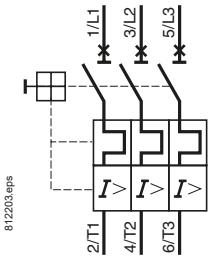
GV2	a
MP01, MP02	–
MP03, MP04	86

References:
pages A1/11 and A1/23
Schemes:
page A1/43

Schemes

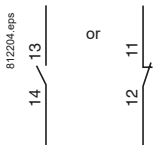
Schemes

GV2ME●●

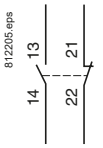


Instantaneous auxiliary contacts

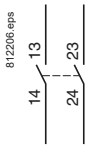
GVAE1



GVAE11

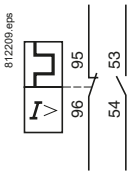


GVAE20

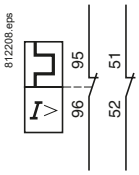


Instantaneous auxiliary contacts and fault signalling contacts

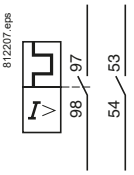
GVAD0110



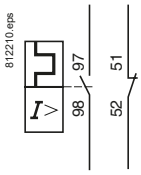
GVAD0101



GVAD1010

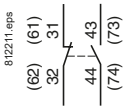


GVAD1001

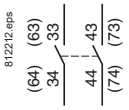


Instantaneous auxiliary contacts

GVAN11

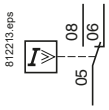


GVAN20



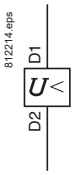
Short-circuit signalling contacts

GVAM11

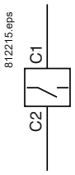


Undervoltage trips

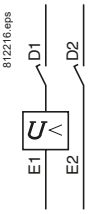
GVAU●●●



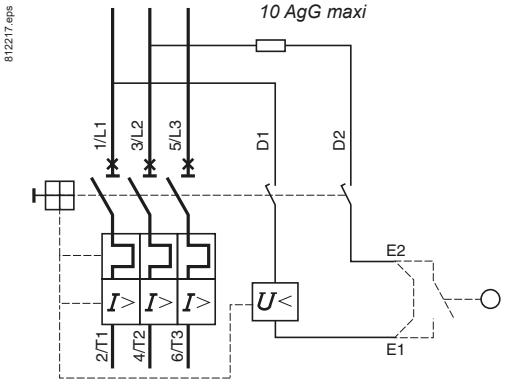
GVAS●●●



GVAX●●●



Wiring diagram for undervoltage trip used on potentially dangerous machines, conforming to INRS

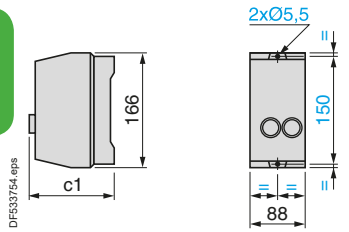


References:
pages A1/11 and A1/23

Dimensions:
page A1/42

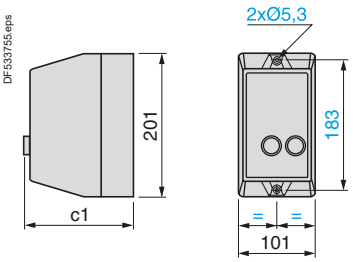
Dimensions

LE1D09 and D12



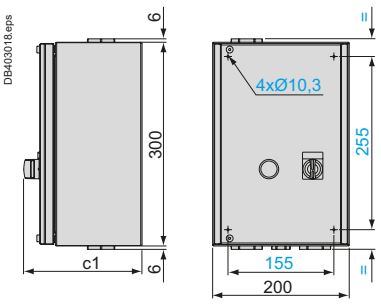
	c1
Standard version	128.5
Variant A04	120
Variant A05	128.5
Variant A09	120
Variant A13	120

LE1D09●●T
LE1D18…D35 and LE2D09…D35



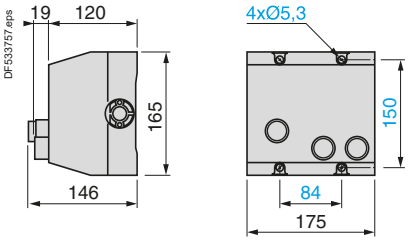
	c1	
	LE1D	LE2D
Standard version	153.5	160
Variant A04	145	145
Variant A05	153.5	153.5
Variant A09	160	–
Variant A13	160	–

LE1D40A…D65A
LE2D40A…D65A



	c1	
	LE1D	LE2D
Standard version	158.5	174
Variant A04	150	150
Variant A05	158.5	158.5

LE2K06 and K09



Knock-outs or blanking plugs for cable glands

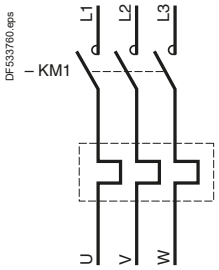
Type of enclosure	At top		At bottom	
	PG	ISO	PG	ISO
LE1D09 and D12	–	2 x 20	–	2 x 20
LE1D18…D35 and LE2D09…D35	–	2 x 20 or 2 x 25	–	2 x 20 or 2 x 25
LE1 and LE2D40A…D65A	–	1 x 32	–	1 x 20 and 2 x 32
LE2K06 and K09	2 x 13 and 2 x 16	4 x 20	2 x 13 and 2 x 16	4 x 20

References:
pages A1/8, A1/13 and A1/28
Schemes:
page A1/45

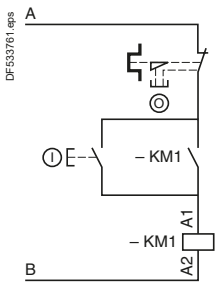
Schemes

Schemes

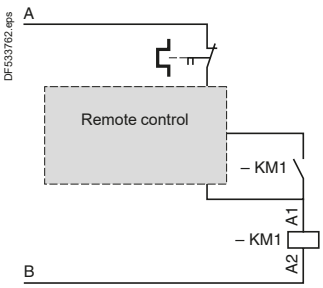
LE1D09…D65A



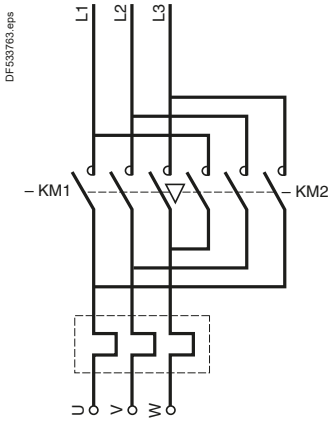
LE1D09…D65A



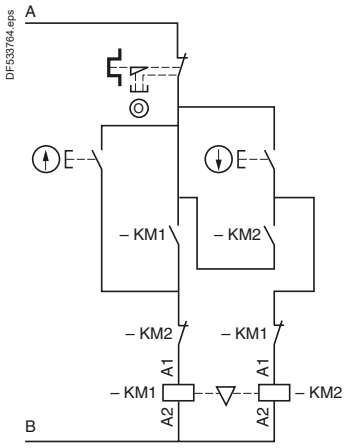
LE1D09…D65A with variant A04 or A05



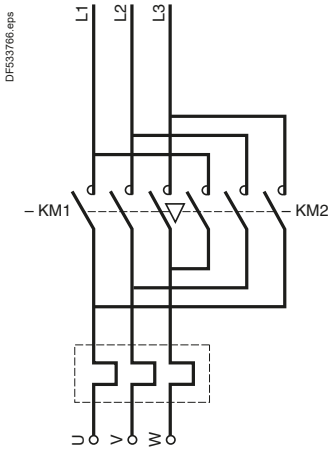
LE2K06, K09



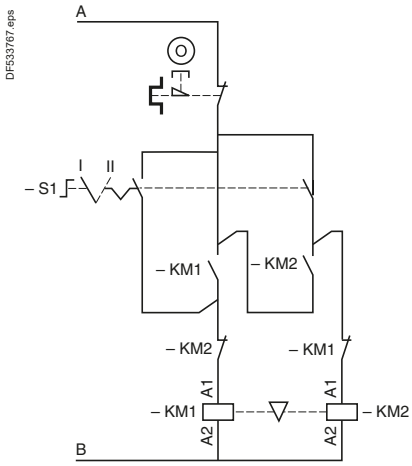
LE2K06, K09



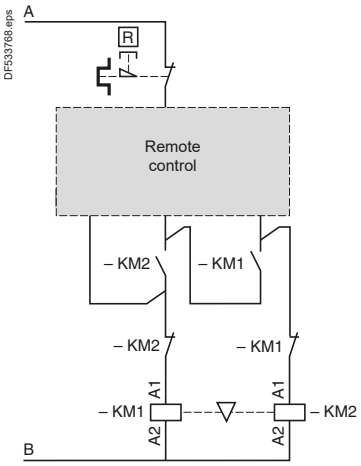
LE2D09…D65A



LE2D09…D65A



LE2D40A…D65A with variants A04 or A05



LE1D09…D65A, LE2D09…D65A Connections

Power voltage	Control circuit voltage	A	B
380 V, 400 V, 415 V, 440 V	220 V, 230 V, 240 V	L3	Neutral terminal
	380 V, 400 V, 415 V, 440 V	L3	L1
	Other voltages	Terminal 1	Terminal 2
Other voltages	Other voltages (600 V max)	For customer assembly	

LE2K06, K09 Connections

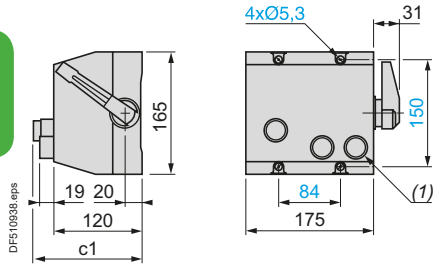
Power voltage	Control circuit voltage	A	B
380 V, 400 V, 415 V	220 V, 230 V, 240 V	L3	Neutral
	380 V, 400 V, 415 V	L3	L1
Other voltages	Other voltages (440 V max)	For customer assembly	

References:
pages A1/8 and A1/13

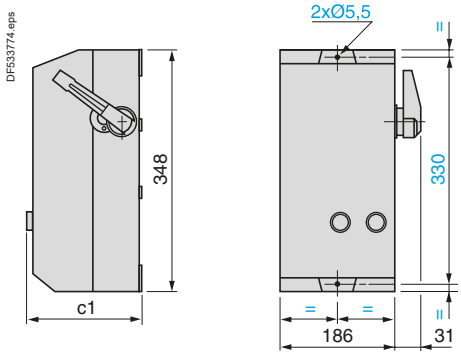
Dimensions:
page A1/44

Dimensions

LE4K06 and K09, LE8K06 and K09



LE4D09…D35, LE8D09…D35



	c1	
	LE4K	LE8K
Standard version	146	146
Variant A05	–	139

(1) For LE8 only.

	c1	
	LE4D	LE8D
Standard version	175.5	182
Variant A04	167	167
Variant A05	175.5	175.5

Knock-outs or blanking plugs for cable glands

Type of enclosure	At top		At bottom	
	PG	ISO	PG	ISO
LE4 and LE8D09…D35	–	2 x 20 or 2 x 25 or 2 x 32 or 2 x 40	–	2 x 20 or 2 x 25 or 2 x 32 or 2 x 40
LE4 and LE8K06 and K09	2 x 13 and 2 x 16	4 x 20	2 x 13 and 2 x 16	4 x 20

References:
pages A1/12 and A1/14

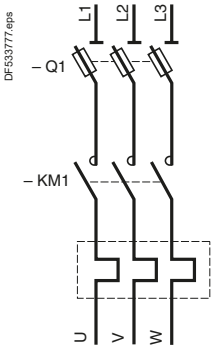
Schemes:
page A1/47

Life Is On Schneider Electric

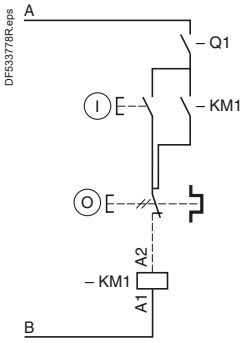
Schemes

Schemes

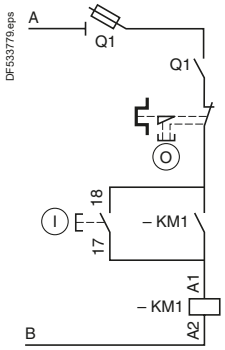
LE4K06, K09 LE4D09…D35



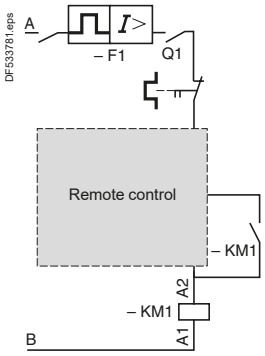
LE4K06, K09



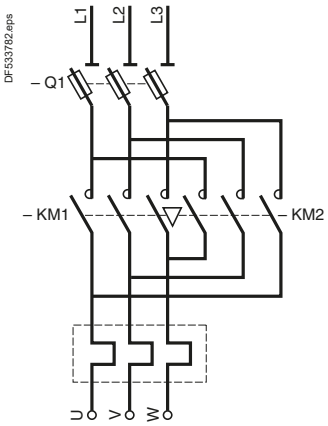
LE4D09…D35



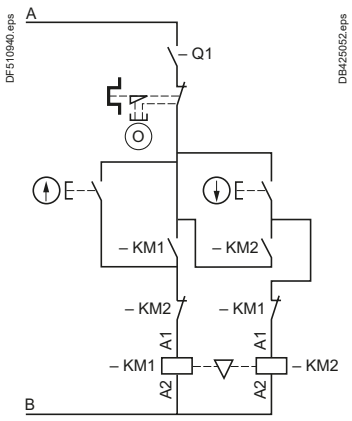
LE4D09…D35 with variant A04 or A05



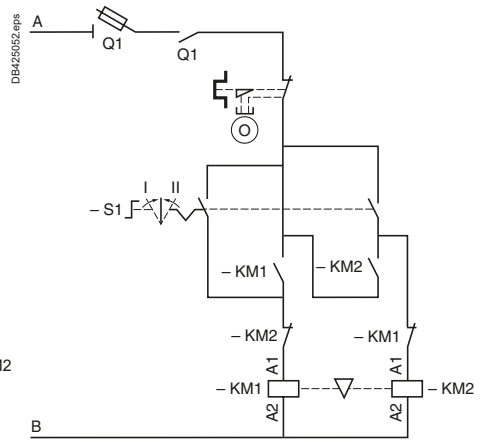
LE8K06, K09 LE8D09…D35



LE8K06, K09



LE8D09...D35



LE4D09 and D12, LE8D09 and D12 Connections			
Power voltage	**Control circuit voltage**	**A**	**B**
380 V, 400 V, 415 V, 440 V	220 V, 230 V, 240 V	L3	Neutral
	380 V, 400 V, 415 V, 440 V	L3	L1
	Other voltages	Terminal 1	Terminal 2
Other voltages	Other voltages (600 V max)	For customer assembly	

LE4D18…D35, LE8D18…D35 Connections			
Power voltage	**Control circuit voltage**	**A**	**B**
380 V, 400 V, 415 V, 440 V	220 V, 230 V, 240 V	L3	Neutral terminal
	380 V, 400 V, 415 V, 440 V	L3	L1
	Other voltages	Terminal 1	Terminal 2
Other voltages	Other voltages (600 V max)	For customer assembly	

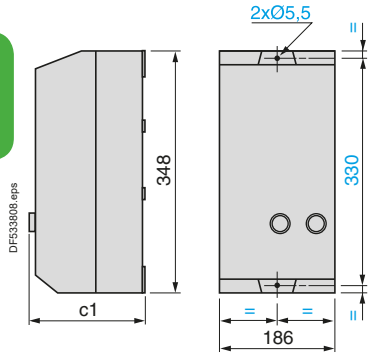
LE4K06, K09, LE8K06, K09 Connections			
Power voltage	**Control circuit voltage**	**A**	**B**
380 V, 400 V, 415 V	220 V, 230 V, 240 V	L3	Neutral
	380 V, 400 V, 415 V	L3	L1
Other voltages	Other voltages (440 V max)	For customer assembly	

References:
pages A1/12 and A1/14

Dimensions:
page A1/46

Dimensions

LE3D09…D35



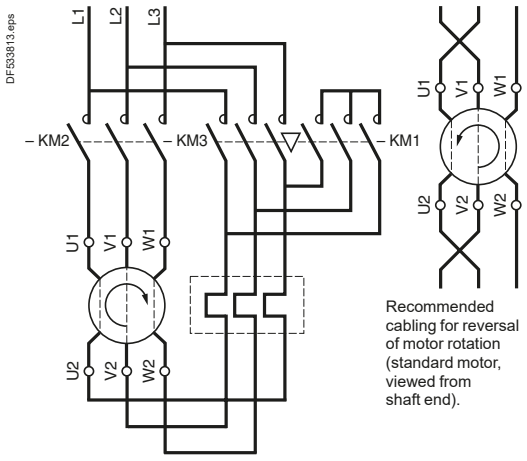
	c1
Standard version	175.5
Variant A04	167
Variant A05	175.5

Knock-outs or blanking plugs for cable glands

Type of enclosure	At top		At bottom	
	PG	ISO	PG	ISO
LE3D09…D35	–	2 x 20 or 2 x 25 or 2 x 32 or 2 x 40	–	2 x 20 or 2 x 25 or 2 x 32 or 2 x 40

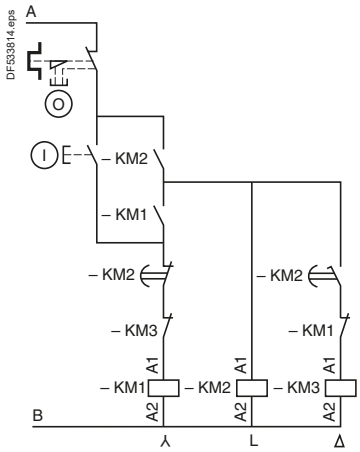
Schemes

LE3D09…D35



Recommended cabling for reversal of motor rotation (standard motor, viewed from shaft end).

LE3D09…D35



Note: in accordance with current installation regulations, short-circuit protection must be provided by fuses or a circuit breaker.

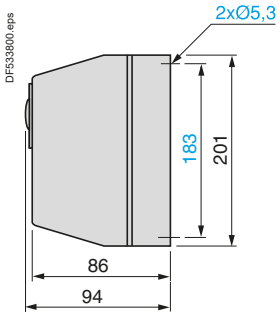
Connections

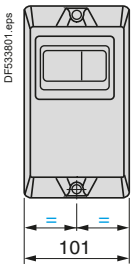
Power voltage	Control circuit voltage	A	B
380 V, 400 V, 415 V, 440 V	220 V, 230 V, 240 V	L3	Neutral terminal
	380 V, 400 V, 415 V, 440 V	L3	L1
	Other voltages	Terminal 1	Terminal 2
Other voltages	All voltages (600 V max)	For customer assembly	

References:
page A1/15

Dimensions

LE1GVMEK

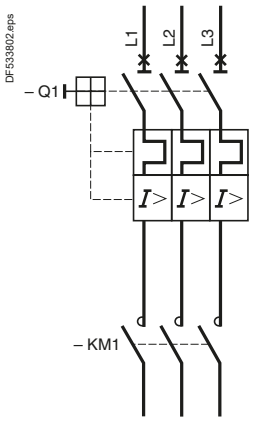


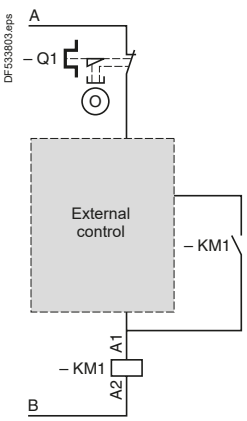


Knock-outs or blanking plugs for cable glands		
Enclosure type	**At top**	**At bottom**
	ISO	**ISO**
LE1GV	2 x 20 or 2 x 25	2 x 20 or 2 x 25

Schemes

LE1GVMEK





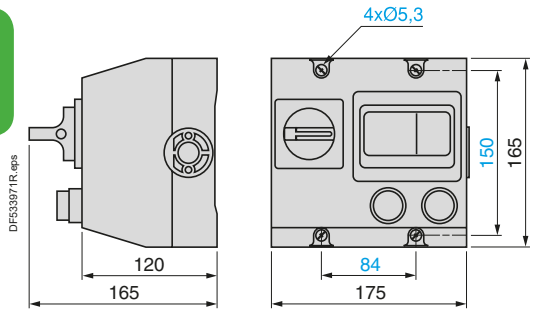
Connections			
Power voltage	**Control circuit voltage**	**A**	**B**
380 V, 400 V, 415 V, 440 V	220 V, 230 V, 240 V	L3	Neutral
	380 V, 400 V, 415 V, 440 V	L3	L1
	Other voltages	For customer assembly	
Other voltages	All voltages (440 V max)	For customer assembly	

References:
page A1/27

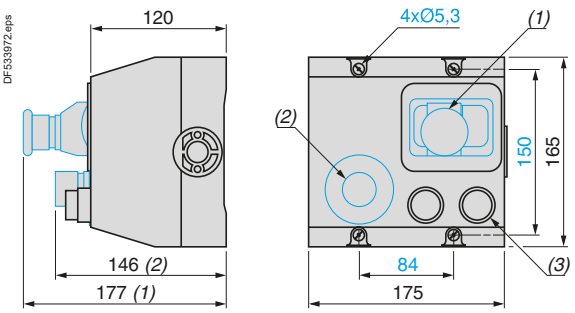
Dimensions

Dimensions

LG1K06, K09
LG1D12, D18



LG7K06, K09, LG7D12, D18
LG8K06, K09, K12



(1) Emergency Stop for starters LG●K06.
(2) Emergency Stop for starters LG●K09, K12, D12 et D18.
(3) Only for LG7.

Knock-outs or blanking plugs for cable glands

Type of enclosure	At top	At bottom
LG1K and LG1D	2 x 13 P and 2 x 16 P	2 x 13 P and 2 x 16 P
LG7K and LG7D	2 x 13 P and 2 x 16 P	2 x 13 P and 2 x 16 P
LG8K	2 x 13 P and 2 x 16 P	2 x 13 P and 2 x 16 P

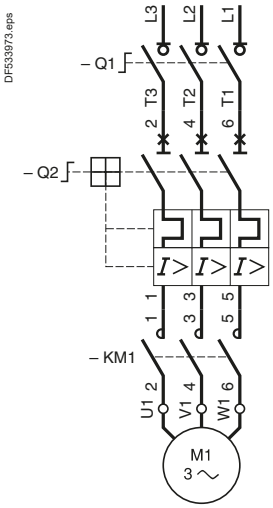
Ref.

References:
pages A1/18, A1/19 and A1/21

Schemes:
page A1/51

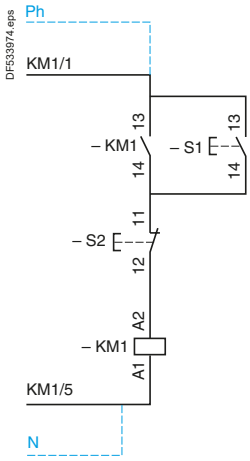
Schemes

LG1K06, K09, D12, D18

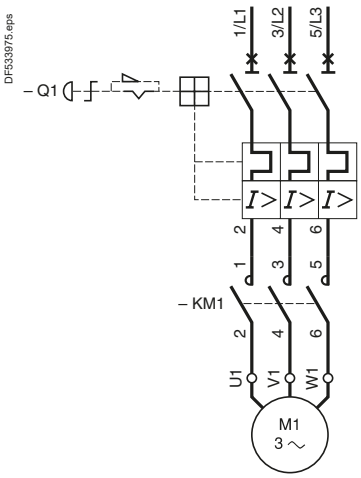


LG1K06, K09, D12, D18

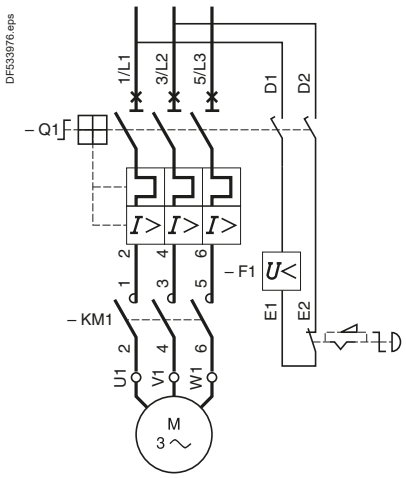
380/400 V, code Q7 or 400/415 V, code N7
220/230 V, code M7



LG7K06

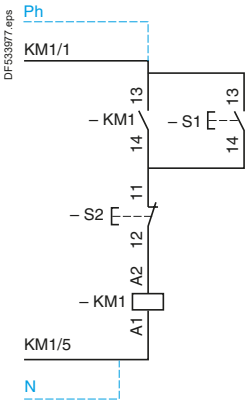


LG7K09, D12, D18

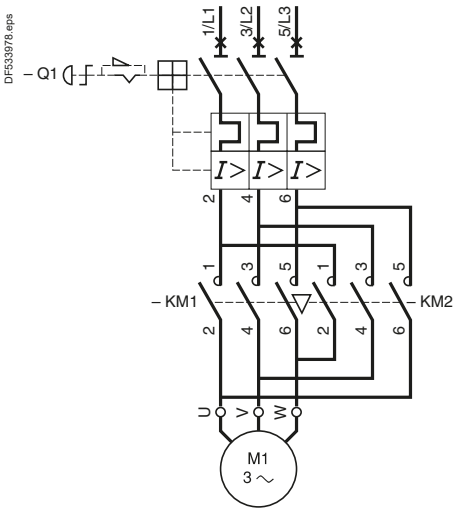


LG7K06, K09, D12, D18

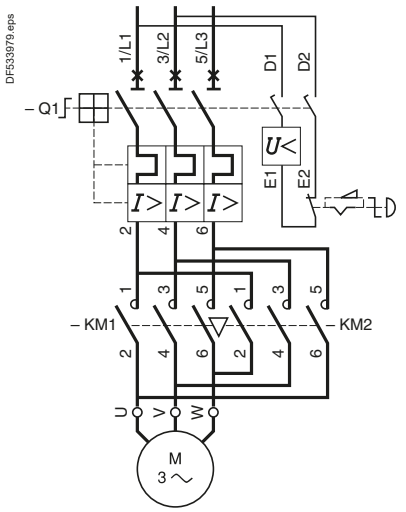
380/400 V, code Q7 or 400/415 V, code N7
220/230 V, code M7



LG8K06

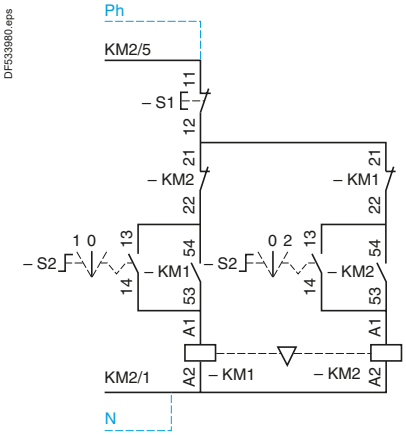


LG8K09, K12



LG8K06, K09, K12

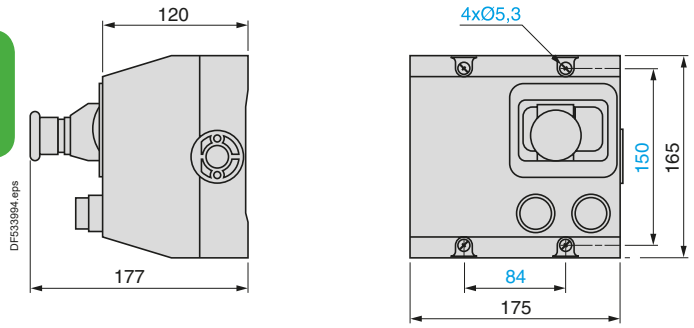
380/400 V, code Q7 or 400/415 V, code N7
220/230 V, code M7



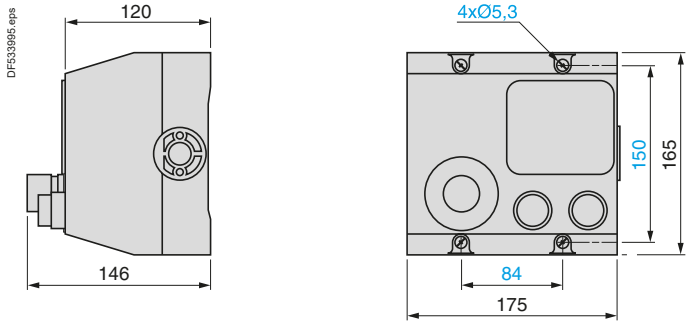
References:
pages A1/18, A1/19 and A1/21
Dimensions:
page A1/50

Dimensions

LJ7K06, LJ8K06



LJ7K09, LJ8K09



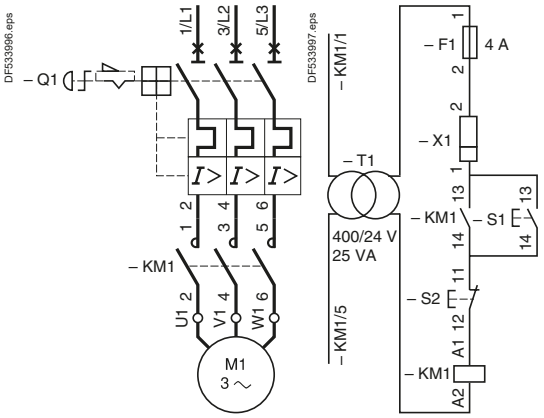
Cut-outs or blanking plugs for cable glands at the top and at the bottom 2 x 13 P and 2 x 16 P.

References:
pages A1/20 and A1/22

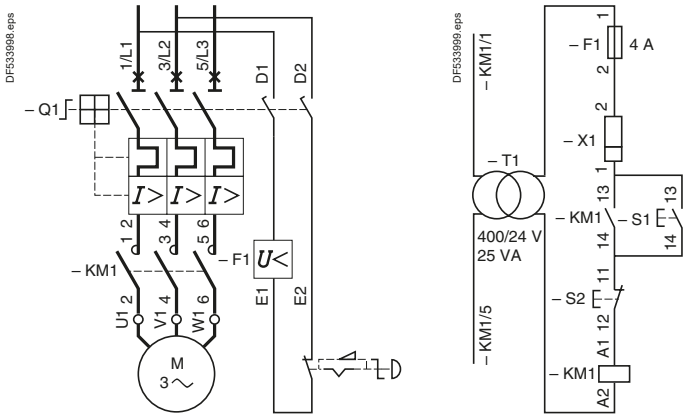
Schemes:
page A1/53

Schemes

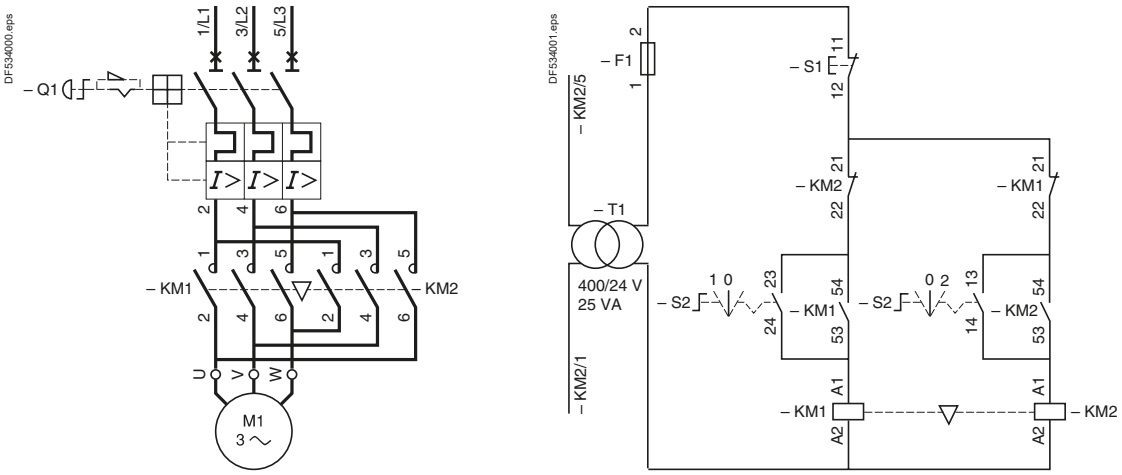
LJ7K06



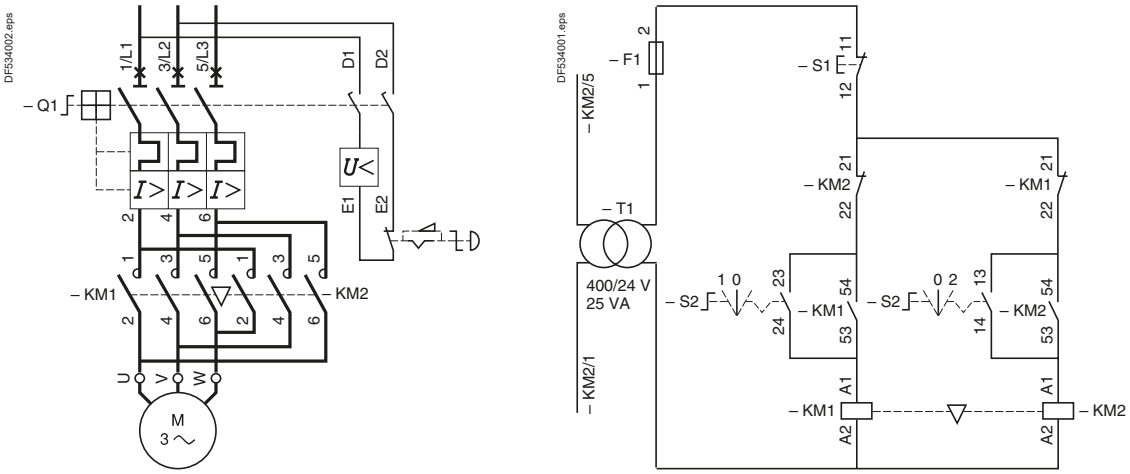
LJ7K09



LJ8K06



LJ8K09

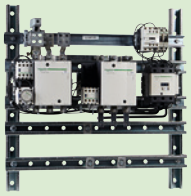
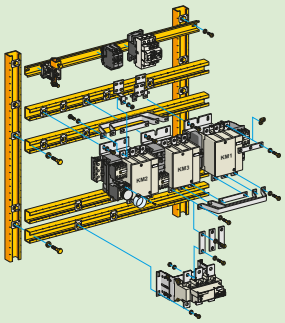


References:
pages A1/20 and A1/22

Dimensions:
page A1/52

Open, pre-cabled motor starters

Direct-on-line and reversing starters

Composition	Range		Page
Motor circuit breaker + contactor (direct-on-line) Coordination type 1	Up to 5.5 kW		A2/2
Motor circuit breaker + 2 contactors (reversing) Coordination type 1	Up to 5.5 kW		A2/3
Motor circuit breaker + contactor (direct-on-line) Coordination type 1	Up to 15 kW		A2/4
Motor circuit breaker + 2 contactors (reversing) Coordination type 1	Up to 15 kW		A2/5
Motor circuit breaker + contactor (direct-on-line) Coordination type 2	Up to 30 kW		A2/6
Motor circuit breaker + 2 contactors (reversing) Coordination type 2	Up to 30 kW		A2/7
Star-delta starters			
3 contactors + 1 time delay aux. block	Up to 132 kW		A2/8
3 contactors + 1 time delay aux. block + 1 control relay	Up to 315 kW		A2/9
Star-delta starters for customer assembly			
Separated components and mounting kits for suggested motor starter components combinations - on plate or mounting rail	Up to 132 kW		A2/10
Separated components for suggested motor starter combinations - on chassis	Up to 315 kW		A2/14

Product references

D.O.L. starters, non-reversing, from 0.37 to 5.5 kW at 400/415 V, type 1 coordination

This pre-assembled combination comprises:
- 1 motor circuit breaker GV2ME,
- 1 3-pole contactor LC1K,
- 1 combination block GV2AF01.

Characteristics

Starter type		GV2		ME06K1	ME07K1	ME08K1	ME10K1	ME14K1	ME16K1
Breaking capacity (Iq) (1)	Conforming to IEC 60947-4-1	400/415 V	**kA**	50	50	50	50	50	15
		440 V	**kA**	50	50	50	50	15	8
		500 V	**kA**	50	50	50	50	10 (4 kW) 6 (5.5 kW)	6

References



GV2ME10K1●●

D.O.L. starters, non-reversing

Standard power ratings of 3-phase motors 50/60 Hz in AC-3			Setting range of thermal trips	Fixed magnetic tripping current 13 Irth	For customer assembly		Pre-assembled	Weight
400/ 415 V	440 V	500 V			Motor circuit-breaker Reference	Contactor Reference to be completed (2)	Basic reference, to be completed by adding the voltage code (3)	
kW	kW	kW	A	A				kg
0.37 0.55 –	0.37 0.55 –	0.37 0.55 0.75	1…1.6	22.5	GV2ME06	LC1K06	**GV2ME06K1●●**	0.460
0.75 –	0.75 1.1	– 1.1	1.6…2.5	33.5	GV2ME07	LC1K06	**GV2ME07K1●●**	0.460
1.1 1.5	– 1.5	1.5 2.2	2.5…4	51	GV2ME08	LC1K06	**GV2ME08K1●●**	0.460
2.2 –	2.2 3	– 3	4…6.3	78	GV2ME10	LC1K06	**GV2ME10K1●●**	0.460
3 4	– 4	4 5.5	6…10	138	GV2ME14	LC1K09	**GV2ME14K1●●**	0.460
5.5	5.5	7.5	9…14	170	GV2ME16	LC1K12	**GV2ME16K1●●**	0.460

Add-on blocks

Description	Sold in lots of	Unit reference
Combination block between circuit breaker and contactor	10	**GV2AF01**

*(1) The breaking performance of circuit breakers **GV2ME** can be increased by adding a current limiter **GV1L3**, see page B6/21.*

(2) Please consult your Regional Sales Office.

(3) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Volts	24	110	220/230	230	230/240	380/400
∿ 50/60 Hz	B7	F7	M7	P7	U7	Q7
⎓ (4)	BW3	–	–	–	–	–

(4) Coil: low consumption (1.5 W), wide range (0.7…1.3 Uc) with integral suppression device as standard.

Dimensions: page A2/20
Schemes: page A2/22

Product references

D.O.L. starters, reversing, from 0.37 to 5.5 kW at 400/415 V, type 1 coordination

This pre-assembled combination comprises:
- 1 motor circuit breaker GV2ME,
- 1 3-pole reversing contactor LC2K,
- 1 combination block GV2AF01.

Characteristics

Starter type		GV2		ME06K2	ME07K2	ME08K2	ME10K2	ME14K2	ME16K2
Breaking capacity (Iq) (1)	Conforming to IEC 60947-4-1	400/415 V	**kA**	50	50	50	50	50	15
		440 V	**kA**	50	50	50	50	15	8
		500 V	**kA**	50	50	50	50	10 (4 kW) 6 (5.5 kW)	6

References



GV2ME10K2●●

D.O.L. starters, reversing

Standard power ratings of 3-phase motors 50/60 Hz in AC-3			Setting range of thermal trips	Fixed magnetic tripping current 13 Irth	For customer assembly		Pre-assembled	Weight
400/415 V	440 V	500 V			Motor circuit-breaker Reference	Contactor Reference to be completed (2)	Basic reference, to be completed by adding the voltage code (3)	
kW	kW	kW	A	A				kg
0.37 0.55 –	0.37 0.55 –	0.37 0.55 0.75	1…1.6	22.5	GV2ME06	LC2K06	**GV2ME06K2●●**	0.460
0.75 –	0.75 1.1	– 1.1	1.6…2.5	33.5	GV2ME07	LC2K06	**GV2ME07K2●●**	0.460
1.1 1.5	– 1.5	1.5 2.2	2.5…4	51	GV2ME08	LC2K06	**GV2ME08K2●●**	0.460
2.2 –	2.2 3	– 3	4…6.3	78	GV2ME10	LC2K06	**GV2ME10K2●●**	0.460
3 4	– 4	4 5.5	6…10	138	GV2ME14	LC2K09	**GV2ME14K2●●**	0.460
5.5	5.5	7.5	9…14	170	GV2ME16	LC2K12	**GV2ME16K2●●**	0.460

Add-on blocks

Description	Sold in lots of	Unit reference
Combination block between circuit breaker and contactor	10	**GV2AF01**

*(1) The breaking performance of circuit breakers **GV2ME** can be increased by adding a current limiter **GV1L3**, see page B6/21.*

(2) Please consult your Regional Sales Office.

(3) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Volts	24	110	220/230	230	230/240	380/400
∼ **50/60 Hz**	B7	F7	M7	P7	U7	Q7
⎓ (4)	BW3	–	–	–	–	–

(4) Coil: low consumption (1.5 W), wide range (0.7…1.3 Uc) with integral suppression device as standard.

***Note:** The combinations are valid for IE2 motors and IE3 with maximum starting current = 7.5 x motor rating current (see pages A6/4 and A6/5).*

Dimensions:
page A2/20

Schemes:
page A2/22

D.O.L. starters, non-reversing, from 0.06 to 15 kW at 400/415 V, type 1 coordination

This pre-assembled combination comprises:
- 1 motor circuit breaker GV2ME,
- 1 3-pole contactor LC1D,
- 1 combination block GV2AF3.

Characteristics

Starter type		GV2		DM102 to DM110	DM114	DM116	DM120	DM121	DM122	DM132
Breaking capacity (Iq) (1)	Conforming to IEC 60947-4-1	400/415 V	**kA**	50	50	15	15	15	15	10
		440 V	**kA**	50	15	8	8	6	6	6
		500 V	**kA**	50	6	6	6	4	4	4

References



GV2DM102●●

D.O.L. starters, non-reversing

Standard power ratings of 3-phase motors 50/60 Hz in AC-3			Setting range of thermal trips	Fixed magnetic tripping current 13 Irth	For customer assembly		Pre-assembled	Weight
400/415 V	440 V	500 V			Motor circuit-breaker Reference	Contactor Reference to be completed (2)	Basic reference, to be completed by adding the voltage code (2)	
kW	kW	kW	A	A				kg
0.06	0.06	–	0.16…0.25	2.4	GV2ME02	LC1D09●●	**GV2DM102●●** (3)	0.596
0.09	0.09	–	0.25…0.40	5	GV2ME03	LC1D09●●	**GV2DM103●●** (3)	0.596
–	0.12							
0.12	–	–	0.40…0.63	8	GV2ME04	LC1D09●●	**GV2DM104●●** (3)	0.596
0.18	0.18	–						
0.25	0.25	–	0.63…1	13	GV2ME05	LC1D09●●	**GV2DM105●●** (3)	0.596
0.37	0.37	–						
–	–	0.37	1…1.6	22.5	GV2ME06	LC1D09●●	**GV2DM106●●** (3)	0.596
0.55	0.55	0.55						
–	–	0.75						
0.75	0.75	–	1.6…2.5	33.5	GV2ME07	LC1D09●●	**GV2DM107●●** (3)	0.596
–	1.1	1.1						
1.1	–	1.5	2.5…4	51	GV2ME08	LC1D09●●	**GV2DM108●●** (3)	0.596
1.5	1.5	2.2						
2.2	2.2	–	4…6.3	78	GV2ME10	LC1D09●●	**GV2DM110●●** (3)	0.596
–	3	3						
3	–	4	6…10	138	GV2ME14	LC1D09●●	**GV2DM114●●** (3)	0.596
4	4	5.5						
5.5	5.5	7.5	9…14	170	GV2ME16	LC1D12●●	**GV2DM116●●**	0.601
7.5	7.5	–	13…18	223	GV2ME20	LC1D18●●	**GV2DM120●●**	0.606
–	9	9						
9	11	11	17…23	327	GV2ME21	LC1D25●●	**GV2DM121●●**	0.646
11	–	15	20…25	327	GV2ME22	LC1D25●●	**GV2DM122●●**	0.646
15	15	18.5	24…32	416	GV2ME32	LC1D32●●	**GV2DM132●●**	0.651

Add-on blocks

Description	Mounting of GV2	Sold in lots of	Unit reference
Combination block between circuit breaker and contactor	⊔ rail	10	**GV2AF3**
	Mounting plate LAD 311	10	**GV2AF4**

*(1) The breaking performance of circuit breakers **GV2ME** can be increased by adding a current limiter **GV1L3**, see page B6/21.*

(2) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Volts	24	220	230
∿ **50/60 Hz**	B7	M7	P7
⎓ (4)	BD	–	–

(3) Type 2 coordination also possible, see page A6/10.

*(4) Only available for **GV2DM**. Coil with integral suppression device as standard.*

***Note:** The combinations are valid for IE2 motors and IE3 with maximum starting current = 7.5 x motor rating current (see pages A6/4 and A6/5).*

Dimensions: page A2/20
Schemes: page A2/22

D.O.L. starters, reversing, from 0.06 to 15 kW at 400/415 V, type 1 coordination

This pre-assembled combination comprises:
- 1 motor circuit breaker GV2 ME,
- 1 3-pole reversing contactor LC2 D,
- 1 combination block GV2AF3.

Characteristics

Starter type		GV2		DM202 to DM210	DM214	DM216	DM220	DM221	DM222	DM232
Breaking capacity (Iq) (1)	Conforming to IEC 60947-4-1	400/415 V	**kA**	50	50	15	15	15	15	10
		440 V	**kA**	50	15	8	8	6	6	6
		500 V	**kA**	50	10	6	6	4	4	4

References

PB114213.eps



GV2DM202●●

D.O.L. starters, reversing (2)

Standard power ratings of 3-phase motors 50/60 Hz in AC-3			Setting range of thermal trips	Fixed magnetic tripping current 13 Irth	For customer assembly		Pre-assembled	Weight
400/415V	440 V	500 V			Motor circuit-breaker Reference	Contactor Reference to be completed (3)	Basic reference, to be completed by adding the voltage code (4)	
kW	kW	kW	A	A				kg
0.06	0.06	–	0.16…0.25	2.4	GV2ME02	LC2D09●●	**GV2DM202●●**	0.963
0.09 –	0.09 0.12	–	0.25…0.40	5	GV2ME03	LC2D09●●	**GV2DM203●●**	0.963
0.12 0.18	– 0.18	– –	0.40…0.63	8	GV2ME04	LC2D09●●	**GV2DM204●●**	0.963
0.25 0.37	0.25 0.37	– –	0.63…1	13	GV2ME05	LC2D09●●	**GV2DM205●●**	0.963
– 0.55 –	– 0.55 –	0.37 0.55 0.75	1…1.6	22.5	GV2ME06	LC2D09●●	**GV2DM206●●**	0.963
0.75 –	0.75 1.1	– 1.1	1.6…2.5	33.5	GV2ME07	LC2D09●●	**GV2DM207●●**	0.963
1.1 1.5	– 1.5	1.5 2.2	2.5…4	51	GV2ME08	LC2D09●●	**GV2DM208●●**	0.963
2.2 –	2.2 3	– 3	4…6.3	78	GV2ME10	LC2D09●●	**GV2DM210●●**	0.963
3 4	– 4	4 5.5	6…10	138	GV2ME14	LC2D09●●	**GV2DM214●●**	0.963
5.5	5.5	7.5	9…14	170	GV2ME16	LC2D12●●	**GV2DM216●●**	0.973
7.5 –	7.5 9	– 9	13…18	223	GV2ME20	LC2D18●●	**GV2DM220●●**	0.983
9	11	11	17…23	327	GV2ME21	LC2D25●●	**GV2DM221●●**	1.063
11	–	15	20…25	327	GV2ME22	LC2D25●●	**GV2DM222●●**	1.063
15	15	18.5	24…32	416	GV2ME32	LC2D32●●	**GV2DM232●●**	1.073

Add-on blocks

Description	Mounting of GV2	Sold in lots of	Unit reference
Combination block between circuit breaker and contactor	⊔ rail	10	**GV2AF3**
	Mounting plate LAD 311	10	**GV2AF4**

*(1) The breaking performance of circuit breakers **GV2ME** can be increased by adding a current limiter **GV1L3**, see page B6/21.*
(2) Type 2 coordination also possible, see page B6/21.
(3) See page B8/8.
(4) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Volts	24	220	230
∼ **50/60 Hz**	B7	M7	P7
⎓ (5)	BD	–	–

(5) Coil with integral suppression device as standard.

***Note:** The combinations are valid for IE2 motors and IE3 with maximum starting current = 7.5 x motor rating current (see pages A6/4 and A6/5).*

Dimensions: page A2/20
Schemes: page A2/22

D.O.L. starters, non-reversing, from 0.06 to 30 kW at 400/415 V, type 2 coordination

This pre-assembled combination comprises:
- 1 motor circuit breaker GV2P,
- 1 3-pole contactor LC1D,
- 1 combination block GV2AF3.

Characteristics

Starter type		GV2		DP102 to DP110	DP114	DP116	DP120	DP121	DP122	DP132
Breaking capacity (Iq) (1)	Conforming to IEC 60947-4-1	400/415 V	kA	130	130	130	50	50	50	50
		440 V	kA	130	130	50	20	20	20	20
		500 V	kA	130	50	42	10	10	10	10

References

D.O.L. starters, non-reversing

Standard power ratings of 3-phase motors 50/60 Hz in AC-3			Setting range of thermal trips	Fixed magnetic tripping current 13 Irth	For customer assembly		Pre-assembled	Weight
400/415 V	440 V	500 V			Motor circuit-breaker Reference	Contactor Reference to be completed (2)	Basic reference, to be completed by adding the voltage code (3)	
kW	kW	kW	A	A				kg
0.06	0.06	–	0.16…0.25	2.4	GV2P02	LC1D09●●	**GV2DP102●●**	0.686
–	0.09	–	0.25…0.40	5	GV2P03	LC1D09●●	**GV2DP103●●**	0.686
0.09	0.12							
0.12	–	–	0.40…0.63	8	GV2P04	LC1D09●●	**GV2DP104●●**	0.686
0.18	0.18	–						
0.25	0.25	–	0.63…1	13	GV2P05	LC1D09●●	**GV2DP105●●**	0.686
0.37	0.37	–						
–	–	0.37	1…1.6	22.5	GV2P06	LC1D09●●	**GV2DP106●●**	0.686
0.55	0.55	0.55						
–	–	0.75						
0.75	0.75	–	1.6…2.5	33.5	GV2P07	LC1D09●●	**GV2DP107●●**	0.686
–	1.1	1.1						
1.1	–	1.5	2.5…4	51	GV2P08	LC1D09●●	**GV2DP108●●**	0.696
1.5	1.5	2.2						
2.2	2.2	–	4…6.3	78	GV2P10	LC1D09●●	**GV2DP110●●**	0.736
–	3	3						
3	–	4	6…10	138	GV2P14	LC1D09●●	**GV2DP114●●**	0.736
4	4	5.5						
5.5	5.5	7.5	9…14	170	GV2P16	LC1D25●●	**GV2DP116●●**	0.741
–	7.5	9						
7.5	9	–	13…18	223	GV2P20	LC1D25●●	**GV2DP120●●**	0.736
9	11	11	17…23	327	GV2P21	LC1D25●●	**GV2DP121●●**	0.741
11	–	15	20…25	327	GV2P22	LC1D25●●	**GV2DP122●●**	0.741
15	15	18.5	24…32	416	GV2P32	LC1D32●●	**GV2DP132●●**	0.741
18.5	–	–	30…40	560	GV3P401 (4)	LC1D50A●●	–	1.725
–	18.5	22	30…40	560	GV3P401 (4)	LC1D65A●●	–	1.730
22	–	–	37…50	700	GV3P501 (4)	LC1D50A●●	–	1.725
–	22	30	37…50	700	GV3P501 (4)	LC1D65A●●	–	1.730
30	37	–	48…65	910	GV3P651 (4)	LC1D65A●●	–	1.730

PB114212.eps



GV2DP102●●

PB108367.eps



PB121239.eps



GV3P651 + LC1D65A●●

Add-on blocks

Description	Mounting of GV2	Sold in lots of	Unit reference
Combination block between circuit breaker and contactor	⊔ rail	10	**GV2AF3**

*(1) The breaking performance of circuit breakers **GV2P** can be increased by adding a current limiter **GV1L3**, see page B6/11.*
(2) See page B8/8.
(3) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Volts	24	220	230
∿ 50/60 Hz	B7	M7	P7
⎓ (5)	BD	–	–

*(4) Circuit breaker supplied without downstream **Ever**Link® power terminal block, which is required for vertical mounting. For side by side mounting, use a **GV3P** circuit breaker with terminal blocks and the **GV3S** set of S-shape busbars (see page B8/28).*
(5) Coil with integral suppression device as standard.

***Note:** The combinations are valid for IE2 motors and IE3 with maximum starting current = 7.5 x motor rating current (see pages A6/4 and A6/5).*

Dimensions: pages A2/20 and A2/21
Schemes: page A2/23

D.O.L. starters, reversing, from 0.06 to 30 kW at 400/415 V, type 2 coordination

This pre-assembled combination comprises:
- 1 motor circuit breaker GV2P,
- 1 3-pole reversing contactor LC2D,
- 1 combination block GV2AF3.

Characteristics

Starter type		GV2		DP202 to DP210	DP214	DP216	DP220	DP221	DP222	DP232
Breaking capacity (Iq) (1)	Conforming to IEC 60947-4-1	400/415 V	kA	130	130	130	50	50	50	50
		440 V	kA	130	130	50	20	20	20	20
		500 V	kA	130	50	42	10	10	10	10

References

D.O.L. starters, reversing


PB114214.eps

GV2DP202●●


PB108367.eps


PB108340.eps

GV3P651
+
LC2D65A●●

Standard power ratings of 3-phase motors 50/60 Hz in AC-3			Setting range of thermal trips	Fixed magnetic tripping current 13 Irth	For customer assembly		Pre-assembled	Weight
400/415 V	440 V	500 V			Motor circuit-breaker Reference	Contactor Reference to be completed (2)	Basic reference, to be completed by adding the voltage code (3)	
kW	kW	kW	A	A				kg
0.06	0.06	–	0.16…0.25	2.4	GV2P02	LC2D09●●	**GV2DP202●●**	1.053
–	0.09	–	0.25…0.40	5	GV2P03	LC2D09●●	**GV2DP203●●**	1.053
0.09	0.12							
0.12	–	–	0.40…0.63	8	GV2P04	LC2D09●●	**GV2DP204●●**	1.053
0.18	0.18	–						
0.25	0.25	–	0.63…1	13	GV2P05	LC2D09●●	**GV2DP205●●**	1.053
0.37	0.37	–						
–	–	0.37	1…1.6	22.5	GV2P06	LC2D09●●	**GV2DP206●●**	1.053
0.55	0.55	0.55						
–	–	0.75						
0.75	0.75	–	1.6…2.5	33.5	GV2P07	LC2D09●●	**GV2DP207●●**	1.053
–	1.1	1.1						
1.1	–	1.5	2.5…4	51	GV2P08	LC2D09●●	**GV2DP208●●**	1.073
1.5	1.5	2.2						
2.2	2.2	–	4…6.3	78	GV2P10	LC2D09●●	**GV2DP210●●**	1.153
–	3	3						
3	–	4	6…10	138	GV2P14	LC2D09●●	**GV2DP214●●**	1.153
4	4	5.5						
5.5	5.5	7.5	9…14	170	GV2P16	LC2D25●●	**GV2DP216●●**	1.163
–	7.5	9						
7.5	9	–	13…18	223	GV2P20	LC2D25●●	**GV2DP220●●**	1.153
9	11	11	17…23	327	GV2P21	LC2D25●●	**GV2DP221●●**	1.163
11	–	15	20…25	327	GV2P22	LC2D25●●	**GV2DP222●●**	1.163
15	15	18.5	24…32	416	GV2P32	LC2D32●●	**GV2DP232●●**	1.163
18.5	–	–	30…40	560	GV3P401 (4)	LC2D50A●●	–	2.750
–	18.5	22	30…40	560	GV3P401 (4)	LC2D65A●●	–	2.760
22	–	–	37…50	700	GV3P501 (4)	LC2D50A●●	–	2.750
–	22	30	37…50	700	GV3P501 (4)	LC2D65A●●	–	2.760
30	37	–	48…65	910	GV3P651 (4)	LC2D65A●●	–	2.760

Add-on blocks

Description	Mounting of GV2	Sold in lots of	Unit reference
Combination block between circuit breaker and contactor	⊥ rail	10	**GV2AF3**

*(1) The breaking performance of circuit breakers **GV2P** can be increased by adding a current limiter **GV1L3**, see page B6/11.*

(2) See page B8/8.

(3) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Volts	24	220	230
~ 50/60 Hz	B7	M7	P7
⎓ (5)	BD	–	–

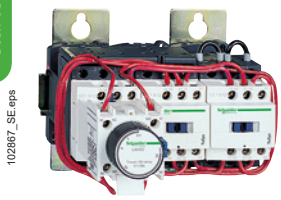
*(4) Circuit breaker supplied without downstream **EverLink®** power terminal block, which is required for vertical mounting. For side by side mounting, use a **GV3P** circuit breaker with terminal blocks and the **GV3S** set of S-shape busbars (see page B8/28).*

(5) Coil with integral suppression device as standard.

***Note:** The combinations are valid for IE2 motors and IE3 with maximum starting current = 7.5 x motor rating current (see pages A6/4 and A6/5).*

Dimensions:
pages A2/20 and A2/21

Schemes:
page A2/23



LC3D32A●●

Plate mounted starters without isolating device

Maximum operating rate: 30 starts/hour. Maximum starting time: 30 seconds.

Standard power ratings of squirrel cage motors Mains voltage - delta connection				Auxiliary contacts available on each contactor						Star delta mechanical interlock	Basic reference, to be completed by adding the voltage code (2)	Weight
				line		delta		star				
220/ 230 V	380/ 400 V	415 V	440 V	KM2		KM3		KM1				
kW	kW	kW	kW									kg
4	7.5	7.5	7.5	–	–	–	– (3)	–	1	With	**LC3D09A●●**	1.530
5.5	11	11	11	–	–	–	– (3)	–	1	With	**LC3D12A●●**	1.530
11	18.5	22	22	–	–	–	– (3)	–	1	With	**LC3D18A●●**	1.730
15	25	30	30	–	–	–	– (3)	–	1	With	**LC3D32A●●**	2.030
37	75	75	75	–	1	1	– (3)	–	– (3)	Without	**LC3D80●●**	5.200
										With	**LC3D80●●A64**	5.400
63	110	110	110	–	1	1	– (3)	–	– (3)	Without	**LC3D115●●** (4)	11.800
										With	**LC3D115●●A64** (4)	12.100
75	132	132	147	–	1	1	– (3)	–	1 (3)	Without	**LC3D150●●** (4)	12.100
										With	**LC3D150●●A64** (4)	12.100

Rail mounted starters (35 mm ⎓ rail) without isolating device

Standard power ratings of squirrel cage motors Mains voltage - delta connection				Auxiliary contacts available on each contactor						Star delta mechanical interlock	Basic reference, to be completed by adding the voltage code (2)	Weight
				line		delta		star				
220/ 230 V	380/ 400 V	415 V	440 V	KM2		KM3		KM1				
kW	kW	kW	kW									kg
Maximum operating rate: 12 starts/hour. Maximum starting time: 30 seconds.												
3	5.5	5.5	5.5	–	–	–	–	–	1	With	**LC3K06●●**	0.740
4	7.5	7.5	7.5	–	–	–	–	–	1	With	**LC3K09●●**	0.740
Maximum operating rate: 30 starts/hour. Maximum starting time: 30 seconds												
4	7.5	7.5	7.5	–	–	–	– (3)	–	1	With	**LC3D090A●●**	1.530
5.5	11	11	11	–	–	–	– (3)	–	1	With	**LC3D120A●●**	1.530
11	18.5	22	22	–	–	–	– (3)	–	1	With	**LC3D180A●●**	1.730
15	25	30	30	–	–	–	– (3)	–	1	With	**LC3D320A●●**	2.030

(1) Protection must be provided by the addition of a thermal overload relay, to be ordered separately. Select appropriate overload relay for setting at 0.58 of the full load rated motor current (see pages B11/4 and B11/5).

(2) Standard control circuit voltages:

Volts ∼ 50/60 Hz	24	36	42	48	110	220	230	240	380	400	415	440
Star-delta starters LC3K06 and K09												
Code	B7	C7	D7	E7	F7	M7	P7	U7	–	–	–	–
Star-delta starters LC3D09A...D150, LC3D090A...D320A												
Code	B7	–	D7	E7	F7	M7	P7	U7	Q7	V7	N7	R7

For other voltages, please consult your Regional Sales Office.

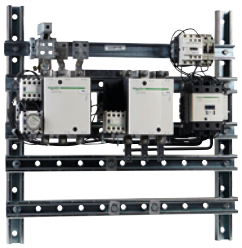
*(3) One auxiliary contact block type **LADN** can also be fitted, see page B8/22.*

*(4) These starters consist of contactors **LC1D115** or **D150** without connectors.*

Pre-assembled starters without isolating device

Maximum operating rate: 12 starts/hour.
Maximum starting time:
LC3F●●●●●: 20 seconds,
LC3F●●●●●A64: 30 seconds (3 identical contactors).
Composition of starters without mechanical interlock, see pages A2/14, A2/15.

PB121240.eps



LC3F115M7

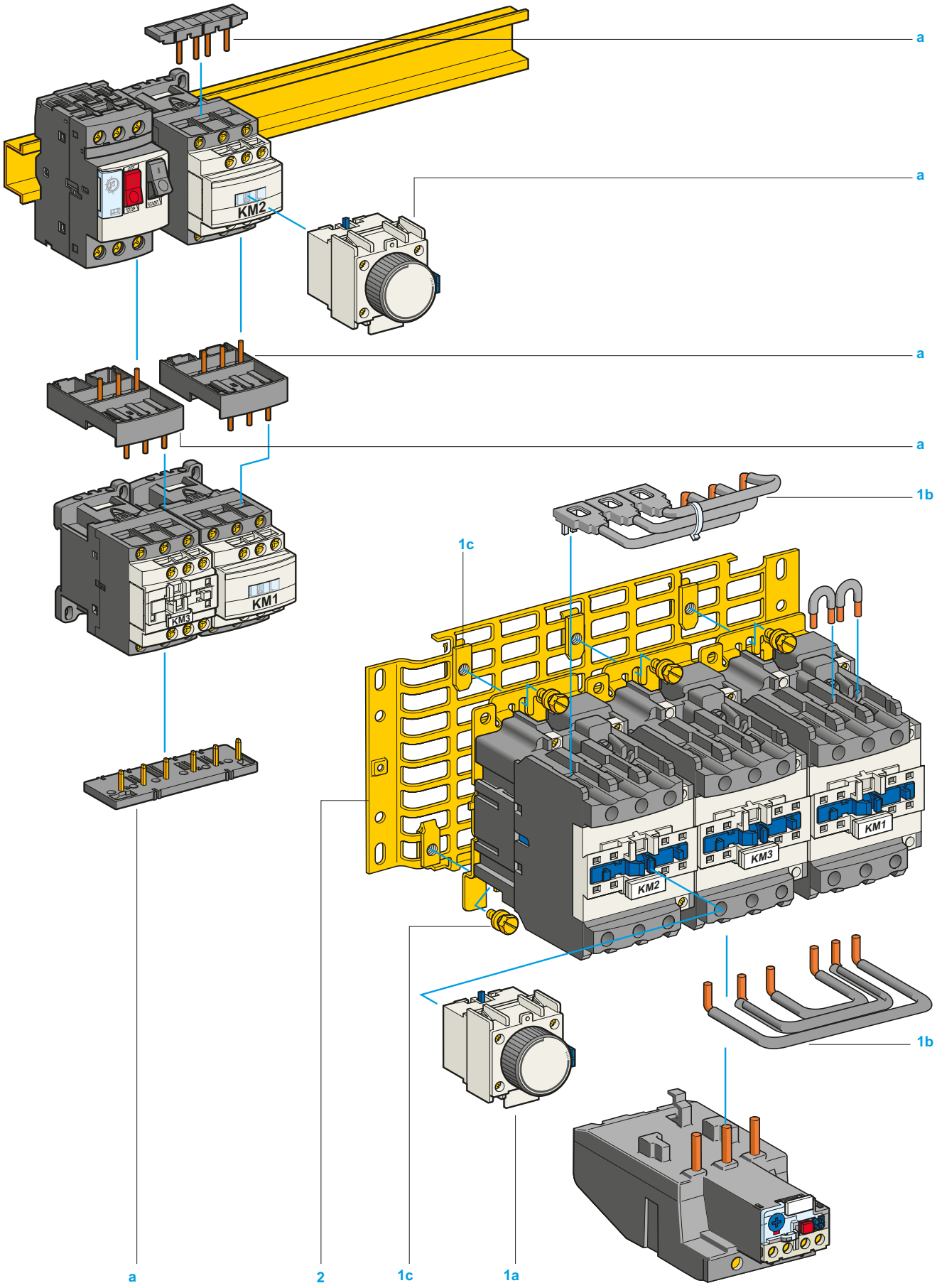
Star-delta starters

Standard power ratings of squirrel cage motors Mains voltage - delta connection				Auxiliary contacts available on each contactor						Star delta mechanical interlock	Basic reference, to be completed by adding the voltage code (2)	Weight
				line		delta		star				
220/ 230 V	380/ 400 V	415 V	440 V	KM2		KM3		KM1				
									(3)			
kW	kW	kW	kW									kg
90	160	160	185	1	2	2	1	1	1	Without	**LC3F185●●**	16.500
										With	**LC3F185●●A64**	16.625
100	200	200	220	1	2	2	1	1	1	Without	**LC3F225●●**	16.500
										With	**LC3F225●●A64**	16.625
110	220	220	250	1	2	2	1	1	1	Without	**LC3F265●●**	27.300
										With	**LC3F265●●A64**	27.425
160	280	280	315	1	2	2	1	1	1	Without	**LC3F330●●**	37.000
										With	**LC3F330●●A64**	37.125
185	315	355	375	1	2	2	1	1	1	Without	**LC3F400●●**	37.000
										With	**LC3F400●●A64**	37.125

(1) Protection must be provided by the addition of a thermal overload relay, to be ordered separately. Select appropriate overload relay for setting at 0.58 of the full load rated motor current, see pages B11/11 and B11/12.
(2) Standard control circuit voltages:

Volts ~ 50/60 Hz	48	110	115	220/230	230	240	380/400	400	415
Code	E7	F7	FE7	M7	P7	U7	Q7	V7	N7

For other voltages, please consult your Regional Sales Office.
*(3) One auxiliary contact block type **LADN** can be fitted.*


a
a
a
a
1b
1c
KM2
KM3
KM1
KM2
KM3
KM1
1b
a
2
1c
1a

Star-delta starters without mechanical interlock, for customer assembly on plate or on mounting rail (2)

Starters for direct combination with a circuit breaker

Maximum operating rate: 30 starts/hour. Maximum starting time: 30 seconds

Standard power ratings of squirrel cage motors (3) Mains voltage-delta connection		Thermal-magnetic motor circuit breaker *References in italics are available in CEE zone only*	Contactors (basic references, to be completed by adding the voltage code) (4)		
400/ 415 V	440 V		line	delta	star
kW	kW		KM2	KM3	KM1
7.5	7.5	**GV2ME20** or *GV2ME20AP*	**LC1D09●●**	**LC1D09●●**	**LC1D09●●**
–	9	**GV2ME20** or *GV2ME20AP*	**LC1D12●●**	**LC1D12●●**	**LC1D09●●**
9	11	**GV2ME21** or *GV2ME21AP*	**LC1D12●●**	**LC1D12●●**	**LC1D09●●**
11	–	**GV2ME22** or *GV2ME22AP*	**LC1D12●●**	**LC1D12●●**	**LC1D09●●**
15	15	**GV2ME32** or *GV2ME32AP*	**LC1D18●●**	**LC1D18●●**	**LC1D09●●**

Separate component

Description	Illustration item no.	Reference
Mounting kit comprising: power circuit connections and 1 time delay contact block LADS2	a	**LAD912GV**

Starters for mounting separately from upstream protection

Maximum operating rate: 30 starts/hour. Maximum starting time: 30 seconds.

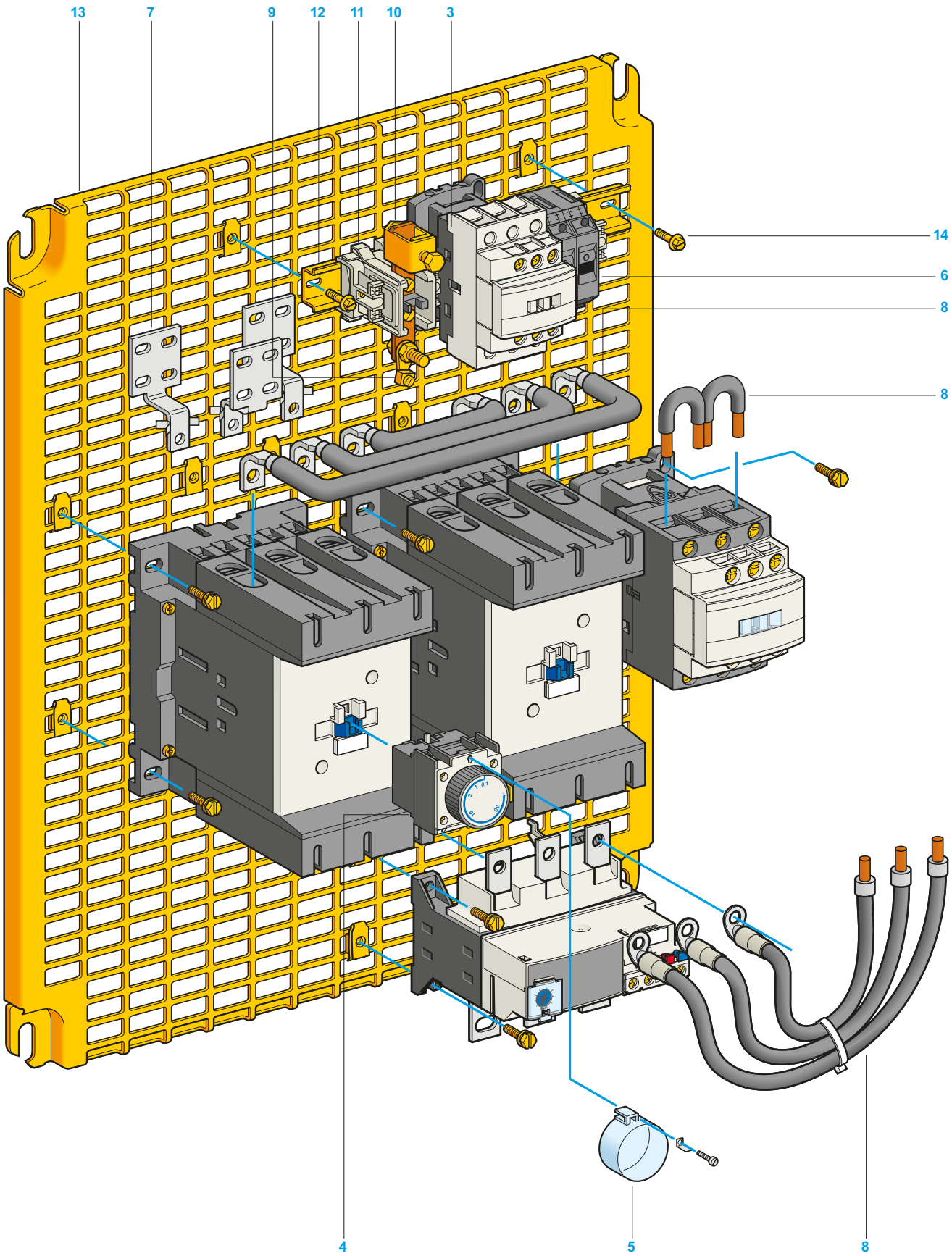
Standard power ratings of squirrel cage motors (3) Mains voltage - delta connection				Contactors (basic references, to be completed by adding the voltage code) (4)			Separate components (see below)
220/ 230 V	380/ 400 V	415 V	440 V	line	delta	star	
kW	kW	kW	kW	KM2	KM3	KM1	Component types
4	7.5	7.5	7.5	**LC1D09●●**	**LC1D09●●**	**LC1D09●●**	D09
5.5	11	11	11	**LC1D18●●** (6)	**LC1D12●●**	**LC1D09●●**	D12
11	18.5	22	22	**LC1D25●●** (7)	**LC1D25●●** (7)	**LC1D09●●**	D18
15	25	30	30	**LC1D32●●**	**LC1D32●●**	**LC1D18●●**	D32
18.5	37	37	37	**LC1D40A●●**	**LC1D40A●●**	**LC1D40A●●**	D40
30	55	59	59	**LC1D50A●●**	**LC1D50A●●**	**LC1D40A●●**	D50
37	75	75	75	**LC1D80●●**	**LC1D80●●**	**LC1D50A●●**	D80
63	110	110	110	**LC1D115●●**	**LC1D115●●**	**LC1D80●●**	D115 (5)
75	132	132	147	**LC1D150●●**	**LC1D150●●**	**LC1D115●●**	D150 (5)

Separate components

Description	Illustration item no.	For components type (5)	Reference	Without timer LADS2
Mounting kit comprising: - 1 time delay contact block LADS2 (D09…D80) (3), - power circuit connections (D09…D80), - screws and clamps for fixing contactors to the plate (D40…D80).	1 a	LC1D09 to D38 (8)	**LAD91217**	**LAD91218**
		LC1D09 to D38 (9)	**LAD93217**	**LAD93218**
	1 b	D40 and D50	**LA9D5017**	–
	1 c	D80	**LA9D8017**	–
Equipment mounting plates	2	LC1D09 to D38	**LA9D12974**	
		D40 and D50	**LA9D40973**	
		D80	**LA9D80973**	

(1) Protection must be provided by the addition of a thermal overload relay, to be ordered separately. Select appropriate overload relay for setting at 0.58 of the full load rated motor current, see pages B11/4 and B11/5.
(2) For mounting, assembly and cabling: please refer to installation instructions supplied with the equipment.
(3) See comments on page A2/24.
(4) See page B8/8.
(5) For D115 and D150 components, see illustration and separate parts on pages A2/12 and A2/13.
(6) A D12 component is adequate for the application, but use of a D18 is recommended. (connection capacity, correct use of power connection kit and connections).
(7) A D18 component is adequate for the application, but use of a D25 is recommended. (connection capacity, correct use of power connection kit and connections).
(8) For assembly of 3 contactors of the same physical size (depth).
(9) For assembly of 3 contactors with star contactor physically smaller (depth).

Introduction: page A2/24
Dimensions: pages A2/25 and A2/26
Schemes: page A2/26


13
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TeSys components for assembling Star-delta starters - up to 147 kW (1)

Product references

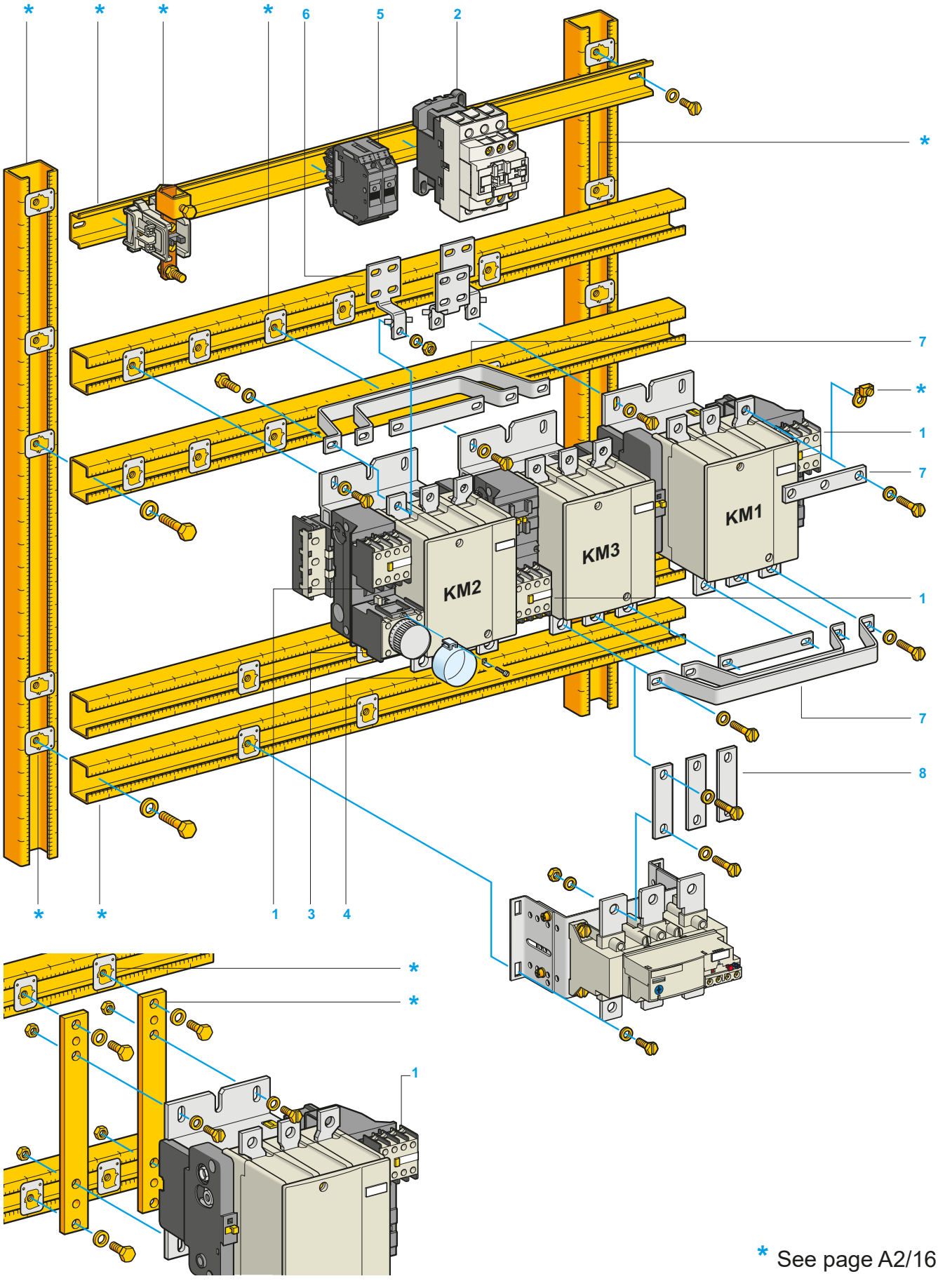
Starters for mounting separately from upstream protection

Separate components (continued)

Description	Illustration item no.	For use on	No.	Sold in lots of	Unit reference	Weight kg
Instantaneous auxiliary contact blocks 1 N/O	1	D115 (star)	1	1	**LADN10**	0.020
Control relay	3	D115, D150	1	1	**CAD32** (3)	0.320
Time delay auxiliary contact blocks	4	D115, D150	1	1	**LADT2**	0.060
Lead sealing kit for time delay auxiliary contact blocks	5	D115, D150	1	1	**LA9D901**	0.005
Thermal magnetic circuit breaker for control circuit (200…415 V)	6	D115, D150	2	6	**GB2CB05**	0.060
Set of 3 connectors for wider terminations (optional)	7	D115, D150	1	1	**LA9FG980**	0.200
Set of power connections with fixing accessories	8	D115	1	1	**LA9D11517**	0.800
		D150	1	1	**LA9D15017**	1.050
Spare volt free terminals	9	D115, D150	1	10	**DZ3HA3**	0.007
			2	10	**DZ3GA3**	0.006
Lug-connector terminal block	10	D115, D150	1	10	**AB1BC9535**	0.236
End stop	11	D115, D150	3	100	**AB1AB8M35**	0.005
Mounting rail ⊔ 35 mm	12	D115, D150	1	10	**NSYDPR25**	0.210
Pre-slotted mounting plate	13	D115, D150	1	1	**AM3PA65**	1.950
Screw with captive washer	14	D115, D150	12	100	**AF1VA618**	0.006
			2	100	**AF1VA410**	0.002

(1) Protection must be provided by the addition of a thermal overload relay, to be ordered separately. Select appropriate overload relay for setting at 0.58 of the full load rated motor current, see pages B11/4 and B11/5.

(2) For mounting, assembly and cabling: please refer to installation instructions supplied with the equipment.



* See page A2/16

Star-delta starters without mechanical interlock for customer assembly on chassis

Contactors

Maximum operating rate: 12 starts/hour. Maximum starting time: 20 seconds (2)

Standard power ratings of squirrel cage motors				Contactors (3)			Separate components (see below)
220/ 230V	380/ 400V	415V	440V	line	delta	star	
kW	kW	kW	kW	KM2	KM3	KM1	Component types
90	160	160	185	**LC1F185●●**	**LC1F185●●**	**LC1D150●●**	F185
100	200	200	220	**LC1F225●●**	**LC1F225●●**	**LC1F185●●**	F225
110	220	220	250	**LC1F265●●**	**LC1F265●●**	**LC1F185●●**	F265
160	280	280	315	**LC1F330●●**	**LC1F330●●**	**LC1F265●●**	F330
185	315	355	375	**LC1F400●●**	**LC1F400●●**	**LC1F265●●**	F400

Separate components (4)

Description	Illustration item no.	For use on	No.	Sold in lots of	Unit reference	Weight kg
Instantaneous auxiliary contact blocks 2 N/O + 2 N/C	1	F185 to F400	3	1	**LADN22**	0.050
Control relay	2	F185 to F400	1	1	**CAD32**	0.580
Time delay auxiliary contact blocks	3	F185 to F400	1	1	**LADT2**	0.060
Sealing cover	4	F185 to F400	1	1	**LA9D901**	0.005
Thermal magnetic circuit breaker for 5 A control circuit	5	F185 to F400	2	6	**GB2CB10**	0.050
Sets of 3 connectors for wider terminations (optional)	6	F185	1	1	**LA9FG980**	0.200
		F225 to F400	1	1	**LA9FJ980**	0.490
Sets of power connections	7	F185	1	1	**LA9F18517**	0.800
		F225	1	1	**LA9F22510**	1.400
		F265	1	1	**LA9FH610**	1.400
		F330 and F400	1	1	**LA9FJ610**	1.500
Set of 3 busbars for thermal overload connections	8	F185 to F400	1	1	**LA7F●●●** (Selected according to size of thermal overload relay) see pages B11/11 and B11/12.	

(1) Protection must be provided by the addition of a thermal overload relay, to be ordered separately. Select appropriate overload relay for setting at 0.58 of the full load rated motor current, see pages B11/11 and B11/12.
(2) For longer starting times, please consult your Regional Sales Office.
(3) Contactors supplied with coil. Complete the reference by adding the control circuit voltage code.
Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

LC1D150

Volts	48	110	115	120	220	230	240	380	400	415
50/60 Hz	E7	F7	FE7	G7	M7	P7	U7	Q7	V7	N7

LC1F185 to F400

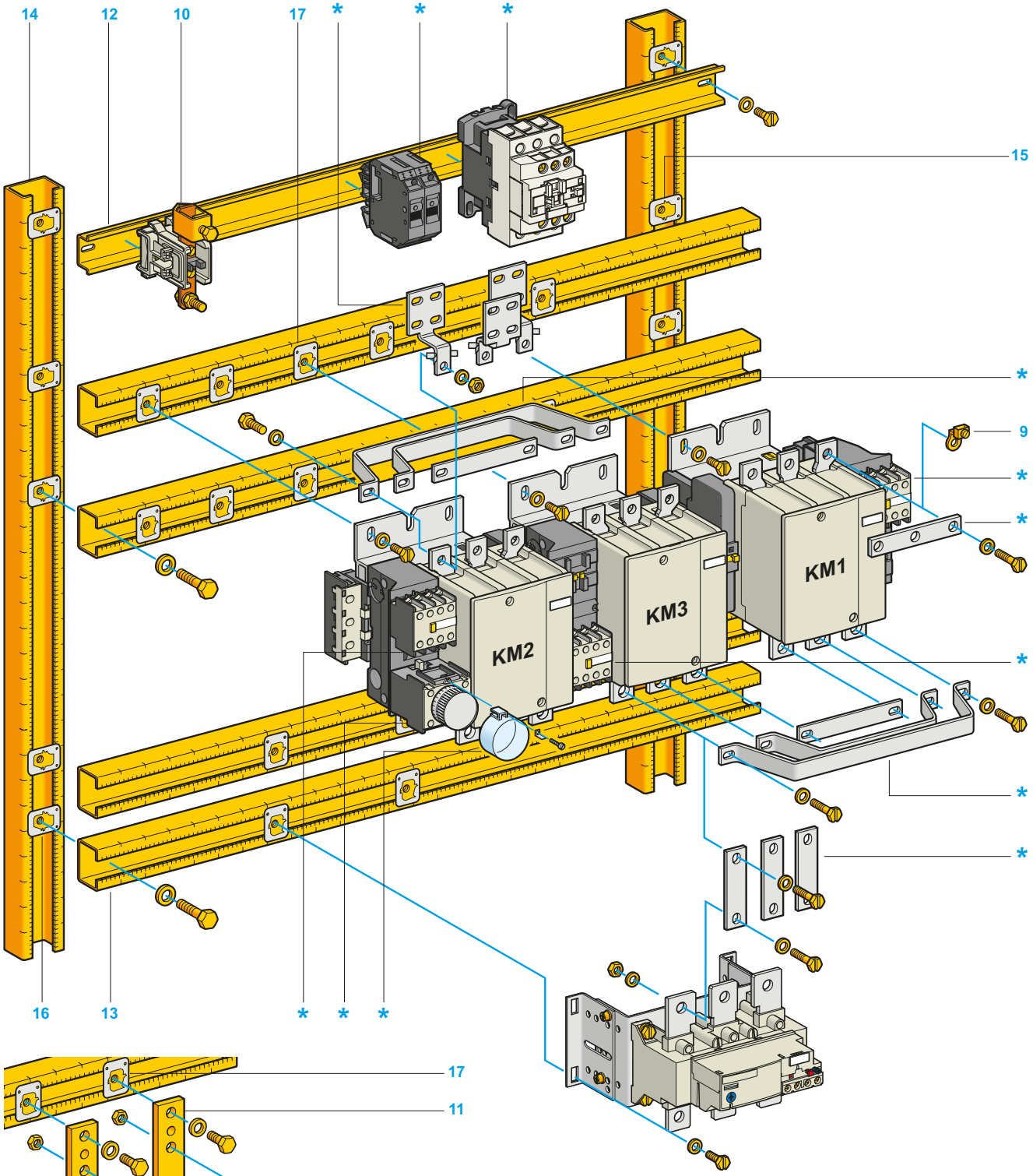
Volts	48	110	115	120	220	230	240	380	400	415
40… 400 Hz (5)	E7 (6)	F7	FE7	G7	M7	P7	U7	Q7	V7	N7

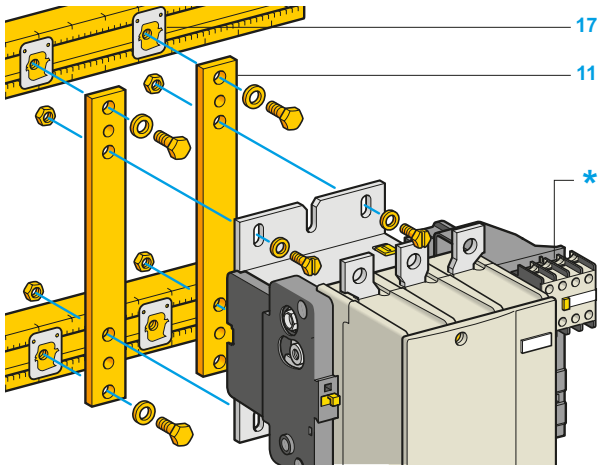
Standard voltages, see page B9/2.

For other voltages between 24 and 660 V, see pages B9/17 and B9/18.

(4) Other separate components, see page A2/17.
(5) Coil LX1: LC1F265, F330 and F400. Coil LX9: LC1F185 and F225.
(6) Except for LC1F400.

Open pre-cabled motor starters





* See page A2/14

Product references

Separate components (continued from page A2/15)

Description	Illustration item no.	For use on	No.	Sold in lots of	Unit reference	Weight kg
Spare volt free terminals	9	F185	3	10	**DZ3GA3**	0.006
		F225…F400	3	10	**DZ3HA3**	0.007
Neutral terminals with stop and spare volt free terminal (for control circuit)	10	F185	1	10	**AB1BC9535**	0.236
			2	100	**AB1AB8P35**	0.006
			1	10	**DZ3HA3**	0.007
		F225 and F265	1	10	**AB1BC15035**	0.277
			2	100	**AB1AB8M35**	0.007
			1	10	**DZ3JA3**	0.010
		F330 and F400	1	10	**AB1BC24035**	0.287
			2	100	**AB1AB8M35**	0.007
			1	10	**DZ3JA3**	0.010
Reducer bracket	11	F400	2	1	**LA9F100**	0.100
Mounting rails (2)	12	F185…F400	1	10	**NSYSDR200**	0.900
	13	F185…F400	1	4	**AM1EC200**	2.980
Uprights (2)	14	F115…F400	2	4	**AM1EC200**	2.980
1/4 turn sliding clip nuts and corresponding bolts for rails NSYSDR	15	F185…F400	2	10	**NSYSNM6**	0.020
				100	**AF1VA618**	0.006
1/4 turn sliding clip nuts and corresponding bolts for rails NSYSDR	16	F185…F400	8	10	**NSYSNM8**	0.020
				10	**AF1VC820**	0.024
1/4 turn sliding clip nuts and corresponding bolts for equipment fixing	17	F185…F330	15	10	**AF1CD061**	0.020
				100	**AF1VA618**	0.006
		F400	8	10	**AF1CD061**	0.020
				10	**AF1CD081**	0.020
				100	**AF1VA618**	0.006
				10	**AF1VC820**	0.024
			4	–	**25 x H6 screws** with washers	
Enclosures: metal, grey RAL 7032	–	F185…F225	1	1	**ACMGV763**	19.090
		F265	1	1	**ACMGV973**	33.310
		F330 and F400	1	1	**ACMGV1084**	54.000
Fixing lugs adjustable for enclosure ACM	–	–	4	4	**AE3FX122**	0.080

(1) Protection must be provided by the addition of a thermal overload relay, to be ordered separately. Select appropriate overload relay for setting at 0.58 of the full load rated motor current, see pages B11/11 and B11/12.
(2) Supplied in 2 m lengths. See page A2/27 for cutting to length.

Open pre-cabled motor starters

Open pre-cabled motor starters

Technical Data for Designers

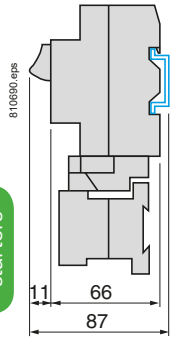
Contents

Non-reversing / Reversing starters ..... A2/20 to A2/23
Star-delta starters ..... A2/24 to A2/28

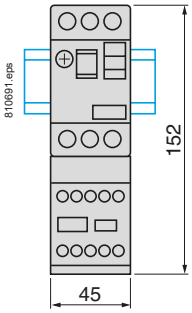
Dimensions, mounting

GV2ME●●K●●●

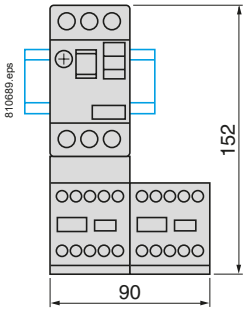
On mounting rail NSYSDR200



GV2ME●●K1●●

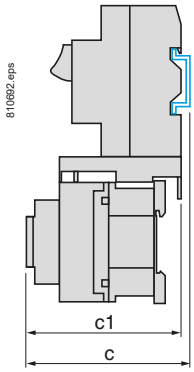


GV2ME●●K2●●

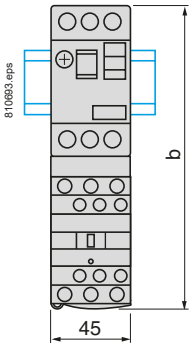


GV2DM●●●●●

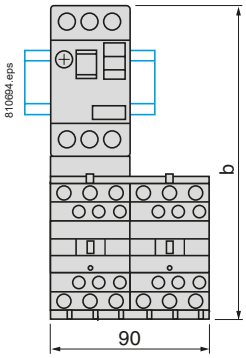
On mounting rail NSYSDR200



GV2DM1●●●●



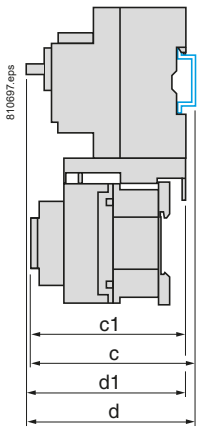
GV2DM2●●●●



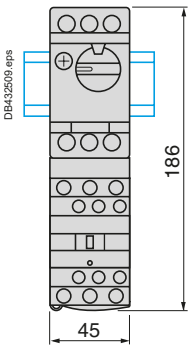
GV2DM●●●●● contactor with AC or DC coil on mounting rail NSYSDR200		
GV2	**DM●02●● to DM●20●●**	**DM●21●● to DM●32●●**
b	177	187
c	106	113
c1	96	103

GV2DP●●●●●

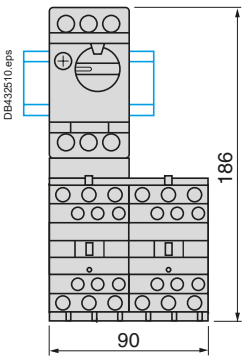
On mounting rail NSYSDR200



GV2DP1●●●●



GV2DP2●●●●



GV2DP●●●●● contactor with AC or DC coil on mounting rail		
GV2	**DP●02●● to DP●08●●**	**DP●10●● to DP●32●●**
b	178	188
c	111	118
c1	101	108
d	107	107
d1	97	97

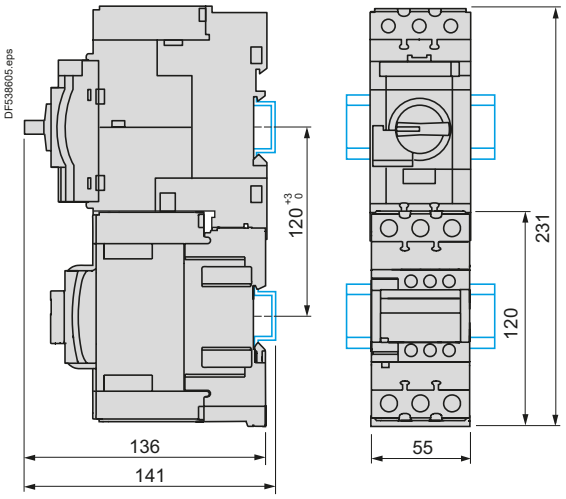
References:
pages A2/2 to A2/7

Schemes:
pages A2/22 and A2/23

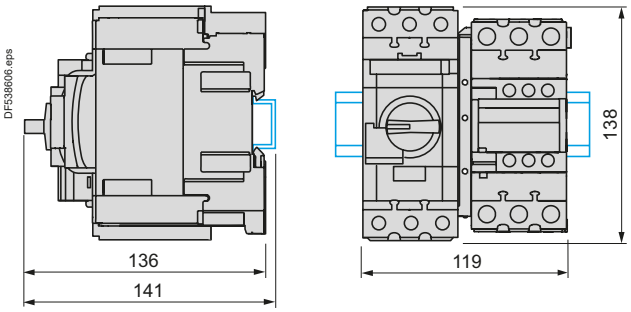
Dimensions, mounting

GV3P●●1 + LC1D40A…D65A (for customer assembly)

Vertical mounting (1)

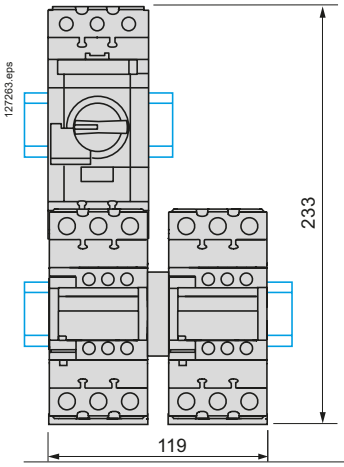


Side by side mounting with S-shape busbar system GV3 S (2)

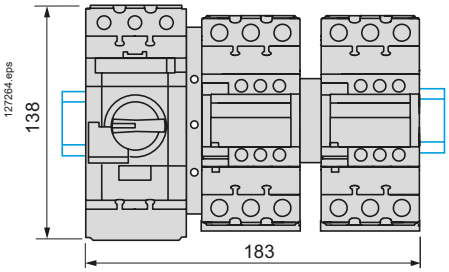


GV3P●●1 + LC2D40A…D65A (for customer assembly)

Vertical mounting (1)



Side by side mounting with S-shape busbar system GV3 S (2)



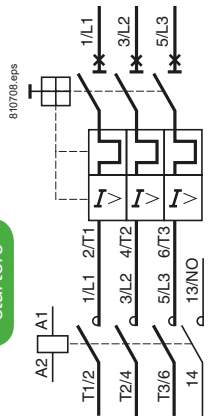
(1) For several side-by-side motor starters, the maximum current allowed is equal to the nominal current under 400 V.
Example: 55 A for a 30 kW motor under 400 V, for a GV3 P65 circuit breaker and a LC1 D65A contactor association.
(2) The maximum current allowed is equal to 90 % of maximum current. Example: 45 A for a LC1 D50A contactor.

References:
pages A2/6 and A2/7

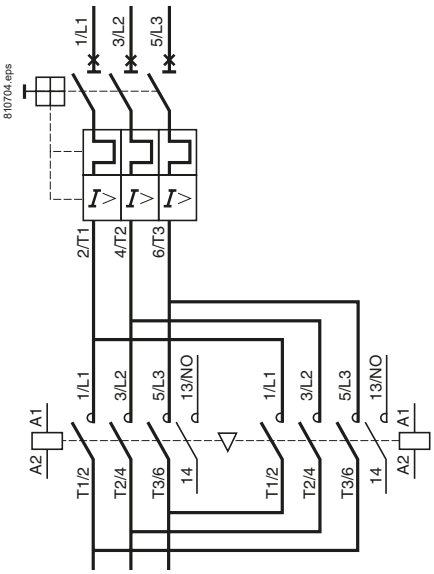
Schemes:
page A2/23

Schemes

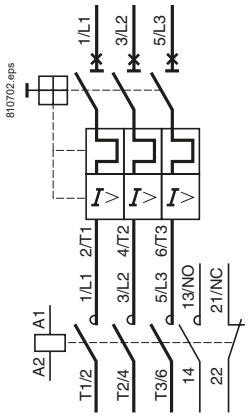
GV2ME●●K1●●



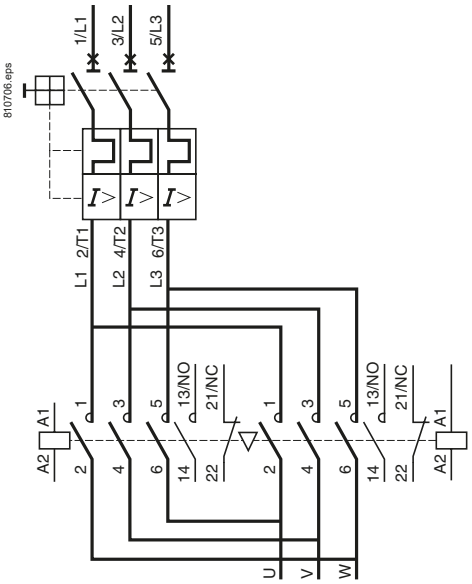
GV2ME●●K2●●



GV2DM1●●●●



GV2DM2●●●●

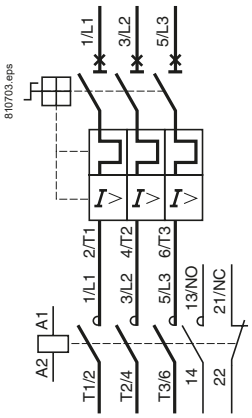


References:
pages A2/2 to A2/5

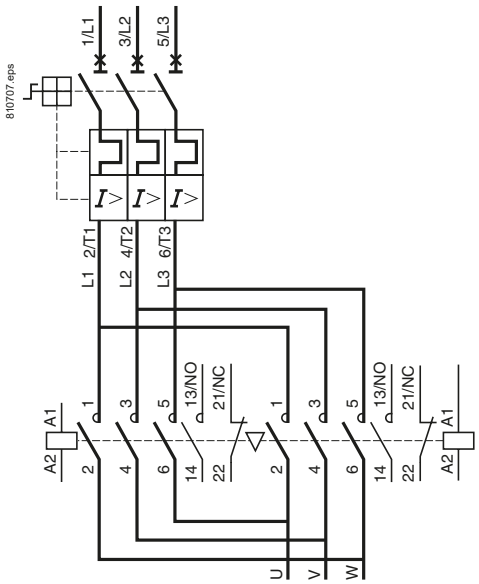
Dimensions:
page A2/20

Schemes

GV2DP1●●●●

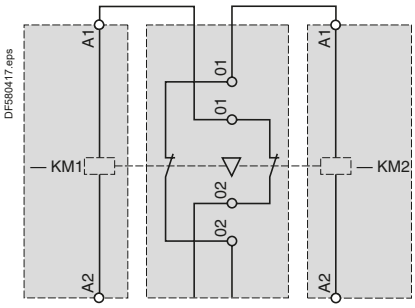


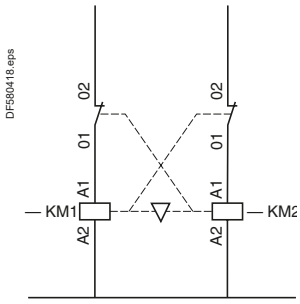
GV2DP2●●●●



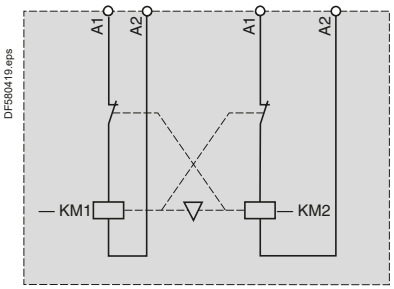
Mechanical interlock with integral electrical contacts

Control circuit ∿





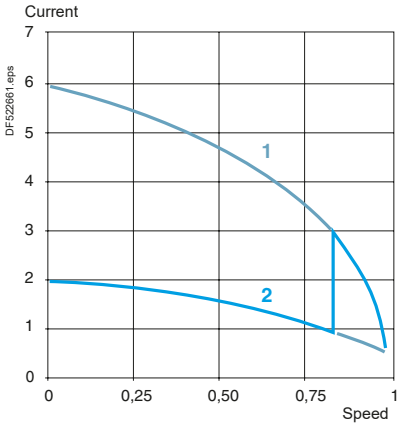
Control circuit ⎓



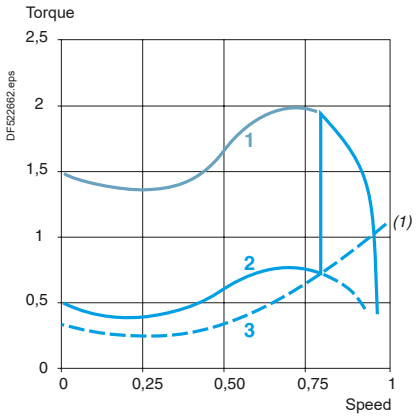
References:
pages A2/6 and A2/7

Dimensions:
pages A2/20 and A2/21

Star-delta starting



1 Starting in direct delta connection
2 Starting in star connection



1 Starting in direct delta connection
2 Starting in star connection
3 Resistive torque of the machine

This method of starting is applicable to motors on which all 6 stator terminals are accessible and whose delta connection voltage corresponds to the mains voltage.

Star-delta starting should be used for motors starting on no-load or having a low load torque and gradual build-up:
- the starting torque in star connection is reduced to one third of the direct starting torque, i.e. about 50 % of the rated torque.
- the starting current in star connection is about 1.8 to 2.6 times the rated current.

The transition from star to delta connection must occur when the machine has run up to speed. A too rapid build-up in load torque would cause the stabilised run-up speed to be too low and would therefore eliminate any advantage in this method of starting: this is the case with certain machines whose load torque depends on the machine speed (a characteristic of centrifugal machines, for example).

All star-delta starters are supplied with a special LADS2 or LA2KT2● time delay relay which imposes a delay on the delta contactor during the transition period in order to allow the star contactor sufficient breaking time.

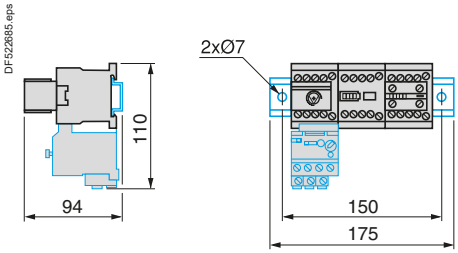
For ratings D115 and D150, this function is performed by a time delay auxiliary contact block LADT2 and a control relay.

(1) Motor manufacturers generally specify machine load torques.
Example: maximum resistive torque on completion of star-delta start (expressed as a proportion of the rated torque).

References:
pages A2/8 to A2/17
Dimensions:
pages A2/25 to A2/27
Schemes:
pages A2/26 and A2/28

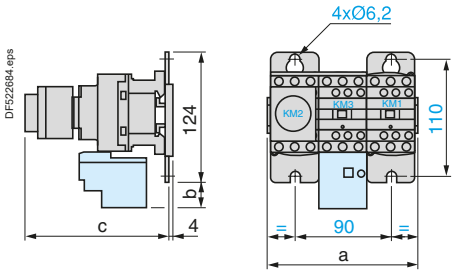
Dimensions

LC3K plate mounted, pre-assembled



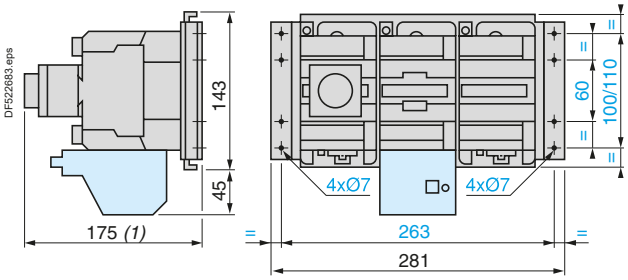
On starters LC3D09A to D18A, a connection block is mounted on the upper part of contactor KM2, increasing the overall height of the product by 6.5 mm.

LC3D09A…D32A pre-assembled or 3 x LC1D09A...D32A (customer assembly) + components



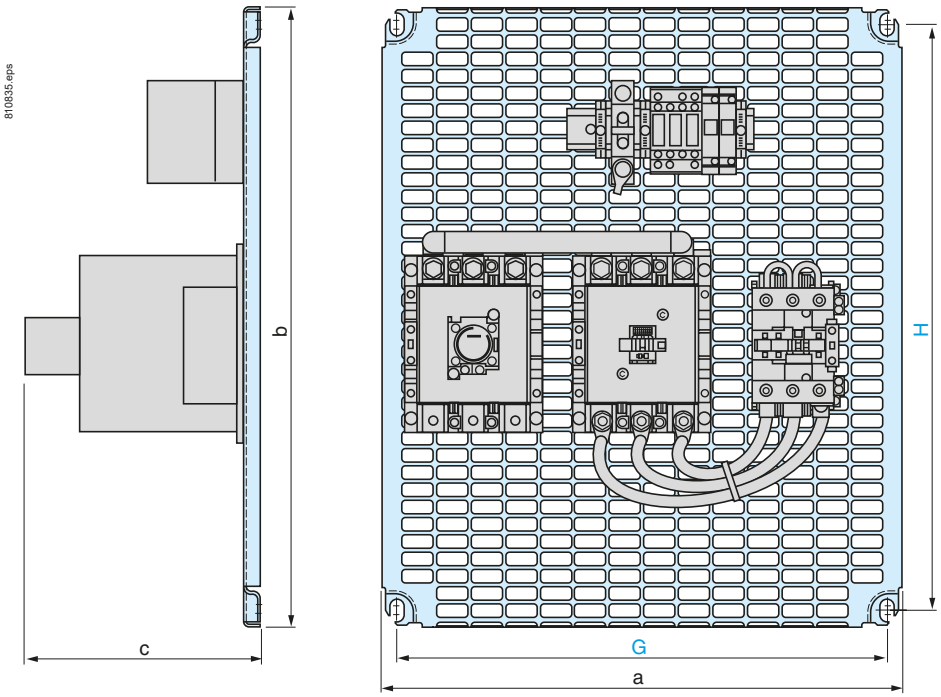
LC3		D09A	D12A	D18A	D32A
a		143	143	144	165
b		26.5	26.5	26.5	32.5
c	with LADS	139	139	139	145
	with LADS and sealing cover	143	143	143	149

LC3D80 pre-assembled or 3 x LC1D80 (customer assembly) + components



(1) +4 mm with sealing cover

LC3D115, D150 pre-assembled or 3 x LC1D115...D150 (customer assembly) + components

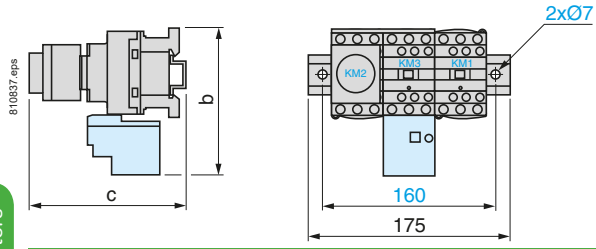


		a	b	c	G	H
LC3D115 or 3 x LC1D with components	D115	450	555	205	425	525
LC3D150 or 3 x LC1D with components	D150	450	555	205	425	525

References:
pages A2/8 to A2/13
Introduction:
page A2/24
Schemes:
page A2/26

Dimensions

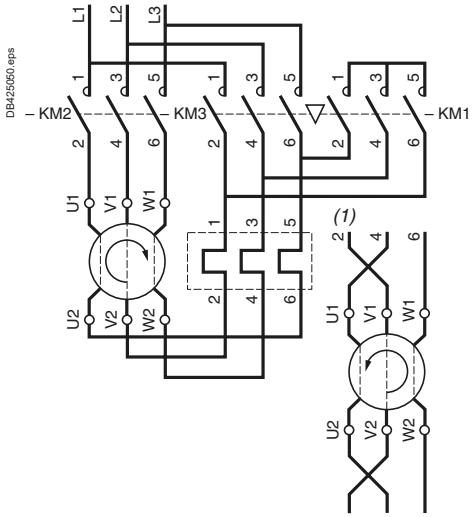
LC3D090A à D320A on NSYSDR mounting rail, pre-assembled



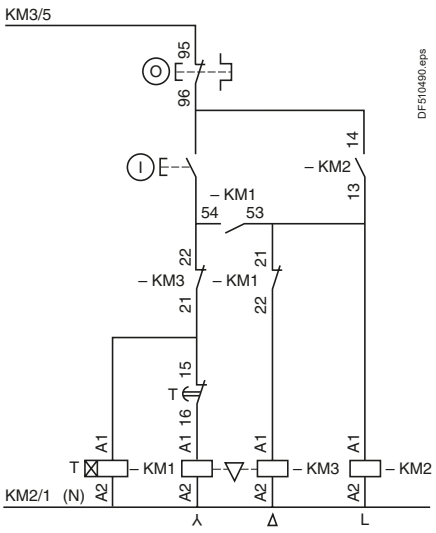
LC3		D090A à D180A	D320A
b		153	137
c	with LADS	139	145
	with LADS and sealing cover	143	149

Schemes

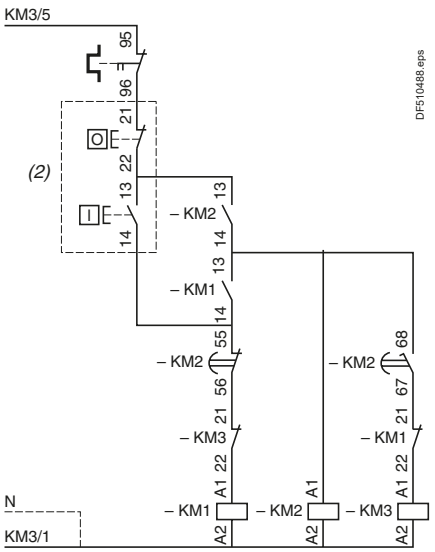
LC3K, LC3D09A to D80
LC3D090A to D320A



LC3K

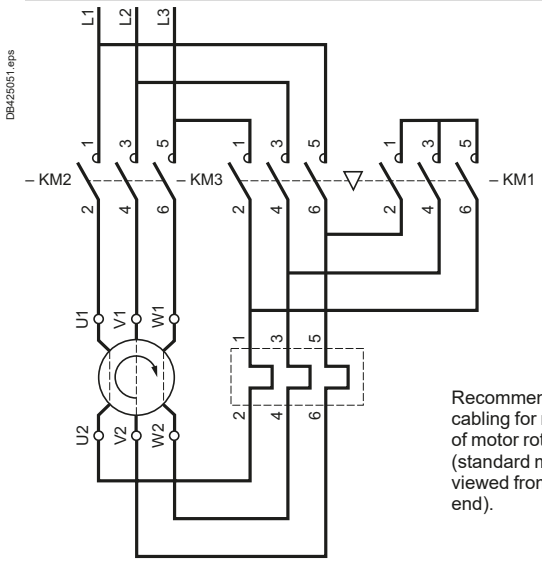


LC3D

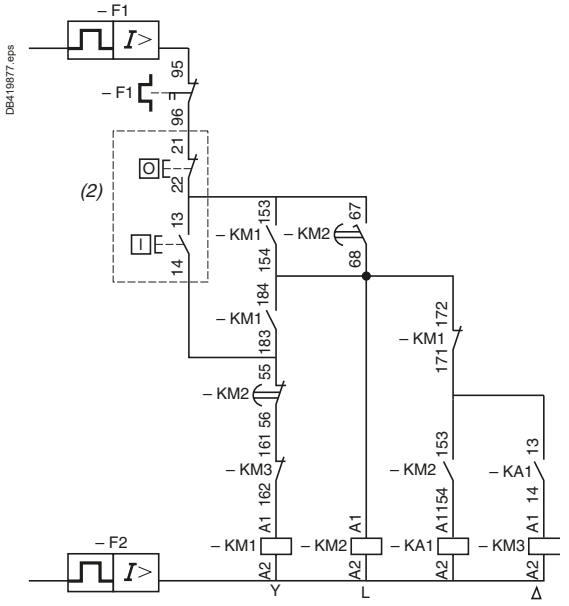


Note: LC3D09A to D18A: Mechanical interlock between KM3 and KM1.

LC3D115 and D150



Recommended cabling for reversal of motor rotation (standard motor, viewed from shaft end).

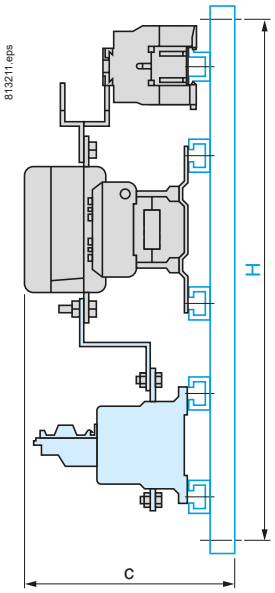


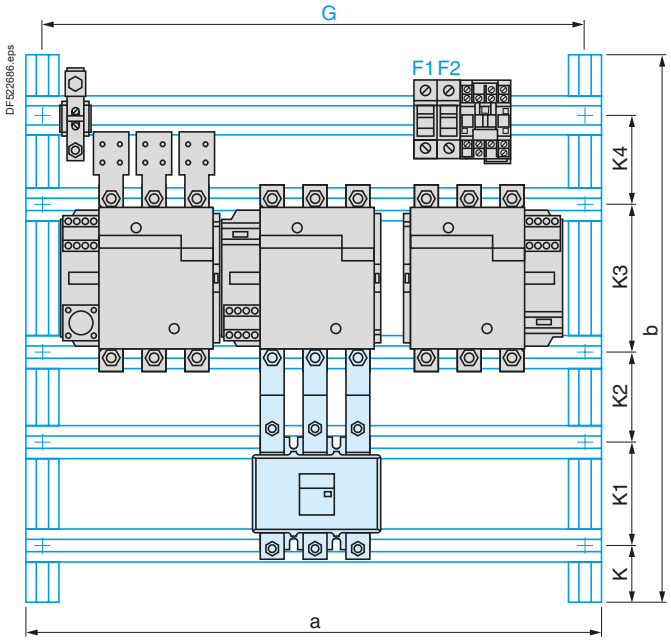
(1) Recommended cabling for reversal of motor rotation (standard motor, viewed from shaft end).
(2) Remote control.

References:
pages A2/8 to A2/13
Dimensions:
page A2/25

Dimensions

LC3F185 to LC3F400 - pre-assembled - chassis mounted or 2 x LC1F●●● and 1 x LC1D150 or 3 x LC1F●●● (customer assembly)





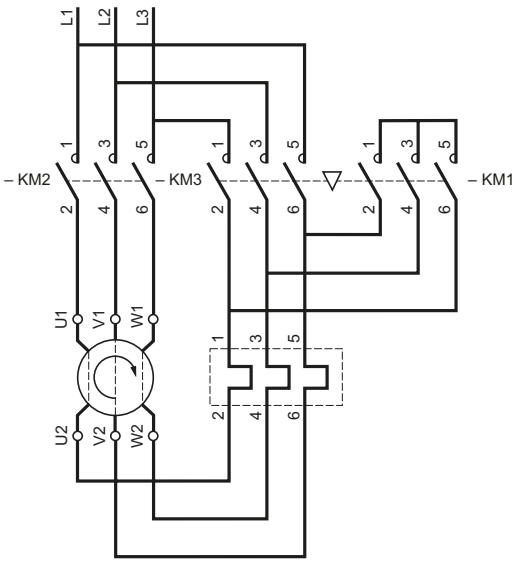
	a	b	c	G	H	K	K1	K2	K3	K4
LC3F185 or **2 x LC1F●●● + 1 x LC1D** with components F185	565	675	235	525	625	160	110	80	110	80
LC3F225 or **3 x LC1F●●●** with components F225	565	675	235	525	625	160	110	80	110	80
LC3F265 or **3 x LC1F●●●** with components F265	665	775	266	625	725	165	110	100	110	110
LC3F330 or **3 x LC1F●●●** with components F330	765	975	276	725	825	195	140	100	110	180
LC3F400 or **3 x LC1F●●●** with components F400	765	975	276	725	925	195	140	100	180	110

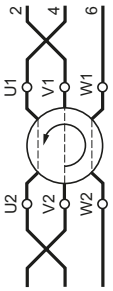
References:
pages A2/9, A2/14 to A2/17
Introduction:
page A2/24
Schemes:
page A2/28

Schemes

LC3F185 to F400

DB425051.eps

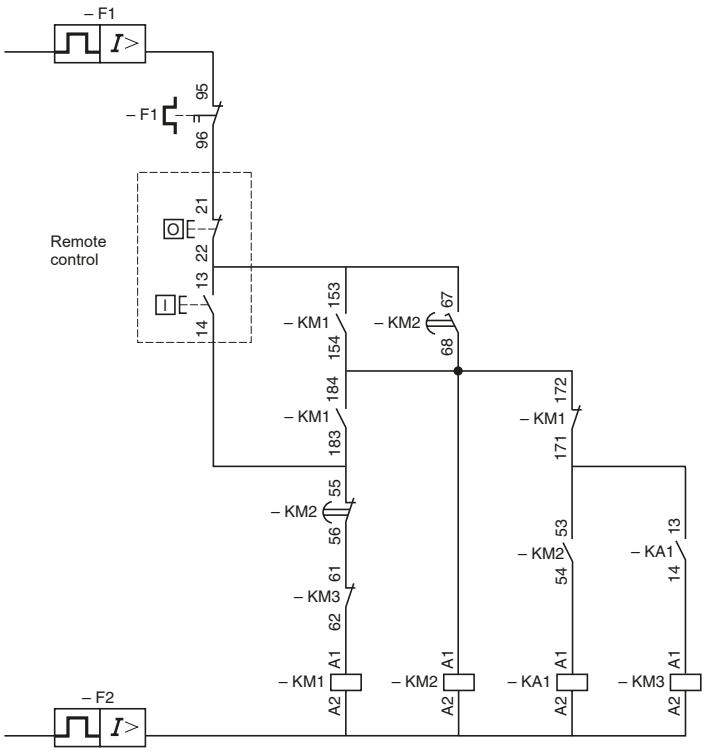




Recommended cabling for reversal of motor rotation (standard motor, viewed from shaft end).

Ref.

DB419878.eps



TeSys H
Ultra-compact starters

Introduction A3/2

TeSys H Ultra-compact 22.5 mm motor starters

Type of product	Range		Page
Ultra-compact starters IEC ratings Standard starters, screw or spring terminals, direct-on-line or reverse Safety starters, screw or spring terminals, direct-on-line or reverse	Up to **3 kW** AC53a Up to **9 A** AC51		A3/6
Ultra-compact starters UL ratings Standard starters, screw or spring terminals, direct-on-line or reverse Safety starters, screw or spring terminals, direct-on-line or reverse	Up to **3 hp** AC53a Up to **9 A** AC51		A3/7
Circuit breakers for a group of starters Selection of magnetic motor circuit breakers GV2L – rotary knob GV2LE – rocker lever	Up to **32 A**		A3/8

Technical Data for Designers A3/9

The most compact 3 KW / 400 V starter in the world



Up to 75 % of space reduction

- Ultra-compact 22.5 mm starter
- Reversing starter in the same width
- Maximum space savings for group starter architecture

Long electrical durability

- Suitable for high demanding application
- 30 000 000 of AC53a electrical cycles

> With printed QR code, refering directly to the product data sheet.

Easy Design

- Wide range setting motor protection
- Automatic, manual or remote reset after thermal trip
- Wide range of control voltage

Easy to integrate

- Direct mounting installation on DIN rail
- Control terminals on the upper side
- Power terminal on the lower side

Standard version

- 2 ratings:
  - 2.4 A 400 V AC53a
  - 6.5 A 400 V AC53a
- 2 control voltages:
  - 24 V DC
  - 110 V / 230 V AC
- 2 terminal types:
  - Screw clamps
  - Spring
- Can provide up to 3 functions:
  - Forward running
  - Reverse running
  - Overload protection









Safety version

- Safe Torque Off embedded:
  - SIL3 according to IEC61508-1
  - Ple according to ISO13849-1
- ATEX:
  - As associated devices for motor protection

> **TeSys** H is a solution dedicated to low footprint applications, in industries as food and beverage, logistics, and durable goods.

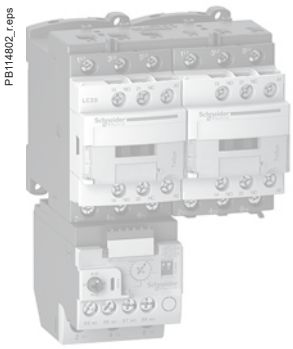


Conventional..... OR .....**TeSys** H standard solutions



Direct-on-line





Reverse



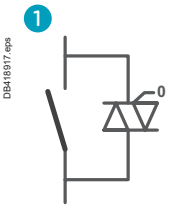
> How does the hybrid technology work ?

Hybrid technology:

Each contact is coupled with a power semiconductor for switching

> Higher number of on/off switches, extended durability.

> Closing

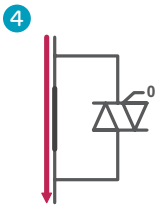




Start: conduction through the semiconductor.

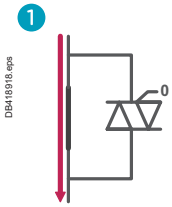


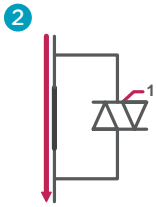
Contact closure under zero voltage. No electrical arc: the contact is preserved.



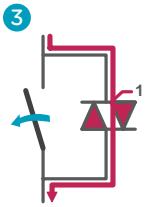
The semiconductor is non-conducting.

> Opening





Before the opening of the contact the semiconductor is triggered.

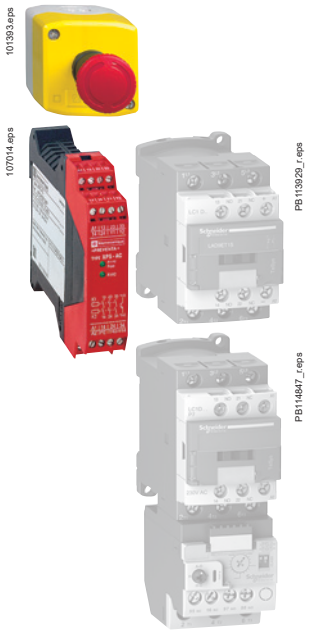


Contact opening:
- no arc: the contact is preserved.



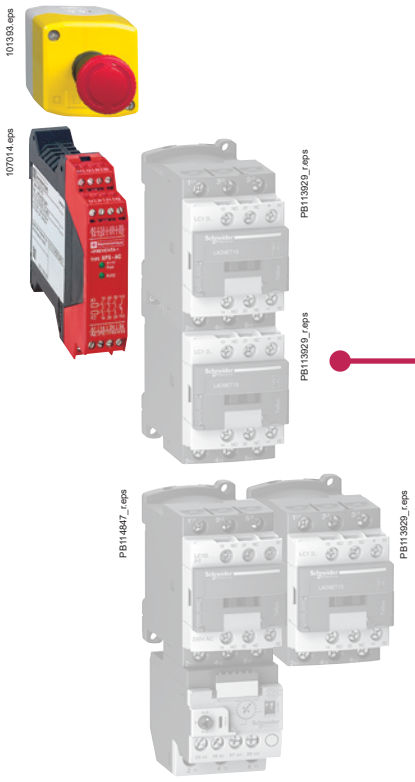
Stop: the semiconductor becomes non-conducting.

Conventional ..... OR ..... TeSys H safety solutions



Direct-on-line





Reverse



TeSys H Safety

- Immediate respect of the **highest safety standards**
- Simplified design of your **safety electrical architecture**
- **Quicker** panel implementation

PB114711.eps



LZ1H2X4BD

Starters for asynchronous motors - AC53a utilization category:

Standard starters TeSys H per IEC ratings

Starters	3- phases motor: max power (KW) for various voltage							Current range	Commercial references (1)
	220 V	230 V	380 V	400 V	415 V	440 V	500 V	A	
Direct-on-line									
Screw terminals	0.37	0.37	0.75	0.75	0.75	0.75	1.1	0.18...2.4	**LZ1H2X4●●**
	1.5	1.5	2.2	3	3	3	3	1.5...6.5	**LZ1H6X5●●**
Spring terminals	0.37	0.37	0.75	0.75	0.75	0.75	1.1	0.18...2.4	**LZ1H2X43●●**
	1.5	1.5	2.2	3	3	3	3	1.5...6.5	**LZ1H6X53●●**
Reverse									
Screw terminals	0.37	0.37	0.75	0.75	0.75	0.75	1.1	0.18...2.4	**LZ2H2X4●●**
	1.5	1.5	2.2	3	3	3	3	1.5...6.5	**LZ2H6X5●●**
Spring terminals	0.37	0.37	0.75	0.75	0.75	0.75	1.1	0.18...2.4	**LZ2H2X43●●**
	1.5	1.5	2.2	3	3	3	3	1.5...6.5	**LZ2H6X53●●**

(1) Remplace the ●● in the reference by the bobine code: BD (24 V DC) or FU (110-230 V AC).

PB114715.eps



LZ7H2X4BD

Safety starters TeSys H per IEC ratings

Starters	3- phases motor: max power (KW) for different tensions							Current range	Commercial references (1)
	220 V	230 V	380 V	400 V	415 V	440 V	500 V	A	
Direct-on-line									
Screw terminals	0.37	0.37	0.75	0.75	0.75	0.75	1.1	0.18...2.4	**LZ7H2X4●●**
	1.5	1.5	2.2	3	3	3	3	1.5...6.5	**LZ7H6X5●●**
Spring terminals	0.37	0.37	0.75	0.75	0.75	0.75	1.1	0.18...2.4	**LZ7H2X43●●**
	1.5	1.5	2.2	3	3	3	3	1.5...6.5	**LZ7H6X53●●**
Reverse									
Screw terminals	0.37	0.37	0.75	0.75	0.75	0.75	1.1	0.18...2.4	**LZ8H2X4●●**
	1.5	1.5	2.2	3	3	3	3	1.5...6.5	**LZ8H6X5●●**
Spring terminals	0.37	0.37	0.75	0.75	0.75	0.75	1.1	0.18...2.4	**LZ8H2X43●●**
	1.5	1.5	2.2	3	3	3	3	1.5...6.5	**LZ8H6X53●●**

(1) Remplace the ●● in the reference by the bobine code: BD (24 V DC) or FU (110-230 V AC).

Starters for resistive load AC51 utilization category:

Starters	Resistive load current	Application	Commercial references (1)
	A		
Screw terminals	2.4	Standard	**LZ1H2X4●●**
		Safety	**LZ7H2X4●●**
	9	Standard	**LZ1H6X5●●**
		Safety	**LZ7H6X5●●**
Spring terminals	2.4	Standard	**LZ1H2X43●●**
		Safety	**LZ7H2X43●●**
	9	Standard	**LZ1H6X53●●**
		Safety	**LZ7H6X53●●**

(1) Remplace the ●● in the reference by the bobine code: BD (24 V DC) or FU (110-230 V AC).

PB114713.eps



LZ1H2X43BD

Starters for asynchronous motors - AC53a utilization category:

Standard starters **TeSys** H per UL ratings

Starters	3- phases motor in HP			Current range	Commercial references (1)
	208 V	220 V - 240 V	440 V - 480 V	A	
Direct-on-line					
Screw terminals	1/2	1/2	1	0.18...2.4	**LZ1H2X4●●**
	1	1.5	3	1.5...6.5	**LZ1H6X5●●**
Spring terminals	1/2	1/2	1	0.18...2.4	**LZ1H2X43●●**
	1	1.5	3	1.5...6.5	**LZ1H6X53●●**
Reverse					
Screw terminals	1/2	1/2	1	0.18...2.4	**LZ2H2X4●●**
	1	1.5	3	1.5...6.5	**LZ2H6X5●●**
Spring terminals	1/2	1/2	1	0.18...2.4	**LZ2H2X43●●**
	1	1.5	3	1.5...6.5	**LZ2H6X53●●**

(1) Remplace the ●● in the reference by the bobine code: BD (24 V DC) or FU (110-230 V AC).

PB114716.eps



LZ8H6X5BD

Safety starters **TeSys** H per UL ratings

Starters	3- phases motor in HP			Current range	Commercial references (1)
	208 V	220 V - 240 V	440 V - 480 V	A	
Direct-on-line					
Screw terminals	1/2	1/2	1	0.18...2.4	**LZ7H2X4●●**
	1	1.5	3	1.5...6.5	**LZ7H6X5●●**
Spring terminals	1/2	1/2	1	0.18...2.4	**LZ7H2X43●●**
	1	1.5	3	1.5...6.5	**LZ7H6X53●●**
Reverse					
Screw terminals	1/2	1/2	1	0.18...2.4	**LZ8H2X4●●**
	1	1.5	3	1.5...6.5	**LZ8H6X5●●**
Spring terminals	1/2	1/2	1	0.18...2.4	**LZ8H2X43●●**
	1	1.5	3	1.5...6.5	**LZ8H6X53●●**

(1) Remplace the ●● in the reference by the bobine code: BD (24 V DC) or FU (110-230 V AC).

Starters for resistive load AC51 utilization category:

Starters	Resistive load current	Application	Commercial references (1)
	A		
Screw terminals	2.4	Standard	**LZ1H2X4●●**
		Safety	**LZ7H2X4●●**
	9	Standard	**LZ1H6X5●●**
		Safety	**LZ7H6X5●●**
Spring terminals	2.4	Standard	**LZ1H2X43●●**
		Safety	**LZ7H2X43●●**
	9	Standard	**LZ1H6X53●●**
		Safety	**LZ7H6X53●●**

(1) Remplace the ●● in the reference by the bobine code: BD (24 V DC) or FU (110-230 V AC).

Description: pages A3/10 and A3/11
Characteristics: pages A3/12 and A3/13
Curves: pages A3/14 and A3/15
Dimensions, schemes: page A3/16

Selection table



GV2L + LZ2H2X4BD

Magnetic motor circuit breakers:
- GV2L: rotary knob type - Ue = 500 V
- GV2LE: rocker lever type - Ue = 415 V.

Selection of the circuit breaker
Type 1 coordination according to IEC/EN 60947-4-2

Max	Iq	Number of TeSys H		Reference Circuit breaker	
		2.4 A	6.5 A	Rotary	Rocker
A	kA				
0.4	50.0	1	–	**GV2L03**	**GV2LE03**
0.63	50.0	1	–	**GV2L04**	**GV2LE04**
1	50.0	1	1	**GV2L05**	**GV2LE05**
1.6	50.0	1	1	**GV2L06**	**GV2LE06**
2.5	35.0	1	1	**GV2L07**	**GV2LE07**
4	12.5	1	1	**GV2L08**	**GV2LE08**
6.3	8.0	2	1	**GV2L10**	**GV2LE10**
10	7.0	4	1	**GV2L14**	**GV2LE14**
14	5.0	5	2	**GV2L16**	**GV2LE16**
18	4.0	7	2	**GV2L20**	**GV2LE20**
25	4.0	10	3	**GV2L22**	**GV2LE22**
32	3.0	13	4	**GV2L32**	**GV2LE32**

TeSys H

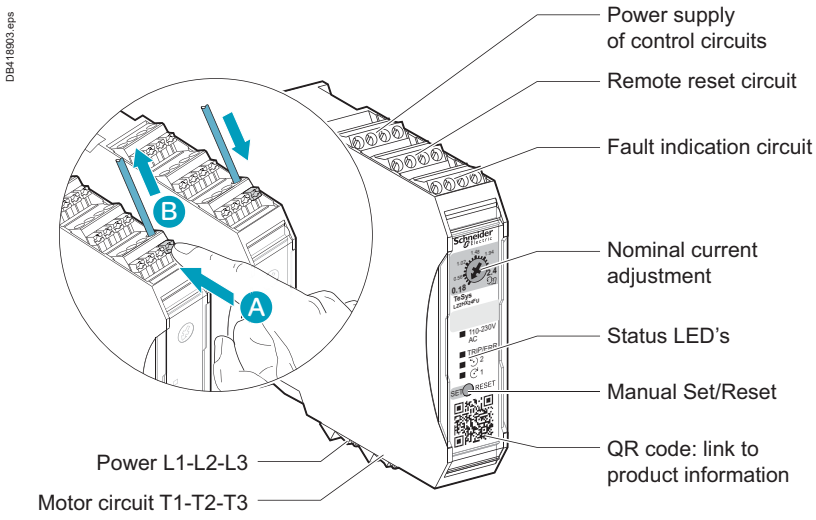
Technical Data for Designers

Contents

Description ..... A3/10 to A3/11
Characteristics..... A3/12 to A3/13
Curves ..... A3/14 to A3/15
Dimensions and schemes A3/16

Identification of terminals / Indicators / Setting means and procedure

Setting procedure



STEP	ACTION
1	Lift the cover on the front of the TeSys H motor starter to access the SET/RESET button.
2	Press and hold down the SET/RESET button for at least 6 seconds. After 6 seconds the 110-230 V AC or 24 V DC LED flashes once.
3	After the LED has flashed once, release the SET/RESET button.
4	Turn the potentiometer to select a nominal current, and then fine-tune the position until the LEDs indicate the exact nominal current.
5	Press the SET/RESET button to save the selected nominal current. The 110-230 V AC or 24 V DC LED comes on and the other LEDs go off.
6	Drop the cover back over the front of the TeSys H motor starter.

Protection functions

The protection of three - phase motors is ensured against potential faults

- Thermal overload: the motor currents exceed the set value.
- Phase unbalanced: the motor currents differ from each other by more than 33 %
- Phase loss: power missing on one or several phases
- Stall and jam: motor current exceeding 45 A for more that 2 s during starting or running phase - No motor is connected - Motor current is lower that the minimum configurable current for more than 2 seconds, on at least two phases.

For all this detected situations, the TeSys H motor starter will switch off, activate its TRP/ERR LED and fault signaling contact.

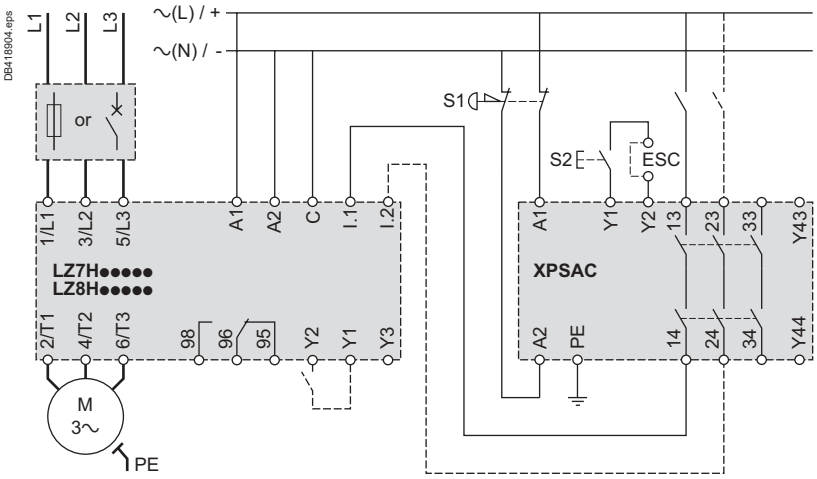
Please refer to the “Instruction sheet and User Guide” for more information.

Electrical diagrams for Safety chain applications

Preferred

Electrical life time: 30000000 AC53a electrical cycles

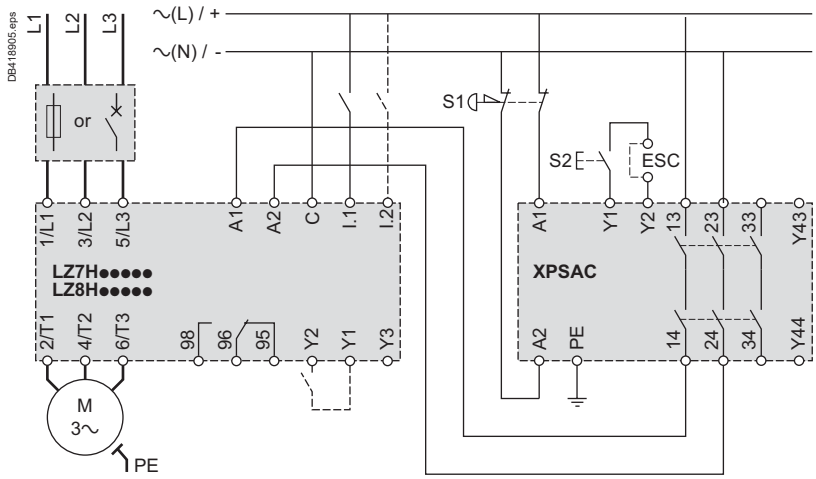
Safety Chain Application for Monitoring Emergency STOP Circuits with Two Channel Inputs and Two Channel Outputs with Preventa XPSAF Safety Processing Device.



Possible but non- recommended

Electrical life time: 10000 AC53 a electrical cycles

Safety Chain Application for Monitoring Emergency Stop Circuits with Two Channel Inputs and Two Channel Outputs with Preventa XPSAC Safety Processing Device.



Characteristics

Environment

Rated insulation voltage (Ui)	Conforming to IEC/EN 60947-1, overvoltage category III, degree of pollution: 2	V	500
Rated impulse withstand voltage (Uimp)	Conforming to IEC/EN 60947-4-2	kV	6 (24 V DC control voltage); 4 (110 V - 230 V AC control voltage)
Conforming to standards			IEC / EN 60947-4-2
Product certifications			CE, CUL, ATEX (for failsafe product), CCC
Degree of protection	Conforming to IEC / EN 60947-1		IP20
Environment category	Conforming to IEC / EN 60947-1		E
Climatic withstand			Conforming to IEC/EN 60068-2-30
Ambient air temperature around the device	Storage	°C	-40…+80
	Operation (see derating curves)	°C	-25…+70
Maximum operating altitude	without derating	m	2000
	with derating	m	No
Operating positions (see derating curves)	Vertical axis (horizontal DIN rail)		Yes
	Horizontal axis (vertical DIN rail)		Not authorised
Shock resistance 1/2 sine wave = 18 ms	Conforming to IEC/EN 60068-2-27	gn	30 Starter OFF
		gn	30 Starter ON
Vibration resistance 10…150 Hz	Conforming to IEC/EN 60068-2-6	gn	5 Starter OFF
		gn	5 Starter ON
Resistance to electrostatic discharge	Conforming to IEC/EN 61000-4-2	kV	Air discharge: 8 kV
		kV	Contact discharge: 6 kV
Immunity to radiated high-frequency disturbance	Conforming to IEC/EN 61000-4-3		
	80 - 1 GHz	V/m	20
	1.0 - 6 GHz	V/m	10
Immunity to fast transient currents	Conforming to IEC/EN 61000-4-4	kV	3
Immunity to conducted high frequency disturbances	Conforming to IEC/EN 61000-4-6	V	10
Radiated emission and conducted	Conforming to CISPR 11 and EN 55011		Class A
Surge	Conforming to IEC/EN 61000-4-5	kV	1 symmetrical
		kV	2 asymmetrical

Control circuit characteristics

Rated voltage	∼ 50/60 Hz	V	110 - 230
	⎓	V	24
Voltage limits	∼ 50/60 Hz	V	85…253
	⎓	V	19.2…30
Voltage dips		ms	3
Short time interruptions		ms	3

Power circuit characteristics

			LZ●2X4●●	LZ●6X5●●
Power disipation for corresponding Rated Operating Current (see derating curve)		W	0.88 … 4.1	0.88 … 7
Rated Operating Current	AC51 conforming to IEC/EN 60947-4-3	A	0.18 - 2.4	1.5 - 9
	AC53a conforming to IEC/EN 60947-4-2	A	0.18 - 2.4	1.5 - 6.5
Electrical life	AC51	Op	30 000 000 (1)	
		Op	10 000 (2)	
	AC53A	Op	30 000 000 (1)	
		Op	10 000 (2)	
Maximum Operating rate	AC51	Op/h	7200	
	AC53A		See curves	
Time to restart after overload trip	Manual or remote mode	mn	2	
	Automatic	mn	20	

Power and control terminal Characteristics

	Terminal type		Screw M3	Push in
Flexible cable without cable end	1 conductor	mm²	0.25…2.5	0.25…2.5
	2 conductors	mm²	0.25…0.75	
Flexible cable with cable end	1 conductor	mm²	0.25…2.5	0.25…2.5
	2 conductors	mm²	0.25…1.5	0.25…1.5
Solid cable without cable end	1 conductor	mm²	0.25…2.5	0.25…2.5
	2 conductors	mm²	0.25…0.75	
Screwdriver		mm	flat screwdriver: 3 mm	
Tightening torque		N.m	0.5..0.6	

(1) With ON/OFF control through control inputs (I_1, I_2 terminals) *(2) With ON/OFF control through power supply (A_1, A_2 terminals).*

References: pages A3/6 and A3/7
Description: pages A3/10 and A3/11
Curves: pages A3/14 and A3/15
Dimensions, schemes: page A3/16

Characteristics

System conditons

Database for failure rates		SN 29500
System type		Type B
Standard used		IEC 61508
Beta factor		1 %
Mean time to failure (MTTF) at an ambient temperature 40 °C		39.3 (LZ7H or LZ8H 24 V DC) 39.1 (LZ7H or LZ8H 110/230 V AC)

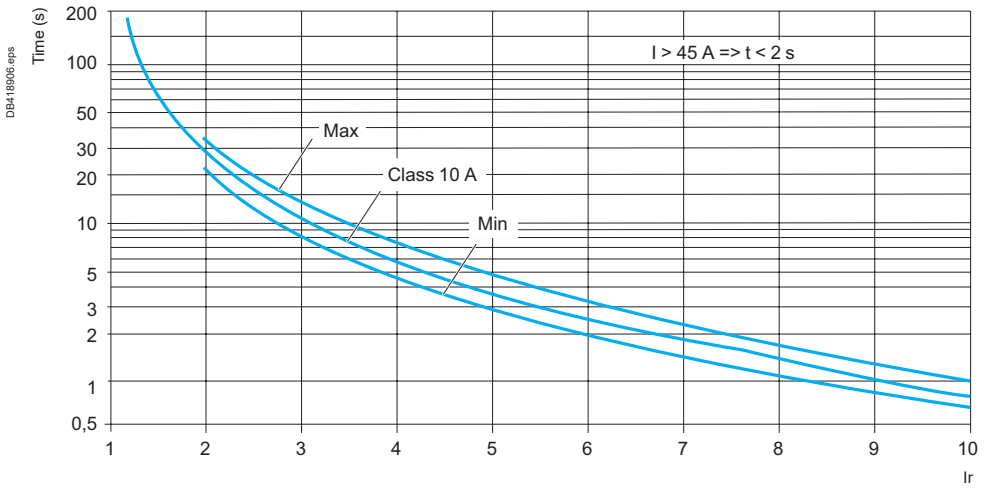
Safe torque-off

		LZ7H or LZ8H 24 V DC	LZ7H or LZ8H 110/230 V AC
Ambient temperature	°C	40	40
Mean time to failure (MTTF)		517	289
Switch-off time		80	100
λsd [FIT] safe, detectable		664	638
λsu [FIT] safe, undetectable		968	935
λdd [FIT] dangerous, detectable		218	388
λdu [FIT] dangerous, undetectable		2.67	6.82
SFF [%] Safe failure fraction		99	99
DCS [%] Diagnostic coverage safe		40.7	40.6
DC [%] Diagnosctic coverage		98	98
PFH Probability of dangerous failure per hour		2.67×10^{-9}	6.82×10^{-9}
Safety level		IEC/CEI 61508-1: SIL 3 ISO 13849-1: Category 3 PL e EN 60954-1: Category 3	

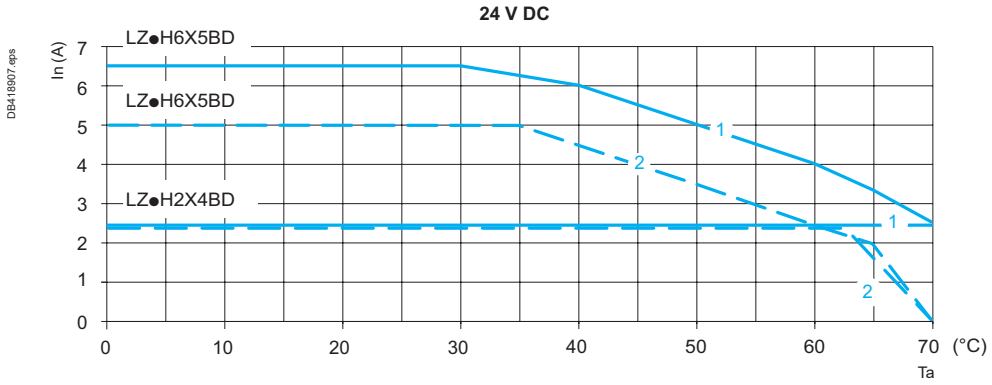
Motor overload protection

		LZ7H or LZ8H 24 V DC	LZ7H or LZ8H 110/230 V AC
Ambient temperature	°C	40	40
Mean time to failure (MTTF)		447	273
Time to trip		As for Class 10 A, IEC/CEI 60947-4-2	
λsd [FIT] safe, detectable		637	636
λsu [FIT] safe, undetectable		870	841
λdd [FIT] dangerous, detectable		239	402
λdu [FIT] dangerous, undetectable		17	17
SFF [%] Safe failure fraction		99	99
DCS [%] Diagnostic coverage safe		42.3	43.1
DC [%] Diagnosctic coverage		93	95
Safety level		IEC/CEI 61508-1: SIL 2	

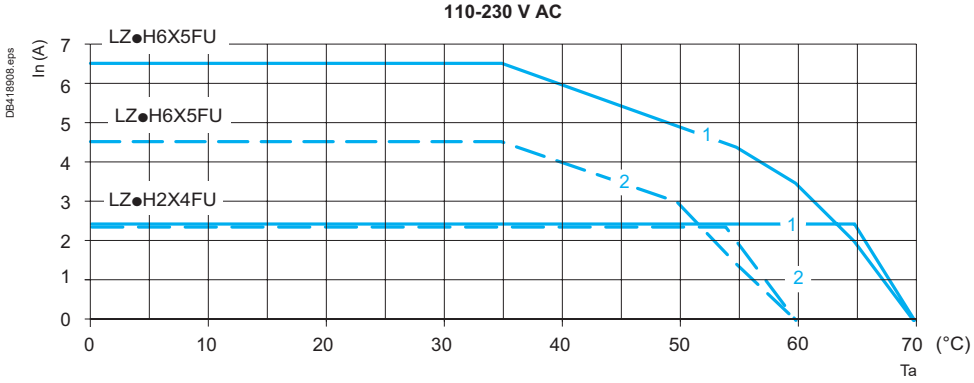
Overload protection tripping curve at 20 °C



Derating curves: maximum load current (In)



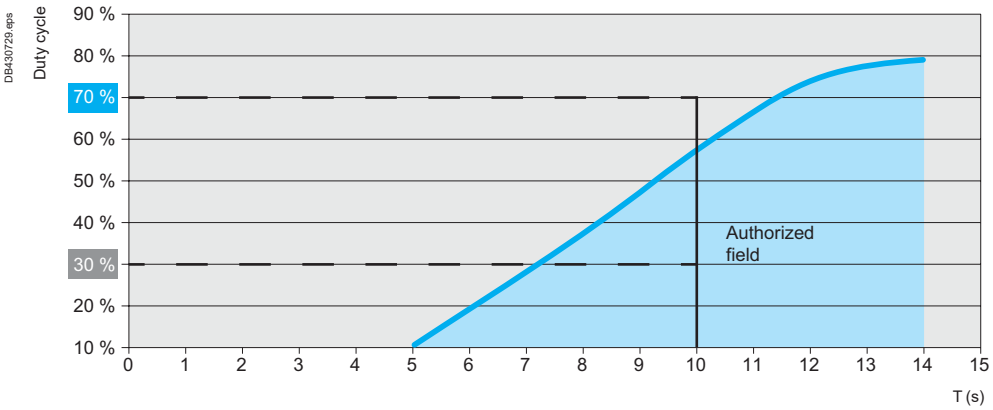
Derating according:
- motor starter control power supply
- ambient temperature (Ta)
- distance between devices **1**: 20 mm, with spacing
  2: without spacing.



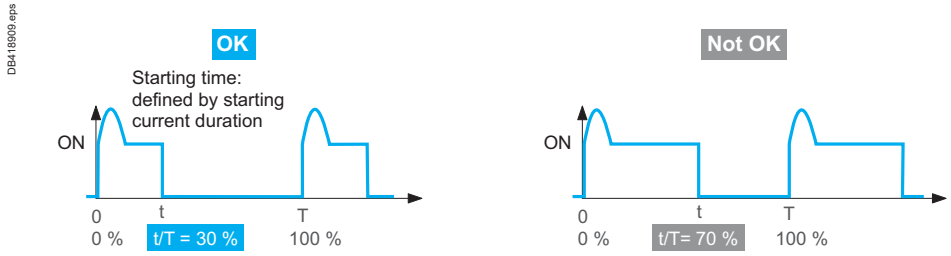
Minimum duty cycle t/T (%) versus cycle duration T (s)

Due to the effect of the peak current on the TeSys H monitoring circuit during the starting time, a stop/start sequence should not occur before a certain amount of time. The diagrams below show the minimum duty cycle according the total period for 2 typical starting time values.

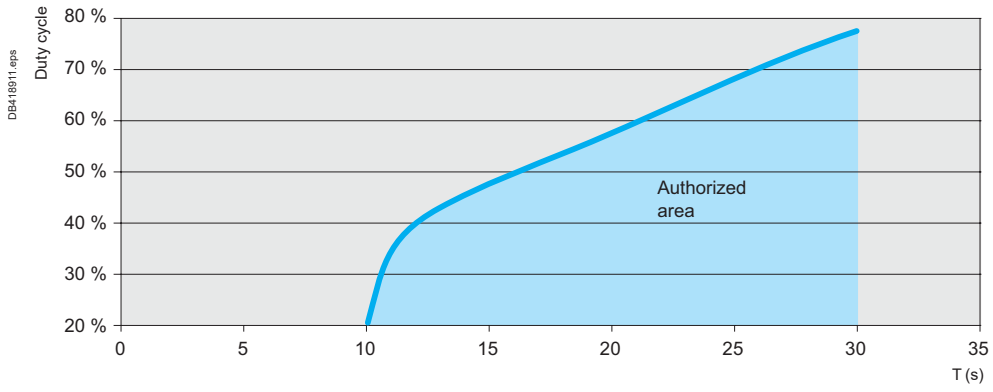
With a starting time = 100 ms



Example for starting time of 100 ms with period T = 10 s.



With a starting time = 150 ms

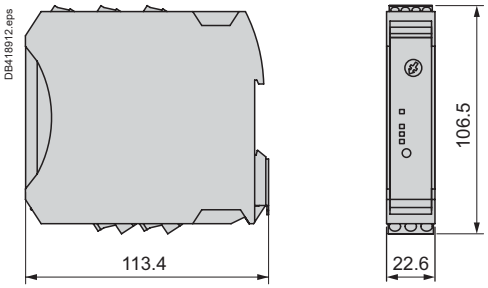


References:
pages A3/6 and A3/7
Description:
pages A3/10 and A3/11
Characteristics:
pages A3/12 and A3/13
Dimensions, schemes:
page A3/16

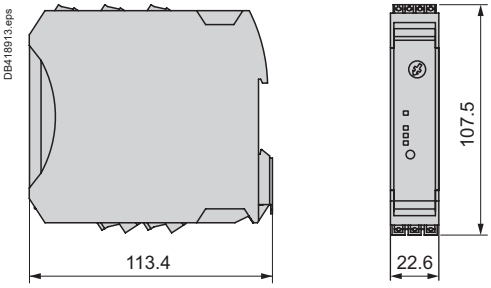
Dimensions, schemes

Dimensions mm

LZ●H●●●●●

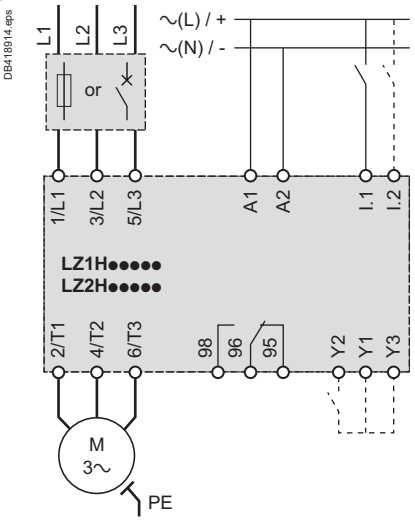


LZ●H●●●3●●

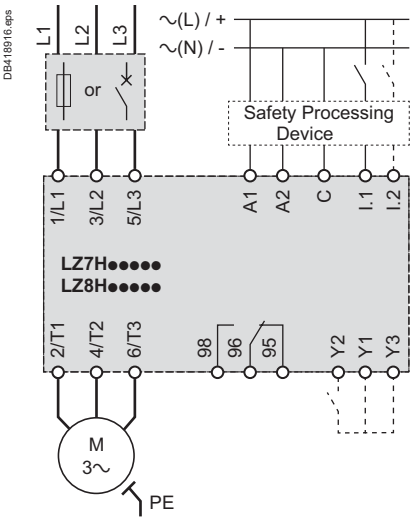


Wiring diagrams

Motor control by standard starter



Motor control by safety starter



Power terminals

T1, T2, T3	*Motor connection*
L1, L2, L3	*Power inputs*

Control terminals

A1, A2	*Auxiliary power unit*
I.1	*Control input, direction 1*
I.2	*Control input, direction 2 (LZ2H and LZ8H only)*
C	*Control inputs common point (LZ7H and LZ8H only)*
Y1	*Reset mode, common point*
Y2	*Reset mode, remote, manual*
Y3	*Reset mode, automatic*
98, 96, 95	*Trip or error signaling contact*

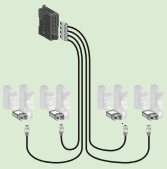
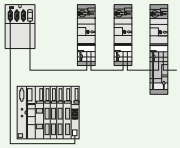
TeSys U
All-in-one motor starters

Introduction A4/2

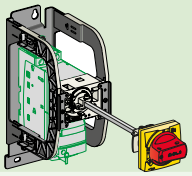
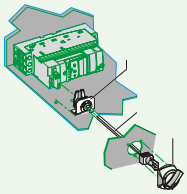
TeSys U - Power bases, control modules, connectors

Type of product	Range		Page
Standard power base, basic control functionalities Direct and reversing	Up to 18.5 kW		A4/10

TeSys U - Communication components

Parallel type cabling system Principle and components		A4/16
Bus type cabling systems Principle, panorama and components		A4/21
LUFP communication gateway		A4/30

TeSys U - Accessories

Short circuit current limiter		A4/31
Handles and accessories for rotary control		A4/32
Handles and accessories for integration into a MCC drawer		A4/33
TeSys U with Altistart U01 Soft starters and Variable speed controllers		A4/34

Technical Data for Designers A4/41

From traditional solution to ...



Motor circuit breaker:
TeSys GV2L

Magnetic protection
> short-circuit protection



Contactor:
TeSys D

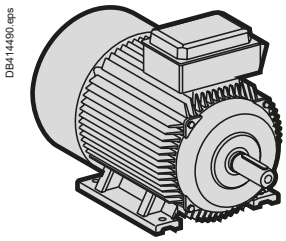
Control
> Start /Stop

Status monitoring
> signaling
> alarm monitoring

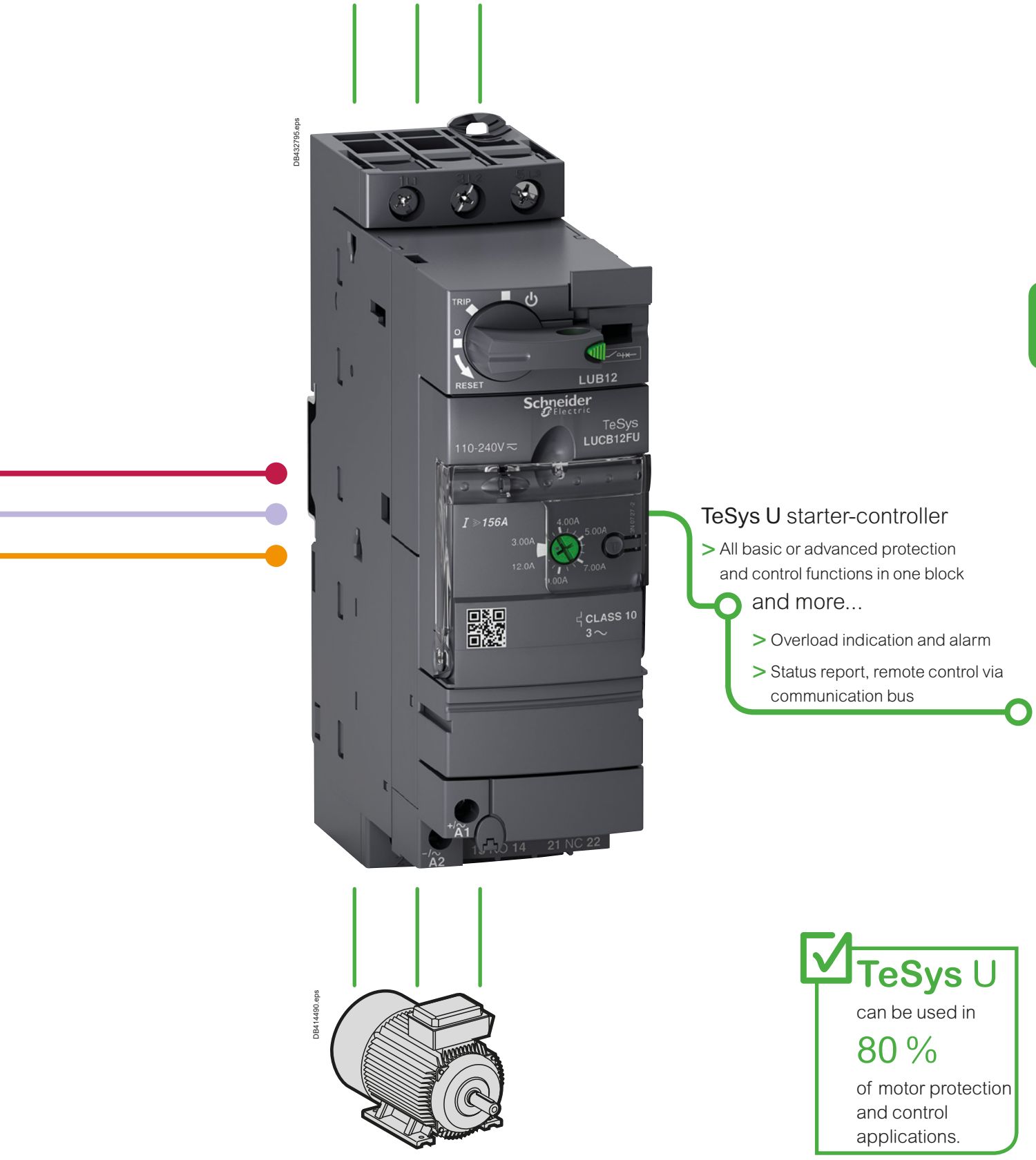


Protection relay:
TeSys LRD

Thermal protection
> overload



...**TeSys** U starter-controller



TeSys U starter-controller

> All basic or advanced protection and control functions in one block

and more...

> Overload indication and alarm

> Status report, remote control via communication bus

TeSys U
can be used in
80 %
of motor protection and control applications.



1 All in one

- Optimising space in enclosures.
- Total coordination (No contact welding on short circuit).
- Reduces installation times.

2 Simplicity of choice

- Controlled power.
- Protection functions ensured.
- Signaling functions, communication with PLC ensured.

3 Universal mounting

- On DIN rail or grid.

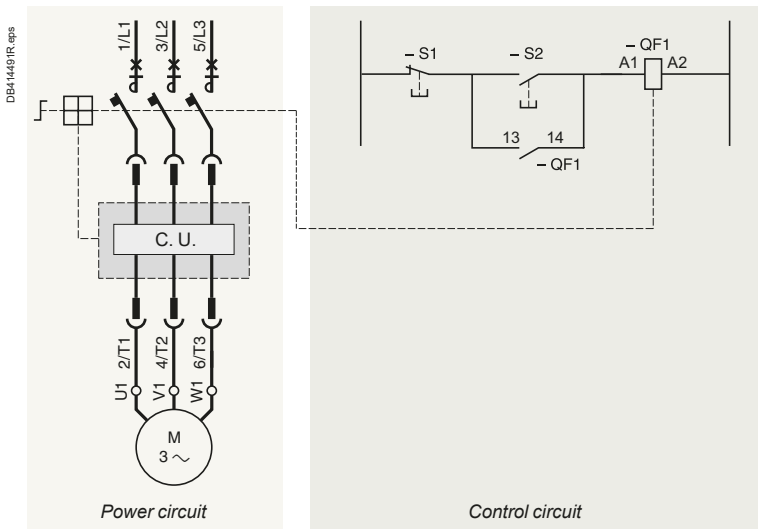
4 Conventional projet design

- Conventional control scheme with start , stop push buttons.

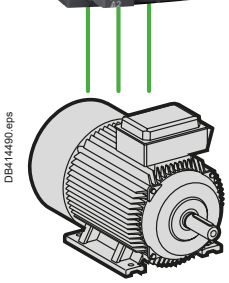
5 Electrically simple

Basic scheme of a TeSys U starter-controller

- Protection and power control functions acting on a single set of contact (QF1).
- The control unit (CU) monitors the voltage and current. In case of fault, it releases the coil, causing tripping.
- The coil is controlled by manual orders from an operator. Automatic control from a PLC is achieved with other diagrams.







Motor up to
- 7.5 kW / 1-phase 230 V / 50-60 Hz.
- 18.5 kW / 3-phase 400-440 V / 50-60 Hz.
- 18.5 kW / 3-phase 500 V / 50-60 Hz.
- 22 kW / 3-phase 690 V / 50-60 Hz.
- Non-reversing or reversing.

Common characteristics

Short-circuit protection
■ Isc:
□ 50 kA at ≤ 400 V
□ 10 kA at 500 V
□ 4 kA at 690 V.
■ Up to 690 V AC.

Overload protection
■ From 0.15 to 38 A, 6 setting ranges (tripping 14.2 x I setting).
■ Test button.
■ Adjustment lock.
■ Coil choice: 24 V, 48…72 V, 110...240 V DC/AC.

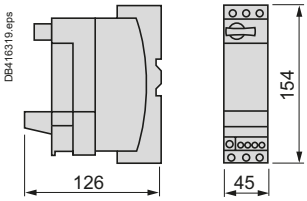
3 power contacts
■ For non-reversing (reversing with reverser block).
■ Imax, for 12 A power base (direct - reversing):
□ 12 A at up to 500 V / 50 Hz
□ 9 A > 500 V, up to 690 V.
■ Imax, for 38 A power base (direct - reversing):
□ 38 A at up to 500 V / 50 Hz
□ 21 A > 500 V, up to 690 V.

1 NO contact
1 NC contact
■ 5 A / max. 690 V AC or 250 V CC.

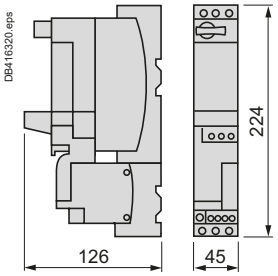
Other monitoring contacts
■ 5 A / max. 690 V AC or 250 V DC.

Communication modules
■ Modbus,
■ Ethernet,
■ CANopen,
■ DeviceNet,
■ Advantys stb,
■ Profibus DP,
■ AS-interface.

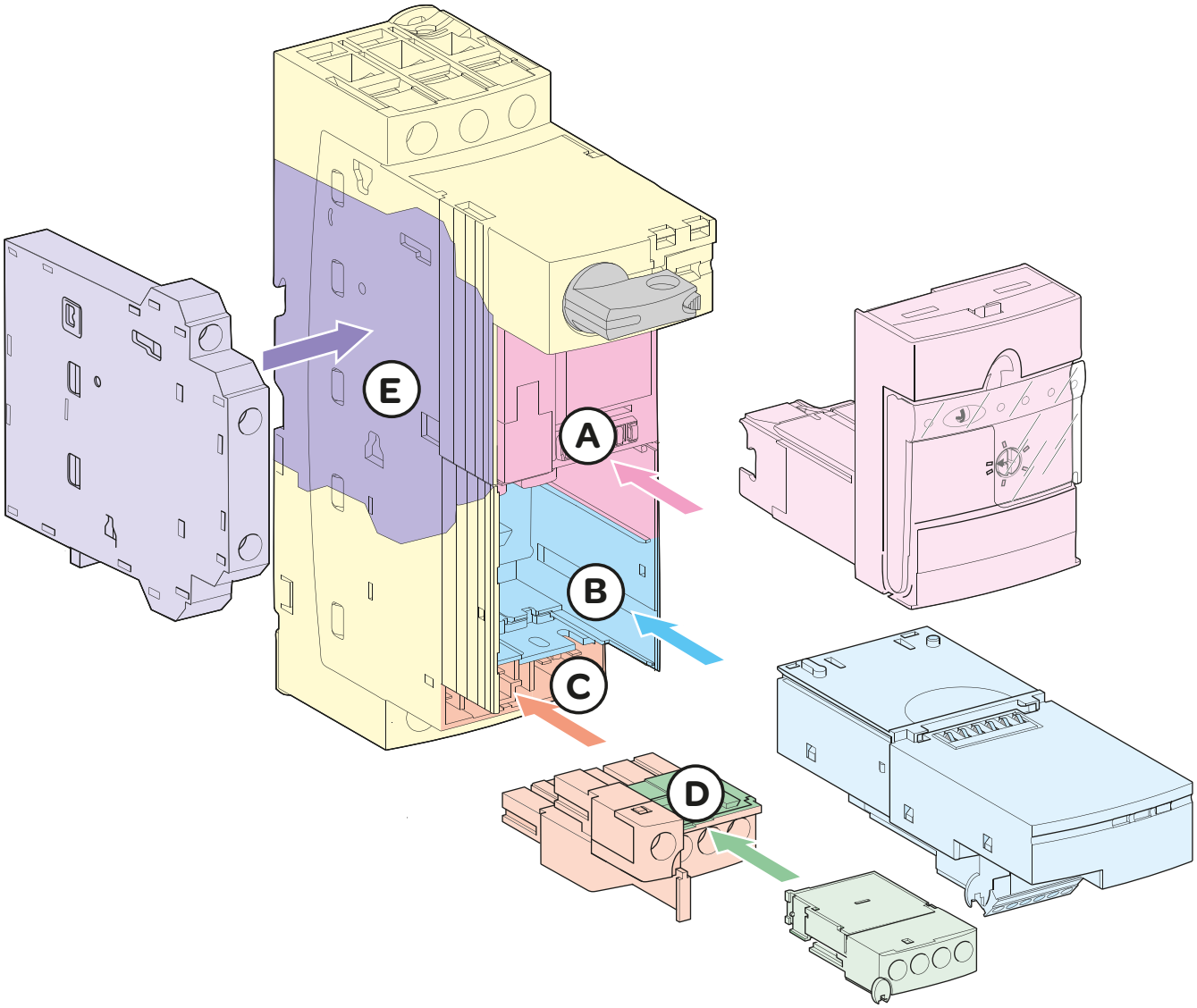
Dimensions
■ Base:



■ Base + reverser block:



DB414493.eps



The modularity principle

- Power base
- (A) Cavity for control unit
- (B) Cavity for auxiliary module
- (C) Cavity for control terminal block
- (D) Cavity for additional contact block or shutter
- (E) Space for additional block fastening

Power Base

This is the basic constituent of the motor starter, it is composed of the power contacts, the control coil, the opening / closing mechanism of the protection device and the control pad.

Additional lateral block

Composed of the protection device signaling contacts.

Control unit

Composed of the power base management processor and setting knobs.

Auxiliary module

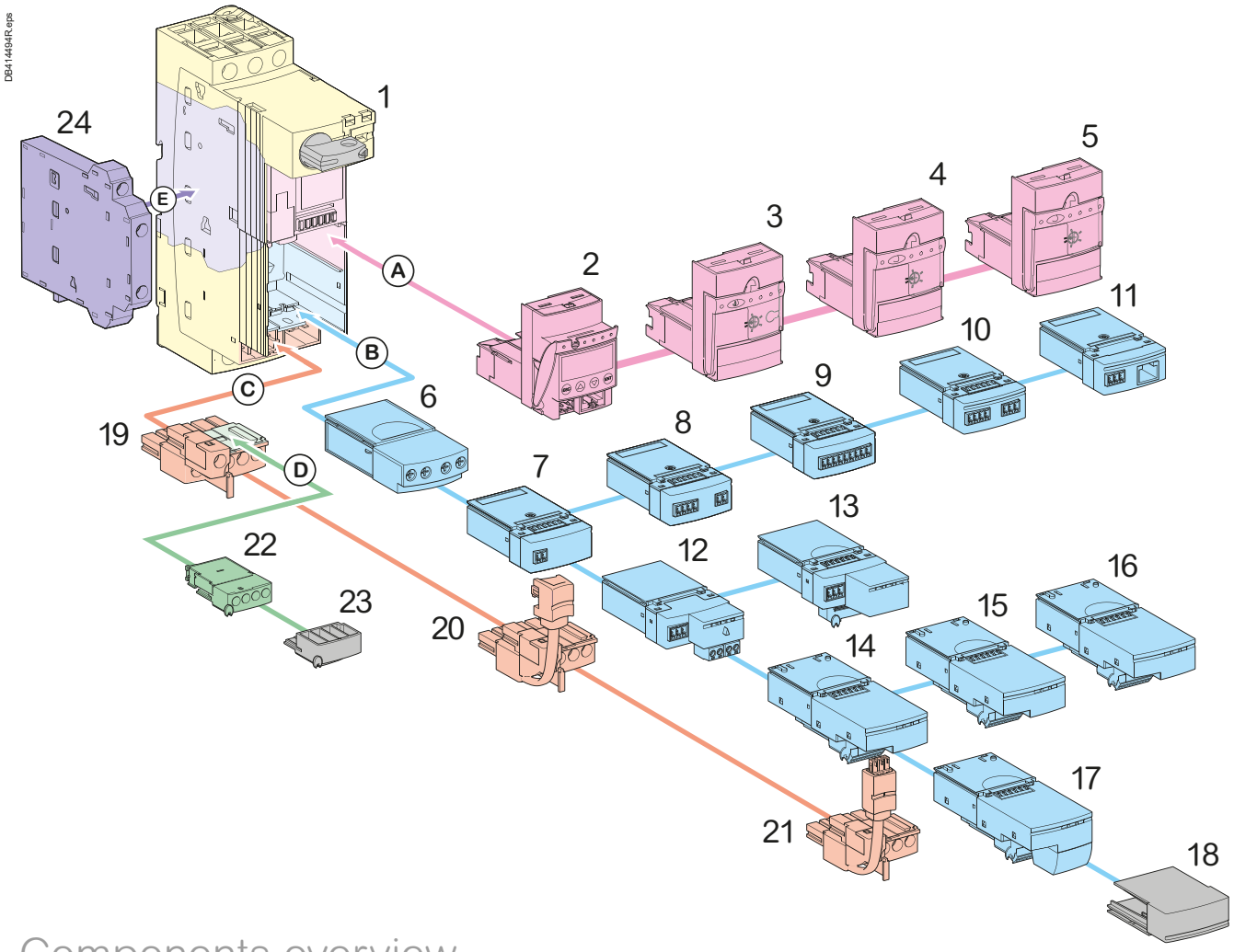
Depending on its type, it integrates load status contacts or a communication processor or an alarm processor.

Control terminal block

It is composed of two terminals "coil control", 1 NO auxiliary contact, 1 NC auxiliary contact. It can be eventually connected to an auxiliary communication module via a dedicated cable.

Additional block

It includes protection device additional signaling contacts. By default, this is a simple shutter.



Components overview

Power base

1- LUB
Non reversing power base - 1 rotation direction

Control units

2- LUCM
Multifunctional control unit

3- LUCB/LUCC/LUCD
Advanced control units

4- LUCA
Standard control unit

5- LUCL
Magnetic protection control unit

Auxiliary module

6- LUFN
Auxiliary contacts module

Load monitoring auxiliary modules

7- LUFW10
Overload alarm module

8- LUFDH11
Overload alarm module with manual reset

9- LUFDA01/LUFAD10
Overload alarm module with automatic reset/remote reset

10- LUFV2
Motor load indication module

Communication auxiliary modules

11- LUFC00
Telefast parallel liaison module, with RJ45 connector

12- ASILUFC5/ASILUFC51
AS-Interface c. m.

13- LULC033
Modbus c. m

14- LULC07 Profibus DP c. m

15- LULC08 CANopen c. m.

16- LULC09 DeviceNET c. m.

17- LULC15 Advantys STB c. m.

Shutters

18- LU9C1
Shutter for module cavity

23- Shutter for contacts additional block cavity

Control terminal blocks

19- LU9BN11
Terminal block for imbedded auxiliary contacts

20- LU9BN11C
Coil terminal block with its connecting cable

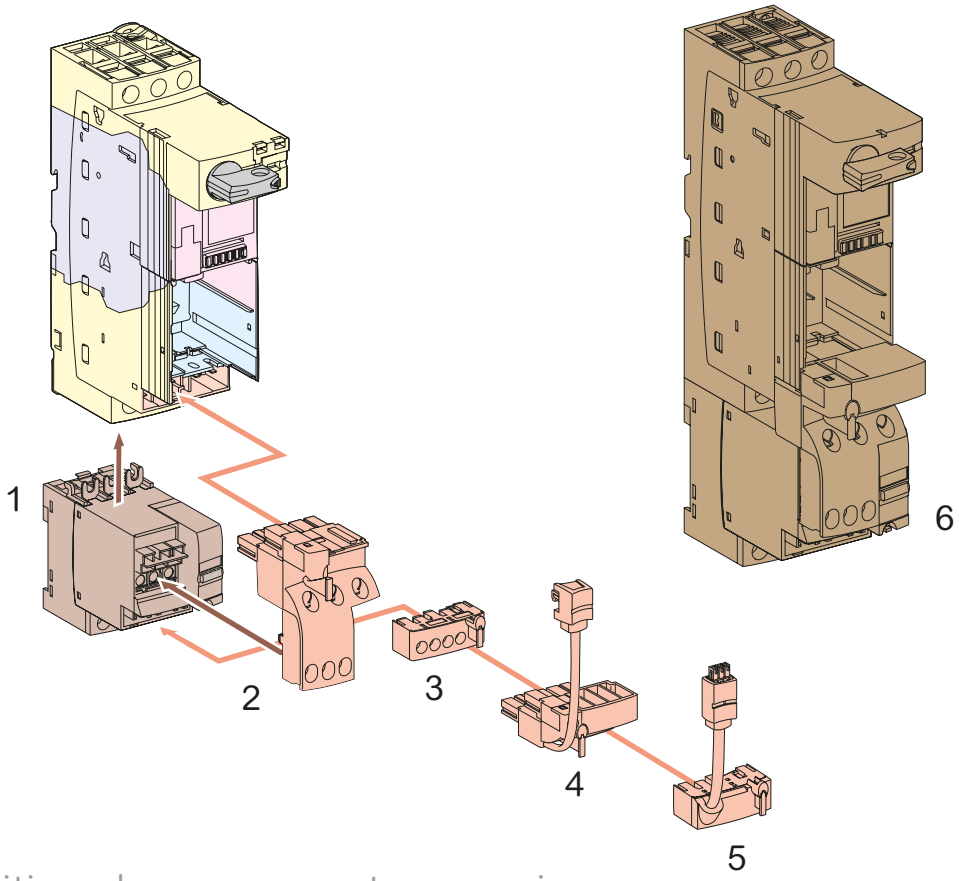
21- LU9BN11L
Coil terminal block with its connecting cable

Additional contacts blocks

22- LUA1
Additional contacts

24- LUA8
side-mounting additional contacts

DB414495R.eps



Additional components overview

Reverser block

1- LU2MB0●●
vertical-mounting reverser block

Evoluting reversing power base

6- Pre-assembled reversing power base **LU2B12**

Control terminal blocks

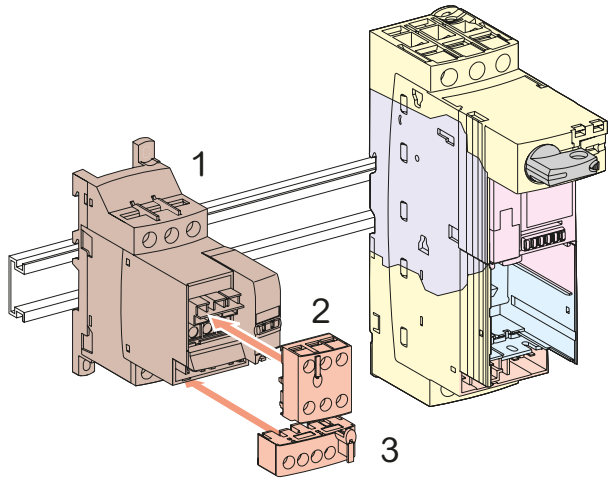
2- LU9MR1C
Base/block assembling connector, with terminal block for imbedded auxiliary contacts

3- LU9M1
Coil terminal block for wired control

4- LU9MRC
Coil terminal block with its connecting cable for communicating control (only compatible with a selection of com. modules).

5-LU9MRL
Coil terminal block with its connecting cable for communicating control (only compatible with a selection of com. modules).

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Additional components overview

Reverser block

1- LU6MB0●●
Side-mounting reverser block

Terminal blocks for electrical remote control

2- LU9MR1
Terminal block for 2 direction control (pulse or maintained control)

3- LU9M1
Terminal block for power base coil interlocking. With direction of rotation monitoring contacts

Product references



1 direction:
LUB12, LUB32, LUB38



1 direction:
LUB120, LUB320, LUB380



2 direction:
LU2B12●●, LU2B32●●,
LU2B38●●



LU9MR1C



LU2MB0●●



LU9M1



LU6MB0●●



LU9MR1

Power bases

TeSys U starters are composed with separate elements: power component + control units + auxiliary components.
The power base includes the electro mechanical parts. It is selected according to:
- Motor power to be handled
- Number of direction of rotation to be controlled: 1 or 2
- Type of control to be acheived: Basic or Advanced.

Basic control

1- direction rotation control
2 - direction rotation control
Overload + Short circuit protection
Main power monitoring
Status signaling contacts

Advanced control

Functions of basic control
+ Digital display of electrical values
+ Overload alarms
+ Network/bus communication

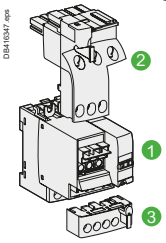
Function	Max motor standard power (400 V)	Lip_in (400 V)	References	
	kW	A	Basic ctrl	Advanced ctrl
	5.5	12	LUB12	LUB120
1-direction rotation	15	32	LUB32	LUB320
	18.5	38	LUB38	LUB380
	5.5	12	LU2B12●● (1)	LUB120 + reverser block ass.
2-direction rotation	15	32	LU2B32●● (1)	LUB320 + reverser block ass.
	18.5	38	LU2B38●● (1) (2)	LUB380 + reverser block ass.

(1) Replace the 2 dots by the coil voltage code below – AC is 50-60 Hz.
(2) With BL or FU code only.

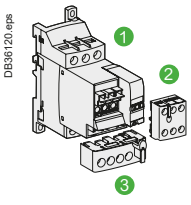
Coil voltage (V)	24 ⎓	24 ∿	48...72 ⎓ or ∿	110...220 ⎓ and 110...240 ∿
Code	BL	B	ES	FU

Reverser blocks - assemblies

A reverser block assembly has to be added to the power base (LUB120 to 380) to build an 'Advanced control' with '2-direction of rotation' TeSys U starter.
Reverser blocks with 2 mounting possibilities:
- vertical mounting– mounted aspect: refer to LU2B12, 32, 38
- side mounting, on a Din rail.



Vertical mounting



Side mounting

Blocks	References	
	Vertical mounting	Side mounting
1 Reverser block	LU2MB0●● (1)	LU6MB0●● (1)
2 Aux. contacts connector	LU9MR1C	LU9MR1
3 Coil supply connector	LU9M1	LU9M1

(1) Replace the 2 dots by the coil voltage code below – AC is 50-60 Hz.

Coil voltage (V)	24 ⎓	24 ∿	48...72 ⎓ or ∿	110...220 ⎓ and 110...240 ∿
Code	BL	B	ES	FU

Main technical caracteristics

Power bases

1-direction power base overall dimensions (HxWxD) : 154 x 45 x 126 mm
2-direction power base (assembly with vertical mounting reverser block) overall dimensions (HxWxD): 224 x 45 x 126 mm
Power bases are delivered with protective blanking plates.

3 power poles, for connections of a 1-phase or 3-phase motor
Screw clamp power terminals, for up to 2 x 6 mm² conductors
Screw clamp control terminals, for up to 2 x 1.5 mm² conductors

LUB12,32,38 imbedded terminals:
- coil supply,
- NO (13-14) contact (for control push button)
- NC (21-22) contact (for control push button).

Additional signaling contact modules provide more possibilities.

Reversing assemblies

LU2MB0, LU6MB0:
3 power poles, for connections of a 1-phase or 3-phase motor, screw clamp power terminals, for up to 2 x 6 mm² conductors
LU9 connectors: screw clamp control terminals, for up to 2 x 1.5 mm² conductors

LU2MB0●●, LU6MB0●● provide terminals for power circuits.
LU9MR1C, LU9MR1 provide signalling contact terminals (82-81-84) that indicate the direction of rotation.
LU9M1 provides coil supply terminals (A2-A1-A3) and 2 NO contact terminals (A1-B1, A3-B3) for direction control.

Characteristics: pages A4/42 to A4/44, A4/52
Curves: pages A4/54 to A4/59
Dimensions: pages A4/60 and A4/61
Schemes: pages A4/62 to A4/74

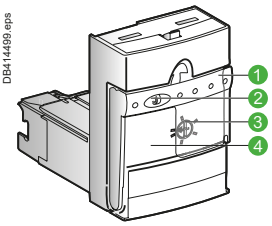
Product references

PB121268.eps



LUCA, LUCB, LUCC, LUCD, LUCL series

DB414499.eps



LUCA●●●●

1. Extraction and locking handle.
2. Sealing of locking handle.
3. Ir adjustment dial.
4. Locking of settings by sealing the transparent cover.

TeSys U starters are composed with separate elements: power component + control units + auxiliary modules.The control unit includes electronic components and the current adjustment dial. The control uinit is selected according to:
- Motor power to be handled.

Type of protection: thermal+magnetic or magnetic only.

Control units for power bases with basic control

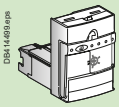
LUCA - thermal + magnetic (standard) units

- Protection against overload: 14.2 x Ir (setting current).
- Protection against short circuit: 13 x Ir max (max setting current).
- Protection against missing or unbalanced phases.
- Protection against insulation fault (protection of equipment only).
- Class 10 tripping.
- Frequency 50...60 Hz.

LUCL - magnetic units

- Protection against short circuits.
- To be used when a standard power base is connected to a motor drive or a soft starter, as they provide the overload protection.

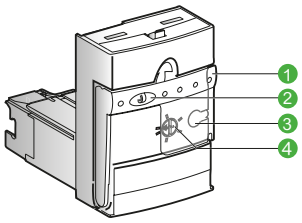
*Note: both **LUCA** and **LUCL** units can be used in the advanced power bases **LUB120** and **LUB320**.*

Maximum standardized power ratings of 3 phases motors 50/60 Hz				Lip_in mounting on the power base - Rating	DB414499.eps  Control unit product reference (1)	
400/440 V	500 V	690 V	Setting range			
kW	kW	kW	A	A	Thermal + magnetic	Magnetic
					LUCA	LUCL
0.09	-	-	0.15...0,6	12 and 32	**LUCAX6●●**	**LUCLX6●●**
0.25	-	-	0.35...1,4	12 and 32	**LUCA1X●●**	**LUCL1X●●**
1.5	2.2	3	1.25...5	12 and 32	**LUCA05●●**	**LUCL05●●**
5.5	5.5	9	3...12	12 and 32	**LUCA12●●**	**LUCL12●●**
7.5	9	15	4.5...18	32	**LUCA18●●**	**LUCL18●●**
15	15	18.5	8...32	32	**LUCA32●●**	**LUCL32●●**
18.5	18.5	22	9.5...38	38	**LUCA38●●** (2)	**LUCL38●●** (2)

(1) Replace the 2 dots by the coil voltage code below – AC is 50-60 Hz.
*(2) With **BL** or **FU** code only.*

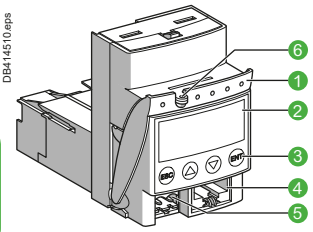
Coil voltage (V)	24 ⎓	24 ~	48...72 ⎓ or ~	110...220 ⎓ and 110...240 ~
Code	**BL**	**B**	**ES**	**FU**

Characteristics: pages A4/45 to A4/47, A4/53
Curves: pages A4/54 to A4/56
Schemes: page A4/60



LUCB●●●●, LUCC●●●●, LUCD●●●● control units

1 Extraction and locking.
2 Handle sealing of locking.
3 Handle
4 Ir adjustment dial test push button.



LUCM●●BL control unit

1 Extraction and locking handle.
2 Built-in LCD display (2 lines, 12 characters).
3 4 button keyboard.
4 RJ45 connector for RS485 Modbus communication
5 Connector for external 24 V DC power supply.
6 Sealing of locking handle.

Control units for power bases with advanced control

LUCB, LUCC, LUCD control and diagnostic units

Motor protection, fault diagnostic.
Protection against
■ overload: 14.2 x Ir (setting current).
Simulation of an overload by depressing the test push button.
■ short circuit: 13 x Ir max (max setting current).
■ missing or unbalanced phases.
■ insulation fault (protection of equipment only).
Overload alarm management:
■ locally: with one of the LUF family module
■ Remotely: with LULC031, LULC033, LULC07, LULC08, LULC09 or LULC15 (thermal alarm only) communication module.
Reset:
■ manual
■ automatic, with a communication module.

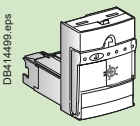
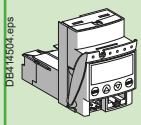
LUCM multifunctional control unit

Motor protection, operational values display and diagnostic.
To be associated with 24 V DC coil only.
LUCM●●BL: tripping class 5 to 30, single phase, three phase
Same functions as LUCB●●●● with complementary functions:
■ in working mode: display of electrical values, setting parameters and events
■ in configuration mode: display of protection and alarm settings.
These functions are available for local display on a display panel, and for remote display via a RJ45 Modbus connector.
LUCM is not compatible with LUB38.

Note: a 24 V DC power supply is required during the configuration process.



LUCM12BL

Maximum standardized power ratings of 3 phases motors 50/60 Hz				Setting range	Lip_in mounting on the power base - Rating	 Protection type: - overload - short-circuit - Main power fault - alarm			 Multifunctional
400/440 V		500 V	600 V						
kW		kW	kW	A	A	Class 10	Class 10	Class 20	Class 5...30
1P	3P	3P	3P			3P	1P	3P	1 - 3P
-	0.09	-	-	0.15...0,6	12 and 32	LUCBX6●●	LUCCX6●●	LUCDX6●●	LUCMX6BL
0.09	0.25	-	-	0.35...1,4	12 and 32	LUCB1X●●	LUCC1X●●	LUCD1X●●	LUCM1XBL
0.55	1.5	2.2	3	1.25...5	12 and 32	LUCB05●●	LUCC05●●	LUCD05●●	LUCM05BL
2.2	5.5	5.5	9	3...12	12 and 32	LUCB12●●	LUCC12●●	LUCD12●●	LUCM12BL
4	7.5	9	15	4.5...18	32	LUCB18●●	LUCC18●●	LUCD18●●	LUCM18BL
7.5	15	15	18.5	8...32	32	LUCB32●●	LUCC32●●	LUCD32●●	LUCM32BL
18.5	18.5	22	9.5...38	38		LUCB38●● (1)		LUCD38●● (1)	

Cial. ref. of the control unit: replace dots by the coil code.

Coil voltage (V)	24 ⎓	24 ∿	48...72 ⎓ and 48 ∿	110...220 ⎓ and 110...240 ∿
Coil code	BL	B	ES	FU

Magelis XBT NU HMI terminal (optional)

Provides display and modification of the LUCM multifunctional control unit settings.
Modbus protocol – dialog up to 8 TeSys U(2)- Pre-loaded application and alarm pages, multi-language.

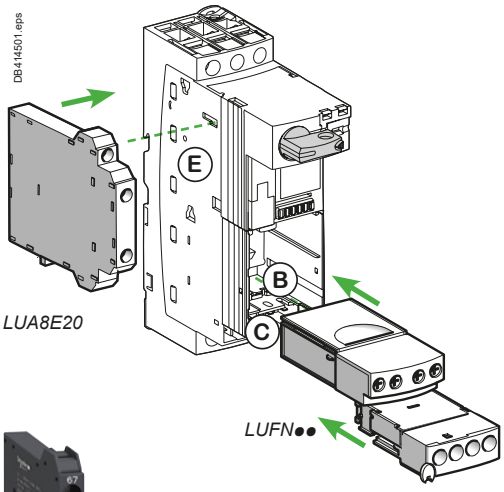


XBTNU400

Designation	References
Magelis TeSys U terminal	XBTNU400
Connecting cable XBTNU400 to LUCM ●●BL, L = 2.50 m (2)	XBTZ938

(1) With BL or FU code only.
(2) A Modbus hub or - junction must be used when connecting several TeSys U.

Characteristics: page A4/45
Curves: pages A4/54 to A4/56
Schemes: page A4/63



LUA8E20

LUFN●●

LUA1C●●



LUA8E20



LUFN02



LUA1C20

Signaling module and blocks

They provide dry contacts of Normally Open (NO) or Normally Closed (NC) type for signaling purpose. The monitored status can be either the motor running status or the protection device status, depending on the commercial reference of the module or block.

Common electrical characteristics

Standard operating voltage: 24…250 V AC/DC.
Maximum current: 5 A.

Compatibility - Positioning

The signaling module and blocks can be use in any power base
LUA8E20 is clipped on the E side of the power base
LUFN11, LUFN02, LUFN02 inserted into B cavity
LUA1C20, LUA1C11 inserted into C cavity
***Note**: B and C cavities may be already used for reverser-starter, communication.*

Signaling module and blocks	Output	References
Module *Motor running status: ON / OFF*	1 NO + 1 NC	**LUFN11**
	2 NC	**LUFN02**
	2 NO	**LUFN20**
Block *Protection status: OPEN / CLOSED (OF) STANDBY / TRIPPED (SD)*	2 NO	**LUA1C20**
	1 NO + 1 NC	**LUA1C11**
Side block *Protection status: OPEN / CLOSED (OF)*	2 NO	**LUA8E20**



LUFV2



LUFW10



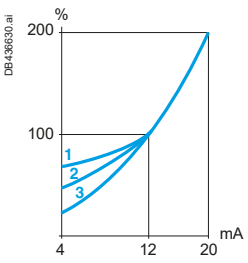
LUFDH11



LUFDA01



LUFDA10



LUFV2 typical response curve

Function modules

They provide analog output or dry contacts of Normally Open (NO) or Normally Closed (NC) type for measurement or signaling purpose.

Common electrical characteristics

Standard operating voltage: 24…250 V AC/DC.
Maximum current: 5 A.

Compatibility - Positioning

The function modules can only be used in a LUB120, LUB320 or LUB380 power base, in cavity B.

Function modules	Output type	References
Electrical value: average current in each phase. The signal is the image of the pourcentage of In. External 24 V DC power supply needed	Analog: 4-20 mA	**LUFV2**
Contact closes if average current in the phases = 105 % of In	1 NO	**LUFW10**
Contacts change state if tripping is caused by overload	1 NO + 1 NC	**LUFDH11**
Contact opens if overload tripping is reset with control pad or remotly	1 NC	**LUFDA01**
Contact closes if overload tripping is reset with control pad or remotly	1 NO	**LUFDA10**

Characteristics:
pages A4/48 to A4/52

Schemes:
pages A4/62 to A4/64

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LUFC00

Auxiliary parallel wiring module (1)

Auxiliary parallel wiring module for Modicon Telefast system

Inputs

They collect the FWD, REV controls from an automation process.
An RJ45 parallel port is used, for connection to the 24 V DC outputs of a PLC.

Outputs

They give the position of the control pad and the state of the poles,
They provide 24 V DC controls to the LUB120, 320 or 380 power base coil via the LU9BN11C adapter (A2, A1) or to the LU2B12, 32, 38 power base coil with a LU9MRC adapter (A2, A1, A3).

Compatibility - Positioning

The paralle wiring module can only be used in any TeSys U power base,
with LUC●●● control unit with coil voltage
Compatible with:
- Modicon TM3 (map I/O controllers for RJ45 M221, M241, M25)
- Modicon STB modules (I/O for automation island)
- Modicon Telefast (interfaces RJ45/HE10).

The parallel wiring module is inserted in cavity B.

*Note: the parallel wiring module must be connected to a **LU9G02** or **LU9G03** Telefast distribution*
Note: more details on parallel wiring page A4/16.

Designation	References
TeSys U power base parallel wiring module	**LUFC00**

PB121261.eps



LULC033

PB121262.eps



ASILUFC51

PB121261.eps



LULC07

PB121290.eps



LULC15

PB121264.eps



LU9BN11C

PB121264.eps



LU9BN11L

Communication modules

Communication modules

These modules send the control pad position and pole state to a communicating system (PLC, monitoring system,…)
They collects the Forward, Reverse motor controls from an automation process.
The status and controls are coded according to an industrial communication protocol, depending on the communication module.
Bus cable connection, external power supply by crew clamp terminals.
Connector for coil control (to A1-A3-A2) via a prewired connection (LU9BN● for 1-direction control, LU9MR● for 2-direction control)

Compatibility - Positioning

The communication modules can only be used in a LUB120, LUB320 or LUB380 power base, in cavity B.

Designation	References
TeSys U Modbus communication module	**LULC033**
TeSys U AS-Interface communication module	**ASILUFC51**
TeSys U Profibus DP communication module	**LULC07**
TeSys U CANopen communication module	**LULC08**
TeSys U DeviceNet communication module	**LULC09**
TeSys U Advantys STB communication module	**LULC15**

*Note: Ethernet communication can be acheived with **LULC033** + ConneXium TeSys Port (ref. **TCSEQM113M13M**)*
Note: more details on bus-type communication page A4/21.

PB121266.eps



LU9MRC

PB121267.eps



LU9MRL

Prewired connectors

They provide the necessary electrical link between a parallel or communication module and the coil supply connector, on the power base or reverser block. Thus, ON-OFF (1 direction) or FORWARD-REVERSE (2 direction) controls can be acheived.

Prewired connection			References	Compatibility with modules
1 direction	Short cable	Side connection	**LU9BN11C**	**LUFC00, LULC033, ASILUFC51**
		Bottom connection	**LU9BN11L**	**LULC07, 08, 09, 15**
2 direction	Long cable	Side connection	**LU9MRC**	**LUFC00, LULC033, ASILUFC51**
		Bottom connection	**LU9MRL**	**LULC07, 08, 09, 15**

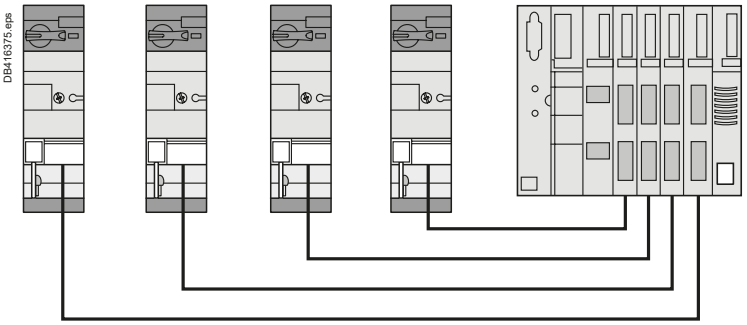
Introduction:
pages A4/16 to A4/19, A4/21 to A4/23
Characteristics:
pages A4/24 to A4/29, A4/49 to A4/53
Schemes:
pages A4/64 to A4/67

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Point-to-point wiring

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■ The control inputs and signaling outputs of the starter are grouped in a single socket, usually RJ45.
They are individually connected to PLC outputs and inputs.
■ The wires run in parallel in a multicore cable equipped with a multipin connectors, RJ45 in the case of Telefast type system.
■ 3 parallel wiring systems are available:
□ Modicon TM3, based on a RJ45 I/O module for M221, M241, M25 PLC
□ Modicon STB, based on I/O modules for automation island
□ Modicon Telefast: RJ45 / HE10 interfaces.
■ Simple way of proximity wiring. Quick cabling.
It is suitable for machine control panels when a large number of TeSys U starter-controller are installed.

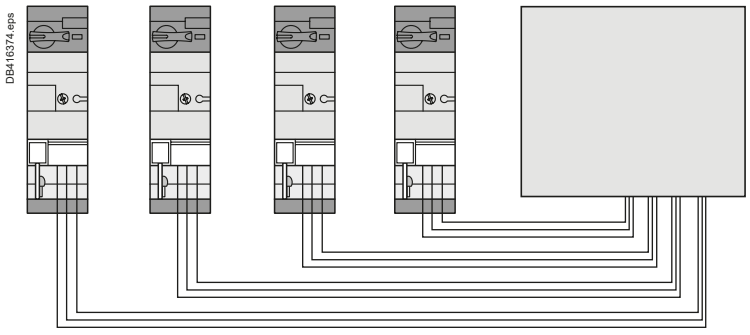
TeSys U

informations

■ The control and signaling terminals of the starters are connected to the output and input terminals of a PLC. No specific connectors or cables are required.
■ Conventional wiring mode, without optimization of the cabling time.
May be suitable when a very small number of starters is used, with a very small number of links.

Parallel cabling systems

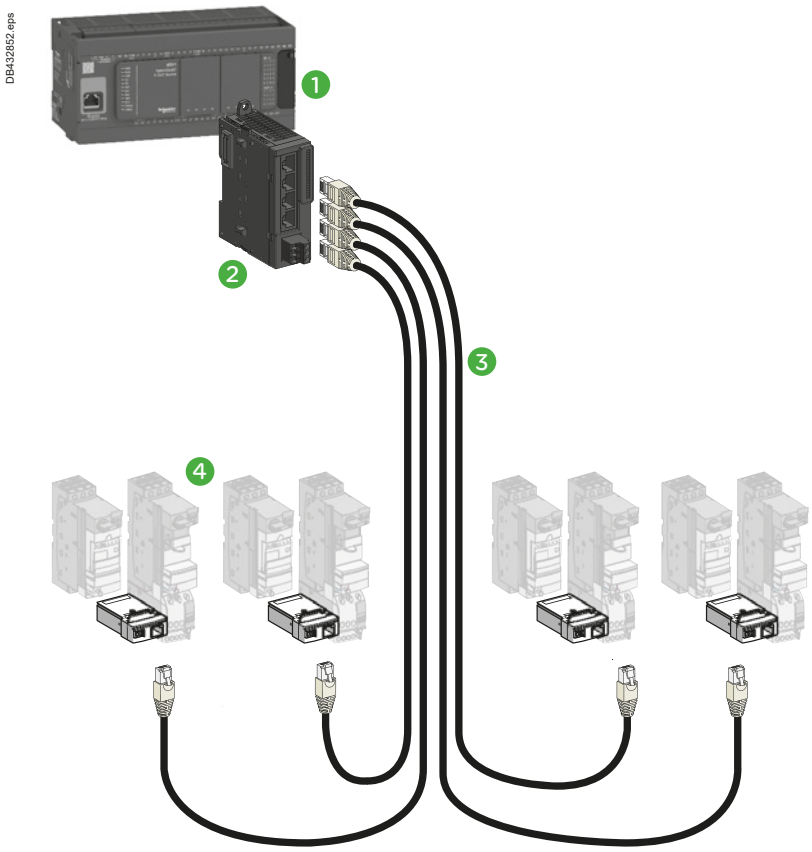
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Integration in the Modicon TM3 wiring system

The TeSys U starter-controller are directly connected to a I/O module equipped with RJ45 connectors.

1. Modicon M221, M241, M251 PLC's
2. TM3XTY I/O module for 4 starters
3. LU9R●● cables with RJ45 connectors,
4. LUFC00 module for TeSys parallel connection (1 or 2 direction of rotation).



Integration in the Modicon Advantys STB system

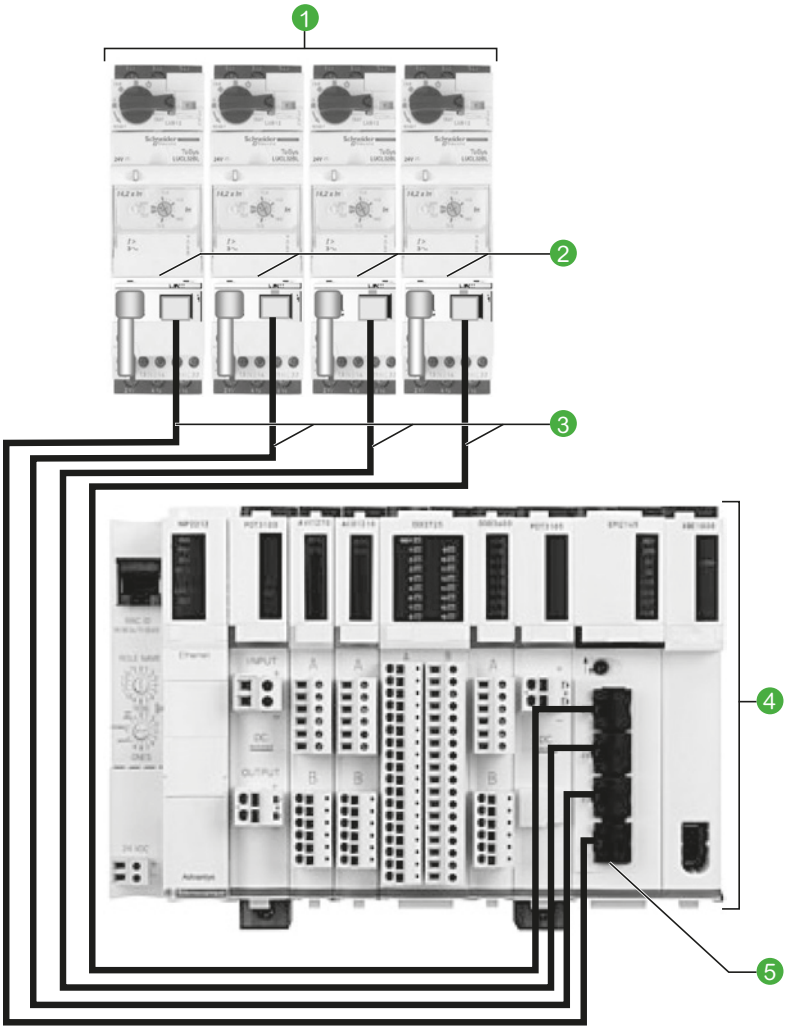
Advantys STB is a solution for remote I/O modules.

These communicate with the Modicon PLCs range thanks to a serial liaison, using the Advantys STB protocol.

In this example an Advantys I/O module is used to facilitate wiring.

Each of its four terminals receives a preassembled RJ45 cable connected to a TeSys U starter-controller.

1. TeSys U LUB120, 320 or 380 power base (equipped with 24 V DC LUC●●●●BL control modules)
2. TeSys module for parallel RJ45 wiring: LUFC00 + LU9BN11C (one direction) or LU9MRC (2 directions for LU2B12, 32 or 38 power base)
3. RJ45 cables (2 connectors):
   ⩽ 3 m: LU9R●●
   > 3 m: 490 NTW000●● (5, 12, 40 or 80 m)
4. PLC: Modicon range
5. I/O Modicon Advantys module: STB EPI 2145K

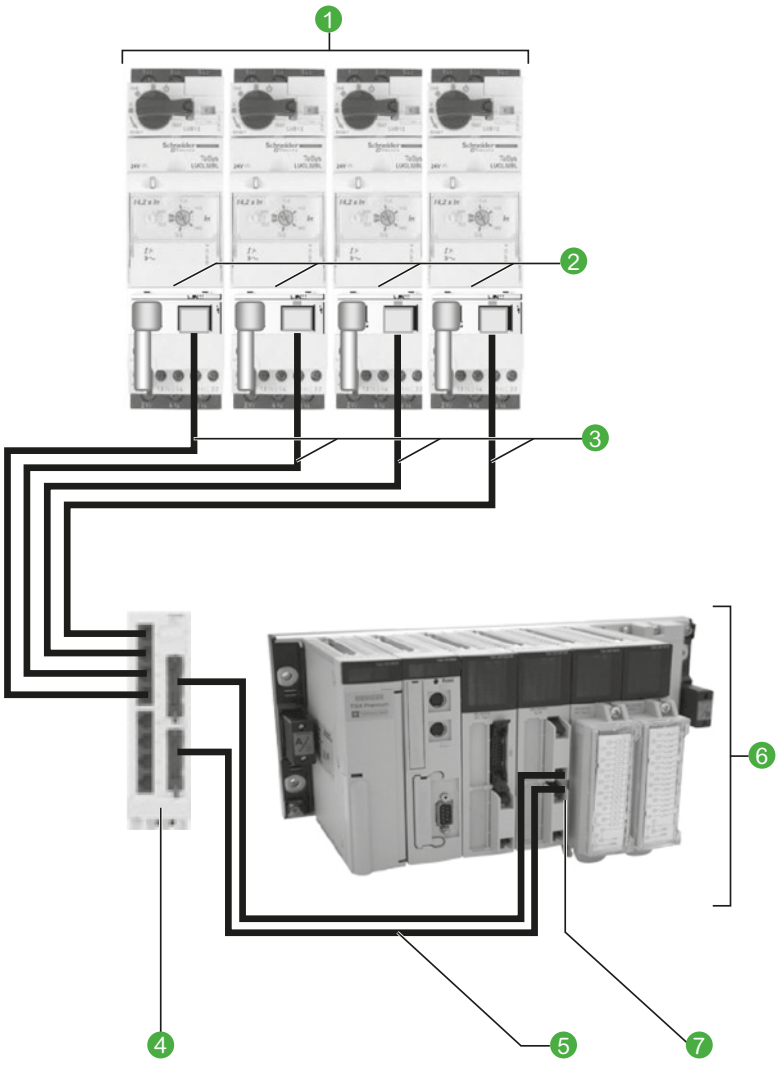


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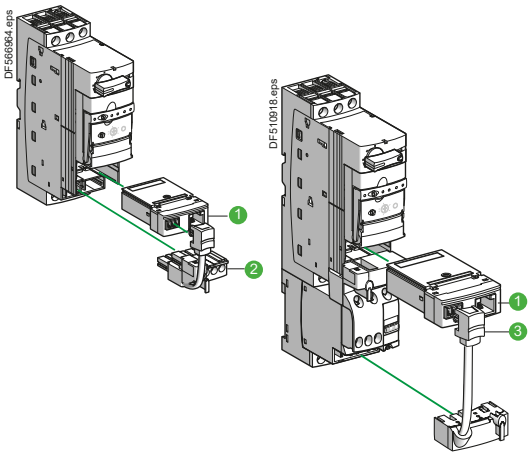
Integration in the Modicon Telefast system

The wiring hubb **LU9G0●** facilitates the connection to Modicon Premium PLCs.
It adapts RJ45 connectors to HE10 available on the Telefast I/O modules.
Connection: up to 8 TeSys U per hubb.

1. TeSys U LUB120, 320 or 380 power base (equipped with 24 V DC LUC●●●●BL control units)
2. TeSys Module for parallel wiring RJ45: LUFC00 + LU9BN11C (one direction) or LU9MRC (2 directions for LU2B12, 32 or 38 power base)
3. RJ45 cables (2 connectors):
⩽ 3 m: LU9R●●
> 3 m: 490 NTW000●● (5, 12, 40 or 80 m)
4. Telefast RJ45 / HE10 splitter box: LU9G02 or LU9G03 (different TeSys U connection capacities)
5. HE10 cables (2 connectors): TSXCDP●●●
6. PLC: Modicon Premium range
7. I/O module: TSX DMY 28FK



Product references



Components for connection of a starter - 1 direction of rotation	
Designation	**Reference**
1 Parallel connection module, RJ45 output 2 coil control inputs, 3 signal outputs	**LUFC00**
2 Pre wired connector, one direction of rotation, for LUB120, 320 or 380 power base coil connection and one contact for emergency stop	**LU9BN11C**

Components for connection of a starter - 2 directions of rotation	
Designation	**Reference**
1 Parallel connection module, RJ45 output	**LUFC00**
3 Pre wired connector, 2 directions of rotation, for LU2B12, 32 or 38 power base coil connection and one contact for emergency stop	**LU9MRC**

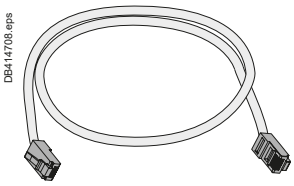


LU9G02

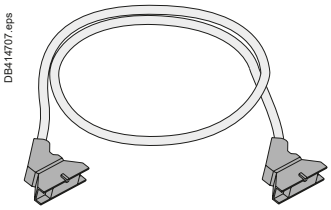


LU9G03

Telefast RJ45/ HE10 splitter box	
Designation	**Reference**
Splitter box Connection to TeSys U: 4 RJ45 connectors: for 1 to 4 TeSys U, 1 or 2 directions 4 RJ45 connectors: for 1 to 4 TeSys U, 1 direction Connection to PLC: 1 x HE10 connector - 20 chanels, for pole status, alarms 1 x HE10 connector - 20 chanels, for control. 24 V DC auxiliary power supply required	**LU9G02**
Splitter box Connection to TeSys U: 8 RJ45 connectors: for 1 to 8 TeSys U, 1 or 2 directions Connection to PLC: 1 x HE10 connector - 20 chanels, for pole status, alarms 1 x HE10 connector - 20 chanels, for control. 24 V DC auxiliary power supply required.	**LU9G03**



RJ45 cables.



HE10 cables.

RJ45 connection cables, with 2 RJ45 connectors	
0.3 m	**LU9R03**
1 m	**LU9R10**
3 m	**LU9R30**

HE10 connection cables, with 2 HE10/20 way connectors	
Section: AWG 22 / 0.324 mm²	
0.5 m	**TSXCDP053**
1 m	**TSXCDP103**
2 m	**TSXCDP203**
3 m	**TSXCDP303**
5 m	**TSXCDP503**
Section: AWG 28 / 0.080 mm² (flat cable)	
1 m	**ABFH20H100**
2 m	**ABFH20H200**
3 m	**ABFH20H300**

HE10 connection cables, with 1 x HE10/40 way connector (PLC side) and 1x HE10/20 way connector (Splitter box side)	
Section: 0.324 mm²	
0,5 m	**BMXFCC053**
1 m	**BMXFCC103**
2 m	**BMXFCC203**
3 m	**BMXFCC303**
5 m	**BMXFCC503**
10 m	**BMXFCC1003**

Cable with stripped wires (PLC side) 1 x HE10/20 ways connector (Splitter box side)	
Section: AWG 22 / 0.324 mm²	
3 m	**TSXCDP301**
5 m	**TSXCDP501**

Characteristics:
page A4/51

Schemes:
pages A4/67 and A4/68

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Application functionality, topology

1 Geographically expanded process

Many motors are scattered on the site, the process control requires individual control to ensure safety and proper operation.
TeSys U is a suitable communicating actuator. The integration of a bus communication module in the starter-controller saves space in the control board and simplifies wiring, compared to solutions based on conventional components (circuit breaker + contactor).

2 Application: automatic motor control / monitoring

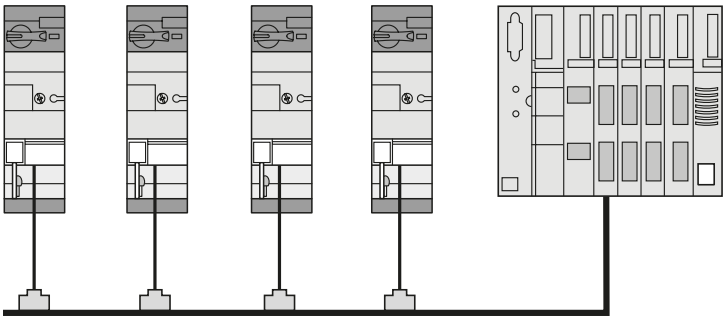
Thanks to a communication bus, starter-controllers are part of an automation system controlled by a PLC and (or) various communicating controllers.
These equipment can then share the status and alarm information related to each motor control and perform specific treatments.

3 Bus- type connection

This type of connection allows different topologies (star, ring ...) and supports various protocols dialogue. It is therefore recommended for geographically expanded process, in order to to simplify wiring and ensure multiple-controller management.

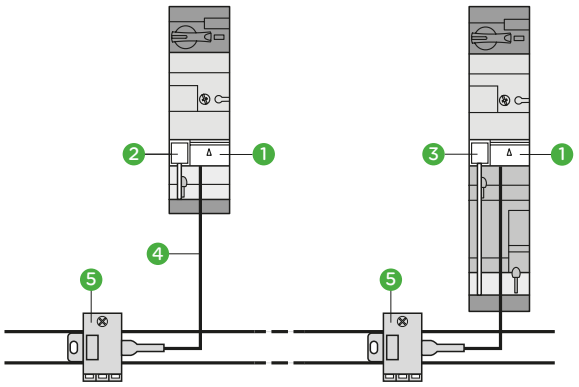
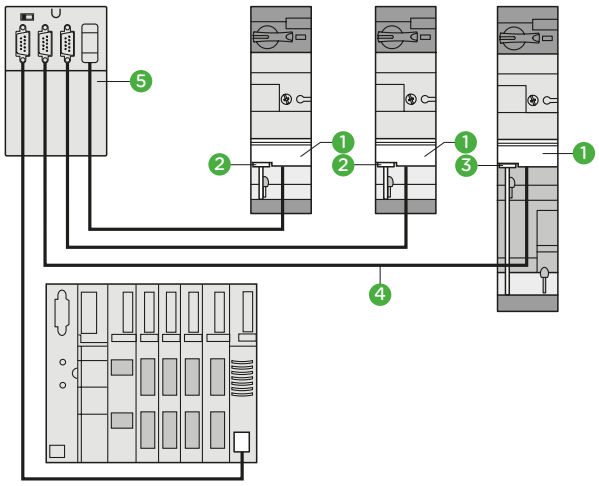
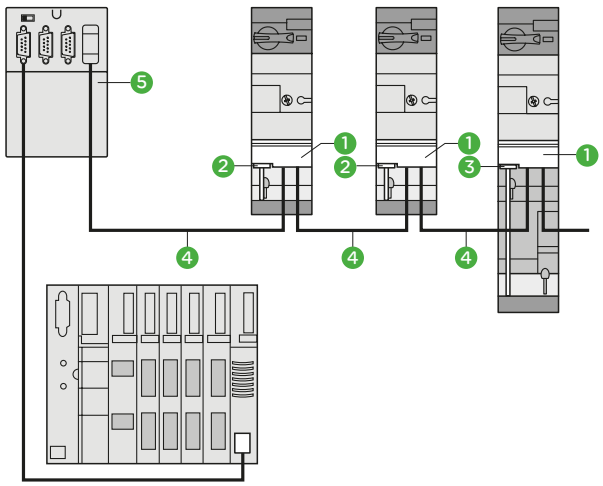
- The bus wiring interconnects TeSys U starters controllers and components of the installation via a single the cable.
- Commands and status are coded according to the selected protocol and transmitted on the communication bus.
- This wiring is simple, usually a shielded (or not) pair of wires, suitable for monitored automation, regardless of the number of TeSys U and their locations.

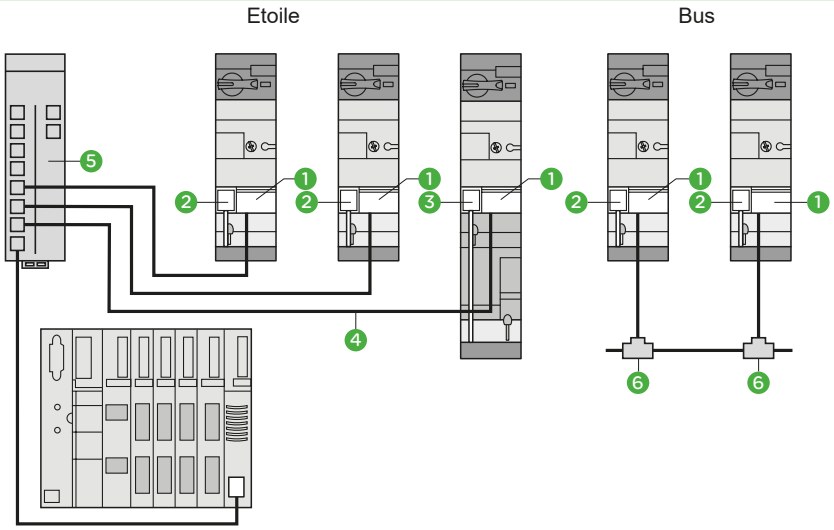
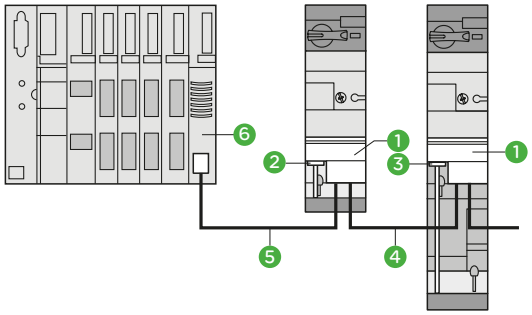
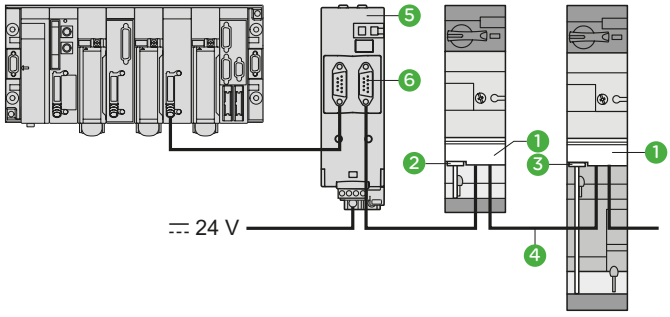
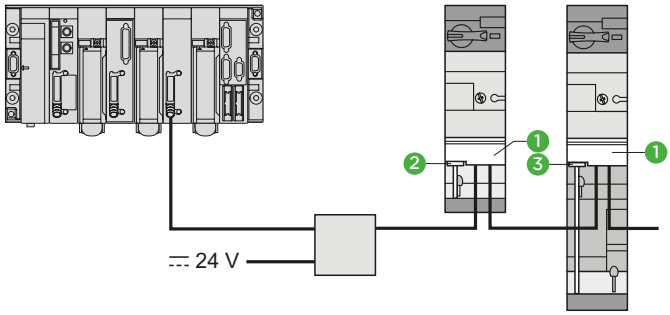
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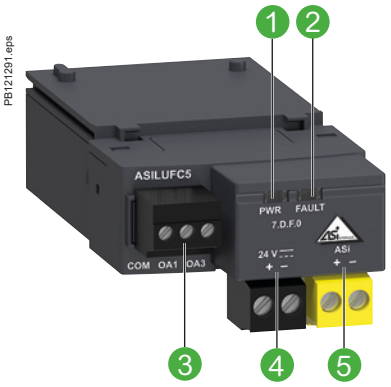
Available TeSys U status and controls via a communication module

Control unit	LUCA	LUCB LUCC LUCD	LUCM
Starter status (ready, running, fault)	■	■	■
Start and Stop commands	■	■	■
Thermal overload alarm		■	■
Remote reset via the bus		■	■
Indication of motor load		■	■
Fault signalling and differentiation		■	■
Remote programming and monitoring of all functions			■
“Log” function			■
“Monitoring” function			■
Alarms (overcurrent, ...)			■

Network	Architecture	Component references
AS Interface		
Cabling system for rapidly connecting sensors and actuators to the controller. A single cable provides both data transmission and power to sensors. Details page **A4/24**		1 ASILUFC5 or ASILUFC51 2 LU9BN11C 3 LU9MRC 4 XZCG0142 5 TCSATV01N2
CANopen		
Etoile		1 LULC08 2 LU9BN11L 3 LU9MRL 4 TSXCANC●●● 5 TSXCANTDM4 6 TSXCPP110
Bus Details page **A4/25**		

Network	Architecture	Component references
Modbus		1 LULC033 2 LU9BN11C 3 LU9MRC 4 VW3A8306R●●● 5 LU9GC3 6 VW3A8306TF
Details page **A4/26**		
Advantys STB		1 LULC15 2 LU9BN11L 3 LU9MRL 4 LU9RDD●●● 5 LU9RCD 6 STBXBE1100
Starter-controllers communicate using ADVANTYS STB protocol to fit into a remote I/O architecture.		
Details page **A4/27**		
Profibus-DP (Decentralized Peripherals)		1 LULC07 2 LU9BN11L 3 LU9MRL 4 LU9RPB010 LU9RPB100 LU9RPB400 5 LU9AD7 6 LU9GC7
is used for connecting actuators and sensors to a central controller for applications in industrial production. The standard bus provides a number of diagnostic means		
Details page **A4/28**		
DeviceNet		1 LULC09 2 LU9BN11L 3 LU9MRL
Details page **A4/29**		

Product references



1 Green LED: AS-Interface voltage present
2 Red LED: AS-Interface or module fault
3 Outputs for starter commands
4 Black connector for connection to ⎓ 24 V auxiliary power supply
5 Yellow connector for connection to the AS-Interface system

The ASILUFC5 communication module, combined with the power base and control unit is used to control TeSys U starters-controllers via DeviceNet bus.
The LULC09 communication module is slave type.

Module Specifications

I/O terminal block

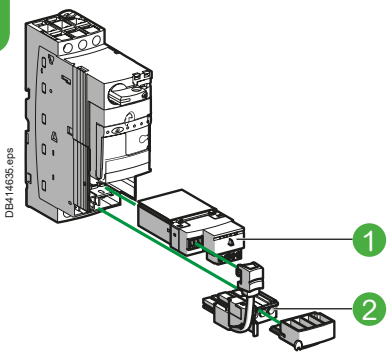
■ Powered by external 24 V DC (power supply not included):
□ 2 x configurable inputs for binary sensors
□ 1 x 24 V DC output - 0.5 A local auxiliary command.

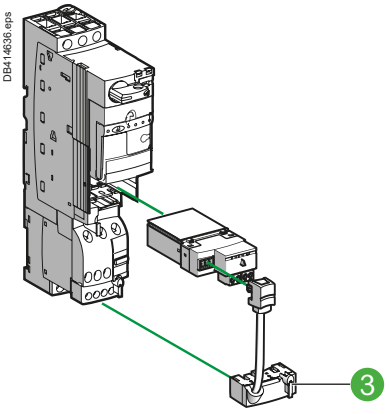
Connectors

■ For TeSys U 24 V DC coil (common, direction 1, direction 2).
■ For AS-Interface bus.

Signaling

■ Module Status - Error - 24 V, by LED.





Tesys components			
Description	**Mark**	**Max number of slaves**	**References**
AS-Interface communication module	1	31	**ASILUFC5**
		62	**ASILUFC51**
Pre-wired connector: coil - LUB powerbase	2	-	**LU9BN11C**
Pre-wired connector: coil - LUB2B powerbase	3	-	**LU9MRC**

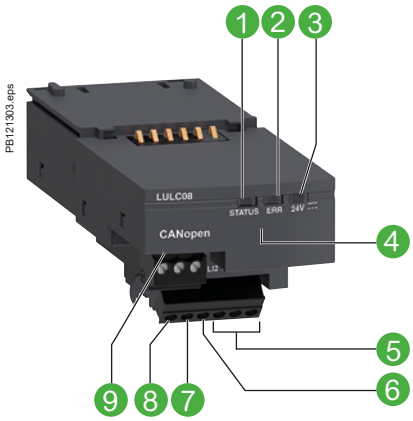
Connection of the communication module

By a "Y" cable with:
■ TeSys U side, 2 connectors (bus + power),
■ Bus side, one connector to be connected to the AS-Interface TCSATV01N2 tap-off.

Description	References
AS-Interface / TeSys U branch cable, L = 2 m	**XZCG0142**
AS-Interface Tap-off	**TCSATV01N2**

Characteristics:
pages A4/49, A4/51, A4/53
Schemes:
pages A4/64, A4/70, A4/72

Product references



1 LED indicating module status
2 Fault signalling LED
3 LED indicating ⎓ 24 V supply ON for outputs OA1, OA3 and LO1
4 SUB-D connector for bus link
5 ⎓ 24 V supply connection
6 Discrete input
7 Discrete input
8 Discrete output
9 Outputs for starter commands

The LULC08 communication module, combined with the power base and control unit is used to control TeSys U starters-controllers via CANopen bus.
The LULC08 communication module is slave type.

Module Specifications

I/O terminal block

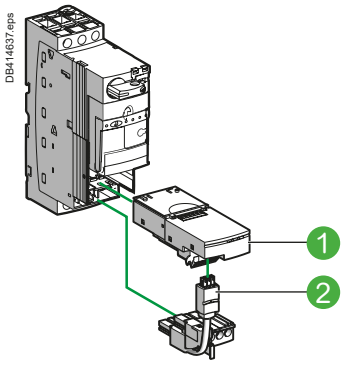
- Powered by external 24 V DC (power supply not included):
  - 2 x configurable inputs for binary sensors
  - 1 x 24 V DC output - 0.5 A local auxiliary command.

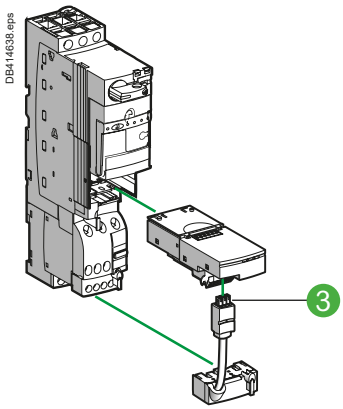
Connectors

- For TeSys U 24 V DC coil (common, direction 1, direction 2).
- For CANopen bus.

Signaling

- Module Status - Error - 24 V, by LED.





Tesys components		
Description	**Item**	**References**
CANopen communication module	1	**LULC08**
Pre-wired connector: coil - LUB powerbase	2	**LU9BN11L**
Pre-wired connector: coil - LUB2B powerbase	3	**LU9MRL**

Compatibility of CANopen communication module with control units	
LUCA ●●BL / B ●●BL / C ●●BL / D ●●BL	All versions marketed after **2T0481** (1)
LUCM●●BL	All versions ≥ V3.2
LUCMT1BL	All versions ≥ V3.2

(1) This "date code" is made up as follows:
***2T** or **2C**: factory code.*
***04**, **05**, **06** and so on: year of manufacture.*
***08**: week.*
***1**: 1st day of the week.*

How to get information on the design of a CANopen architecture and the choice of network accessories

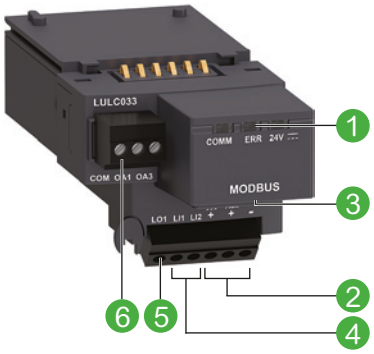
Consult the library of downloadable documents on schneider-electric.com by searching on the name of the communication protocol.

Characteristics:
pages A4/50, A4/51, A4/53

Schemes:
page A4/66

LULC033

PB121552.eps



1 Module status signalling LED
2 24 V supply connection
3 RJ45 connector for RS485 Modbus link
4 2 discrete inputs
5 1 discrete output
6 Outputs for starter commands

LULC033 communication module, combined with the power base and control unit is used to control TeSys U starters-controllers via Modbus.

Module Specifications

I/O terminal block

■ Powered by external 24 V DC (power supply not included):
□ 2 x configurable inputs for binary sensors (on LULC033 only)
□ 1 x 24 V DC output - 0.5 A local auxiliary command.

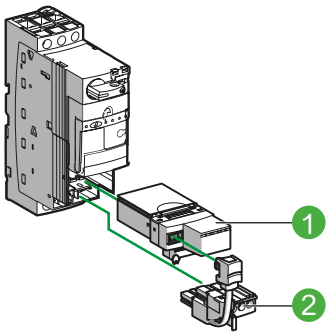
Connectors

For TeSys U 24 V DC coil (common, direction 1, direction 2).
■ RJ45, For Modbus line.

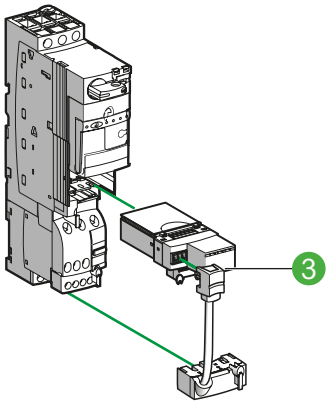
Signaling

■ Module Status - Error - 24 V, by LED.

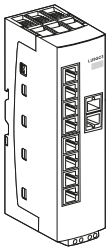
DB414639.eps



DB414640.eps



DB414709.eps



Tesys components			
Description	**Item**	**Bin. input**	**References**
Modbus communication module	1	2	**LULC033**
Pre-wired connector: coil - LUB powerbase	2	-	**LU9BN11C**
Pre-wired connector: coil - LUB2B powerbase	3	-	**LU9MRC**

Modbus hub		
Description	**Length (m)**	**References**
Modbus communication distributor	-	**LU9GC3**
Cables fitted with 2 x RJ45 connectors	0.3	**VW3A8306R03**
	1	**VW3A8306R10**
	3	**VW3A8306R30**
Tees derivations	0.3	**VW3A8306TF03**
	1	**VW3A8306TF10**
Description		**References**
RS 485 line terminator		**VW3A8306R**

Compatibility of Modbus communication modules			
Communication modules (software version)		**LUCLC033 from V2.1**	**LUCLC033 from V2.2**
Power base	LUB●● / LU2B●2	■	■
	LUTM●●BL	■	■
Control unit	LUCA●●BL		■
	LUCB●●BL LUCC●●BL LUCD●●BL		■
	LUCM●●BL		■ (1)
	LUCBT●●BL LUCDT●●BL	■	
	LUCMT●●BL	■	

*(1) Except **LUCM ●●BL** V1.04 and V1.06.*

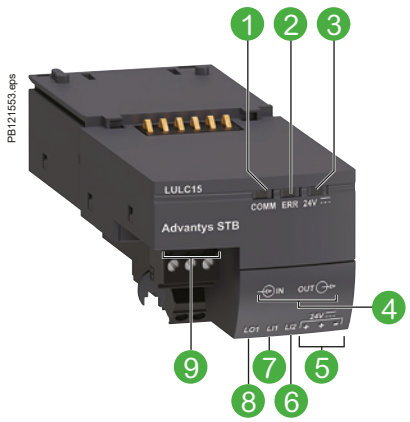
How to get information on the design of a Modbus architecture and the choice of network accessories

Consult the library of downloadable documents on schneider-electric.com by searching on the name of the communication protocol.

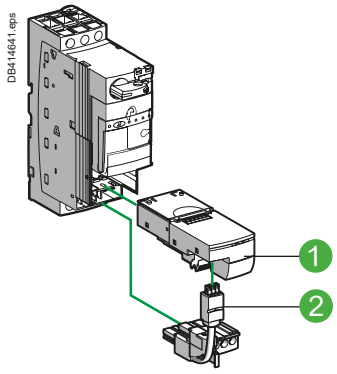
Characteristics:
pages A4/49, A4/51, A4/53

Schemes:
pages A4/65 and A4/73

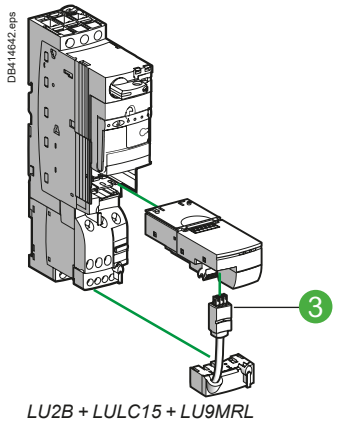
Product references



1 Two-colour LED indicating module status
2 Fault signalling LED
3 LED indicating that ⎓ 24 V supply is ON
4 Bus connectors
5 ⎓ 24 V supply connection
6 Discrete input
7 Discrete input
8 Discrete output
9 Outputs for starter commands



LUB + LULC15 + LU9BN11L



LU2B + LULC15 + LU9MRL

Communication module LULC15 allows direct connection of TeSys U starter-controllers and controllers on an Advantys STB island, between two segments or at the end of a segment. The starter-controller will then be able to make use of the services provided by Advantys STB: self-addressing, autobaud, fallback positions.

Module Specifications

I/O terminal block

- Powered by external 24 V DC (power supply not included):
  - 2 x configurable inputs for binary sensors (on LULC033 only)
  - 1 x 24 V DC output - 0.5 A local auxiliary command.

Connectors

- For TeSys U 24 V DC coil (common, direction 1, direction 2).
- For Advantys STB bus.

Signaling

- Com - Error - 24 V, by LED.

Tesys components

Description	Item	References
Advantys STB communication module	1	**LULC15**
Pre-wired connector: coil - LUB powerbase	2	**LU9BN11L**
Pre-wired connector: coil - LUB2B powerbase	3	**LU9MRL**

Cables

Description	Length (m)	References
Cables fitted with connectors, one straight and one elbowed	0.3	**LU9RCD03**
	1	**LU9RCD10**
	3	**LU9RCD30**
	5	**LU9RCD50**
Cables fitted with two straight connectors	0.3	**LU9RDD03**
	1	**LU9RDD10**
	3	**LU9RDD30**

Compatibility of Advantys STB communication module with control units

LUCA●●BL / B●●BL / C●●BL / D●●BL	All versions marketed after **2T0481** (1)
LUCM●●BL	All versions ≥ V3.2
LUCMT1BL	All versions ≥ V3.2

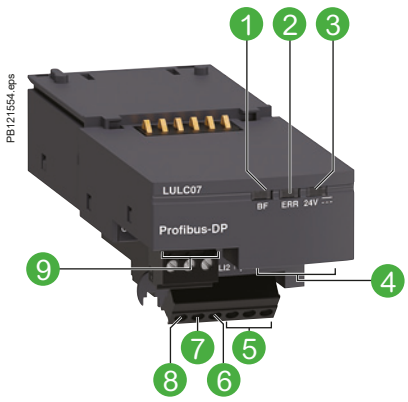
(1) This "date code" is made up as follows:
2T *or* ***2C****: factory code.*
04, 05, 06 *and so on: year of manufacture.*
08*: week.*
1*: 1st day of the week.*

How to get information on the design of a Advantys STB architecture and the choice of network accessories

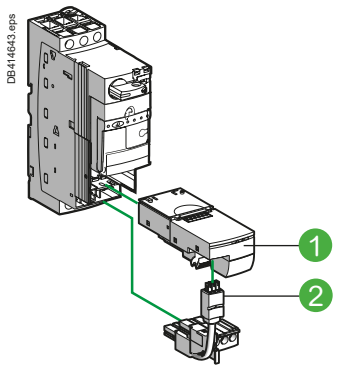
Consulter la librairie des documents téléchargeables sur le site schneider-electric.com en faisant une recherche sur le nom du protocole de transmission.

Characteristics: pages A4/50, A4/51, A4/53
Schemes: page A4/67

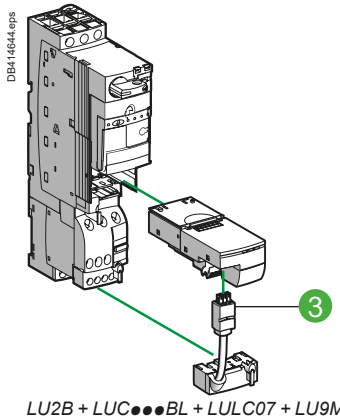
Product references



1 Two-colour LED indicating module status
2 Fault signalling LED
3 LED indicating ⎓ 24 V supply ON for outputs OA1, OA3 and LO1
4 SUB-D connector for bus link
5 ⎓ 24 V supply connection
6 Discrete input
7 Discrete input
8 Discrete output
9 Outputs for starter-controller commands (non-reversing and reversing)



LUB + LUC●●●BL + LULC07 + LU9BN11L



LU2B + LUC●●●BL + LULC07 + LU9MRL

When used in conjunction with the power base and control unit, communication module LULC07 allows TeSys U starter-controllers to be controlled via Profibus DP (Deported Periphery) bus.
Communication module LULC07 is of the slave type.

Module Specifications

I/O terminal block

■ Powered by external 24 V DC (power supply not included):
□ 2 x configurable inputs for binary sensors
□ 1 x 24 V DC output - 0.5 A local auxiliary command.

Connectors

■ For TeSys U 24 V DC coil (common, direction 1, direction 2).
■ For Profibus DP bus.

Signaling

■ Com - Error - 24 V, by LED.

Tesys components

Description	Item	References
Profibus DP communication module	1	**LULC07**
Pre-wired connector: coil - LUB powerbase	2	**LU9BN11L**
Pre-wired connector: coil - LUB2B powerbase	3	**LU9MRL**

Components for connection to the bus and to the installation

The 24 V DC -Aux supply to Profibus DP modules LULC07 must pass through power supply module LU9GC7.
LULC07 modules must be connected to the LU9GC7 splitter box in order to be powered.
The number of TeSys U starter-controllers that can be powered by an LU9GC7 module is limited by the maximum current (1.5 A) which it can deliver.
The ⎓ 24 V supply for the inputs/outputs must be provided separately..

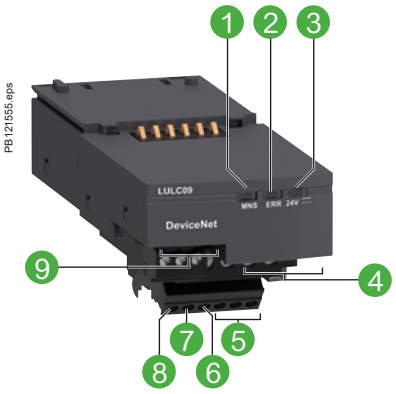
Description	Length (m)	References
Profibus DP power supply module	-	**LU9GC7**
Profibus DP connector	-	**LU9AD7**
Profibus DP cables 2-wire	100	**TSXPBSCA100**
	400	**TSXPBSCA400**
Profibus DP cables 4-wire	10	**LU9RPB010**
	100	**LU9RPB100**
	400	**LU9RPB400**

How to get information on the design of a Profibus DP architecture and the choice of network accessories

Consult the library of downloadable documents on schneider-electric.com by searching on the name of the communication protocol.

Characteristics: pages A4/50 and A4/53
Schemes: page A4/66, A4/67

Product references



1 LED indicating module status
2 Fault signalling LED
3 LED indicating ⎓ 24 V supply ON for outputs OA1, OA3 and LO1 and 24 V bus
4 DeviceNet connector for bus link
5 ⎓ 24 V supply connection
6 Discrete input
7 Discrete input
8 Discrete output
9 Outputs for starter-controller commands (non-reversing and reversing)

When used in conjunction with the power base and control unit, communication module LULC09 allows TeSys U starter-controllers to be controlled via DeviceNet bus. Communication module LULC09 is of the slave type.

Module Specifications

I/O terminal block

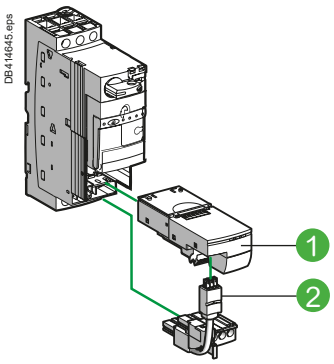
- Powered by external 24 V DC (power supply not included):
  - 2 x configurable inputs for binary sensors
  - 1 x 24 V DC output - 0.5 A local auxiliary command.

Connectors

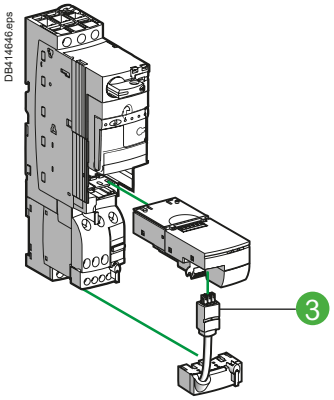
- For TeSys U 24 V DC coil (common, direction 1, direction 2).
- For DeviceNet bus.

Signaling

- Com - Error - 24 V , by LED.



LUB + LUC●●●BL + LULC07 + LU9BN11L



LU2B + LUC●●●BL + LULC07 + LU9MRL

Tesys components		
Description	**Item**	**References**
DeviceNet communication module	1	**LULC09**
Pre-wired connector: coil - LUB powerbase	2	**LU9BN11L**
Pre-wired connector: coil - LUB2B powerbase	3	**LU9MRL**

How to get information on the design of a DeviceNet architecture and the choice of network accessories

Consult the library of downloadable documents on schneider-electric.com by searching on the name of the communication protocol.

Characteristics:
pages A4/50, A4/51, A4/53

Schemes:
page A4/66

Product references

PB121557.eps



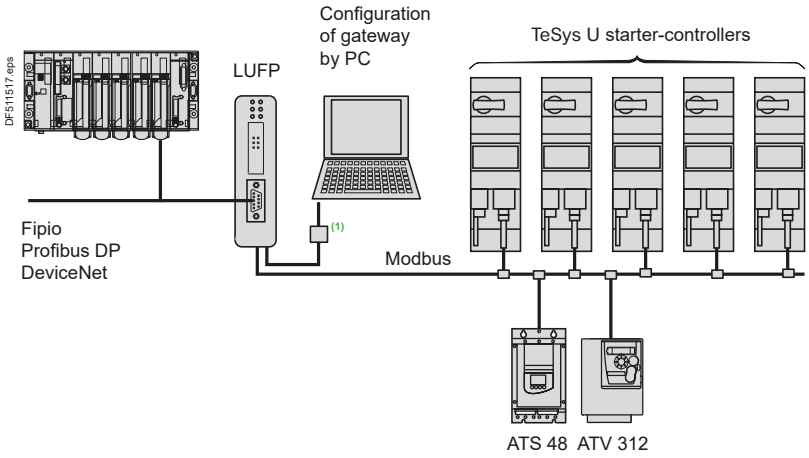
Introduction

LUFP communication gateways allow connection between the Modbus serial link and Fipio, Profibus DP or DeviceNet field buses.

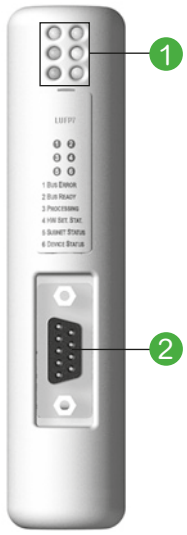
After configuration, these gateways manage information which can be accessed by the Modbus serial link and make this information available for read/write functions (command, monitoring, configuration and adjustment) on the field buses.

An LUFP communication gateway consists of a box which can be clipped onto a 35 mm omega rail, allowing connection of up to 8 Slaves connected on the Modbus serial link.

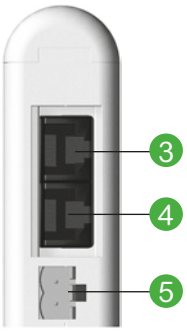
Example of architecture



DF526109-17-M.eps



561512.eps



Communication gateway LUFP	
Description	**Reference**
Fipio / Modbus gateway	**LUFP1**
Profidus DP / Modbus gateway	**LUFP7**
DeviceNet / Modbus gateway	**LUFP9**

Description

Front panel of the product

1 LED indicating :
- communication status of the Modbus serial links,
- gateway status,
- communication status of the Fipio, Profibus DP or DeviceNet bus.

2 Connectors for connection to Fipio, Profibus DP or DeviceNet buses.

Underside of product

3 RJ45 connector for connection of the Modbus serial link
4 RJ45 connector for link to a PC
5 ⎓ 24 V power supply

Software set-up

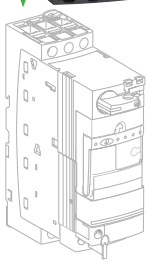
For the Fipio bus, software set-up of the gateway is performed using either PL7 Micro/Junior/Pro software or ABC Configurator software.
For the Profibus DP and DeviceNet buses, software set-up is performed using ABC Configurator.
This software is included in the TeSys U user's manual.

(1) Connection kit for PowerSuite software workshop.

Schemes:
page A4/68

Product references





LUALB1



LUALF1



LA9LB920

Short-circuit current limiter block

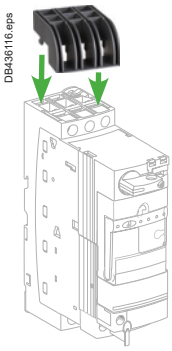
To be connected in series and upstream of a TeSys U starter-controller. It increases its ability to withstand the short circuit current from 50 kA to 100 or 130 kA under 400 V.

Principle: under the action of a short-circuit, the opening of two contacts of each phase of the limiter creates a resistive arc. The current then decreases to a value tolerable by a TeSys U power base.

Limiter blocks and accessories

Description	Breaking capacity Iq (kA)		Ie (A)	Ith (A)	Mounting	Unit reference
	≤ 440 V	690 V				
Limiter-disconnector (1 x LUAFL1 cartridge supplied)	130	70	-	32	Direct on power base up to 15 kW/32 A	**LUALB1** (1)
Limiter	100	35	32	63	Separate	**LA9LB920** (2)
limiter cartridge for LUALB1	130	70	-	-	Limiter-disconnector	**LUALF1**

(1) Must be connected to one power base only.
(2) Can be connected to multiple TeSys U *power bases in parallel with limitation :*
- *Total Ith max 63 A*
- *Total nominal current (Ie) 32 A from motor with simultaneous start (**LA9LB920** could not withstand higher inrush peak current)*



LU9SP0

Phase barrier

Ensures a complementary electrical insulation between phases.
690 V AC network: compulsory.
440 V AC network: compulsory when assembling a UL508 type E compliant motor starter (Self Protected Starter).

Description	Use	Mounting	Reference
Phase separator	LUB or LU2B 12 or 120 LUB or LUB2B 32 or 320 LUALB1	Live terminals L1, L2, L3	**LU9SP0**

Clip-in labels

Can be clipped on any TeSys U power base, on LU6MB0●● inverser block, and Linergy HK busbar system.

Marking accessory

Description	Sold by lot of	Reference per unit
Clip-in label 8 x 18 mm	100	**LAD90**



LU9ET1S

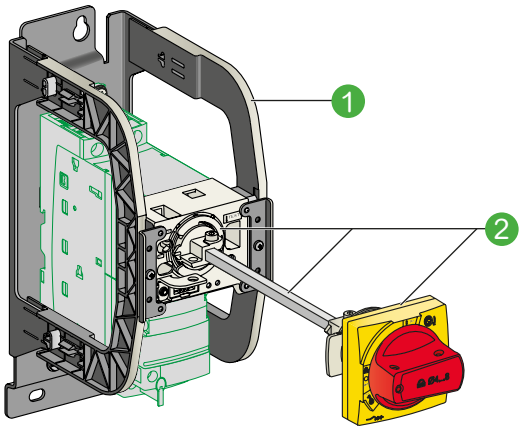
Safety-chain identification - Red label

The red sticker is dedicated to TeSys U LUCA, LUCB, LUCC, LUCD and LUCL control units.

Description	Reference per unit
Retrofit safety-chain identification sticker	**LU9ET1S**

Characteristics: page A4/48
Dimensions: page A4/61

DB414540.eps



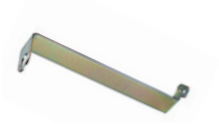
LU9APN21 mounting kit

PB106291.eps



GVAPA1 long shaft

PB121242.eps



GVAPK12 shaft support plate for deep enclosure

PB106296.eps



GVAPP1 spacer base (retrofit accessory)

PB106289.eps



GVAPR54 red handle, IP 54



GVAPYPHP external handle protection frame

PB106297.eps



GVAPL01 "Laser square" plotting tool

Extended rotary handle

Allows a circuit breaker or a TeSys U starter-controller installed in back of an enclosure to be operated from the front panel.
The rotary handle can be black or red/yellow, IP54 or IP65. It includes a function for locking the circuit breaker or the starter in the O (OFF) or | (ON) position (depending on the type of rotary handle) by means of up to 3 padlocks with a shank diameter of 4 to 8 mm.
The extension shaft must be adjusted to the depth of the enclosure.
The IP54 rotary handle is fixed with a nut (Ø22) to make it easier to assemble.

Mounting kit

1 TeSys U Power base bracket; its horseshoe shaped sides hold the rotary mechanism facing the original handle.
2 Mechanism, shaft and handle; the shaft enters the handle attached to the door during closing.

Long shaft

■ to be cut to the required length. Equipped with a connection endpiece.

Shaft support plate for deep enclosure

■ Provides horizontal guiding of the shaft, when the door is open.

Spacer base (retrofit accessory)

■ Fixed on a side of the box, for heightening an GVAP●●● handle.

Handle

■ Delivered as a single unit, to be fitted on a side of the enclosure.
Note: *references below are suitable for* TeSys U *power bases after 2004.*

"Laser Square" Tool

■ On the principle of an angle extended with a laser beam, the "Laser Square" facilitates tracing the piercing marks on the door or the sides of an enclosure.

"Safety" stickers

■ Marking: Electrical hazard, etc.

Description		Tripping indication	Reference
Mounting kit	Black handle, with error status, IP54	●	**LU9APN21**
	Red handle, with error status, IP54	●	**LU9APN22**
	Red handle, without error status, IP65	-	**LU9APN24**
Separate elements	Long shaft = 315 mm	-	**GVAPA1**
	Shaft (≥ 300 mm) support plate for deep enclosure	-	**GVAPK12**
	Spacer base	-	**GVAPP1**
	Black handle, IP54	●	**GVAPB54**
	Red handle, IP54	●	**GVAPR54**
	Black handle, IP65		**GVAPB65**
	Red handle, IP65		**GVAPR65**
Tool	"Laser square" plotting tool		**GVAPL01**
"Safety" stickers	French (x10)		**GVAPSFR**
	English (x10)		**GVAPSEN**
	German (x10)		**GVAPSDE**
	Spanish (x10)		**GVAPSES**
	Chinese (x10)		**GVAPSCN**
	Portuguese (x10)		**GVAPSPT**
	Russian (x10)		**GVAPSRU**
	Italian (x10)		**GVAPSIT**
External handle protection frame for TeSys U	Yellow frame		**GVAPYPHP**
	Black frame		**GVAPBPHP**

Dimensions:
page A4/61

Product references

PB111807_104.eps



MCC drawers (Motor Control Center)

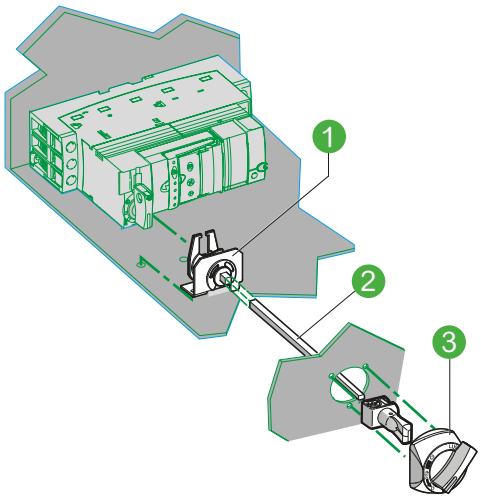
The drawers are composed of:

- a fixed part, in the frame of the panel,
- a fully withdrawable part, integrating the protection, control and automation components.

With a height of 3/4/6/8/12/18/24/36 modules, they allow the assembling of motor protection/control feeders:

- Direct, one direction of rotation
- Direct, 2 directions of rotation
- Star-delta
- Dahlander (2 speeds)
- 2-speed, separate winding
- Motor drives from 0 to 500 kW
- Soft starters of 0 to 75 kW.

DB123404.eps



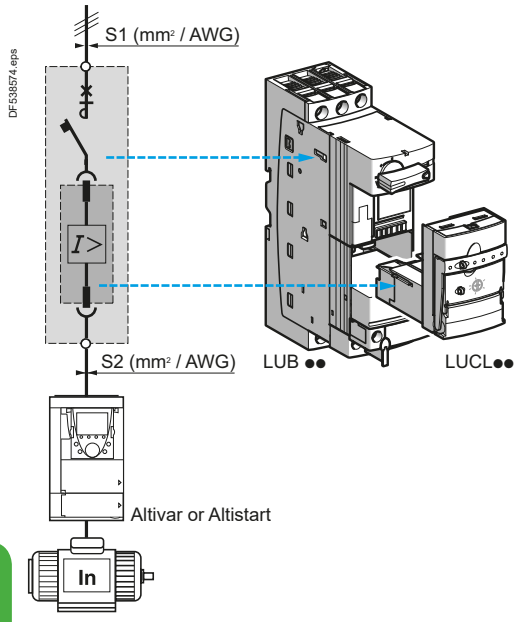
Mounting kit and handle for MCC drawer

Together, this provides manual control of a TeSys U starter-controller from the front face of the drawer.
As the clamping part on top of TeSys U control pad is open, the kit may be used on TeSys U power bases before 2005.

Mounting kit + small handle		
Description	**Item**	**Reference**
Handle with mounting kit for MCC drawer	❶ + ❷ + ❸	**LU9AP20**

PB121243.eps





Introduction

When installed upstream of a variable speed controller or soft start unit, control unit LUCL●●, used in conjunction with an LUB12 or LUB32 power base, provides:
- isolation,
- short-circuit protection of the motor starter.

(variable speed controller-based or soft start unit-based motor starters).

Note: *control unit LUCL, when used in conjunction with power base LUB12 or LUB32, conforms to standard IEC 60947-6-2.*

Installation regulations

When the length of the cable between the TeSys U starter and the variable speed controller is more than 1.5 m, the c.s.a. of the cable between the variable speed controller and the TeSys U starter (S2) must be equal to the c.s.a. of the cable upstream of TeSys U (S1).



Description of LUCL magnetic control unit

1. Extraction and locking handle
2. Sealing of locking handle
3. Dial for magnetic adjustment of motor In
4. Locking of settings by sealing the transparent cover

References

Description	Line current of the variable speed controller or soft start unit	Reference (1)
	A	
Magnetic control unit	0.15…0.6	**LUCLX6●●**
	0.35…1.4	**LUCL1X●●**
	1.25…5	**LUCL05●●**
	3…12	**LUCL12●●**
	4.5…18	**LUCL18●●**
	8…32	**LUCL32●●**

(1) Standard control circuit voltage:

Volts	24	48…72	110…240
⎓	BL (2) (3)	–	–
~	B	–	–
⎓ or ~	–	ES (4)	FU (5)

(2) Voltage code to be used for a starter-controller with communication module.
(3) d.c. voltage with maximum ripple of ±10 %.
(4) ⎓: 48…72 V, ~: 48 V.
(5) ⎓: 110…220 V, ~: 110…240 V.

Characteristics:
pages A4/46 and A4/47

Product references

Control unit and associated power base selection

Functions provided	Maximum motor power ratings 50/60 Hz			Power base reference	Control unit reference	Line current
	< 400/415 V	500 V	690 V			
	KW	KW	KW			A
■ Short-circuit protection ■ Manual reset	0.09	–	–	**LUB12 or LUB32**	**LUCLX6●●**	0.15…0.6
	0.25	–	–	**LUB12 or LUB32**	**LUCL1X●●**	0.35…1.4
	1.5	2.2	3	**LUB12 or LUB32**	**LUCL05●●**	1.25…5
	5.5	5.5	9	**LUB12 or LUB32**	**LUCL12●●**	3…12
	7.5	9	15	**LUB32**	**LUCL18●●**	4.5…18
	15	15	18.5	**LUB32**	**LUCL32●●**	8…32

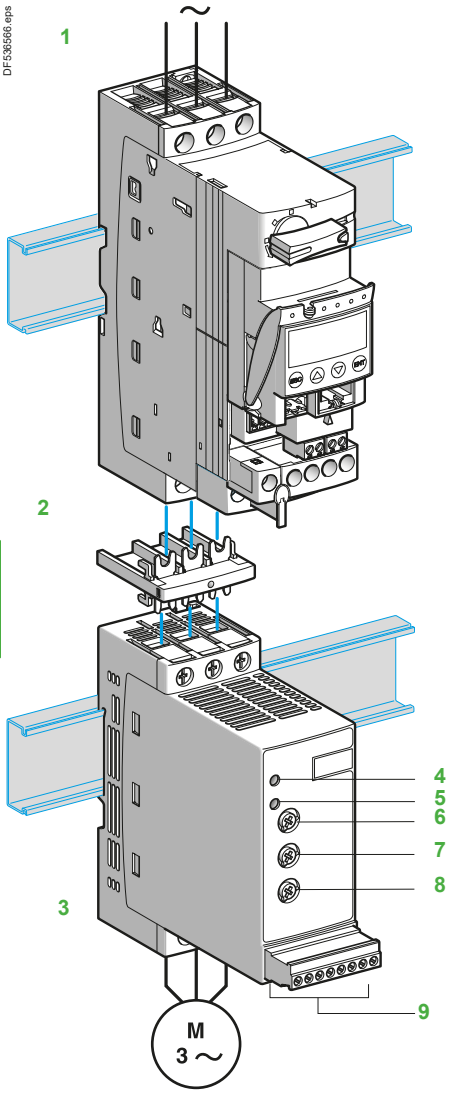
Operating characteristics

Control units		Standard	Advanced				Multifunction
		LUCA	LUCB	LUCC	LUCD	LUCL	LUCM
Thermal overload protection							
Over current protection		14.2 x the setting current					3 to 17 x the setting current
Short-circuit protection		13 x Ir max (max current setting)					
Protection against phase loss							
Protection against phase imbalance							
Earth fault protection (equipment protection only)							
Tripping class		10		10	20		5…30
Motor type		3-phase		Single-phase	3-phase	Single-phase and 3-phase	
Thermal overload test function							
Overtorque							
No-load running							
Long starting time							
Reset method	Manual						Parameters can be set
	Automatic or remote		With function module, or parameters can be set via the bus with a communication module (see page 24614/2).				Parameters can be set
							Parameters can be set via the bus with a communication module (see page 24614/2).

Integrated function *Function provided with accessory*

Compatibility

Compatibility of control unit LUCL●● with		References	Functions
The controller	No	LUTM	Controller (without thermal overload protection)
Add-on contact blocks with fault signalling and auxiliary contacts	Yes	LUA1C11	Add-on contact blocks with fault signalling (1 N/O + 1 N/C)
		LUA1C20	Add-on contact blocks with fault signalling (2 N/O)
		LUFN20	Auxiliary contacts (2 N/O)
		LUFN11	Auxiliary contacts (1 N/O + 1 N/C)
		LUFN02	Auxiliary contacts (2 N/C)
Communication modules	Yes	ASILUFC5 and ASILUFC51	AS-Interface communication modules
		LUFC00	Parallel wiring module
		LULC07	Profibus DP communication module (1 output/2 inputs)
		LULC08	CANopen communication module (1 output/2 inputs)
		LULC09	DeviceNet communication module (1 output/2 inputs)
		LULC15	Advantys STB communication module (1 output/2 inputs)
		LULC033	Modbus communication module (1 output/2 inputs)
Function modules	No	LUFW10	Alarm function module
		LUFDH11	Thermal overload signalling module with manual reset
		LUFDA01	Thermal overload signalling module with automatic or remote reset (1 N/C)
		LUFDA10	Thermal overload signalling module with automatic or remote reset (1 N/O)
		LUFV2	Motor load indication module



Introduction

The Altistart U01 is a soft start/soft stop unit for asynchronous motors. It is designed primarily for combinations with TeSys U controller-starters.

When combined with a TeSys U **1** controller by means of a connector **2**, the Altistart U01 **3** is a power option which provides the “Soft start/soft stop” function. The result is a unique, innovative motor starter.

Using the Altistart U01 starter enhances the starting performance of asynchronous motors by allowing them to start gradually, smoothly and in a controlled manner. It prevents mechanical shocks, which lead to wear and tear, and limits the amount of maintenance work and production downtime.
The Altistart U01 limits the starting torque and current peaks on starting, on machines which do not require a high starting torque.

The Altistart U01 is designed for the following simple applications:
- Conveyors
- Conveyor belts
- Pumps
- Fans
- Compressors
- Automatic doors and gates
- Small cranes
- Belt-driven machines, etc.

The Altistart U01 is compact and easy to install. It complies with standards IEC/EN 60947-4-2, carries UL, CSA, C-Tick, CCC certifications and CE marking.

- **ATSU01N2●●LT soft start/soft stop units**
  - Control two phases of the motor power supply to limit the starting current and for deceleration
  - Internal bypass relay
  - Motor power ratings ranging from 0.75 kW to 15 kW
  - Motor supply voltages ranging from 200 V to 480 V, 50/60 Hz.

An external power supply is required for controlling the starter.

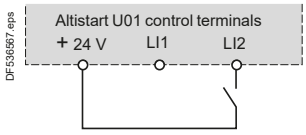
Description

- Altistart U01 soft start/soft stop units are equipped with:
  - A potentiometer for setting the starting time **6**
  - A potentiometer for setting the deceleration time **8**
  - A potentiometer for adjusting the start voltage threshold according to the motor load **7**
  - 1 green LED **4** to indicate that the unit is switched on
  - 1 yellow LED **5** **to indicate that the motor is powered at nominal voltage, if it is connected to the starter**
  - A connector **9**:
  - 2 logic inputs for Run/Stop commands
  - 1 logic input for the BOOST function
  - 1 logic output to indicate the end of starting
  - 1 relay output to indicate the starter has a power supply fault or the motor has reached a standstill at the end of the deceleration stage

Characteristics: pages A4/75 and A4/76
References: page A4/38
Dimensions: page A4/77
Schemes: pages A4/78 to A4/81

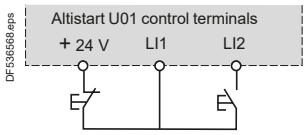
ATSU01N2●●●LT soft start unit functions

■ 2-wire control
The run and stop commands are controlled by a single logic input. State 1 of logic input LI2 controls starting and state 0 controls stopping.



Wiring diagram for 2-wire control

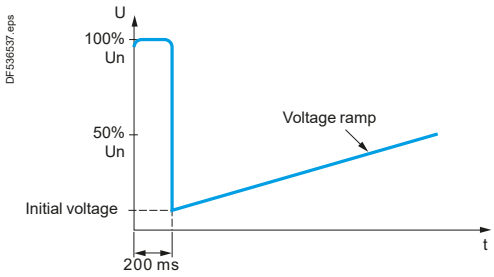
■ 3-wire control
The run and stop commands are controlled by 2 different logic inputs.
Stopping is achieved when logic input LI1 opens (state 0).
The pulse on input LI2 is stored until input LI1 opens.



Wiring diagram for 3-wire control

■ Starting time
Controlling the starting time means that the time of the voltage ramp applied to the motor can be adjusted to obtain a gradual starting time, dependent on the motor load.

■ Voltage boost function via logic input
Activating the BOOST logic input enables the function for supplying a starting overtorque capable of overcoming any mechanical friction.
When the input is at state 1, the function is active (input connected to the + 24 V) and the starter applies a fixed voltage to the motor for a limited time before starting.



Application of a voltage boost equal to 100% of the nominal motor voltage

■ End of starting
○ application function for logic output LO1
ATSU01N2●●LT soft start/soft stop units are equipped with an open collector logic output LO, which indicates the end of starting when the motor has reached nominal speed.

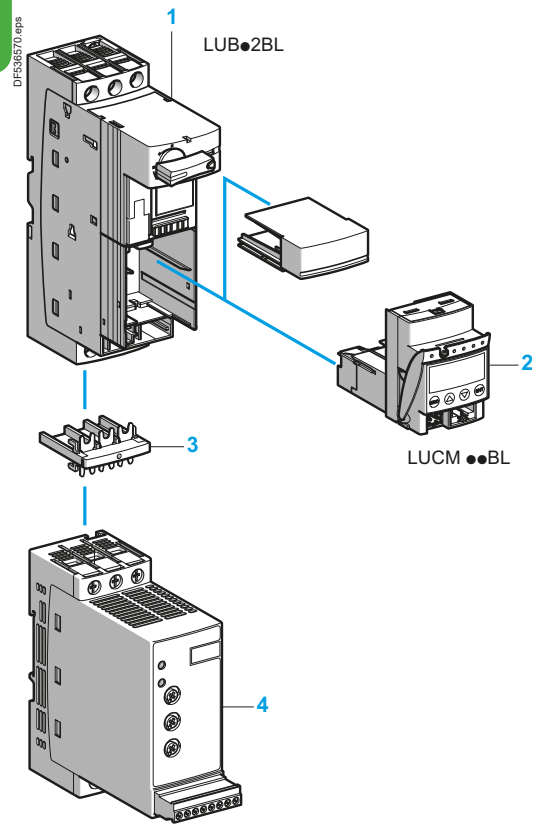
TeSys U
Ref.



ATSU01N222LT

Soft start/soft stop units for 0.75 to 15 kW motors (can be combined with the TeSys U starter)

Motor power [1]				Starter	
230 V	230 V	400 V	460 V	Nominal current	Reference
kW	*HP*	kW	*HP*	A	
3-phase supply voltage: 200…480 V 50/60 Hz					
0.75 1.1	*1* *1.5*	1.5 2.2 3	*2* *3*	6	**ATSU01N206LT**
1.5 –	*2* –	– 4	*5* –	9	**ATSU01N209LT**
2.2 3	*3* –	5.5 –	*7.5* –	12	**ATSU01N212LT**
4 5.5	*5* *7.5*	7.5 11	*10* *15*	22	**ATSU01N222LT**
7.5	*10*	15	*20*	32	**ATSU01N232LT**



ATSU 01N2●●LT

Accessorie

Description	Used for starter	Reference
Power connector between ATSU01N2●●LT and TeSys U	ATSU01N2●●LT	**VW3G4104**

TeSys U starter and soft start unit combinations

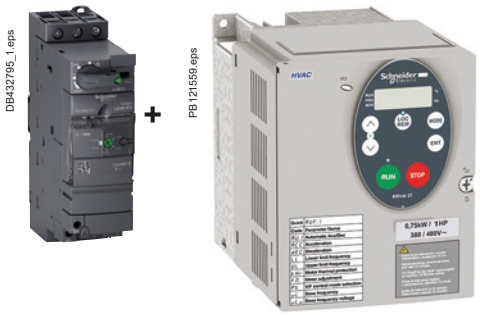
Numerous possibilities for combinations and options are offered.
Please consult the "TeSys U Starters-open version" specialist catalogue.

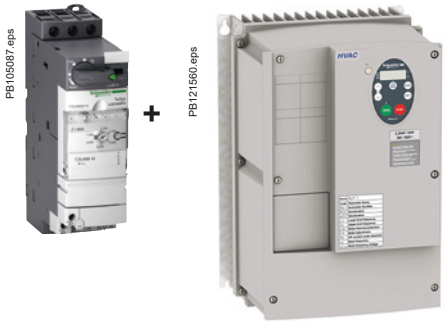
Motor power Voltage			Soft starter	TeSys U	
				Power base	Control unit [2]
230 V kW/*HP*	400 V kW	460 V *HP*			
0.75/*1*	1.5	*2*	ATSU01N206LT	LUB12	LUC●05BL
1.1/*1.5*	2.2/3	*3*	ATSU01N206LT	LUB12	LUC●12BL
1.5/*2*	–	–	ATSU01N209LT	LUB12	LUC●12BL
–	4	*5*	ATSU01N209LT	LUB12	LUC●12BL
2.2/*3*	–	–	ATSU01N212LT	LUB12	LUC●12BL
3/–	5.5	*7.5*	ATSU01N212LT	LUB32	LUC●18BL
4/*5*	7.5	*10*	ATSU01N222LT	LUB32	LUC●18BL
5.5/*7.5*	11	*15*	ATSU01N222LT	LUB32	LUC●32BL
7.5/*10*	15	*20*	ATSU01N232LT	LUB32	LUC●32BL

Example of a starter-motor combination with:
1 non-reversing power base for DOL starting (LUB●2BL)
2 control unit (LUCM●●BL)
3 power connector (VW3G4104)
4 Altistart U01soft start/soft stop unit (ATSU01N2●●LT)

(1) Standard motor power ratings, HP power ratings indicated according to standard UL508.
(2) Depending on the configuration of the chosen TeSys U starter, replace the ● with A for standard, B for expandable, and M for multifunction.







Coordination

The standard defines tests at different levels of current; the purpose of these tests is to place the equipment in extreme conditions.
The standard defines 2 types of coordination, according to the condition of the components after testing: type 1 and type 2.
Type 1 coordination requires that in a short-circuit condition, the contactor or starter must not present any danger to personnel or installations and must not be able to resume operation without repair or the replacement of parts.
The product combinations given below provide type 1 coordination

Soft start-soft stop unit/TeSys U starter controller combination with magnetic protection

TeSys U / Altistart 48: type 1 coordination

Power 400 V (kW)	TeSys U references (protection + power switching)	Soft start unit reference	
		Class 10	Class 20
5.5	LUB32 + LUCL32 or LUCL18	–	**ATS48D17**
7.5	LUB32 + LUCL32	**ATS48D17**	**ATS48D22**
11	LUB32 + LUCL32	**ATS48D22**	**ATS48D32**
15	LUB32 + LUCL32	**ATS48D32**	**ATS48D38**

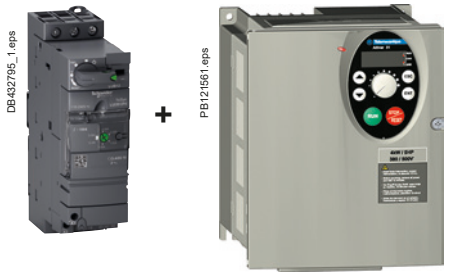
Variable speed controller/TeSys U starter controller combination with magnetic protection

TeSys U / Altivar 21 UL Type 1/IP 20: type 1 coordination

Power 400 V (kW)	TeSys U references (protection + power switching)	Variable speed controller reference
0.75	LUB12 + LUCL05	**ATV21H075N4**
		ATV21HU15N4
2.2	LUB12 + LUCL12	**ATV21HU22N4**
3	LUB12 + LUCL12	**ATV21HU30N4**
4	LUB12 + LUCL12	**ATV21HU40N4**
5.5	LUB32 + LUCL32 or LUCL18	**ATV21HU55N4**
7.5	LUB32 + LUCL32 or LUCL18	**ATV21HU75N4**
11	LUB32 + LUCL32	**ATV21HD11N4**
15	LUB32 + LUCL32	**ATV21HD15N4**

TeSys U / Altivar 21 IP 54: type 1 coordination

Power 400 V (kW)	TeSys U references (protection + power switching)	Variable speed controller reference
0.75	LUB12 + LUCL05	**ATV21W075N4/N4C**
1.5	LUB12 + LUCL12 or LUCL05	**ATV21WU15N4/N4C**
2.2	LUB12 + LUCL12	**ATV21WU22N4/N4C**
3	LUB12 + LUCL12	**ATV21WU30N4/N4C**
4	LUB12 + LUCL12	**ATV21WU40N4/N4C**
5.5	LUB32 + LUCL32 or LUCL18	**ATV21WU55N4/N4C**
7.5	LUB32 + LUCL32 or LUCL18	**ATV21WU75N4/N4C**
11	LUB32 + LUCL32	**ATV21WD11N4/N4C**
15	LUB32 + LUCL32	**ATV21WD15N4/N4C**



Variable speed controller/TeSys U starter controller combination with magnetic protection (continued)

TeSys U / Altivar 31: type 1 coordination

Power 400 V (kW)	TeSys U references (protection + power switching)	Variable speed controller reference
0.37	LUB12 + LUCL05	**ATV31H037N4**
0.55	LUB12 + LUCL05	**ATV31H055N4**
0.75	LUB12 + LUCL05	**ATV31H075N4**
1.1	LUB12 + LUCL12	**ATV31HU11N4**
1.5	LUB12 + LUCL12	**ATV31HU15N4**
2.2	LUB12 + LUCL12	**ATV31HU22N4**
3	LUB32 + LUCL18	**ATV31HU30N4**
4	LUB32 + LUCL18	**ATV31HU40N4**
5.5	LUB32 + LUCL32	**ATV31HU55N4**
7.5	LUB32 + LUCL32	**ATV31HU75N4**



TeSys U / Altivar 61: type 1 coordination

Power 400V (kW)	TeSys U references (protection + power switching)	Variable speed controller reference
0.75	LUB12 + LUCL05	**ATV61H075N4**
1.5	LUB12 + LUCL12	**ATV61HU15N4**
2.2	LUB12 + LUCL12	**ATV61HU22N4**
3	LUB32 + LUCL18	**ATV61HU30N4**
4	LUB32 + LUCL18	**ATV61HU40N4**
5.5	LUB32 + LUCL32	**ATV61HU55N4**
7.5	LUB32 + LUCL32	**ATV61HU75N4**



TeSys U / Altivar 71: type 1 coordination

Power 400V (kW)	TeSys U references (protection + power switching)	Variable speed controller reference
0.75	LUB12 + LUCL05	**ATV71H075N4**
1.5	LUB12 + LUCL12	**ATV71HU15N4**
2.2	LUB12 + LUCL12	**ATV71HU22N4**
3	LUB32 + LUCL18	**ATV71HU30N4**
4	LUB32 + LUCL18	**ATV71HU40N4**
5.5	LUB32 + LUCL32	**ATV71HU55N4**

TeSys U

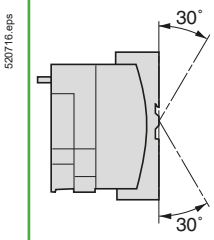
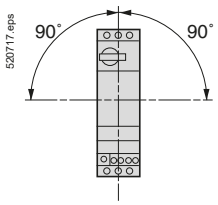
Technical Data for Designers

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Schemes ..... A4/62 to A4/74
Altistart U01 Soft starter ..... A4/75 to A4/81

Characteristics

Environment

Product certifications			UL, CSA, CCC, GOST, ASEFA.
			ABS, BV, DNV, GL, LROS. ATEX.
Conforming to standards			IEC/EN 60947-6-2, CSA-22.2 N° 60947-4-1-14 UL 60947-4-1: with phase barrier LU9 SP0
Rated insulation voltage (Ui)	Conforming to IEC/EN 60947-1, overvoltage category III, degree of pollution: 3	**V**	690
	Conforming to UL508, CSA C22-2 n°14	**V**	600
Rated impulse withstand voltage (Uimp)	Conforming to IEC/EN 60947-6-2	**kV**	6
Degree of protection Conforming to IEC/EN 60947-1 (protection against direct finger contact)	Front panel outside connection zone		IP 40
	Front panel and wired terminals		IP 20
	Other faces		IP 20
Protective treatment	Conforming to IEC/EN 60068		"TH"
	Conforming to IEC/EN 60068-2-30	**Cycles**	12
	Conforming to IEC/EN 60068-2-11	**h**	48
Ambient air temperature around the device	Storage	**°C**	-40…+85
	Operation	**°C**	Power bases and standard and advanced control units: -25… +70. (At temperatures above 60°C and up to 70°C, for starter-controller LUB32, LUB38, leave a minimum gap of 9 mm between products).
			Power bases and multifunction control units: -25…+60. (At temperatures above 45 °C, leave a minimum gap of 9 mm between products. At temperatures above 55 °C and up to 60 °C, leave a gap of 20 mm between products.)
Maximum operating altitude		**m**	2000
Operating positions	In relation to normal vertical mounting plane		 
Flame resistance	Conforming to UL 94		V2
	Conforming to IEC/EN 60695-2-12	**°C**	960 (parts supporting live components)
		°C	650
Environmental restrictions			Cadmium and silicone-free, recyclable
Shock resistance 1/2 sine wave = 11 ms	Conforming to IEC/EN 60068-2-27 (1)		Power poles open: 10 gn
			Power poles closed: 15 gn
Vibration resistance 5…300 Hz	Conforming to IEC/EN 60068-2-6 (1)		Power poles open: 2 gn
			Power poles closed: 4 gn (2)
Resistance to electrostatic discharge	Conforming to IEC/EN 61000-4-2	**kV**	In open air: 8 - Level 3
		kV	On contact: 8 - Level 4
Immunity to radiated high-frequency disturbance	Conforming to IEC/EN 61000-4-3	**V/m**	10 - Level 3
Immunity to fast transient currents	Conforming to IEC/EN 61000-4-4	**kV**	All circuits except for serial link: 4 - Level 4
		kV	Serial link: 2 - Level 3
Immunity to dissipated shock waves	Conforming to IEC/EN 60947-6-2		Common mode / Serial mode
	Uc ∿ 24…240 V, Uc ⎓ 48…220 V	**kV**	2 / 1
	Uc = 24 V ⎓		Not applicable
Immunity to conducted high-frequency disturbance	Conforming to IEC/EN 61000-4-6	**V**	10
Radiated emission and conducted	Conforming to CISPR 11 and EN 55011		Class A

(1) Without modifying the contact states, in the most unfavourable direction.
(2) 2 gn with Advantys STB or CANopen communication modules.

References: pages A4/10 to A4/14
Curves: pages A4/54 to A4/59
Dimensions: pages A4/60 and A4/61
Schemes: pages A4/62 to A4/74

Power circuit connection characteristics

Connection to Ø4 mm screw clamp terminals

Power base, control unit or reverser block type			LUB12 + LUCA or LUCB or LUCC or LUCD	LUB32/LUB38 + LUCA or LUCB or LUCC or LUCD	LUB12 + LUCM	LUB32 + LUCM	LU2B LU2M LU6M
Flexible cable without cable end	1 conductor	mm²	2.5…10	2.5…10	2.5…10	2.5…10	2.5…10
	2 conductors	mm²	1.5…6	1.5…6	1.5…6	1.5…6	1.5…6
Flexible cable with cable end	1 conductor	mm²	1…6	1…6	1…6	1…6	1…6
	2 conductors	mm²	1…6	1…6	1…6	1…6	1…6
Solid cable without cable end	1 conductor	mm²	1…10	1…10	1…10	1…10	1…10
	2 conductors	mm²	1…6	1…6	1…6	1…6	1…6
Screwdriver			Philips n° 2 or flat screwdriver: Ø6 mm				
Tightening torque		N.m	1.9…2.5	1.9…2.5	1.9…2.5	1.9…2.5	1.9…2.5

Control circuit connection characteristics

Connection to Ø3 mm screw clamp terminals

Flexible cable without cable end	1 conductor	mm²	0.75…1.5	0.75…1.5	0.75…1.5	0.75…1.5	0.75…1.5
	2 conductors	mm²	0.75…1.5	0.75…1.5	0.75…1.5	0.75…1.5	0.75…1.5
Flexible cable with cable end	1 conductor	mm²	0.34…1.5	0.34…1.5	0.34…1.5	0.34…1.5	0.34…1.5
	2 conductors	mm²	0.34…1.5	0.34…1.5	0.34…1.5	0.34…1.5	0.34…1.5
Solid cable without cable end	1 conductor	mm²	0.75…1.5	0.75…1.5	0.75…1.5	0.75…1.5	0.75…1.5
	2 conductors	mm²	0.75…1.5	0.75…1.5	0.75…1.5	0.75…1.5	0.75…1.5
Screwdriver			Philips n° 1 or flat screwdriver: Ø5 mm				
Tightening torque		N.m	0.8…1.2	0.8…1.2	0.8…1.2	0.8…1.2	0.8…1.2

Control circuit characteristics

Rated voltage of control circuit	∿ 50/60 Hz	V	24…240	24…240	–	–	–
	⎓	V	24…220	24…220	24	24	–
Voltage limits	⎓ 24 V (1)	V	20…27	20…27	20…28	20…28	–
Operation	∿ 24 V	V	20…26.5	20…26.5	–	–	–
	∿ or ⎓ 48…72 V	V	∿ 38.5…72. ⎓ 38.5…93		–	–	–
	∿ 110…240 V	V	∿ 88…264	∿ 88…264	–	–	–
	⎓ 110…220 V	V	⎓ 88…242	⎓ 88…242	–	–	–
Drop-out	⎓ 24 V	V	14.5	14.5	14.5	14.5	–
	∿ 24 V	V	14.5	14.5	–	–	–
	∿ or ⎓ 48…72 V	V	29	29	–	–	–
	∿ 110…240 V, ⎓ 110…220 V	V	55	55	–	–	–
Typical consumption	⎓ 24 V	mA	130	220	150	200	120
I max while closing	∿ 24 V	mA	140	220	–	–	2360
	∿ or ⎓ 48…72 V	mA	280	280	–	–	2300
	∿ 110…240 V, ⎓ 110…220 V	mA	280	280	–	–	1000
I rms sealed	⎓ 24 V	mA	60	80	70	75	120
	∿ 24 V	mA	70	90	–	–	(2)
	∿ or ⎓ 48…72 V	mA	35	45	–	–	(2)
	∿ 110…240 V, ⎓ 110…220 V	mA	35	25	–	–	(2)
Heat dissipation		W	2	3	1.7	1.8	–
Operating time	Closing	ms	24 V: 70; 48 V: 60; ≥ 72 V: 50		75	65	–
	Opening	ms	35	35	35	35	–
Resistance to micro-breaks		ms	3	3	3	3	–
Resistance to voltage dips	IEC/EN 61000-4-11		At least 70 % of Uc for 500 ms				–
Mechanical durability	In millions of operating cycles		15	15	15	15	–
Maximum operating rate	In operating cycles per hour		3600	3600	3600	3600	–

Main pole characteristics

Number of poles			3	3	3	3	–
Isolation conforming to IEC/EN 60947-1	Possible		Yes	Yes	Yes	Yes	–
	Padlocking		1 padlock with Ø6.9 mm shank				–
Rated thermal current		A	12	32/38	12	32	–
Rated operational current (Ue ≤ 440V)	To IEC/ EN 60947-6-2 Category AC-41		θ ≤ 70°C: 12 A	θ ≤ 70°C: 32/38 A	θ ≤ 55°C: 12 A	θ ≤ 55°C: 32 A	–
	Category AC-43		θ ≤ 70°C: 12 A	θ ≤ 70°C: 32/38 A	θ ≤ 55°C: 12 A	θ ≤ 55°C: 32 A	–
Rated operational voltage		V	690 (3)	690 (3)	690 (3)	690 (3)	–
Frequency limits	Of the operating current	Hz	40…60	40…60	40…60	40…60	–
Power dissipated in the power circuits	Operational current	A	3 6 9 12	18 25 32 38			–
	Power dissipated in all three poles	W	0.1 0.3 0.6 1.1	2.4 4.6 7.5 10.6			–
Rated breaking capacity on short-circuit		V	230 440	500 690			–
		kA	50 50 (25 for LUB38)	10 4			–
Total breaking time		ms	2 2	2			–
Thermal limit	With Isc max on 440 V	kA²s	90	120	90	120	–

(1) Voltage with maximum ripple of ±10 %. *(2) No consumption sealed.* *(3) For 690 V, use phase barrier **LU9SP0**.*

References: pages A4/10 to A4/14
Curves: pages A4/54 to A4/59
Dimensions: pages A4/60 and A4/61
Schemes: pages A4/62 to A4/74

Specific characteristics of power bases LU2B and reverser blocks LU2M or LU6M

Duration of inrush phase		∼ 50/60 Hz	**ms**	25
		⎓	**ms**	15
Maximum operating time	Without change of direction		**ms**	75
	With change of direction		**ms**	150

General characteristics of auxiliary contacts

Conventional thermal current (Ith)	For ambient temperature θ < 70 °C		**A**	5
Frequency of the operational current			**Hz**	Up to 400
Minimum switching capacity λ = 10^{-8}		U min	**V**	17
		I min	**mA**	5
Short-circuit protection	Conforming to IEC/EN 60947-5-1		**A**	gG fuse: 4
Short-time rating	Permissible for	1 s	**A**	30
		500 ms	**A**	40
		100 ms	**A**	50
Insulation resistance			**mΩ**	10
Non-overlap time	Guaranteed between N/C and N/O contacts		**ms**	2 (on energisation and on de-energisation)

Specific characteristics of auxiliary contacts built-into the power base

Linked contacts	Conforming to IEC/EN 60947-4-1		Each power base has 1 N/O contact and 1 N/C contact which are mechanically linked
Mirror contact	Conforming to IEC/EN 60947-1		The N/C contact fitted in each power base reliably represents the state of the power contacts (safety scheme)
Rated operational voltage (Ue)		**V**	Up to ∼ 690; ⎓ 250
Rated insulation voltage (Ui)	Conforming to IEC/EN 60947-5-1	**V**	690
	Conforming to UL, CSA	**V**	600

Specific characteristics of auxiliary contacts in modules LUFN, of auxiliary contacts LUA1 and of reverser blocks LU2M and LU6M

Rated operational voltage (Ue)		**V**	Up to ∼ 250; ⎓ 250
Rated insulation voltage (Ui)	Conforming to IEC/EN 60947-5-1	**V**	250
	Conforming to UL, CSA	**V**	250

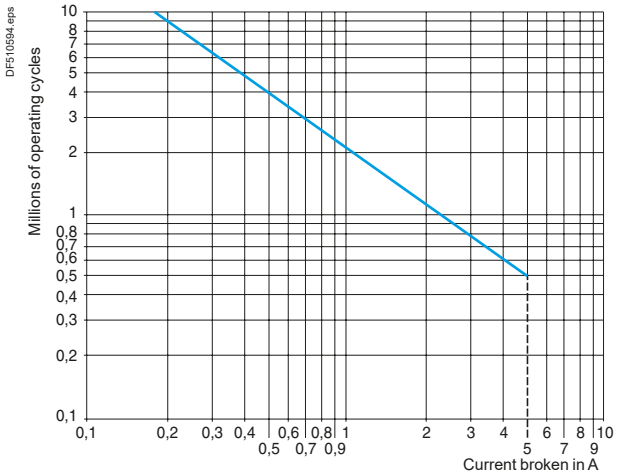
Rated operational power of contacts
Conforming to IEC/EN 60947-5-1

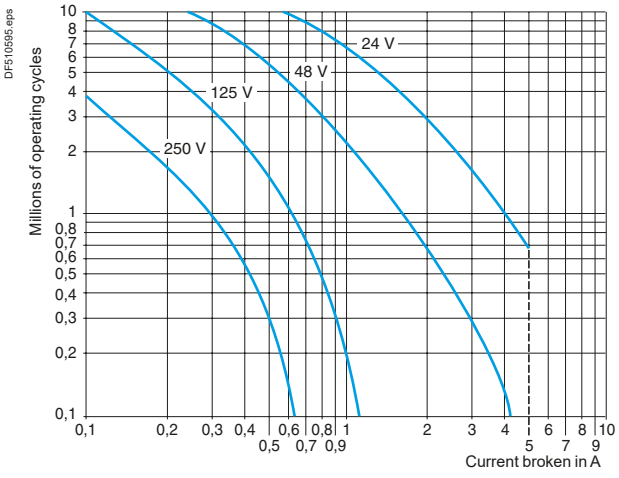
a.c. supply, categories AC-14 and AC-15
Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current (cos φ 0.7) = 10 times the power broken (cos φ = 0.4)

	V	24	48	115	230	400	440	690
1 million operating cycles	VA	60	120	280	560	960	1050	1440
3 million operating cycles	VA	16	32	80	160	280	300	420
10 million operating cycles	VA	4	8	20	40	70	80	100

d.c. supply, category DC-13
Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.

V	24	48	125	250
W	120	90	75	68
W	70	50	38	33
W	25	18	14	12





References: pages A4/10 to A4/14
Curves: pages A4/54 to A4/59
Dimensions: pages A4/60 and A4/61
Schemes: pages A4/62 to A4/74

Characteristics

Characteristics of standard control units LUCA

Protection	Motor type		3-phase
	Conforming to standard		IEC/EN 60947-6-2, UL 60947-4-1, CSA C22-2 n°14
Overload protection	Tripping class conforming to UL 508, IEC/EN 60947-6-2		10
	Frequency limits of the operational current	**Hz**	40…60
	Temperature compensation	**°C**	- 25…+ 70
	Protection against phase imbalance		Yes
Short-circuit protection	Tripping threshold		13 x Ir max (max current setting)
	Tripping tolerance		± 20 %

Characteristics of advanced control units LUCB, LUCC and LUCD

Control unit type			**LUCB**	**LUCC**	**LUCD**
Protection	Motor type		3-phase	Single-phase	3-phase
	Conforming to standard		IEC/EN 60947-6-2, CSA C22-2 n°14	IEC/EN 60947-6-2, CSA C22-2 n°14	IEC/EN 60947-6-2, CSA C22-2 n°14
Overload protection	Tripping class conforming to UL 508, IEC/EN 60947-6-2		10	10	20
	Frequency limits of the operational current	**Hz**	40…60	40…60	40…60
	Temperature compensation	**°C**	-25…+70	-25…+55	-25…+70
	Protection against phase imbalance		Yes	–	Yes
Short-circuit protection	Tripping threshold		13 x Ir max.	13 x Ir max.	13 x Ir max.
	Tripping tolerance		±20 %	±20 %	±20 %

Characteristics of multifunction control units LUCM

Protection	Motor type		Parameters can be set: single-phase or 3-phase
	Conforming to standard		IEC/EN 60947-6-2
Overload protection	Tripping class conforming to IEC/EN 60947-6-2		5, 10, 15, 20, 25, 30 (selectable)
	Frequency limits of the operational current	**Hz**	50…60
	Temperature compensation	**°C**	-25…+55
Communication interface for terminal on enclosure door	Physical interface		RS 485 multi-drop
	Connections		RJ45 on front panel
	Protocol		Modbus RTU
	Maximum transmission speed	**bit/s**	19 200 (self-configuration up to this value)
	Maximum return time	**ms**	200
Display	Type		LCD, 2 lines of 12 characters
	Language version		Multilanguage (English, French, German, Italian, Spanish)
	Precision		±5 %
	Resolution		1 % of Ir
Auxiliary supply	External type	**V**	⎓ 24, with maximum ripple of ±10 %.
	Heat dissipation	**W**	0.8

Configuration table for protection devices and alarms on multifunction control units LUCM

	Tripping	**Alarm**	**Adjustment of tripping threshold**		**Adjustment of time before tripping**		**Adjustment of alarm threshold**	
	Factory setting	**Factory setting**	**Range**	**Default value**	**Range**	**Default value**	**Range**	**Default value**
Overcurrent	Activated (1)	–	3…17 Ir	14.2	–	–	–	–
Overload	Activated (1)	Activated	0.5…32 A (2)	Ir min	Class: 5…30	5	10…100 % of the thermal state	85 %
Earth fault	Activated	Activated	0.2…5 Ir min	0.3 Ir min	0.1…1.2 s	0.1 s	0.2…5 Ir min	0.3 Ir min
Phase imbalance	Activated	Activated	10…30 %	10 %	0.2…20 s	5 s	10…30 %	10 %
Torque limitation	Deactivated	Deactivated	1…8 Ir	2 Ir	1…30 s	5 s	1…8 Ir	2 Ir
No-load running	Deactivated	Deactivated	0.3…1 Ir	0.5 Ir	1…200 s	10 s	0.3…1 Ir	0.5 Ir
Long starting time	Deactivated	Deactivated	1…8 Ir	Ir	1…200 s	10 s	1…8 Ir	Ir

Configuration of additional functions on multifunction control units LUCM

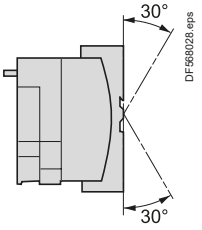
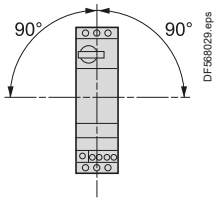
	Factory setting	**Setting range**
Reset	Manual	Manual, automatic or remote
Time before reset	120 s	1…1000 s
Type of load	3-phase motor	3-phase motor, single-phase motor
	Self-cooled	Self-cooled, force cooled
Language	English	English, French, German, Italian, Spanish
Display	Average current	Average current, thermal state of motor, current in phase 1 / 2 / 3, earth leakage current, phase imbalance, cause of last 5 faults

(1) This function cannot be deactivated.
(2) The setting range depends on the rating of the control unit used.

References: pages A4/11 to A4/14
Curves: pages A4/54 to A4/59
Dimensions: pages A4/60 and A4/61
Schemes: pages A4/62 to A4/74

Characteristics

Characteristics of magnetic control unit LUCL

Protection	Motor type		3-phase
	Conforming to standard		When used in conjunction with an LUB12, LUB32 or LUB38 power base, magnetic control unit LUCL conforms to standard IEC 60947-6-2.
Short-circuit protection	Tripping threshold		14.2 x In (max. setting current)
	Tripping tolerance		±20 %
Environment			
Product certifications			CE
Conforming to standards			When used in conjunction an LUB power base, control unit LUCL conforms to standard 60947-6-2.
Rated insulation voltage (Ui)	Conforming to IEC/EN 60947-1, overvoltage category III, degree of pollution: 3	**V**	690
Rated impulse withstand voltage (Uimp)	Conforming to IEC/EN 60947-6-2	**kV**	6
Safety separation of circuits SELV	Conforming to IEC/EN 60947-1 appendix N	**V**	Between the control or auxiliary circuit and the main circuit: 400
			Between the control and auxiliary circuits: 40
Degree of protection Conforming to IEC/EN 60947-1 (protection against direct finger contact)	Front panel outside connection zone		IP 40
	Front panel and wired terminals		IP 20
	Other faces		IP 20
Protective treatment	Conforming to IEC/EN 60068		"TH"
	Conforming to/EN 60068-2-30	**Cycles**	12
	Conforming to IEC/EN 60068-2-11	**h**	48
Ambient air temperature around the device	Storage	**°C**	- 40…+ 85
	Operation	**°C**	Power bases and standard and advanced control units: - 25… + 70. (At temperatures above 60°C and up to 70°C, for Ie = 32 A, leave a minimum gap of 9 mm between products).
			Power bases and multifunction control units: - 25…+ 60. (At temperatures above 45 °C, leave a minimum gap of 9 mm between products. At temperatures above 55 °C up to 60 °C, leave a gap of 20 mm between products.)
Maximum operating altitude		**m**	2000
Operating positions	In relation to normal vertical mounting plane		 
Flame resistance	Conforming to UL 94		V2
	Conforming to IEC/EN 60695-2-12	**°C**	960 (parts supporting live components)
		°C	650
Environmental restrictions			Cadmium and silicone-free, recyclable
Shock resistance 1/2 sine wave = 11 ms	Conforming to IEC/EN60068-2-27 (1)		Power poles open: 10 gn
			Power poles closed: 15 gn
Vibration resistance 5…300 Hz	Conforming to IEC/EN 60068-2-6 (1)		Power poles open: 2 gn
			Power poles closed: 4 gn (2)
Resistance to electrostatic discharge	Conforming to IEC/EN 61000-4-2	**kV**	In open air: 8 - Level 3
		kV	On contact: 8 - Level 4
Immunity to radiated high-frequency disturbance	Conforming to IEC/EN 61000-4-3	**V/m**	10 - Level 3
Immunity to fast transient currents	Conforming to IEC/EN 61000-4-4	**kV**	All circuits except for serial link: 4 - Level 4
		kV	Serial link: 2 - Level 3
Immunity to dissipated shock waves	Conforming to IEC/EN 60947-6-2		**Common mode** / **Serial mode**
	Uc ∿ 24…240 V, Uc ⎓ 48…220 V	**kV**	2 / 1
	Uc = 24 V ⎓		Not applicable
Immunity to conducted high-frequency disturbance	Conforming to IEC/EN 61000-4-6	**V**	10

(1) Without modifying the contact states, in the most unfavourable direction.
(2) 2 gn with Advantys STB or CANopen communication modules.

References: page A4/34
Schemes: pages A4/63

Characteristics

Power circuit connection characteristics of LUCL

Power base and control unit type			LUB12 + LUCL	LUB32 + LUCL	LUB38 + LUCL
Connection to Ø4 mm screw clamp terminals					
Flexible cable without cable end	1 conductor	mm²	2.5…10	2.5…10	
	2 conductors	mm²	1.5…6	1.5…6	
Flexible cable with cable end	1 conductor	mm²	1…6	1…6	
	2 conductors	mm²	1…6	1…6	
Flexible cable without cable end	1 conductor	mm²	1…10	1…10	
	2 conductors	mm²	1…6	1…6	
Screwdriver			Philips n° 2 or flat screwdriver: Ø6 mm		
Tightening torque		N.m	1.9…2.5	1.9…2.5	

Control circuit connection characteristics of LUCL

Connection to Ø3 mm screw clamp terminals					
Flexible cable without cable end	1 conductor	mm²	0.75…1.5	0.75…1.5	
	2 conductors	mm²	0.75…1.5	0.75…1.5	
Flexible cable with cable end	1 conductor	mm²	0.34…1.5	0.34…1.5	
	2 conductors	mm²	0.34…1.5	0.34…1.5	
Flexible cable without cable end	1 conductor	mm²	0.75…1.5	0.75…1.5	
	2 conductors	mm²	0.75…1.5	0.75…1.5	
Screwdriver			Philips n° 2 or flat screwdriver: Ø5 mm		
Tightening torque		N.m	0.8…1.2	0.8…1.2	

Control circuit characteristics of LUCL

Rated control circuit voltage	∿ 50/60 Hz	V	24…240	24…240	
	⎓	V	24…220	24…220	
Voltage limits	⎓ 24 V (1)	V	20…27	20…27	
Operation	∿ 24 V	V	20…26.5	20…26.5	
	∿ or ⎓ 48…72 V	V	∿ 38.5…72. ⎓ 38.5…93	∿ 38.5…72. ⎓ 38.5…93	
	∿ 110…240 V	V	∿ 88…264	∿ 88…264	
	⎓ 110…240 V	V	⎓ 88…242	⎓ 88…242	
Drop-out	⎓ 24 V	V	14.5	14.5	
	∿ 24 V	V	14.5	14.5	
	∿ or ⎓ 48…72 V	V	29	29	
	∿ 110…240 V, ⎓ 110…220 V	V	55	55	
Typical consumption	⎓ 24 V	mA	130	220	
I max while closing	∿ 24 V	mA	140	220	
	∿ or ⎓ 48…72 V	mA	280	280	
	∿ 110…240 V, ⎓ 110…220 V	mA	280	280	
I rms sealed	⎓ 24 V	mA	60	80	
	∿ 24 V	mA	70	90	
	∿ or ⎓ 48…72 V	mA	35	45	
	∿ 110…240 V, ⎓ 110…220 V	mA	35	25	
Heat dissipation		W	2	3	
Operating time	Closing	ms	24 V: 70; 48 V: 60; ≥ 72 V: 50	24 V: 70; 48 V: 60; ≥ 72 V: 50	
	Opening	ms	35	35	
Resistance to micro-breaks		ms	3	3	
Resistance to voltage dips	IEC/EN 61000-4-11		At least 70 % of Uc for 500 ms		
Mechanical durability	In millions of operating cycles		15	15	
Maximum operating rate	In operating cycles per hour		3600	3600	

Main pole characteristics of LUCL

Number of poles			3	3	
Isolation conforming to IEC/EN 60947-1	Possible		Yes	Yes	
	Padlocking		1 padlock with Ø6.9 mm shank	1 padlock with Ø6.9 mm shank	
Rated thermal current		A	12	32	(38 A for LUB38)
Rated operational current (Ue ≤ 440 V)	Conforming to IEC/EN 60947-6-2	Category AC-41	θ ≤ 70 °C: 12 A	θ ≤ 70 °C: 32 A	(38 A for LUB38)
		Category AC-43	θ ≤ 70 °C: 12 A	θ ≤ 70 °C: 32 A	38
Rated operational voltage		V	690 (3)	690 (3)	690
Frequency limits	Of the operating current	Hz	40…60	40…60	40...60
Power dissipated in the power circuits	Operational current	A	3 6 9 12 18 25 32 38		
	Power dissipated in all three poles	W	0.1 0.3 0.6 1.1 2.4 4.6 7.5 10.5		
Rated breaking capacity on short-circuit		V	230 440 500 690		
		kA	50 50 10 4		
Total breaking time		ms	2 2 2		
Thermal limit	With Isc max on 440 V	kA²s	90	120	

(1) d.c. voltage with maximum ripple of ± 10 %. *(2) No consumption sealed.* *(3) For 690 V, use phase barrier **LU9SP0**.*

References: page A4/34
Schemes: page A4/63

Characteristics

Characteristics of limiter-disconnector LUALB1

Rated insulation voltage (Ui) conforming to standard IEC/EN 60947-1		V	690	
Conventional thermal current (Ith) conforming to standard IEC/EN 60947-1		A	32	
Operating threshold	I rms	kA	50	
Breaking capacity		V	440	690
		kA	130	70
Mounting			Directly on the upstream terminals of the starter-controller	
Cabling				
Solid cable	1 conductor	mm²	1.5…10	
	2 conductors	mm²	1.5...6	
Flexible cable without cable end	1 conductor	mm²	1…10	
	2 conductors	mm²	1…6	
Flexible cable with cable end	1 conductor	mm²	1...6	
	2 conductors	mm²	1...6	
Screwdriver			Phillips n°2 or flat screwdriver Ø6 mm	
Tightening torque		N.m	1.9…2.5	

Characteristics of current limiter LA9LB920

Rated insulation voltage (Ui) conforming to standard IEC/EN 60947-1		V	690	
Conventional thermal current (Ith) conforming to standard IEC/EN 60947-1		A	63	
Operating threshold	I rms	A	1000	
Breaking capacity		V	440	690
		kA	100	35
Mounting			Separate	
Cabling				
Solid cable	1 conductor	mm²	1.5…25	
	2 conductors	mm²	1.5...10	
Flexible cable without cable end	1 conductor	mm²	1.5…25	
	2 conductors	mm²	2.5…10	
Flexible cable with cable end	1 conductor	mm²	1.5…16	
	2 conductors	mm²	1.5…4	
Screwdriver			Phillips n°2 or flat screwdriver Ø6 mm	
Tightening torque		N.m	2.2	

Characteristics of thermal overload alarm function modules LUFW10

Activation threshold			Fixed at 88 % of the thermal tripping state
Hysteresis between activation and switching off			5 %
Display			By LED on front panel
Supply			Powered by the control unit
Discrete output characteristics	Type		N/O contact
	AC-15		230 V max; 400 VA 100 000 operating cycles
	DC-13		24 V; 50 W 100 000 operating cycles
Conventional thermal current (Ith)	For ambient temperature θ < 70 °C	A	2
Short-circuit protection	Conforming to IEC/EN 60947-5-1	A	gG fuse: 2

Characteristics of thermal overload fault signalling and reset modules

Module type			LUFDH11	LUFDA01	LUFDA10
Fault signalling			By LED on front panel		
External power supply		V	∿/⎓ 24… 240		
Module consumption		mA	7 at ⎓ 24 1.1 at ∿ 240		
Discrete outputs	Type		1 N/C+ 1 N/O	1 N/C	1 N/O
	AC-15		230 V max; 400 VA 100 000 operating cycles		
	DC-13		24 V; 50 W 100 000 operating cycles		
Conventional thermal current (Ith)	For ambient temperature θ < 70 °C	A	2		
Short-circuit protection	Conforming to IEC/EN 60947-5-1	A	gG fuse: 2		
Reset input	Conductor c.s.a.	mm²	0.2 min		
	Length	m	500 (R = 50 Ω , L = 52.8 mH, Cp = 93 pF)		

References:
pages A4/13, A4/31

Dimensions:
page A4/61

Life Is On Schneider Electric

Characteristics

Characteristics of motor load indication function module LUFV2

Analogue output			4 - 20 mA
Signal delivered			Value of I average/Ir ratio within the range of 0 to 2 for LUCB and LUCD
			Value of I average/Ir ratio within the range of 0 to 3 for LUCC
Load impedance	Minimum	kΩ	–
	Maximum	Ω	500
	Typical	Ω	100
Signal characteristics with advanced control unit	Precision		±6 %
Signal characteristics with multifunction control unit	Precision		±10 %
	Resolution		1 % of Ir
Supply			External ⎓ 24 V

Characteristics of AS-Interface communication modules ASILUFC5 and ASILUFC51

Module type			ASILUF C5	ASILUF C51
Product certification			AS-Interface V2.1 n° 52901	AS-Interface V2.1 n° 52303
AS-Interface profile			7.D.F.0	7.A.7.E
Ambient air temperature		°C	Operation -25…+70	
Cycle time		ms	5	10
Addressing			31 slaves	62 slaves
AS-Interface supply		V	29.5...31.5	
Current consumption	On the AS-Interface bus	mA	Normal operation: 25	
		mA	Fault condition: 30	
	On 24 V supply for the outputs	mA	200	
Auxiliary supply		V	⎓ 24 ±30 %	
Number of outputs			2 dedicated to starter-controller coil operation	
Switching capacity of the solid state outputs			0.5 A/24 V (outputs protected against short-circuits)	
Indication/diagnostics			By 2 LEDs on front panel	

Characteristics of Modbus communication module LULC033

Physical interface				RS 485 multi-drop
Connections				RJ45 on front panel
Protocol				Modbus RTU
Maximum transmission speed			bit/s	19 200 (self-configuration up to this value)
Maximum return time			ms	30
Addressing				By switches: from 0...31
Ambient air temperature			°C	Operation -25…+55
Discrete inputs		Number		2 (to be assigned according to the configuration)
		Supply	V	⎓ 24
		Input current	mA	7
	Nominal input values	Voltage	V	⎓ 24 (positive logic)
		Current	mA	7
	Response time	Change to state 1	ms	10 (±30 %)
		Change to state 0	ms	10 (±30 %)
	Input type			Resistive
Solid state outputs		Number		3, of which 2 dedicated to starter-controller coil operation
		Supply	V	⎓ 24
		Max. current	mA	500
	Protection	gI fuse	A	1
	Switching capacity			0.5 A/24 V
Indication/diagnostics				By 3 LEDs on front panel

References:
pages A4/13, A4/24, A4/26

Schemes:
pages A4/64, A4/72, A4/73

Characteristics

Characteristics of CANopen, Profibus DP and DeviceNet communication modules

Communication module				Profibus DP LULC07	CANopen LULC08	DeviceNet LULC09
Services	Conformity class			NA	S 20 (Schneider Electric)	NA
	Standard			Profibus DP	CIADS-301 V4.02 DR 303-2	IEC 62026-1, overvoltage category III, degree of pollution: 3
	Profile			LVSG V1.0 MS (Motor Starter) and MMS (Motor Management Starter)	–	ODVA (Open DeviceNet Vendor Association) MS (Motor Starter)
	Protocol			Profibus DP	CAN 2.0A (2B passive)	CAN 2.0A (2B passive)
	Address			1…125	0…127 (by switches)	0…63
Structure	Physical interface			9-way SUB-D male	9-way SUB-D female	"Open Style" connector
	Binary rate			9600 Kbits/s…12 Mbits/s	10, 20, 50, 125, 250, 500 and 1000 Kbits/s (by switches)	125…500 kbaud
	Cables			2 shielded twisted pairs		
Supply for the discrete outputs and control	⎓ 24 V		**V**	20…28		
	Current consumption		**A**	1.5 (max)		
	Protection by gI fuse		**A**	2		
Ambient air temperature			**°C**	Operation -25…+55		
Logic inputs	Number			2 (to be assigned according to the configuration)		
	Supply		**V**	⎓ 24		
	Input current		**mA**	7		
	Nominal input values	Voltage	**V**	⎓ 24 (positive logic)		
		Current	**mA**	7		
	Response time	Change to state 1	**ms**	10 (±30 %)		
		Change to state 0	**ms**	10 (±30 %)		
	Input type			Resistive		
Discrete outputs	Number			3, of which 2 dedicated to starter-controller coil operation		
	Max. current		**mA**	500		
	Short-circuit protection			Yes		
	Switching capacity			0.5 A / ⎓ 24 V		
Indication/diagnostics				By 3 LEDs on front panel		

Characteristics of Advantys STB communication module LULC15

Physical interface				CAN
Connections				Fire Wire
Protocol				CAN 2.0 and CAN 2.B (passive mode)
Transmission speed			**kbit/s**	800
Addressing				Self-addressing
Supply for the discrete outputs and control	⎓ 24 V		**V**	20…28
	Current consumption		**A**	1.5 (max)
	Protection by gI fuse		**A**	2
Ambient air temperature			**°C**	Operation -25…+55
Discrete inputs	Number			2 (to be assigned according to configuration)
	Supply		**V**	⎓ 24
	Input current		**mA**	7
	Nominal input values	Voltage	**V**	⎓ 24 (positive logic)
		Current	**mA**	7
	Response time	Change to state 1	**ms**	10 (± 30 %)
		Change to state 0	**ms**	10 (± 30 %)
	Input type			Resistive
Discrete outputs	Number			3, of which 2 dedicated to starter-controller coil operation
	Max. current		**mA**	500
	Short-circuit protection			Yes
	Switching capacity			0.5 A / ⎓ 24 V
Indication/diagnostics				By 3 LEDs on front panel

References:
pages A4/25, A4/27, A4/28, A4/29
Schemes:
pages A4/66 and A4/67

Characteristics

Connection characteristics

Module type				LUFW10, LUFDH11, LUFDA01 and LUFDA10	LUFV2	ASILUFC5 and ASILUFC51	
						Inputs and 24 V auxiliary supply	Outputs
Connectors		Pitch		5.08	3.81	5.08	3.81
Flexible cable without cable end		1 conductor	mm²	0.2…1.5	0.14…1	0.2…1.5	0.14…1
		2 identical conductors	mm²	0.2…1	0.14…0.75	0.2…1	0.14…0.75
Flexible cable with cable end	Without insulated ferrule	1 conductor	mm²	0.25…1.5	0.25…1	0.25…1.5	0.25…1
		2 identical conductors	mm²	0.25…1	0.25…0.34	0.25…1	0.25…0.34
	With insulated ferrule	1 conductor	mm²	0.25…1.5	0.25…0.5	0.25…1.5	0.25…0.5
		2 identical conductors (Use a double cable end)	mm²	0.5…1	0.5	0.5…1	0.5
Solid cable without cable end		1 conductor	mm²	0.2…1.5	0.14…1	0.2…1.5	0.14…1
		2 identical conductors	mm²	0.2…1	0.14…0.5	0.2…1	0.14…0.5
Conductor size		1 conductor		AWG24… AWG16	AWG26… AWG16	AWG24… AWG16	AWG26… AWG16
Tightening torque			N.m	0.5…0.6	0.20…0.25	0.5…0.6	0.20…0.25
Flat screwdriver			mm	3.5	2.5	3.5	2.5

Module type				LULC033, LULC08 and LULC15	LUFC00	LULC09	
						Inputs and 24 V auxiliary supply	Connection on the bus
Connectors		Pitch		3.81	3.81	3.81	5 (Open Style) DeviceNet
Flexible cable without cable end		1 conductor	mm²	0.14…1	0.14…1	0.14…1	0.2…2.5
		2 identical conductors	mm²	0.14…0.75	0.14…0.75	0.14…0.75	0.5…1.5
Flexible cable with cable end	Without insulated ferrule	1 conductor	mm²	0.25…1	0.25…1	0.25…1	0.25…2.5
		2 identical conductors	mm²	0.25…0.34	0.25…0.34	0.25…0.34	0.25…1
	With insulated ferrule	1 conductor	mm²	0.25…0.5	0.25…0.5	0.25…0.5	0.25…2.5
		2 identical conductors (Use a double cable end)	mm²	0.5	0.5	0.75	0.5…1.5
Solid cable without cable end		1 conductor	mm²	0.14…1	0.14…1	0.14…1	0.2…2.5
		2 identical conductors	mm²	0.14…0.5	0.14…0.5	0.14…0.5	0.14…0.5
Conductor size		1 conductor		AWG26… AWG16	AWG26… AWG16	AWG26… AWG16	AWG24… AWG16
Tightening torque			N.m	0.20…0.25	0.20…0.25	0.20…0.25	0.5…0.6
Flat screwdriver			mm	2.5	2.5	2.5	3.5

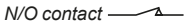
References:
pages A4/13, A4/24 to A4/29

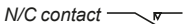
Schemes:
pages A4/64, A4/66 to A4/73

Characteristics

Knob positions - Poles and Signaling contact states

TeSys U operating status		Position of rotary knob	Indication on front panel	N/O pole contact	N/C pole contact	N/O contact any fault	N/C ontact any fault	⏱ N/O contact product ready	N/C contact Rotary knob on OFF position
References of add-on contact blocks and auxiliary contact modules Terminal referencing		–	–	–	**LUFN11** 31-32	**LUA1C20** 97-98	**LUA1C11** 95-96	**LUA1C20** 17-18	–
	or	–	–	–	**LUFN02** 31-32 41-42	**LUA1C200** No terminal block	**LUA1C110** No terminal block	**LUA1C200** No terminal block	**LUA8E20** 57/58 67/68
	or	–	–	**LUFN20** 33-34 43-44	**LUB9N11** 21-22	–	–	**LUA1C11** 17-18	–
	or	–	–	**LUFN11** 43-44	–	–	–	**LUA1C110** No terminal block	–
	or	–	–	**LUB9N11** 13-14	–	–	–	–	–
Off		OFF	**0**						
Ready to operate			**0**						
Start			**1**						
Tripped on short-circuit		TRIP	**I>>**						
Tripped on thermal overload	Manual reset mode	TRIP	**0**						
	Automatic reset on thermal overload fault mode		**0**						
	Remote reset mode		**0**						

N/O contact  *in closed position.*

N/C contact  *in open position.*

References: pages A4/10 and A4/13

Schemes: pages A4/71 and A4/74

Characteristics

Data profile under AS-Interface						
Control unit present in the product				Standard LUCA	Advanced LUCB, CC, CD	Multifunction LUCM
Status		D0	Ready (available)			
		D1	Poles closed (running)			
Commands		D0	Start - forward running			
		D1	Start - reverse running			

Main registers accessible with Modbus, CANopen, Advantys STB, Profibus DP and DeviceNet communication modules.						
For other registers and for further information, please consult the User's Manual *Communication variables* on the website www.schneider-electric.com						
Control unit present in the product				Standard	Advanced	Multifunction
Marking	Register 0…Register 99	Words…Bits	Commercial reference, serial number, software version			
Log	Register 100…Register 450	Words…Bits	Fault log, Operating log, Log of last 5 trips			
Status	Register 451…Register 464	Words…Bits	Alarm signalling (bits), Fault signalling (bits)			
Values	Register 465…Register 473	Words	Irms phase 1, phase 2, phase 3. Motor load, thermal status Earth leakage current. Phase imbalance and phase failure			
	Register 474…Register 599	Words…Bits	Reserved			
Configuration	Register 600…Register 699	Words…Bits	Protection and alarm thresholds, fallback mode and reset mode			
Commands	Register 700…Register 714	Words…Bits	Commands			

Status and values	Register 452	Bit 0	Short-circuit fault			
		Bit 1	Overcurrent fault			
		Bit 2	Thermal overload fault			
	Register 455	Bit 0	Ready (available)			
		Bit 1	Poles closed			
		Bit 2	Fault			
		Bit 3	Alarms			
		Bit 4	Tripped ("TRIP" position)			
		Bit 5	Fault acknowledgement allowed			
		Bit 6	Reserved			
		Bit 7	Motor running			
		Bit 8	Motor current % (bit 0)			
		Bit 9	Motor current % (bit 1)			
		Bit 10	Motor current % (bit 2)			
		Bit 11	Motor current % (bit 3)			
		Bit 12	Motor current % (bit 4)			
		Bit 13	Motor current % (bit 5)			
		Bit 14	Reserved			
		Bit 15	Motor starting			
	Register 461	Bit 3	Thermal overload alarm			
	Register 465	Word	Thermal status value			
	Register 466	Word	Motor load value (Im/Ir)			

Configuration	Register 602	Bit 0	Manual reset on thermal overload fault			
		Bit 1	Remote reset on thermal overload fault			
		Bit 2	Automatic reset on thermal overload fault			
	Register 682	Value 0	Fallback mode validation			
		Value 1	Outputs OA1 and OA3 unchanged			
		Value 2	Outputs OA1 and OA3 forced to 0			
		Value 3	Outputs OA1 and OA3 unchanged, signalling existence of communication failure			
		Value 4	Outputs OA1 forced to 1 and OA3 unchanged			
		Value 5	Outputs OA3 forced to 1 and OA1 unchanged			

Commands	Register 700	Bit 0	LO1 output command			
	Register 704	Bit 0	OA1 output command			
		Bit 1	OA3 output command			
		Bit 2	Reserved			
		Bit 3	Fault acknowledgement			
		Bit 4	Reserved			
		Bit 5	Trip test			
		Bit 6…15	Reserved			

Data accessible

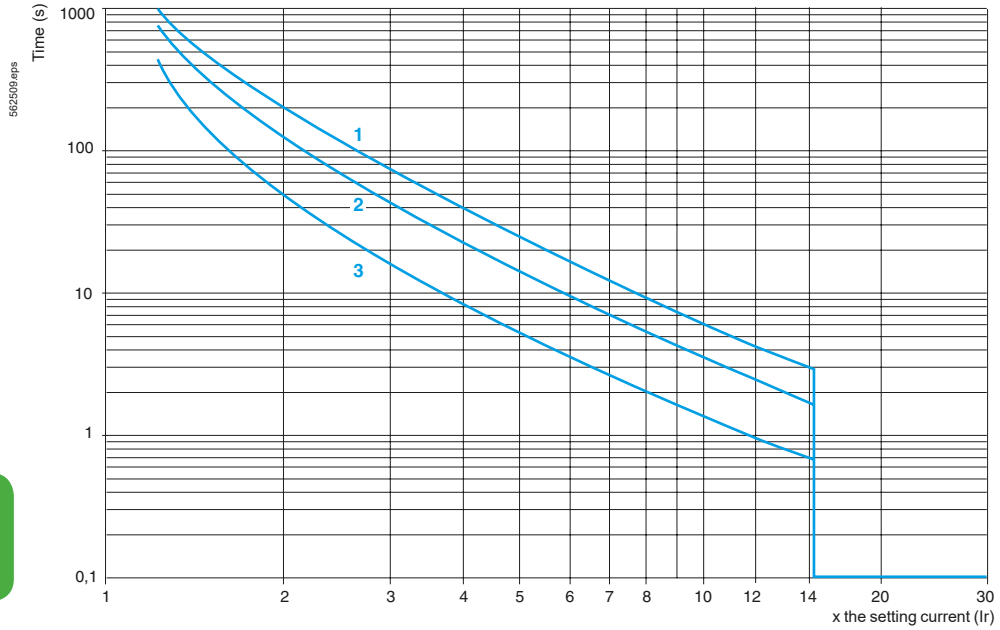
References:
pages A4/24 to A4/29

Schemes:
pages A4/64 and A4/65

Curves

Tripping curves for control units LUCA, LUCB, LUCD

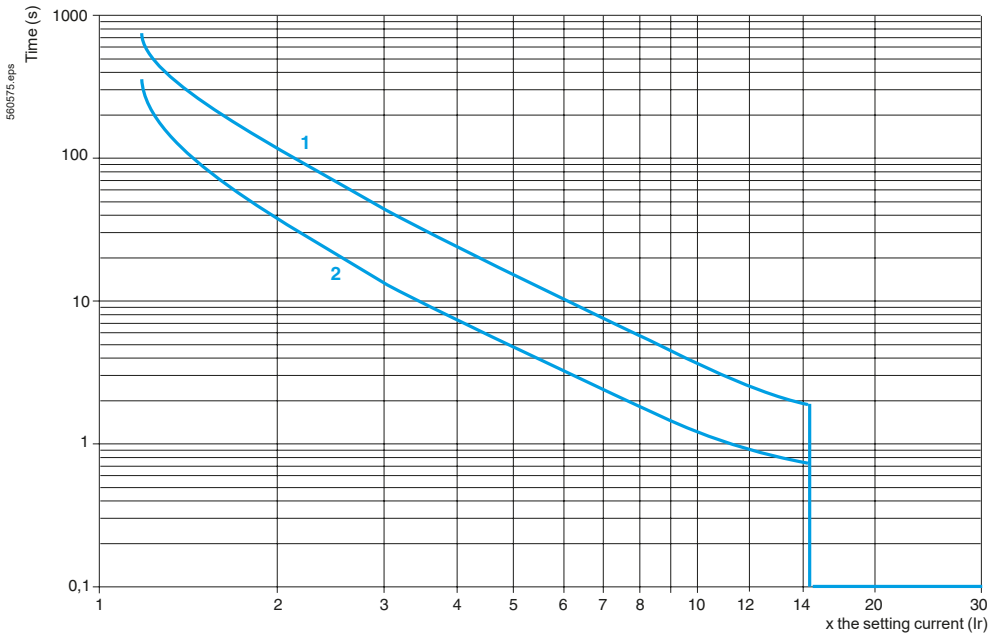
Average operating times at 20 °C according to multiples of the setting current, tolerance : ± 20 %.



1 LUCD, 3 poles from cold state, class 20.
2 LUCA, LUCB, 3 poles from cold state, class 10.
3 LUCA, LUCB, LUCD, 3 poles from hot state.

Tripping curves for control units LUCC

Average operating times at 20 °C according to multiples of the setting current, tolerance : ± 20 %.



1 LUCC, single-phase, cold state.
2 LUCC, single-phase, hot state.

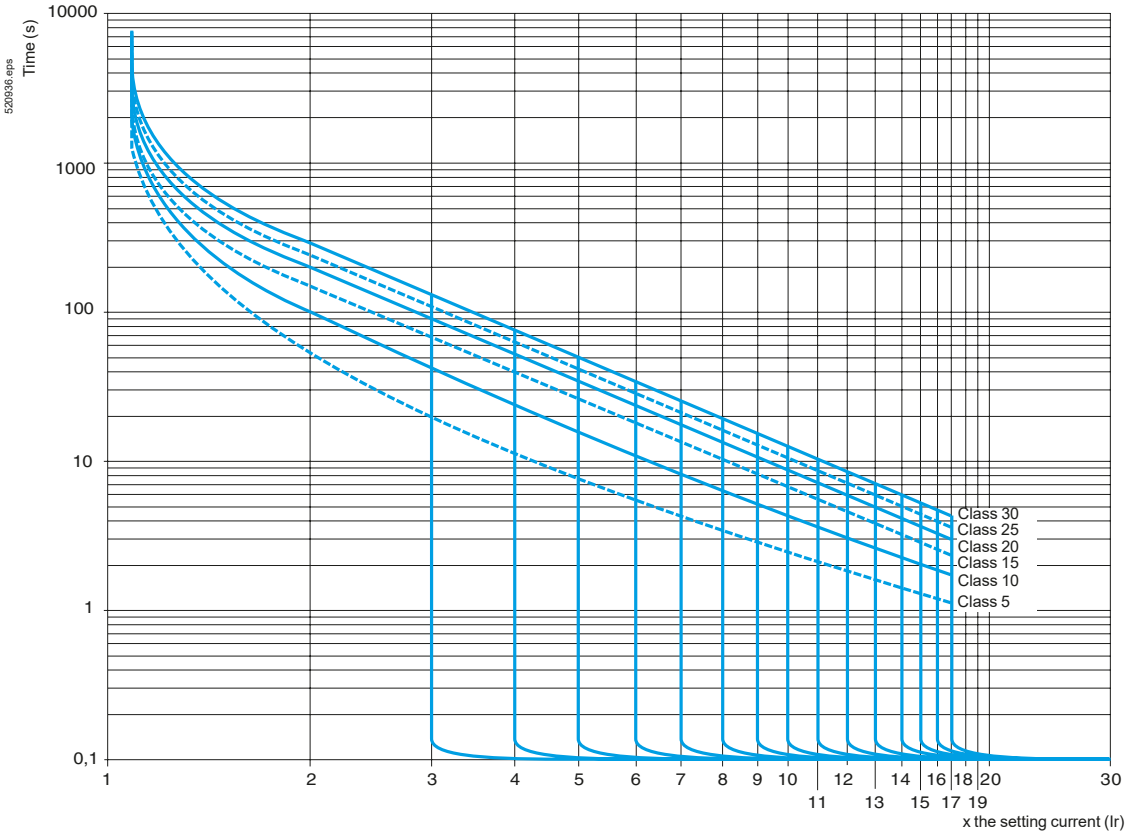
References:
pages A4/11 and A4/12
Characteristics:
page A4/45
Schemes:
page A4/63

Curves

Tripping curves for control units LUCM

Cold state curves

Average operating times at 20 °C according to multiples of the setting current, tolerance : ± 20 %.



TeSys U
Ref.

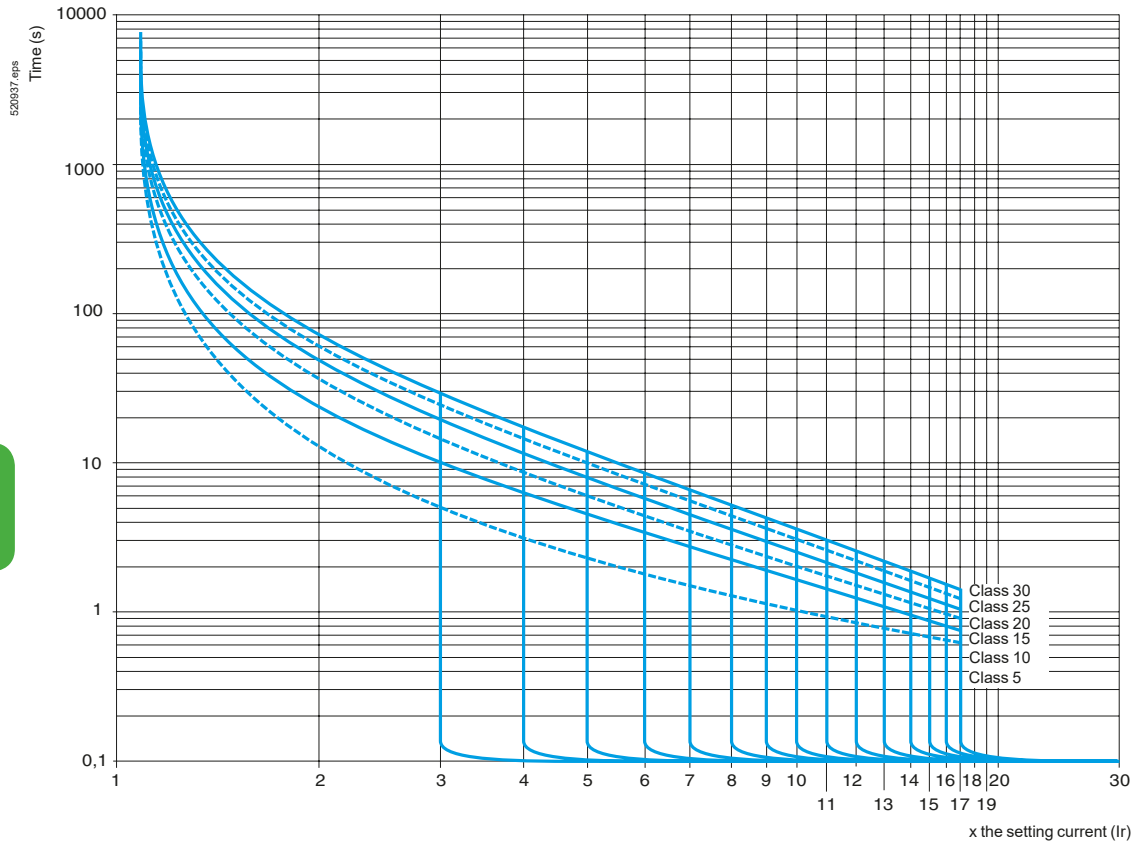
References:
page A4/12
Characteristics:
page A4/45
Schemes:
page A4/63

Curves

Tripping curves for control units LUCM

Hot state curves

Average operating times at 20 °C according to multiples of the setting current, tolerance : ± 20 %



TeSys U
Ref.

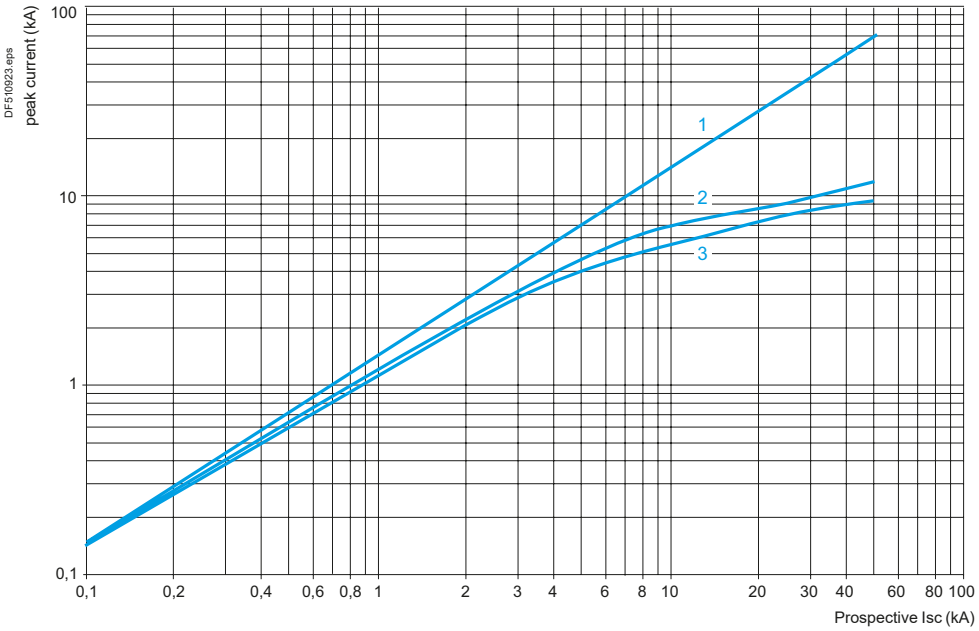
References:
page A4/12
Characteristics:
page A4/45
Schemes:
pages A4/62 and A4/63

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Curves

Current limitation on short-circuit

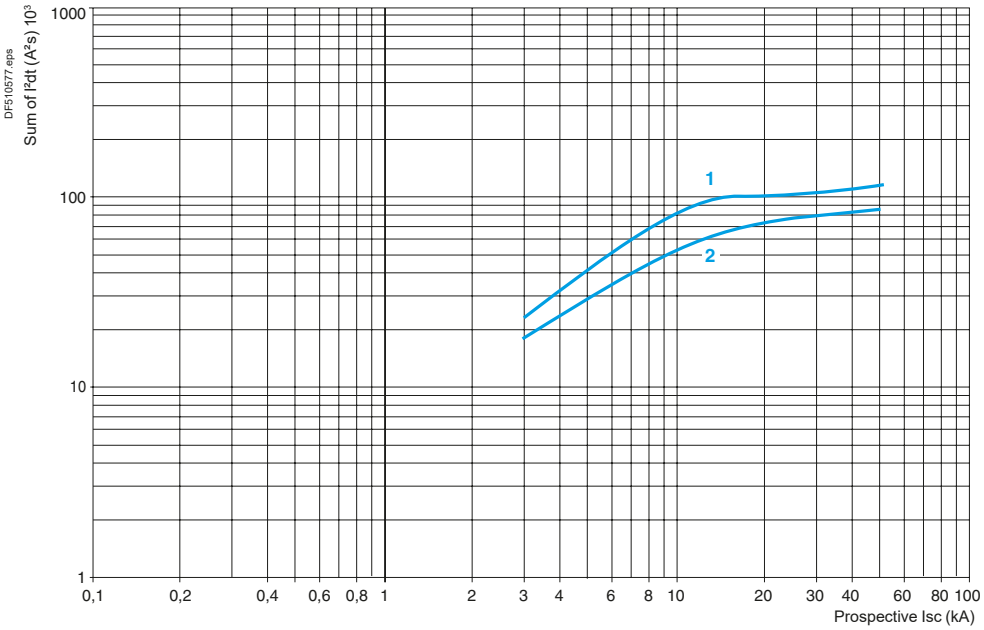
U_e = 460 V



1 Maximum peak current
2 32 A, 38 A power base
3 12 A power base

Thermal limit on short-circuit

U_e = 460 V



1 32 A, 38 A power base
2 12 A power base

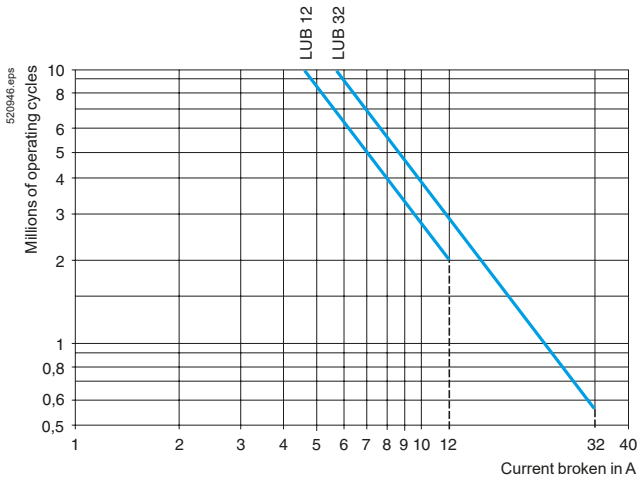
References:
page A4/10

Characteristics:
pages A4/42, A4/44 to A4/52

Schemes:
pages A4/62 to A4/74

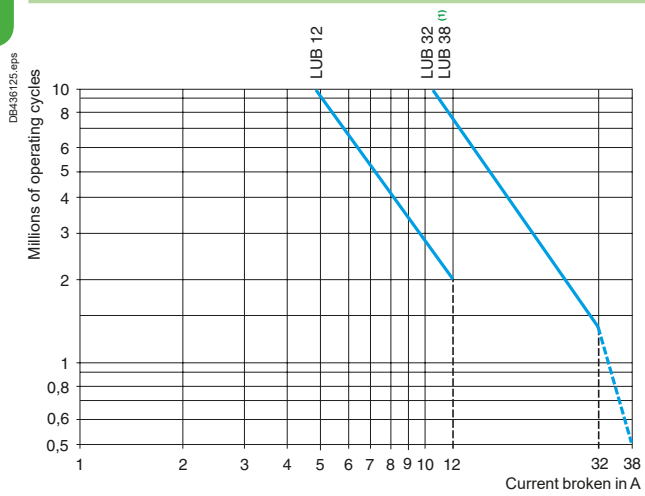
Curves

Use in category AC-41

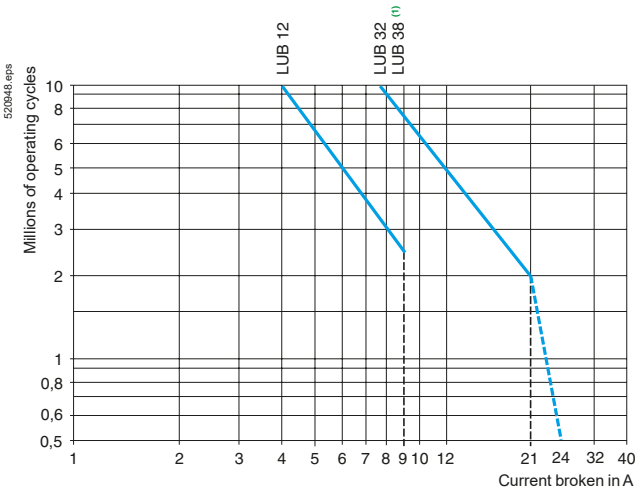


Use in category AC-43

Ue ⩽ 440 V



Ue = 690 V



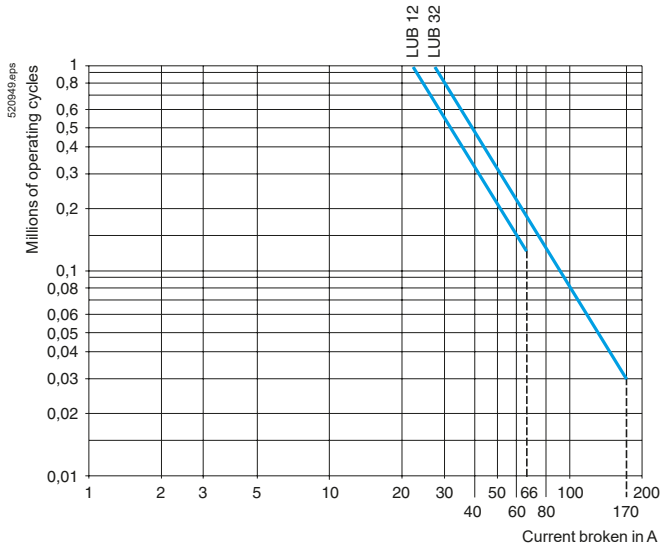
(1) Plain curve: **LUB32** + **LUB38**, doted curve: **LUB38** only.

References:
page A4/10
Characteristics:
pages A4/42, A4/44 to A4/52
Dimensions:
pages A4/60 and A4/61
Schemes:
pages A4/62 to A4/74

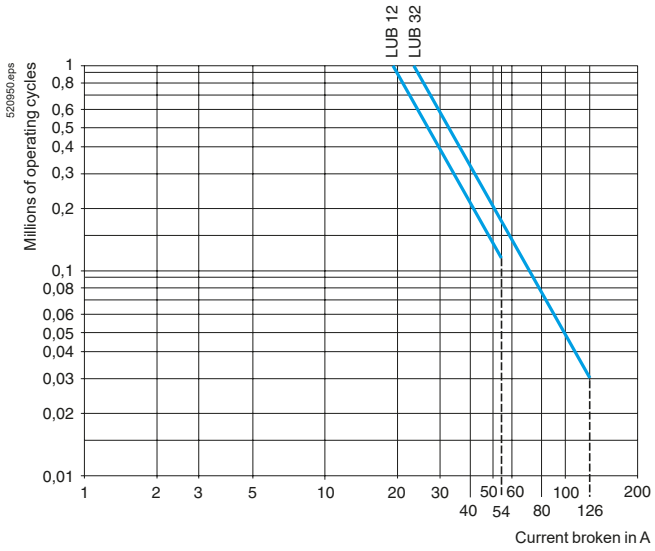
Curves

Use in category AC-44

Ue ≤ 440 V



Ue = 690 V

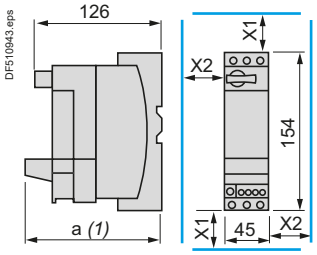


TeSys U
Ref.

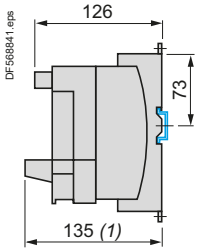
Dimensions

Starter-controllers

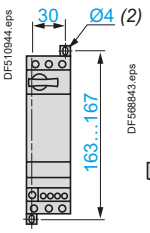
LUB: non-reversing



Rail mounting



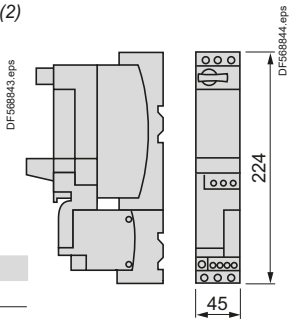
Screw fixing



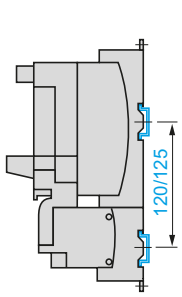
	a
With Modbus module	135
With Advantys STB, CANopen, Profibus DP or DeviceNet modules	147

Minimum electrical clearance:
X1 = 50 mm for Ue = 440 V and 70 mm for Ue = 500 and 690 V, X2 = 0

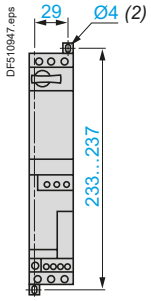
LU2B: reversing



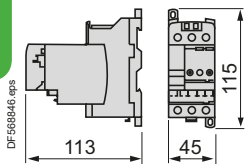
Rail mounting



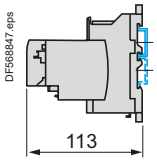
Screw fixing



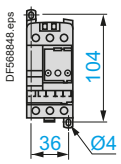
Reverser block for mounting separately from power base



Rail mounting

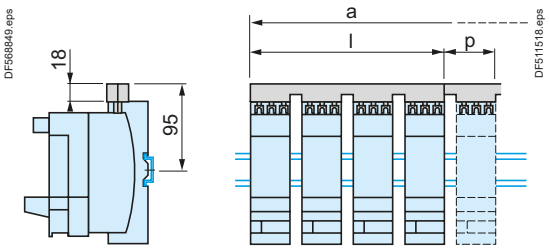


Screw fixing



Sets of busbars and plug-in power sockets

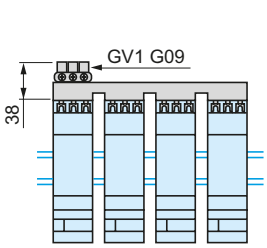
GV2G445 and GV2G454



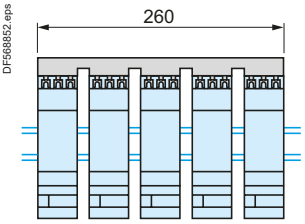
	l	P
GV2G445 (2 x 45)	179	45
GV2G454 (2 x 54)	206	54

	a			
Number of tap-offs	5	6	7	8
GV2G445 (2 x 45)	224	269	314	359
GV2G454 (2 x 54)	260	314	368	422

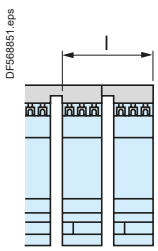
GV2G●●● with terminal block GV1G09



GV2G554

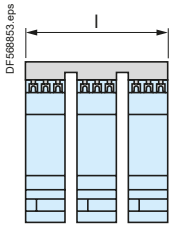


GV2G245 and G254



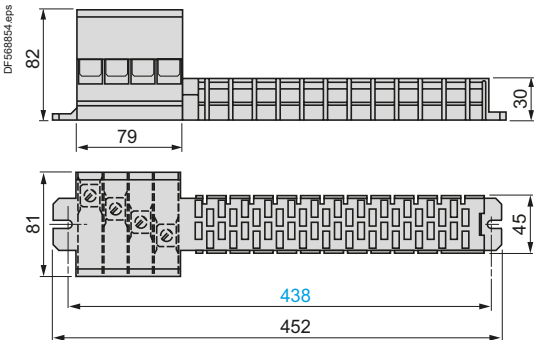
	l
GV2G245 (2 x 45)	89
GV2G254 (2 x 54)	98

GV2G345 et G354

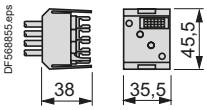


	l
GV2G345 (2 x 45)	**134**
GV2G354 (2 x 54)	**152**

AK5JB144



AK5PC13, PC33, PC33L



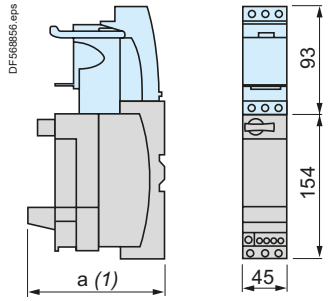
(1) Depth with communication module.
(2) Retractable fixing lugs.

References:
pages A4/10 and A4/11
Characteristics:
page A4/42
Curves:
pages A4/54 to A4/59
Schemes:
pages A4/61 to A4/74

Dimensions

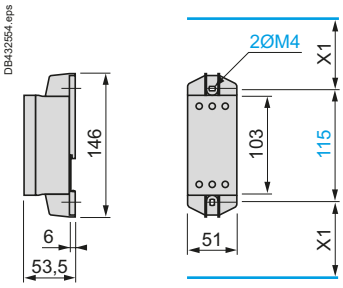
Dimensions, mounting

Limiter-disconnector LUALB1
Disconnector LUALB10



	a
With Modbus module	135
With Advantys STB, CANopen, Profibus DP or DeviceNet modules	147

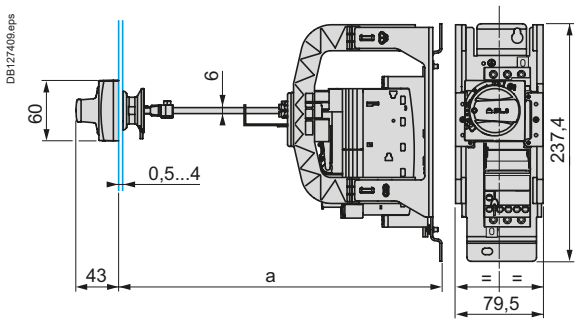
Current limiter LA9LB920



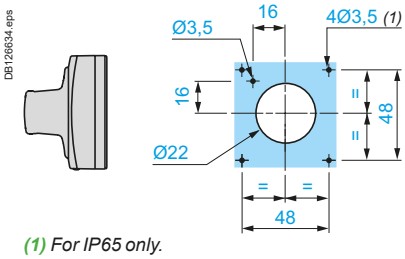
X1: Electrical clearance = 30 mm for Ue ≤ 690 V

Door interlock mechanisms

LU9APN21, LU9APN22, LU9APN24



Door cut-out

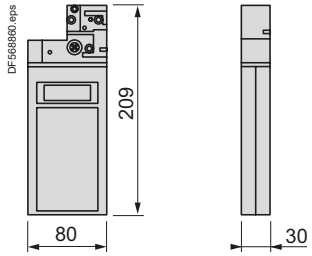


(1) For IP65 only.

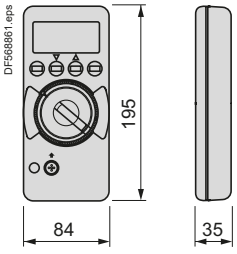
	a	
	Mini	**Maxi**
LU9APN●●	191	300
LU9APN●● + GVAPK12	300	483

Addressing consoles

XZMC11

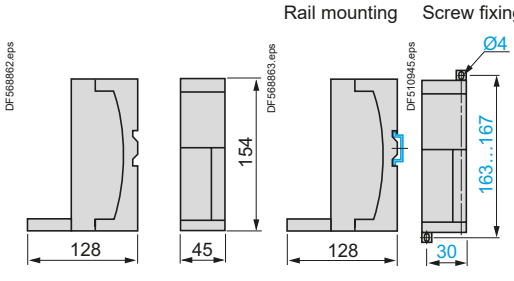


ASITERV2

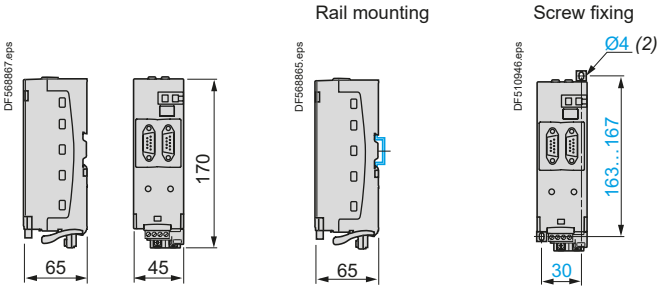


Splitter boxes

LU9GC3 (Modbus) LU9G02 and LU9G03



LU9GC7 (Profibus DP)



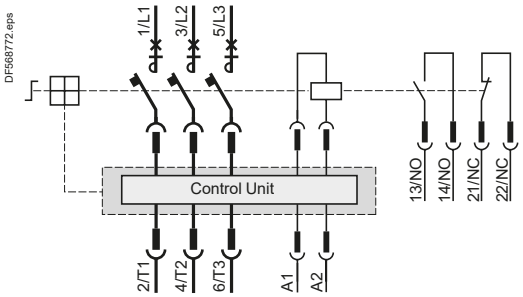
(1) Depth with communication module.
(2) Retractable fixing lugs.

References:
pages A4/20, A4/31, A4/32

12, 32, 38 A power bases with standard, advanced or multifunction control unit

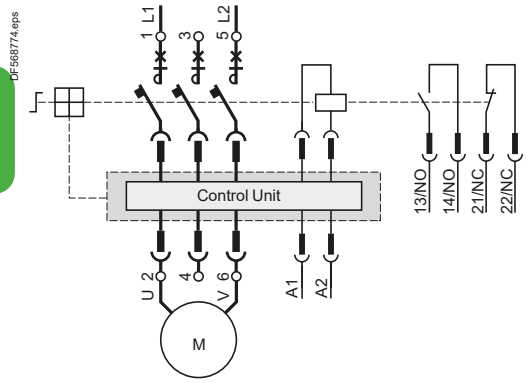
LUB

Non-reversing



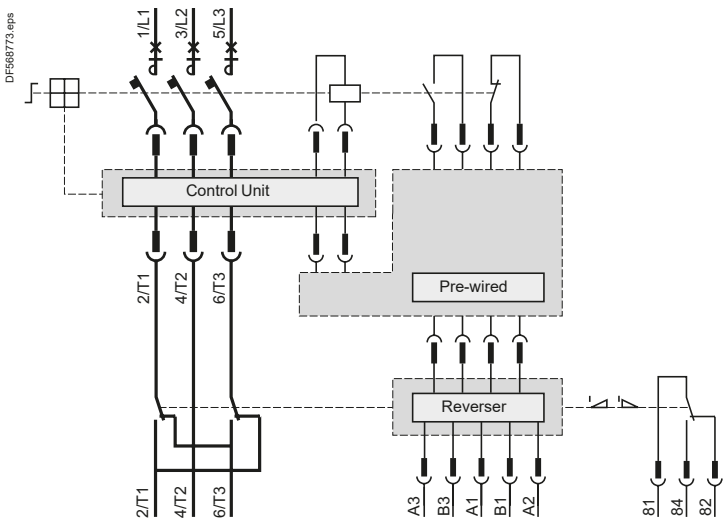
With control unit LUCC or LUCM

Connection of a single-phase motor

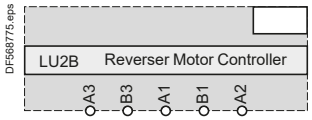


LU2B

Reversing

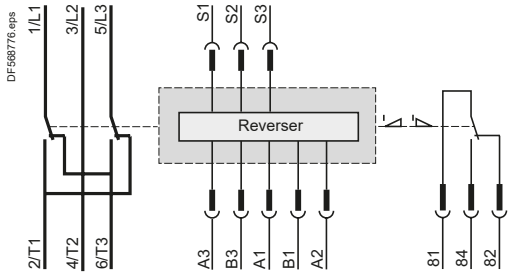


Control terminal block

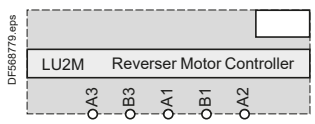


Reverser blocks

LU2M

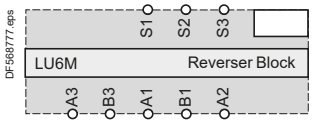


Control terminal block

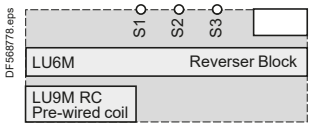


LU6M

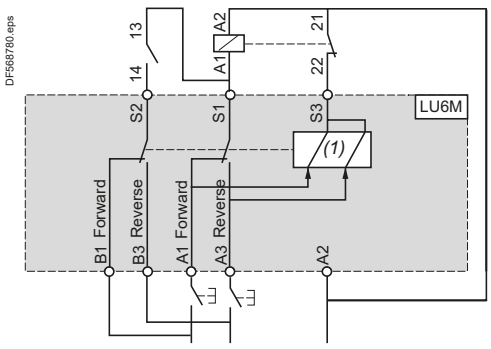
Control terminal blocks



With pre-wired connector LU9MRC



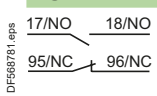
Basic scheme



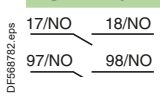
S1 *Start next stage*
S2 *Electrical interlocking*
S3 *Maintaining contact*
B1 *Maintain forward running*
B3 *Maintain reverse running*
A1 *Pulse forward running*
A2 *Common*
A3 *Pulse reverse running*
(1) Electronically operated bistable electromagnet.

Add-on contact blocks

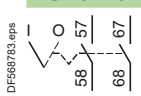
LUA1C11



LUA1C20

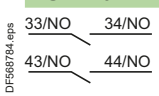


LUA8E20

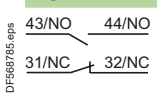


Add-on contact modules

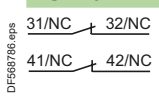
LUFN20



LUFN11



LUFN02



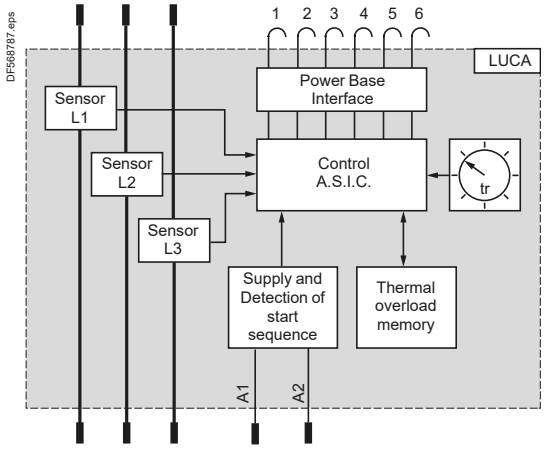
References:
pages A4/10 and A4/11
Characteristics:
pages A4/42 and A4/43
Curves:
pages A4/54 to A4/59

Schemes

Control units

Standard control units LUCA

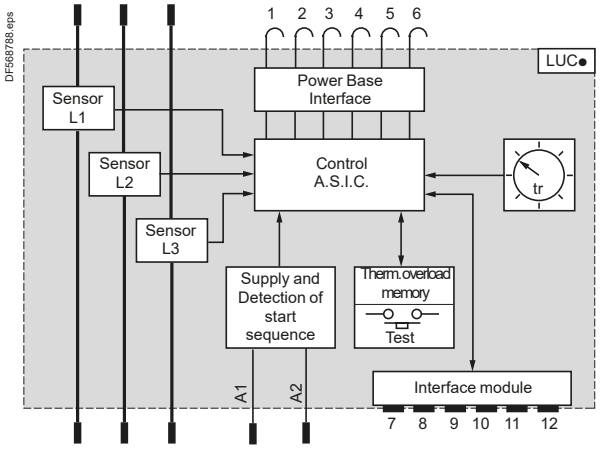
Basic scheme



1 and 2 Trips
3 and 4 Electromagnet
5 Power base rating
6 N/C

Advanced control units LUCB, LUCC, LUCD

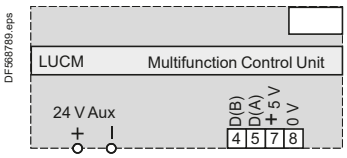
Basic schemehd



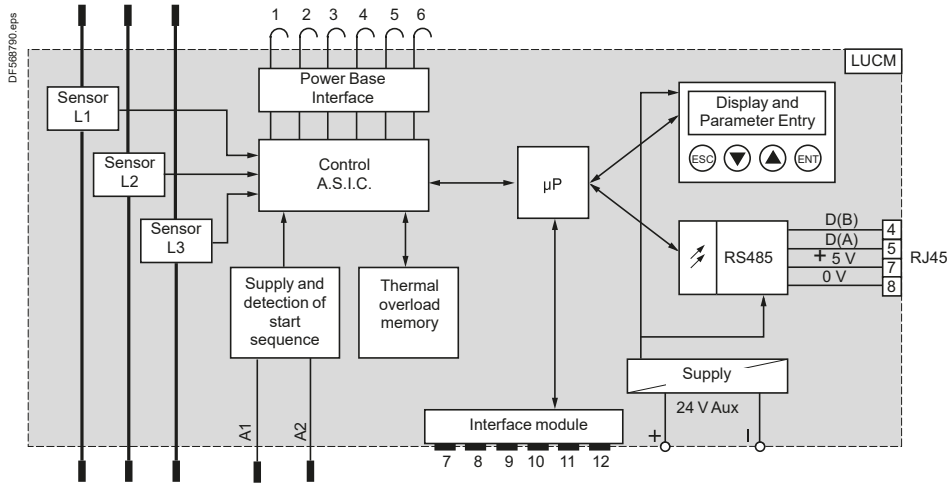
1 and 2 Trips
3 and 4 Electromagnet
5 Power base rating
6 N/C
7 Earth
8 Thermal status/Set
9 Reset mode/Reset
10 (Im/Ir)
11 Vc2
12 Vc1

Multifunction control units LUCM

Control terminal block



Basic scheme



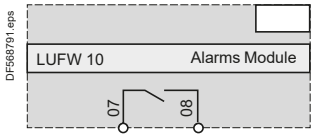
1 and 2 Trips
3 and 4 Electromagnet
5 Power base rating
6 N/C
7 Earth
8 N/C
9 Earth
10 (Im/Ir)
11 Rx/Tx
12 Vc1

References:
pages A4/11 and A4/12
Characteristics:
pages A4/45 to A4/47
Curves:
pages A4/54 to A4/56

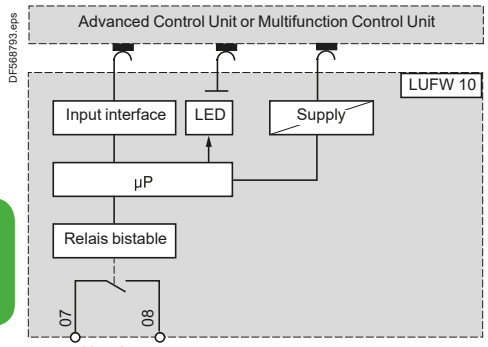
Schemes

Function modules

Alarm
LUFW10



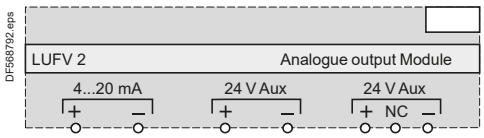
Basic scheme



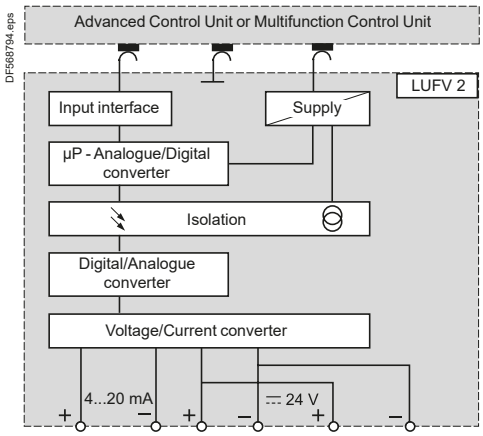
~ 250 V, 2 A
⎓ 24 V, 2 A

Indication of motor load
LUFV2

4-20 mA output



Basic scheme

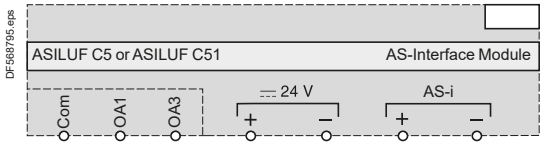


100 Ω < load < 500 Ω ⎓ 30 V max and 40 mA min

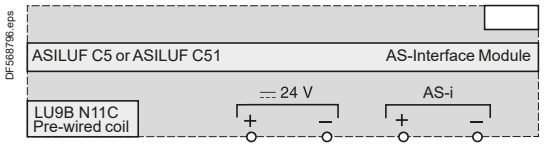
Communication modules

Communication modules ASILUFC5 and ASILUFC51

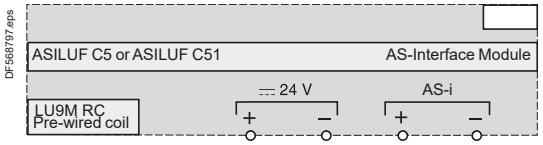
Without pre-wired coil connection



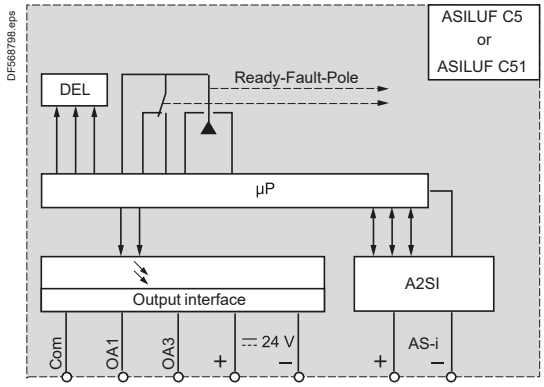
With pre-wired coil connection LU9BN11C



With pre-wired coil connection LU9MRC



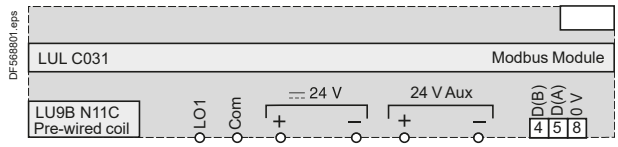
Basic scheme



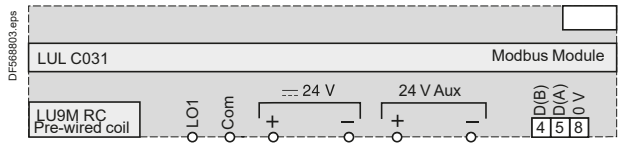
References:
pages A4/13, A4/24
Characteristics:
pages A4/48 to A4/53

Communication modules (continued)

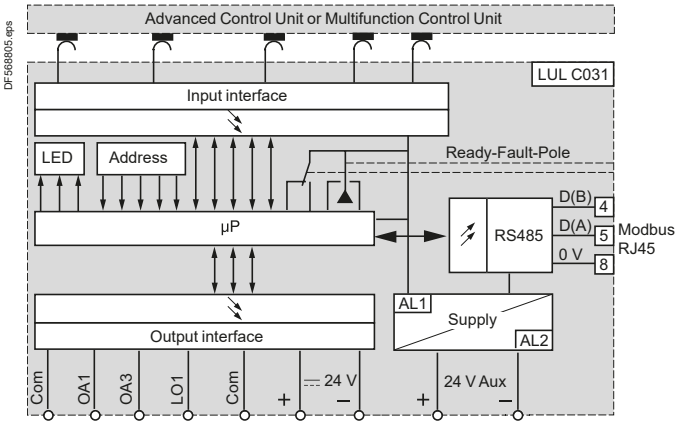
With pre-wired coil connection LU9BN11C



With pre-wired coil connection LU9MRC

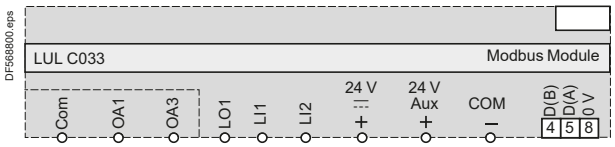


Basic scheme

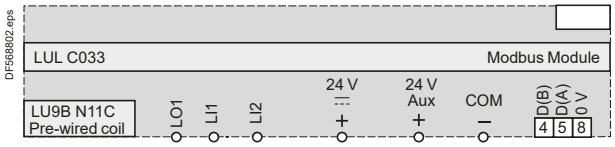


Modbus communication module LULC033

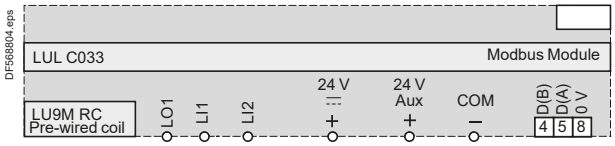
Without pre-wired coil connection



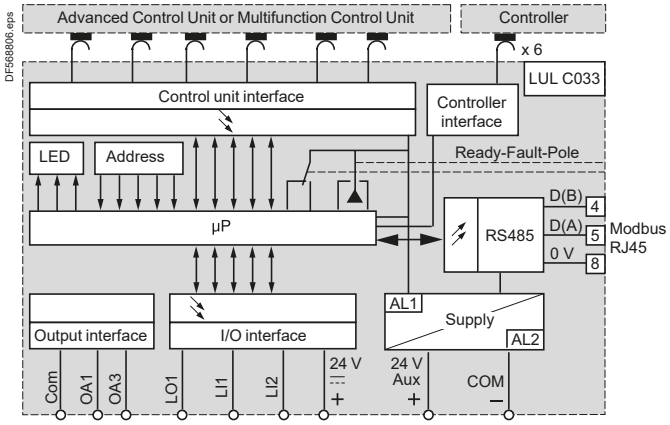
With pre-wired coil connection LU9BN11C



With pre-wired coil connection LU9MRC



Basic scheme



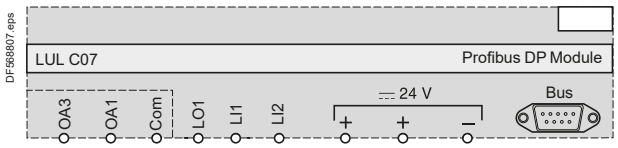
References:
page A4/26

Characteristics:
pages A4/49 to A4/53

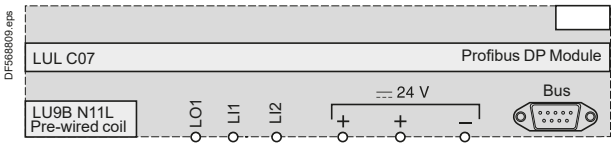
Communication modules (continued)

Profibus DP communication module LULC07

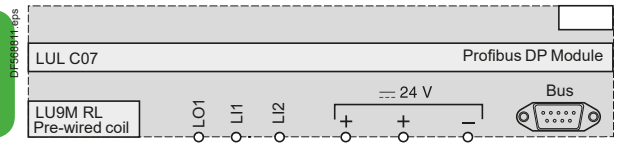
Without pre-wired coil connection



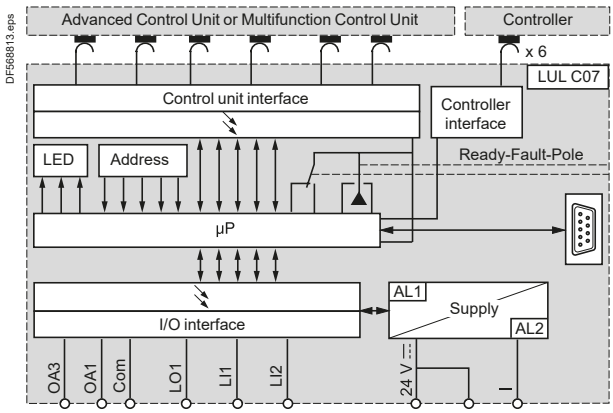
With pre-wired coil connection LU9BN11LC



With pre-wired coil connection LU9MRC

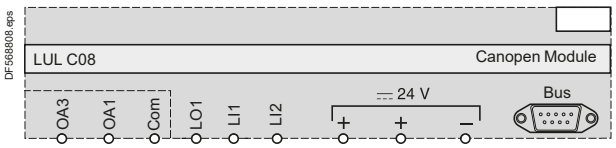


Basic scheme

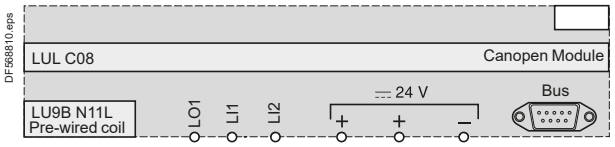


CANopen communication module LULC08

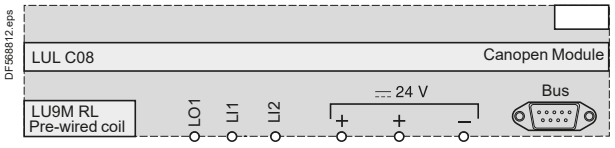
Without pre-wired coil connection



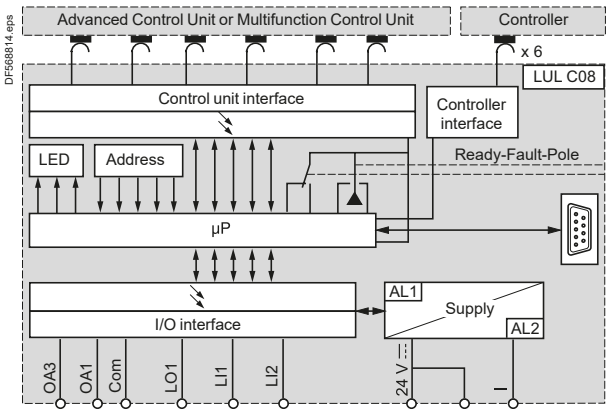
With pre-wired coil connection LU9BN11LC



With pre-wired coil connection LU9MRC

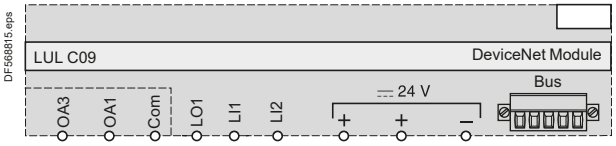


Basic scheme

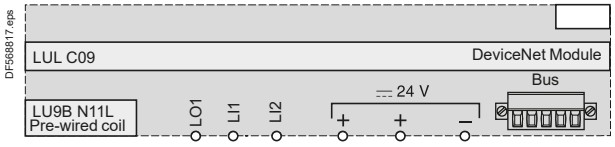


DeviceNet communication module LULC09

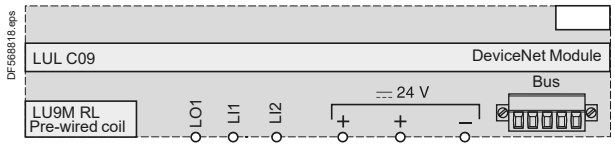
Without pre-wired coil connection



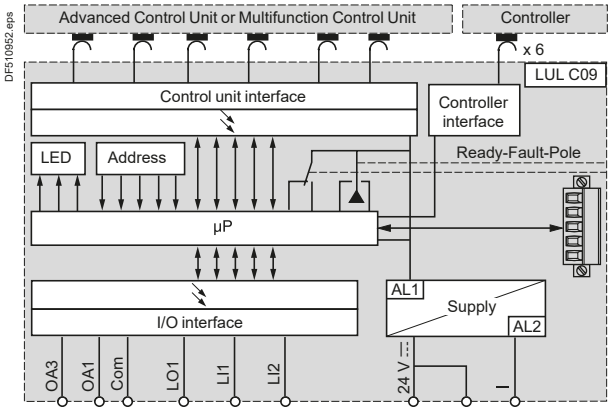
With pre-wired coil connection LU9BN11LC



With pre-wired coil connection LU9M RL



Basic scheme



References:
pages A4/25, A4/28, A4/29

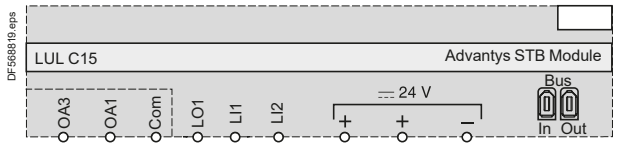
Characteristics:
pages A4/49 to A4/53

Life Is On Schneider Electric

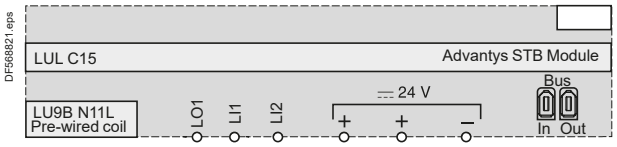
Communication modules (continued)

Advantys STB communication module LULC15

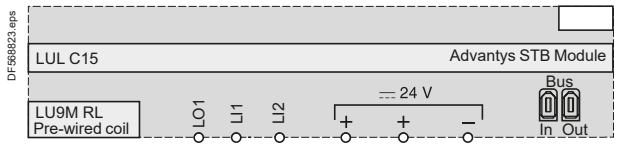
Without pre-wired coil connection



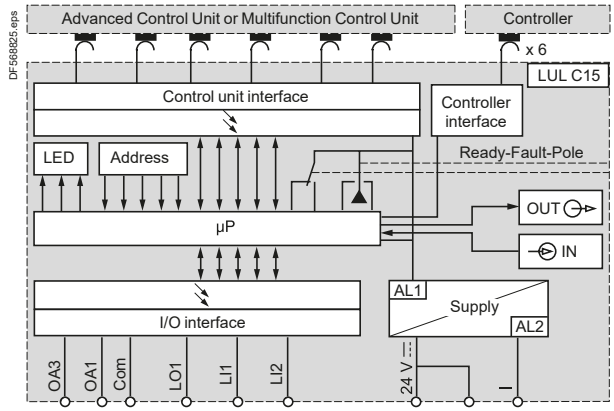
With pre-wired coil connection LU9BN11LC



With pre-wired coil connection LU9MRC

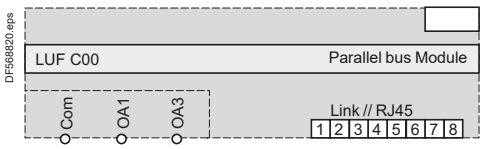


Basic scheme

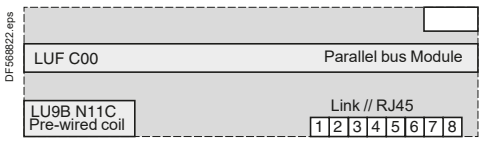


Parallel wiring modules

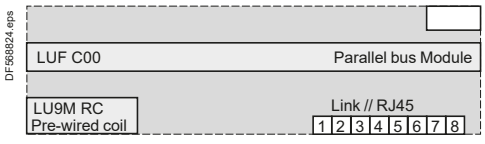
Without pre-wired coil connection



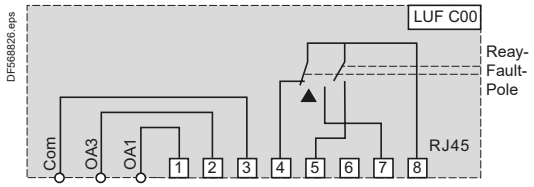
With pre-wired coil connection LU9BN11LC



With pre-wired coil connection LU9MRC

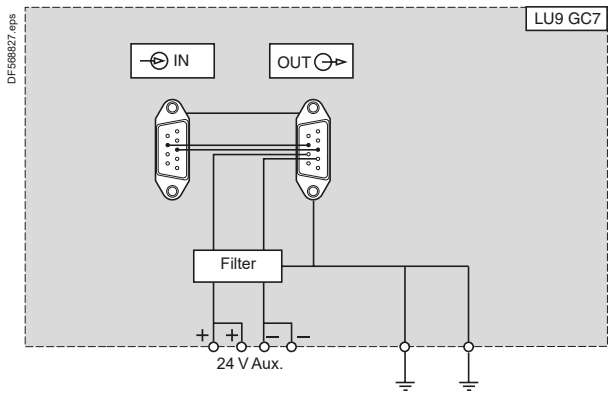


Basic scheme



1 Forward running
2 Reverse running
3 Output common
4 Selector in position ⏻
5 Pole state
6 Reserved
7 Fault
8 Input common

Profibus DP power supply module LU9GC7



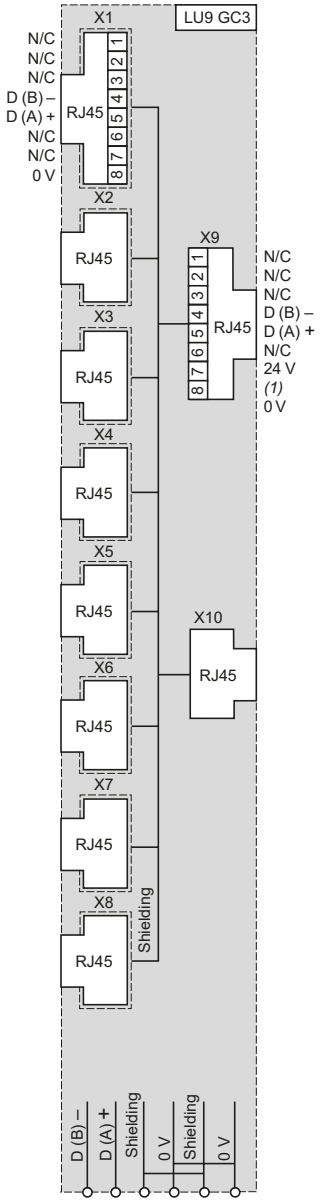
References:
pages A4/20, A4/27, A4/28

Characteristics:
pages A4/49 to A4/53

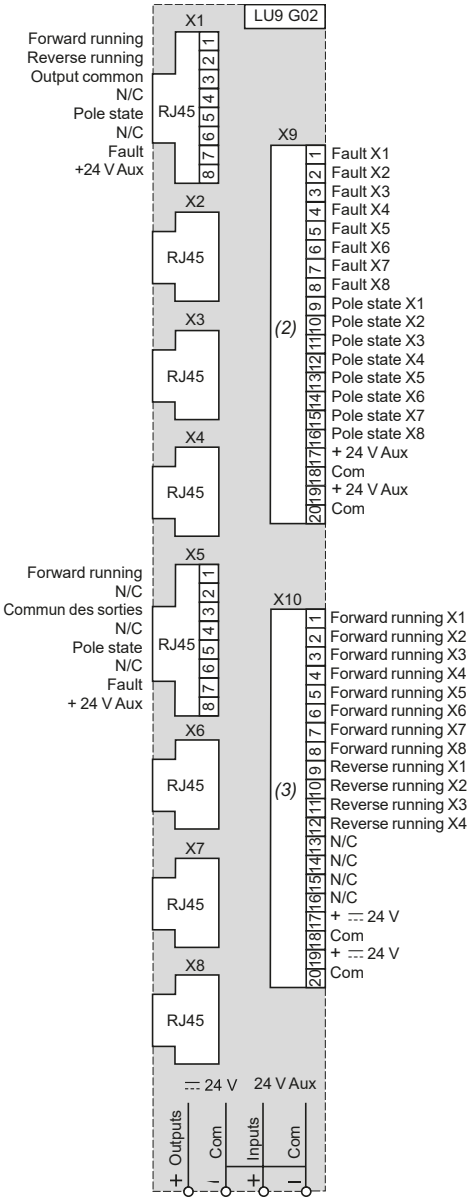
Communication modules (continued)

Wiring hub and splitter boxes

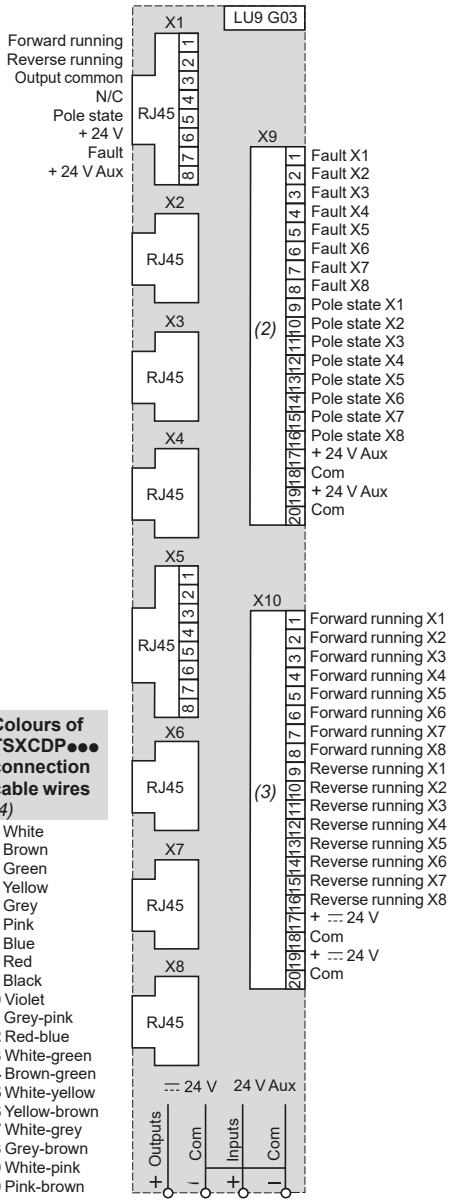
Modbus hub LU9GC3



Parallel wiring splitter box LU9G02



Parallel wiring splitter box LU9G03



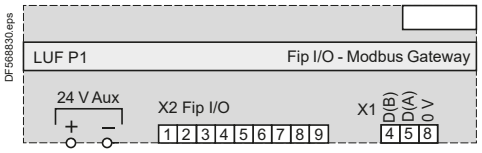
Colours of TSXCDP●●● connection cable wires *(4)*

1	White
2	Brown
3	Green
4	Yellow
5	Grey
6	Pink
7	Blue
8	Red
9	Black
10	Violet
11	Grey-pink
12	Red-blue
13	White-green
14	Brown-green
15	White-yellow
16	Yellow-brown
17	White-grey
18	Grey-brown
19	White-pink
20	Pink-brown

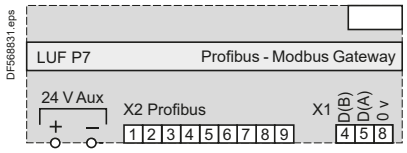
(1) Not connected on connectors X1 to X8. Only present on RJ45 IN and OUT connectors.
(2) 20-way HE10 input connector.
(3) 20-way HE10 output connector.
(4) Wire colours and corresponding HE10 connector pin numbers.

Gateways

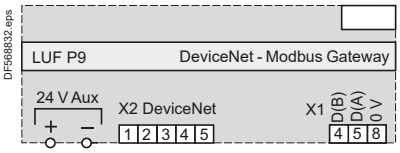
LUFP1



LUFP7



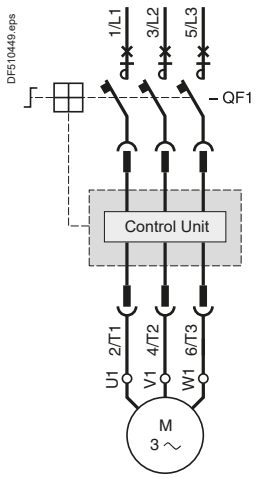
LUFP9



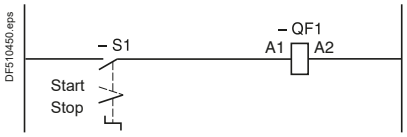
References:
pages A4/20 and A4/30
Dimensions:
pages A4/61 and A4/68

Schemes

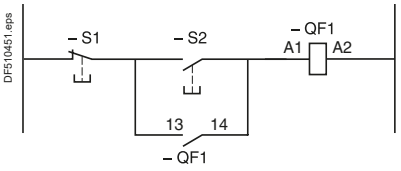
Non-reversing starter-controllers LUB



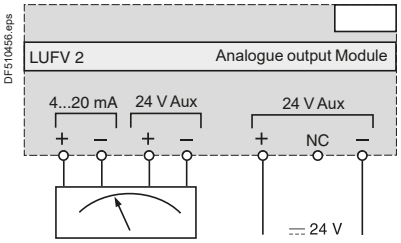
2-wire control via 2-position switch



3-wire control, pulsed start with maintaining contact

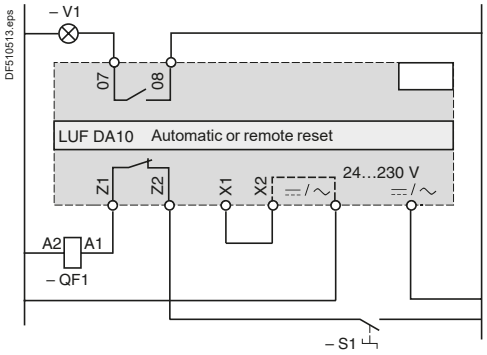


Connection of a motor load indicator module LUFV2

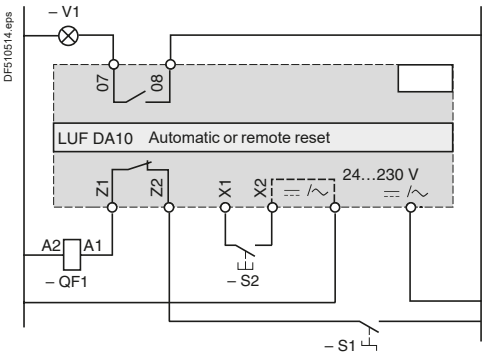


Connection of thermal overload fault signalling modules LUFDA10

Automatic reset

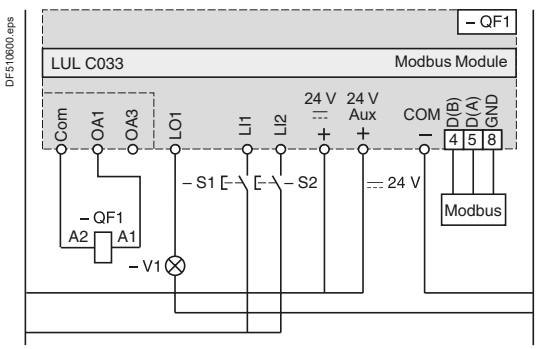


Remote reset



Control via Modbus communication module LULC033

Without pre-wired coil connection

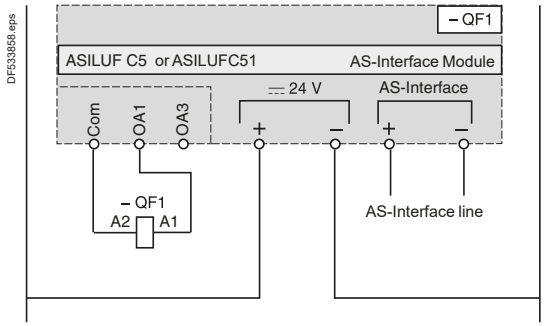


References:
pages A4/10 to A4/14

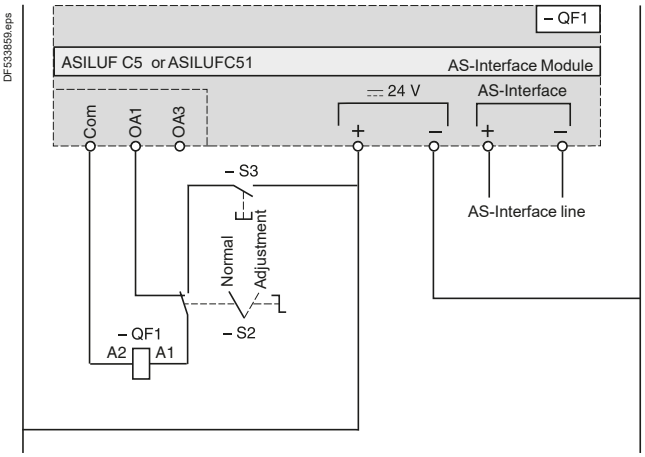
Non-reversing starter controllers LUB (continued)

Control by communication modules ASILUFC5 and ASILUFC51

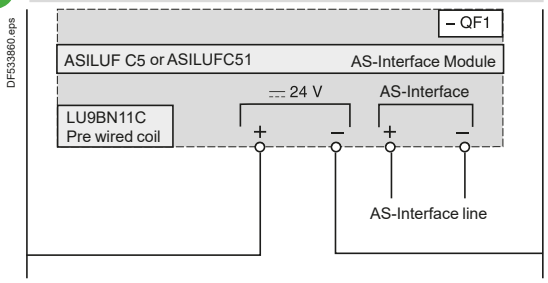
Without pre-wired coil connection



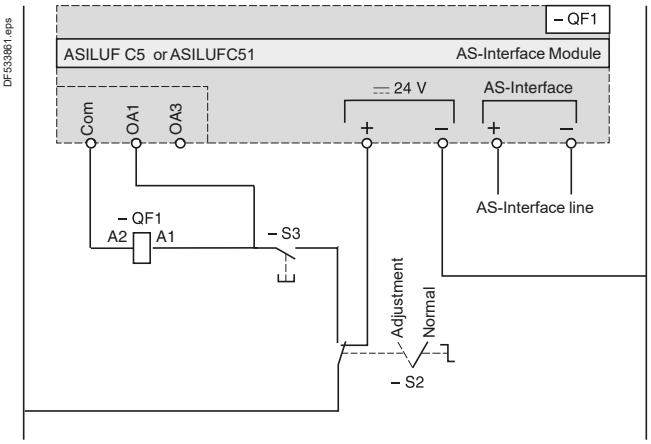
Without pre-wired coil connection
With local control



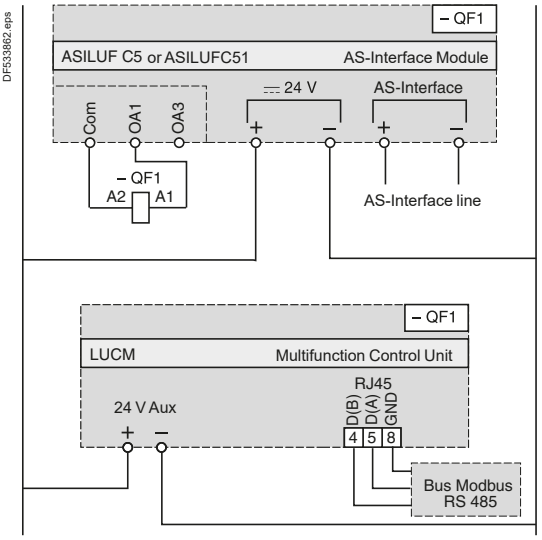
With pre-wired coil connection LU9BN11C



Without pre-wired coil connection
With local control



Without pre-wired coil connection
With multifunction control unit LUCM



TeSys U
Ref.

References:
page A4/14

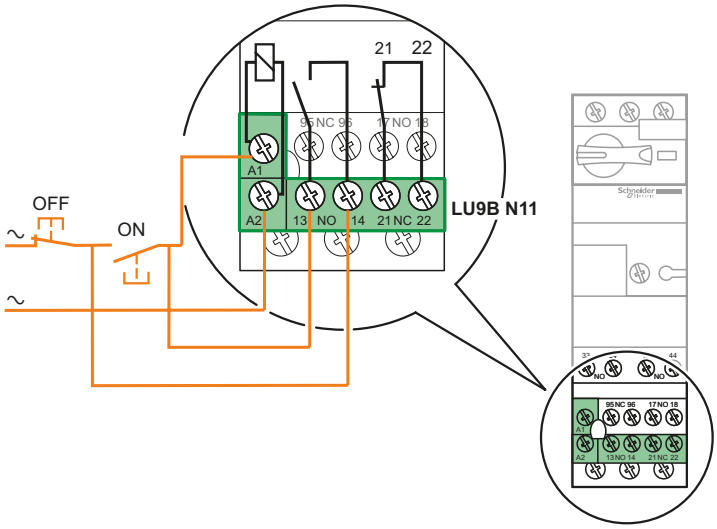
Schemes

Standard or advanced power base

ON/OFF control (1 direction of rotation)

Push buttons wiring

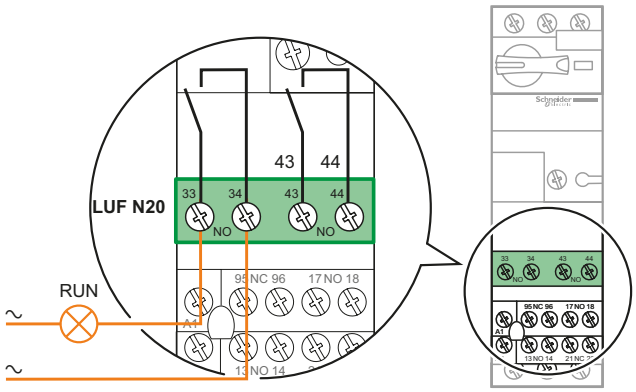
DB414426_b.eps



ON indication

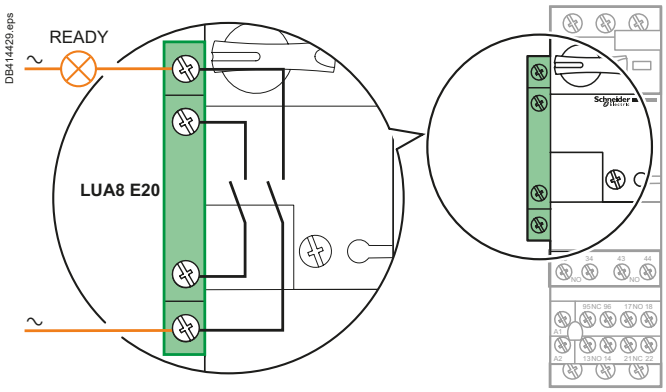
"Motor RUN" indicator wiring

DB414428.eps



"Motor starter READY" indicator wiring

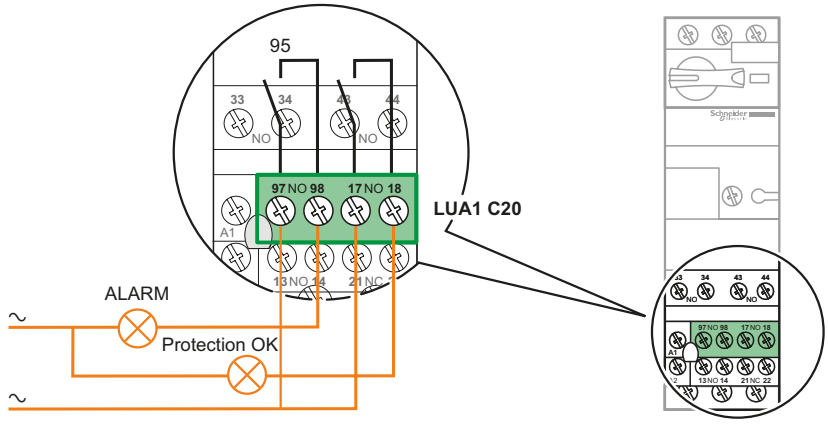
DB414429.eps



ALARM indication

Protection device status indicator wiring

DB432552.eps

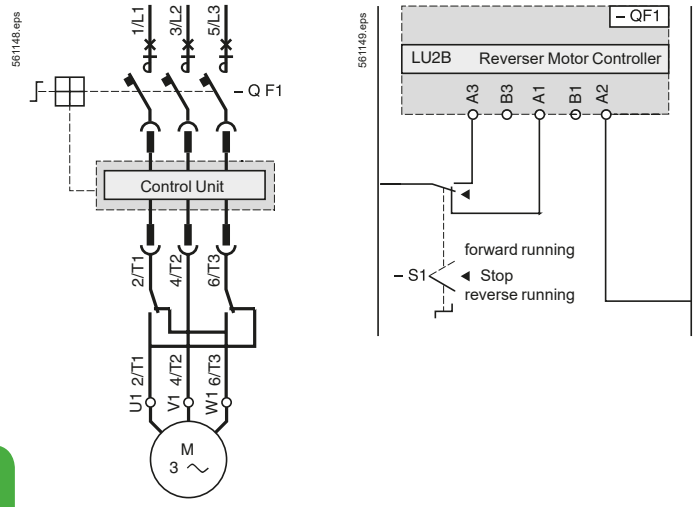


References:
pages A4/10 to A4/13

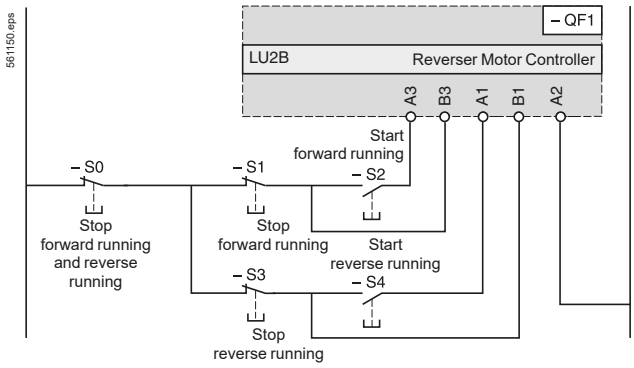
Schemes

Reversing starter-controllers LUB

2-wire control via 3-position switch

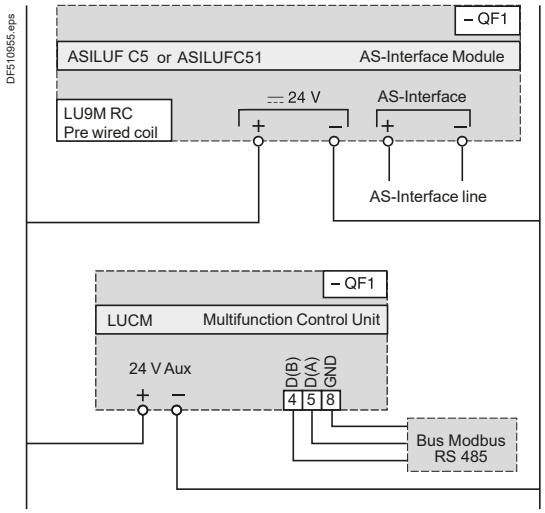


3-wire control, pulsed start with maintaining contact

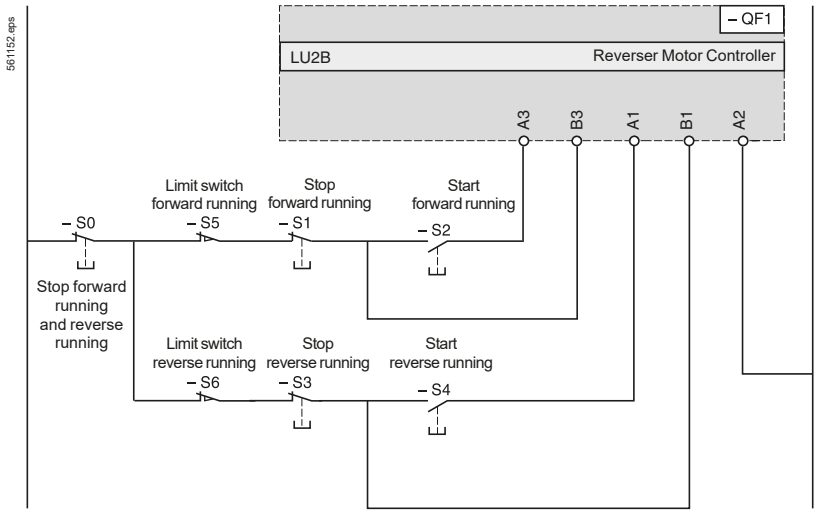


Control by communication modules ASILUFC5 and ASILUFC51

With pre-wired coil connection LU9MRC
With multifunction control unit LUCM

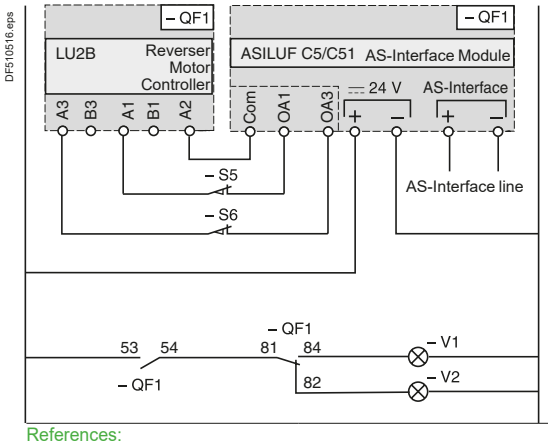


3-wire control, pulsed start with maintaining contact and limit switches



Control by communication modules ASILUFC5 and ASILUFC51

Without pre-wired coil connection
With running direction pilot lights and limit switches



References:
pages A4/10 and A4/24

TeSys U

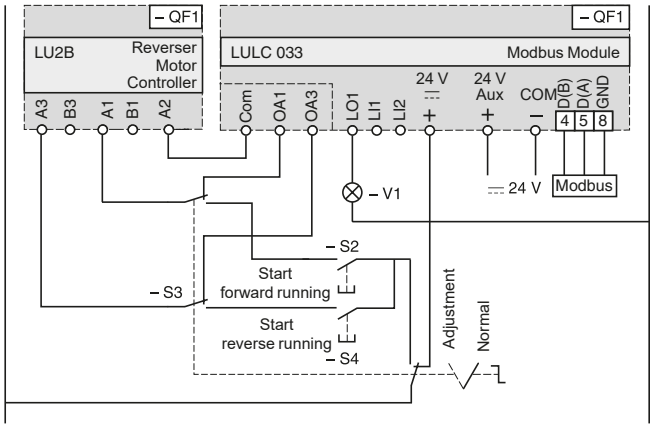
Ref.

Reversing starter controllers LU2B (continued)

Control via Modbus communication module LULC033

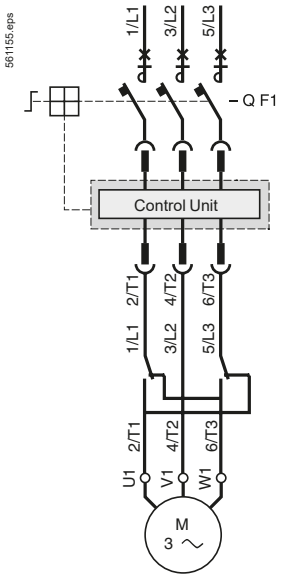
Without pre-wired coil connection. With local control

DF510601.eps



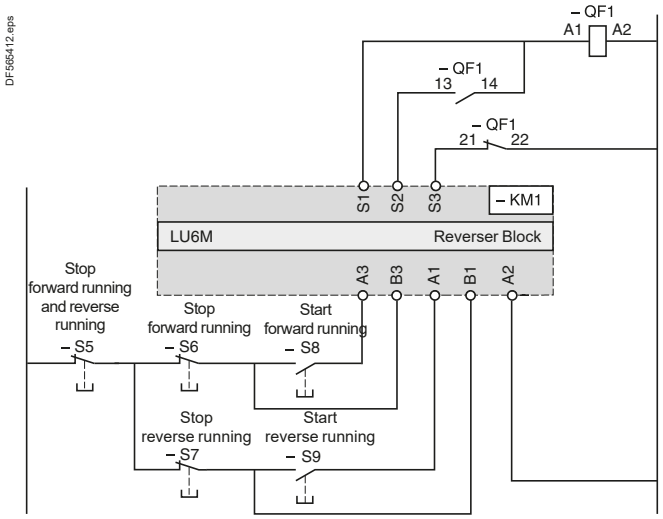
Reversing starter-controllers LUB + LU6M

561155.eps



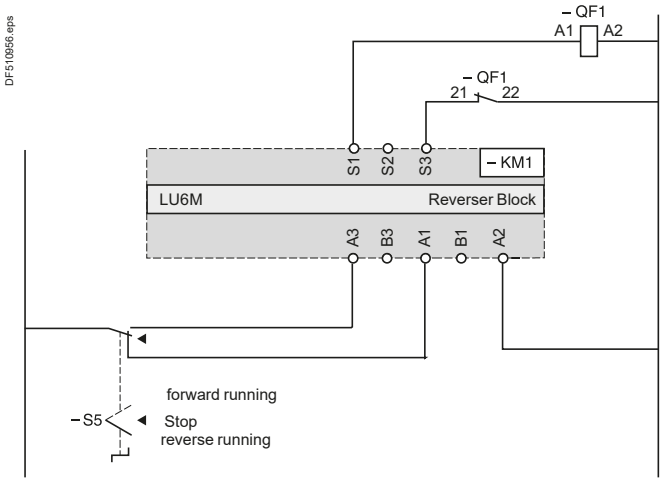
3-wire control, pulsed start with maintaining contact

DF565412.eps



2-wire control via 3-position switch

DF510956.eps



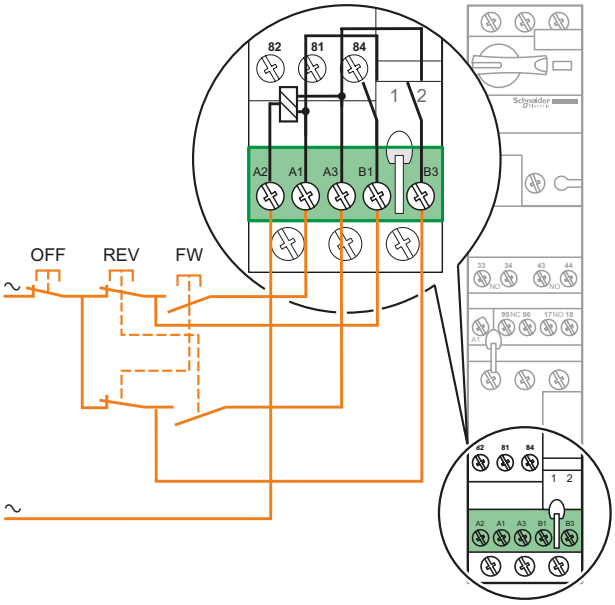
References:
page A4/10

Power base with vertical mounting reverser block

FW/REV/OFF control (2 directions of rotation)

Push buttons wiring

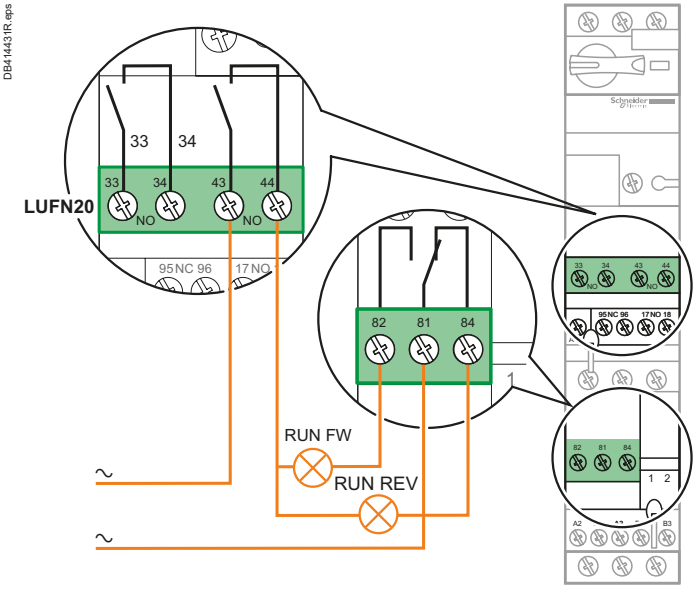
DB414430R.eps



FW/REV control

FW, REV indicators wiring

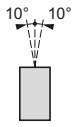
DB414431R.eps



TeSys U
Ref.

References:
pages A4/10 and A4/13

Environmental characteristics

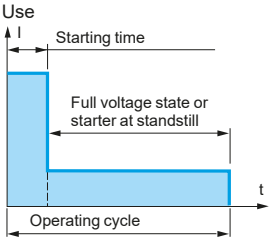
Type of starter			ATSU01N2●●LT
Conformity to standards			Altistart U01 electronic starters have been developed to conform to the strictest international standards and the recommendations relating to electrical industrial control devices (IEC, EN), in particular standard IEC/EN 60947-4-2.
Electromagnetic compatibility EMC			
	Conducted and radiated emissions		CISPR 11 level B, IEC 60947-4-2, level B
	Harmonics		IEC 1000-3-2, IEC 1000-3-4
	EMC immunity		EN 50082-2, EN 50082-1
	Electrostatic discharge		IEC 61000-4-2 level 3
	Immunity to radiated radio-electrical interference		IEC 61000-4-3 level 3
	Immunity to electrical transients		IEC 61000-4-4 level 4
	Voltage/current impulse		IEC 61000-4-5 level 3
	Conducted and radiated emissions		IEC 61000-4-6 level 3
	Immunity to conducted interference caused by radio-electrical fields		IEC 61000-4-11
	Damped oscillating waves		IEC 61000-4-12 level 3
CE marking			The starters carry CE marking in accordance with the European low voltage directives IEC/EN 60947-4-2.
Product certifications			UL, CSA, C-Tick and CCC
Degree of protection			IP 20
Degree of pollution			2 conforming to IEC/EN 60947-4-2
Vibration resistance			1.5 mm peak to peak from 3 to 13 Hz, 1 gn from 13 to 150 Hz, conforming to IEC/EN 60068-2-6
Shock resistance			15 gn for 11 ms conforming to IEC/EN 60068-2-27
Relative humidity			5…95 % without condensation or dripping water conforming to IEC 60068-2-3
Ambient temperature around the unit	Storage	°C	-25…+70 conforming to IEC/EN 60947-4-2
	Operation	°C	-10…+40 without derating, up to 50°C with current derating of 2 % per °C above 40°C
Maximum operating altitude		m	1000 without derating (above this, derate the current by 2.2 % per additional 100 m)
Operating position Maximum permanent angle in relation to the normal vertical mounting position			

Electrical characteristics

Type of starter			ATSU01N2●●LT
Category of use	Conforming to IEC 60947-4-2		Ac-53b
Rated operating voltage	3-phase ∼ voltage	V	200 - 10 % to 480 + 10 %
Frequency		Hz	50 - 5 % to 60 + 5 %
Output voltage			Maximum 3-phase voltage equal to line supply voltage
Control supply voltage			24 V ⎓, 100 mA ±10 %
Rated operating current		A	6...32
Adjustable starting time		s	1...10
Adjustable deceleration time		s	1...10
Starting torque		%	30.... 80 % of DOL motor starting torque

Type of starter	ATSU		01N206LT	01N209LT	01N212LT	01N222LT	01N232LT
Control power supply consumption			24 V ⎓, 65 mA			24 V ⎓, 100 mA	
Power dissipated	At full load at end of starting	W	1.5	1.5	1.5	2.5	2.5
	In transient state at 5 times the rated operating current	W	61.5	91.5	121.5	222.5	322.5

Type of starter			ATSU01N206LT to ATSU01N222LT			ATSU01N232LT		
Use								
	Starting time	s	1	5	10	1	5	10
	Maximum number of cycles per hour		100	20	10	50	10	5



References: page A4/38
Dimensions: page A4/77
Schemes: pages A4/78 to A4/81

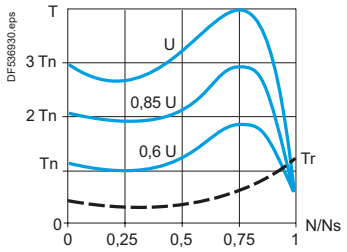
Electrical characteristics (continued)

Logic input power supply (electrically isolated between power and control) + 24 V, COM			24 V ±10 % Isolated Max. current 100 mA
Logic inputs LI1, LI2, BOOST Stop, run and boost on start-up functions			Logic inputs with impedance 27 kΩ; 24 V power supply (U max 40 V) Max. current 8 mA State 0 if U < 5 V and I < 0.2 mA State 1 if U > 13 V and I > 0.5 mA
Logic output LO1 End of starting signal			Open collector logic output: External 24 V power supply (minimum 6 V, maximum 30 V) Max. current 200 mA
Relay output R1A R1C			Normally open (N/O) contact Minimum switching capacity: 10 mA for 6 V ⎓ Maximum switching capacity on inductive load (cos φ = 0.5 and L/R = 20 ms): 2 A for 250 V ∿ or 30 V ⎓ (AC-15) Maximum operating voltage 440 V
LED signalling	Green LED		Starter powered up
	Yellow LED		Nominal voltage reached

Connections (maximum connection capacity and tightening torque)

Power circuit			**Connection to Ø4 mm screw clamps**
Flexible wire without cable end	1 conductor	**mm²**	1.5…10 8 AWG
	2 conductors	**mm²**	1.5…6 10 AWG
Flexible wire with cable end	1 conductor	**mm²**	1…6 10 AWG
	2 conductors	**mm²**	1…6 10 AWG
Rigid wire	1 conductor	**mm²**	1…10 8 AWG
	2 conductors	**mm²**	1…6 10 AWG
Tightening torque		**N.m**	1.9…2.5
Control circuit			**Screw connector**
Flexible wire without cable end	1 conductor	**mm²**	0.5…2.5 14 AWG
	2 conductors	**mm²**	0.5…1.5 16 AWG
Flexible wire with cable end	1 conductor	**mm²**	0.5…1.5 16 AWG
	2 conductors	**mm²**	0.5…1.5 16 AWG
Rigid wire	1 conductor	**mm²**	0.5…2.5 14 AWG
	2 conductors	**mm²**	0.5…1 17 AWG
Tightening torque		**N.m**	0.5

Torque characteristics (typical curves)



The diagram opposite shows the torque/speed characteristic of a cage motor in relation to the supply voltage.
The torque varies in line with the square of the voltage at a fixed frequency. The gradual increase in the voltage prevents the instantaneous current peak on power-up.

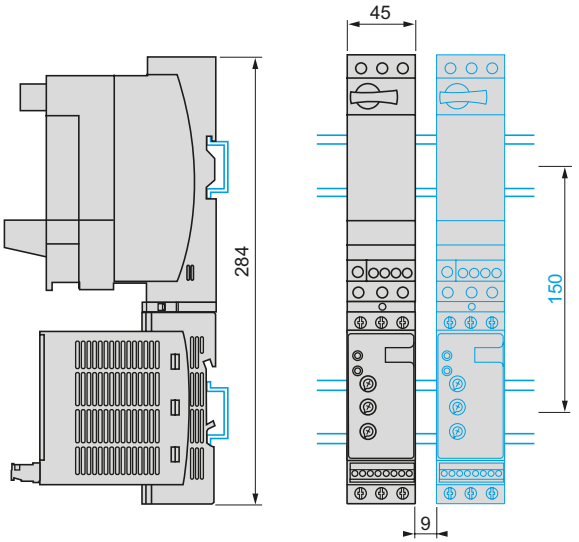
References:
page A4/38
Dimensions:
page A4/77
Schemes:
pages A4/78 to A4/81

Dimensions

TeSys U combination (non-reversing power base) and ATSU01N206LT to ATSU01N212LT

Mounting on ⊥ (35 mm) rail with VW3G4104 connector

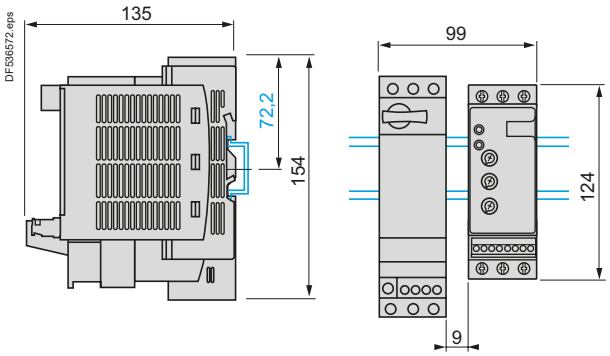
DF536571.eps



TeSys U combination (non-reversing or reversing power base) and ATSU01N206LT to ATSU01N212LT

Side by side mounting

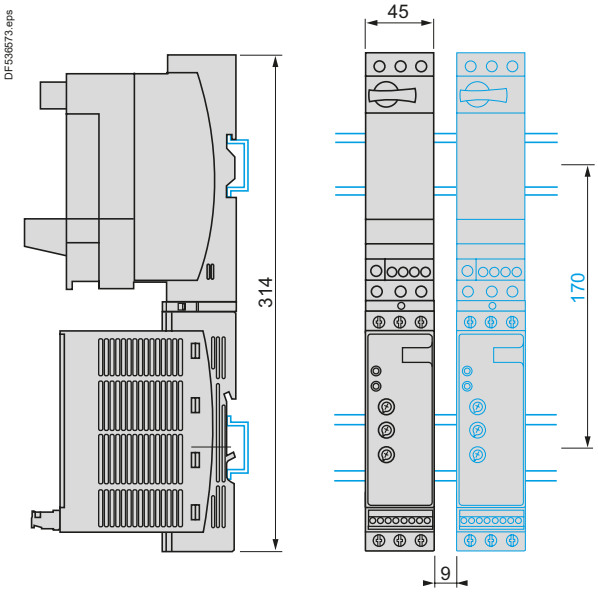
DF536572.eps



TeSys U combination (non-reversing power base) and ATSU01N222LT to ATSU01N232LT

Mounting on ⊥ (35 mm) rail with VW3G4104 connector

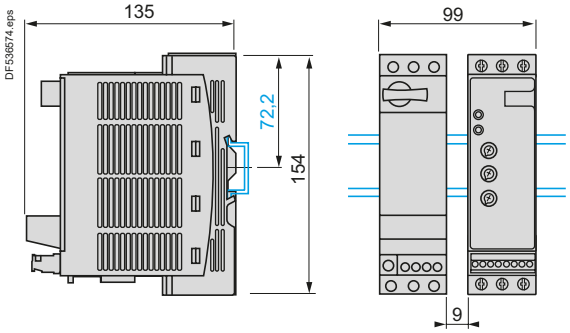
DF536573.eps



TeSys U combination (non-reversing or reversing power base) and ATSU01N222LT to ATSU01N232LT

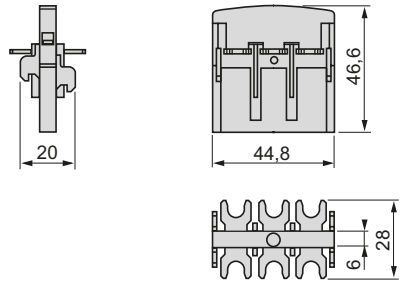
Side by side mounting

DF536574.eps



VW3G4104 connector

DF536575.eps



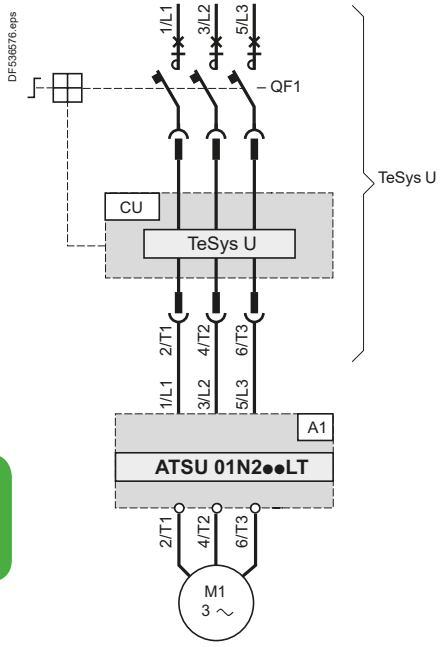
References:
page A4/38

Characteristics:
pages A4/75 and A4/76

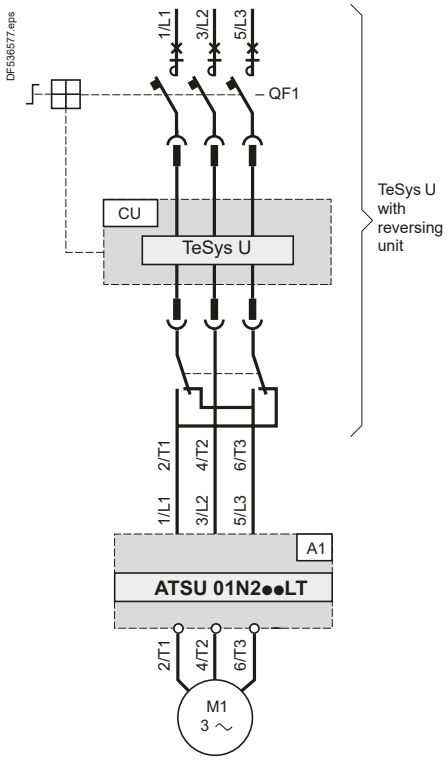
Schemes:
pages A4/78 to A4/81

ATSU01N2●●LT soft start/soft stop units

Power wiring



Power wiring with reversing unit



Compatible components

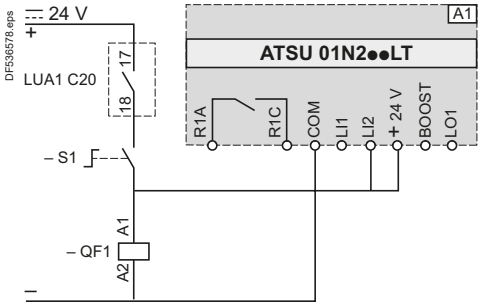
Code	Description
A1	Soft start/soft stop unit
QF1	TeSys U controller-starter
CU	TeSys U control unit

References:
page A4/38
Characteristics:
pages A4/75 and A4/76
Dimensions:
page A4/77

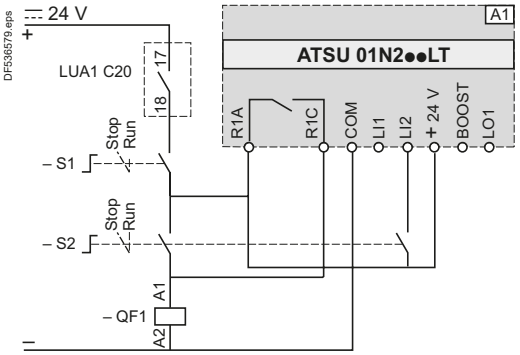
ATSU01N2●●LT soft start/soft stop units *(continued)*

Automatic 2-wire control

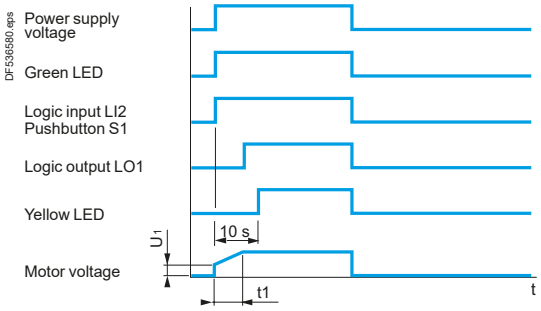
Without deceleration

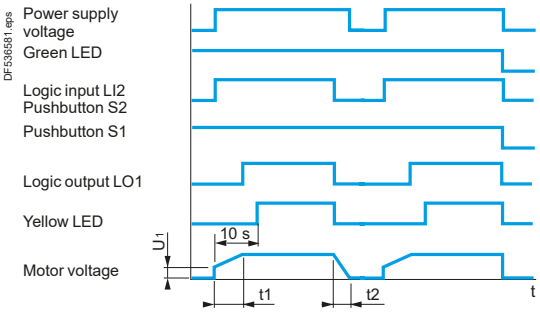


With and without deceleration



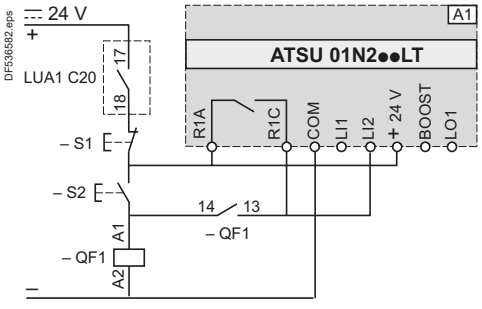
Functional diagrams



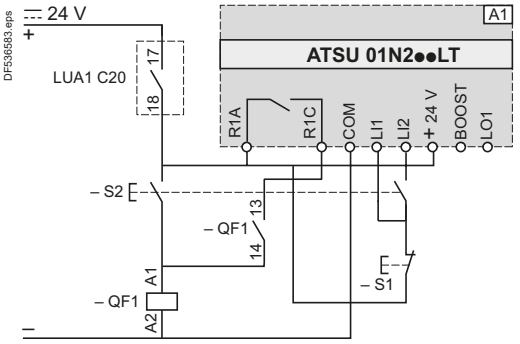


Automatic 3-wire control

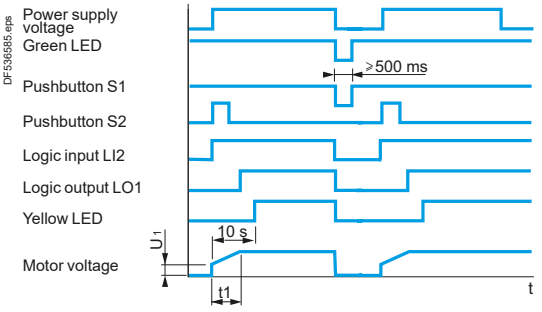
Without deceleration

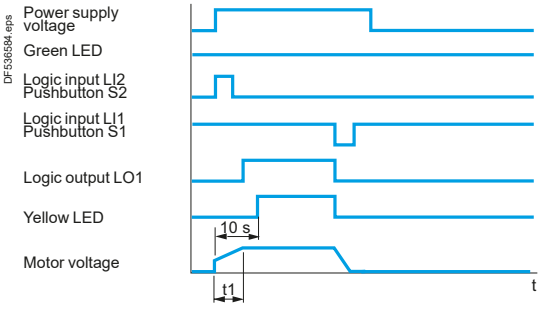


With deceleration



Functional diagrams





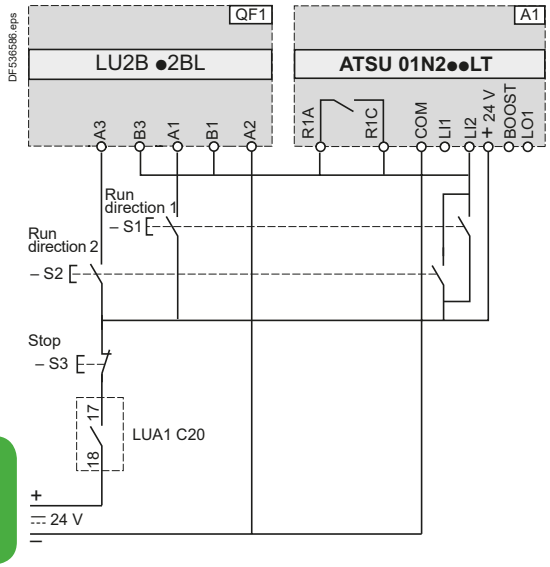
A1: Soft start/soft stop unit
S1, S2: XB4B or XB5B pushbuttons
QF1: TeSys U controller-starter
t1: Acceleration time can be controlled by a potentiometer
t2: Deceleration time can be controlled by a potentiometer
U_1: Starting time can be controlled by a potentiometer

References:
page A4/38
Characteristics:
pages A4/75 and A4/76
Dimensions:
page A4/77

ATSU01N2●●LT soft start/soft stop units *(continued)*

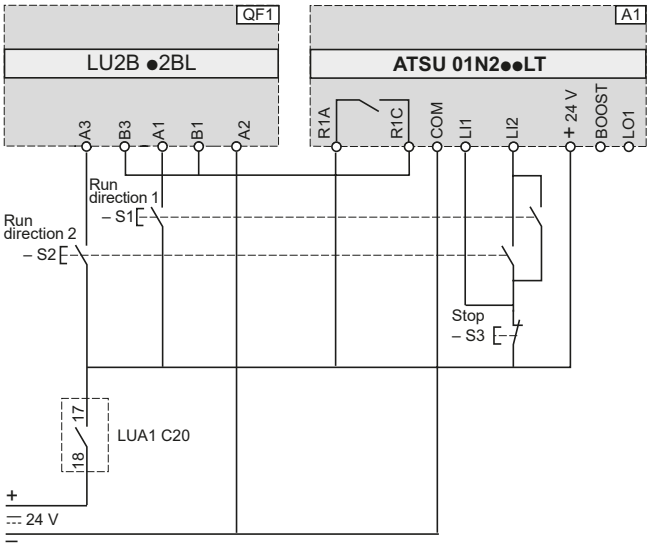
Automatic 3-wire control, with reversing unit

Without deceleration



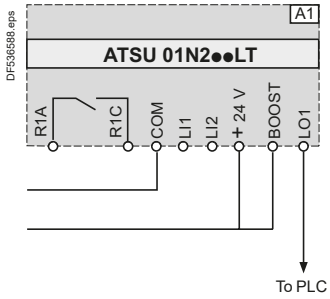
QF1: TeSys U controller-starter with reversing unit
A1: Soft start/soft stop unit
S1, S2, S3: XB4B or XB5B pushbuttons
S3: minimum depression time 500 ms

With deceleration



QF1: TeSys U controller-starter with reversing unit
A1: Soft start/soft stop unit
S1, S2, S3: XB4B or XB5B pushbuttons

Boost on starting and end of starting signal



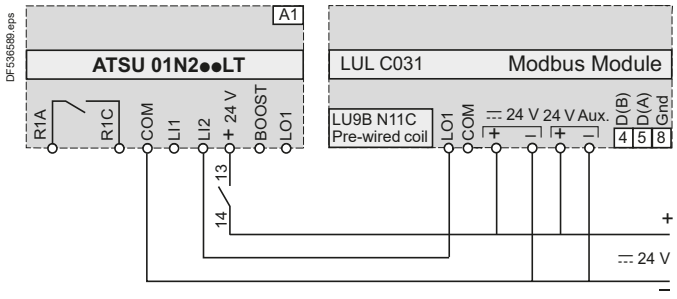
A1: Soft start/soft stop unit

References:
page A4/38
Characteristics:
pages A4/75 and A4/76
Dimensions:
page A4/77

ATSU01N2●●LT soft start/soft stop units *(continued)*

Automatic control with Modbus communication module, with and without deceleration

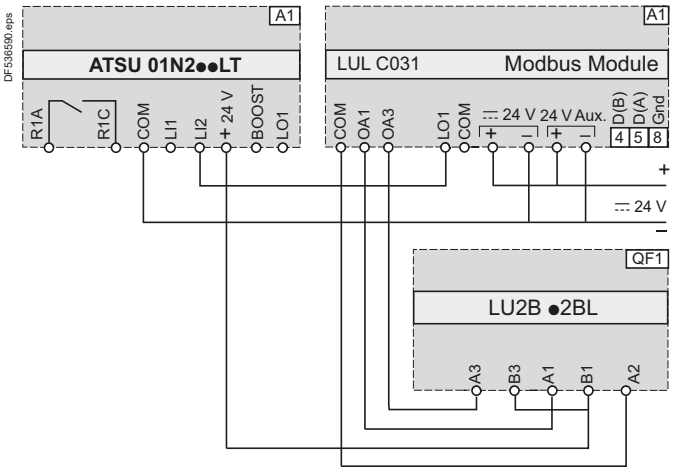
Without reversing unit



Function	Register	Bit	Value
Powering down TeSys U and ATSU			
–	704	0	0
Automatic control without deceleration			
Run	700	0	1
Stop	704	0	0
Automatic control with deceleration			
Run	700	0	1
Soft stop	700	0	0

A1: Soft start/soft stop unit

With reversing unit

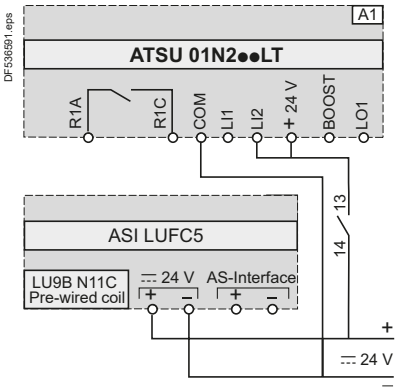


Function	Register	Bit	Value
Powering up TeSys U and ATSU			
Forward	704	0	1
Reverse	704	1	1
Powering down TeSys U and ATSU			
Forward	704	0	0
Reverse	704	1	0
Automatic control without deceleration			
Run	700	0	1
Stop forward	704	0	0
Stop reverse	704	1	0
Automatic control with deceleration (forward or reverse)			
Run	700	0	1
Soft stop	700	0	0

A1: Soft start/soft stop unit
QF1: TeSys U controller-starter with reversing unit

Automatic control with AS-Interface communication module, without deceleration

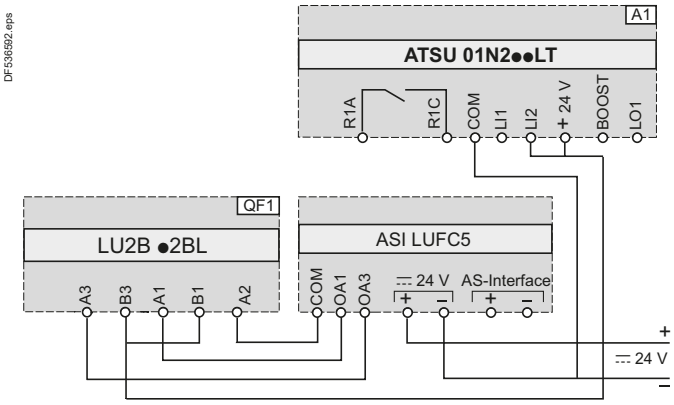
Without reversing unit



Function	Bit	Value
Power-up and automatic control without deceleration		
Run	D0	1
Stop	D0	0

A1: Soft start/soft stop unit

With reversing unit



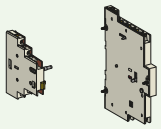
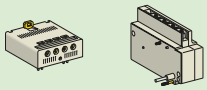
Function	Bit	Value
Power-up and automatic control without deceleration		
Run forward	D0	1
Stop	D0	0
Run reverse	D1	1
Stop	D1	0

A1: Soft start/soft stop unit
QF1: TeSys U controller-starter with reversing unit

References:
page A4/38
Characteristics:
pages A4/75 and A4/76
Dimensions:
page A4/77

TeSys Integral 63
All-in-one motor starter

TeSys Integral 63 All-in-one motor starter

					Page
Introduction					A5/2
Type of product	**Direct**	**Reversing**	**Range**		
3 pole all-in-one motor starter	☑	☑	Up to 33 kW		A5/4
3 pole all-in-one motor starter for resistive loads – AC-1	☑		Up to 63 kW		A5/7
Add-on blocks					A5/8
Accessories and spare parts					A5/10
Technical Data for Designers					A5/17

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Integral 63: a high performance concept for reliability of operation

Integral 63 all-in-one motor starters combine all the functions of a power switching assembly up to 63 A in a single compact device, with performance equivalent to that of the best separate specialist devices.

They conform to the main standards currently in force, in particular IEC 60947-1, IEC 60947-2, IEC 60947-3, IEC 60947-4-1 and IEC 60947-6-2 (welding of power poles impossible), as well as to international approvals UL, CSA…, and the European directives.

The integral range ensures reliability of operation up to 63 A. In addition to safety of operation, integral has numerous other functions: increased protection, communication, remote control, fault identification, isolation, padlocking.

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Functions performed by Integral 63 units

The equipment in a power switching circuit must perform 4 main functions:
- power switching,
- isolation,
- overload protection,
- short-circuit protection.

These functions are traditionally performed by separate devices which must be combined to form a motor starter assembly, the most common being:
- fuses + contactor + thermal overload relay,
- circuit breaker + contactor + thermal overload relay.

Power switching

Contactor (for automatic and remote control)

- Operational power for use in category AC-43:
  - up to 30 kW at 400/415 V 50 Hz,
  - up to 33 kW at 440/415 V 50 Hz.

- Electrical life in number of operating cycles, in category AC-43, at 415 V and at rated power: 1.2 million.

- Mechanical life in number of operating cycles: 5 million.

Reversing pairs

Two 3-pole contactors, horizontally mounted:
- mechanically interlocked.

Can be fitted with the same protection modules as Integral 63 all-in-one motor starter.

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Functions performed by Integral 63 units (continued)

Isolation

Isolation conforming to IEC 60947

Integral 63 all-in-one motor starters provide isolation and padlocking functions conforming to standards IEC 60947.
In addition, Integral 63 “LD4” all-in-one motor starters and “LD5” reversing all-in-one motor starters incorporate specific poles for control testing and padlocking.

Overload protection

Thermal-magnetic protection module (for protection against overload and overcurrent)

A range of interchangeable modules allows the equipment to be adapted to suit:
- the rated operational current (rating and settings),
- the application:
  - motors,
  - frequent starting motors,
  - distribution circuits.

Short-circuit protection

High breaking capacity current limiting circuit breaker

For short-circuit protection.

High breaking capacity with short-circuit limited by ultra-fast tripping.

Possibility of increasing the breaking capacity of the integral unit by adding a current limiter (**LA9LB920**).

The current limiter is fitted upstream of the integral unit.
Several integral units may be fitted downstream of the current limiter
(Ith = 63 A, Ie = 32 A).

Signalling and attachments

These devices provide comprehensive local signalling:
- pole position indicator,
- different signalling for “overload” and “short-circuit”.

They also allow dialogue with the automated control system by means of numerous add-on blocks:
- auxiliary contact and signalling blocks,
- remote electrical reset device,
- undervoltage and shunt trips,
- control circuit switching,
- etc.

Simple fixing and cabling methods

Integral 63 contractor breakers and reversing all-in-one motor starters fit onto 75 mm ⎓ rails using a separate mounting plate.
integral units can also be mounted on:
- panels,
- pre-slotted mounting plates type AM1 P,
- 2 x 35 mm ⎓ rails using sliding clip nuts,
- CMD prefabricated plug-in busbar trunking (providing an economical assembly, combining safety and simplicity of use),
- AK5 panel busbar systems.

References:
pages A5/4 to A5/15
Characteristics:
pages A5/22 to A5/27
Curves:
pages A5/28 to A5/31
Dimensions, schemes:
pages A5/34 to A5/37

Product references

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LD1LD030●

3-pole power bases for AC-3 (1)

Without control test function, with padlocking facility

Standard power ratings of 3-phase motors 50/60 Hz in AC-43					Operational current	Breaking capacity (Iq) for Ue ≤ 415 V	Basic reference (3) To be completed by adding the control circuit voltage code (2)	Weight
220 V 240 V	400 V 415 V	440 V	500 V	660 V				
kW	kW	kW	kW	kW	A	kA		kg
Black knob								
15	30 33	33	37	55	63	50	**LD1LD030●**	3.700

With control test function and padlocking facility

Standard power ratings of 3-phase motors 50/60 Hz in AC-43					Operational current	Breaking capacity (Iq) for Ue ≤ 415 V	Basic reference (3) To be completed by adding the control circuit voltage code (2)	Weight
220 V 240 V	400 V 415 V	440 V	500 V	660 V				
kW	kW	kW	kW	kW	A	kA		kg
Black knob (CNOMO, VDE 0113)								
15	30 33	33	37	55	63	50	**LD4LD130●**	3.800
Red knob on yellow background (CNOMO) Emergency Stop								
15	30 33	33	37	55	63	50	**LD4LD030●**	3.800

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LD5LD130B

3-pole reversing power bases (1)

With control test function and padlocking facility

Standard power ratings of 3-phase motors 50/60 Hz in AC-43					Operational current	Breaking capacity (Iq) for Ue ≤ 415 V	Basic reference (3) To be completed by adding the control circuit voltage code (2)	Weight
220 V 240 V	400 V 415 V	440 V	500 V	660 V				
kW	kW	kW	kW	kW	A	kA		kg
Black knob (CNOMO, VDE0113)								
15	30 33	33	37	55	63	50	**LD5LD130●**	7.600
Red knob on yellow background (CNOMO) Emergency Stop								
15	30 33	33	37	55	63	50	**LD5LD030●**	7.600

(1) To be completed with a protection module (to be ordered separately).
(2) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Volts	24	36	42	48	110	120	220	230	240	380 400	415	440	480	500	600	660
50 Hz	B	–	D	E	F	–	M	M	U	Q	N	N	–	S	–	Y
60 Hz	BC	CC	–	CE	K	FC	LC	MC	MC	–	–	UX	Q	–	S	–
⎓ (4)	BD	–	–	ED	FD	–	–	–	–	–	–	–	–	–	–	–

*(3) Variant: UL508 "type E" approved version (SPCD) at 347/600 V; to order, add suffix **H5** to the reference.*
*Example: **LD1LD030MH5**.*
(4) For use on d.c., the unit is supplied with 1 or 2 converters, including coil suppression devices (2 converters for reversing all-in-one motor starters).

Product references

PB121273.eps



LB1LD03M●●

Thermal-magnetic protection modules (compensated and differential for normal starting motors) (1)

Fixed magnetic protection, set at 15 Irth max, for mounting on Integral 63

Standard power ratings of 3-phase motors 50/60 Hz in category AC-43					Thermal setting range (Irth min to Irth max)	Magnetic protection	Reference	Weight
220 V 240 V	400 V 415 V	440 V	480 V 525 V	600 V 690 V				
kW	kW	kW	kW	kW	A	A		kg
3	5.5	5.5	7.5	10	10…13	–	**LB1LD03P16**	0.780
4	9	9	11	15	13…18	–	**LB1LD03P21**	0.780
5.5	11	11	15	18.5	18…25	–	**LB1LD03P22**	0.780
7.5	15	15	18.5	22	23…32	–	**LB1LD03P53**	0.780
9	22	22	25	33	28…40	–	**LB1LD03P55**	0.780
11	25	25	33	45	35…50	–	**LB1LD03P57**	0.780
15	33	33	40	55	45…63	–	**LB1LD03P61**	0.780

Adjustable magnetic protection from 6 to 12 Irth max, for mounting on Integral 63

Standard power ratings of 3-phase motors 50/60 Hz in category AC-43					Thermal setting range (Irth min to Irth max)	Magnetic protection	Reference	Weight
220 V 240 V	400 V 415 V	440 V	480 V 525 V	600 V 690 V				
kW	kW	kW	kW	kW	A	A		kg
3	5.5	5.5	7.5	10	10…13	78…156	**LB1LD03M16**	0.780
4	9	9	11	15	13…18	108…216	**LB1LD03M21**	0.780
5.5	11	11	15	18.5	18…25	150…300	**LB1LD03M22**	0.780
7.5	22	22	25	33	23…32	190…380	**LB1LD03M53**	0.780
9	22	22	25	33	28…40	240…480	**LB1LD03M55**	0.780
11	25	25	33	45	35…50	300…600	**LB1LD03M57**	0.780
15	33	33	40	55	45…63	380…760	**LB1LD03M61**	0.780

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LB6LD03M●●

Magnetic only protection modules (for frequent starting motors)

Standard power ratings of 3-phase motors 50/60 Hz in category AC-43					Magnetic protection	Reference	Weight
220 V 240 V	400 V 415 V	440 V	480 V 525 V	600 V 690 V			
kW	kW	kW	kW	kW	A		kg
3	5.5	5.5	7.5	10	78…156	**LB6LD03M16**	0.780
4	9	9	11	15	108…216	**LB6LD03M21**	0.780
5.5	11	11	15	18.5	150…300	**LB6LD03M22**	0.780
7.5	22	22	25	33	190…380	**LB6LD03M53**	0.780
9	22	22	25	33	240…480	**LB6LD03M55**	0.780
11	25	25	33	45	300…600	**LB6LD03M57**	0.780
15	33	33	40	55	380…760	**LB6LD03M61**	0.780

(1) Protection modules UL and CSA approved.

Product references

PB121271.eps



LD1LD030●

3-pole power bases for AC-1 (1)

Without control test function, with padlocking facility

Rated thermal current I th θ ≤ 40 °C	Maximum operational current AC-1 θ ≤ 40 °C	Maximum operational voltage	Breaking capacity (Iq) for Ue ≤ 415 V	Number of poles	Basic reference. To be completed by adding the control voltage code (2)	Weight
A	A	V	kA			kg
Black knob						
63	63	690	50	3	**LD1LD030●**	3.700

With control test function and padlocking facility

Rated thermal current I th θ ≤ 40 °C	Maximum operational current AC-1 θ ≤ 40 °C	Maximum operational voltage	Breaking capacity (Iq) for Ue ≤ 415 V	Number of poles	Basic reference. To be completed by adding the control voltage code (2)	Weight
A	A	V	kA			kg
Black knob (CNOMO. VDE0113)						
63	63	690	50	3	**LD4LD130●**	3.800
Red knob on yellow background (CNOMO. VDE0113) Emergency Stop						
63	63	690	50	3	**LD4LD030●**	3.800

Protection modules (for customer assembly)

Thermal-magnetic (compensated)

Thermal setting range (Irth min./Irth max.)	Magnetic setting range (3…6 Irth max)	Number of poles	Number of protected poles	Reference	Weight
A	A				kg
10…13	39…78	3	3	**LB1LD03L16**	0.780
13…18	54…108	3	3	**LB1LD03L21**	0.780
18…25	75…150	3	3	**LB1LD03L22**	0.780
23…32	95…190	3	3	**LB1LD03L53**	0.780
28…40	120…240	3	3	**LB1LD03L55**	0.780
35…50	150…300	3	3	**LB1LD03L57**	0.780
45…63	190…380	3	3	**LB1LD03L61**	0.780

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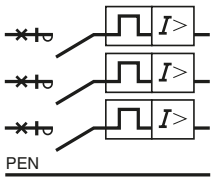
LB1LD03L●●

(1) To be completed with a protection module (to be ordered separately).
(2) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

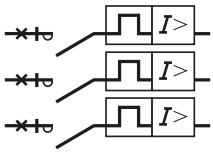
Volts	24	36	42	48	110	120	220	230	240	380 400	415	440	480	500	600	660
50 Hz	B	–	D	E	F	–	M	M	U	Q	N	N	–	S	–	Y
60 Hz	BC	CC	–	CE	K	FC	LC	MC	MC	–	–	UX	Q	–	S	–
⎓ (3)	BD	–	–	ED	FD	–	–	–	–	–	–	–	–	–	–	–

(3) For use on d.c., the unit is supplied with a converter, including coil suppression device.

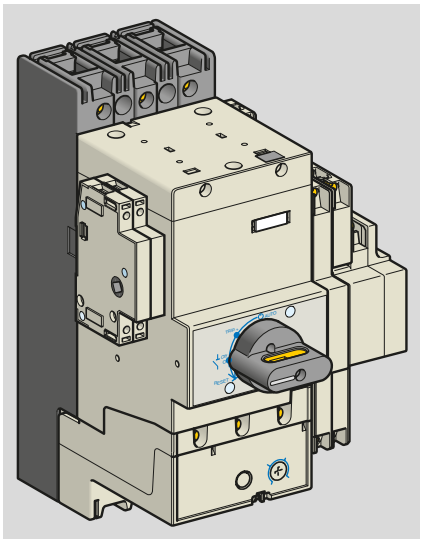
Selection of all-in-one starter and protection module for AC-1

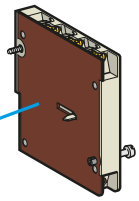
Earthing system	Type of circuit	Equipment scheme	Product combinations 3-pole all-in-one starter + protection module
TNC (Neutral and PE are combined)	3-pole + PEN		LD1LD030● + LB1LD03L●● LD4LD130● + LB1LD03L●● LD4LD030● + LB1LD03L●●

Note: *the PEN conductor must not be isolated,*

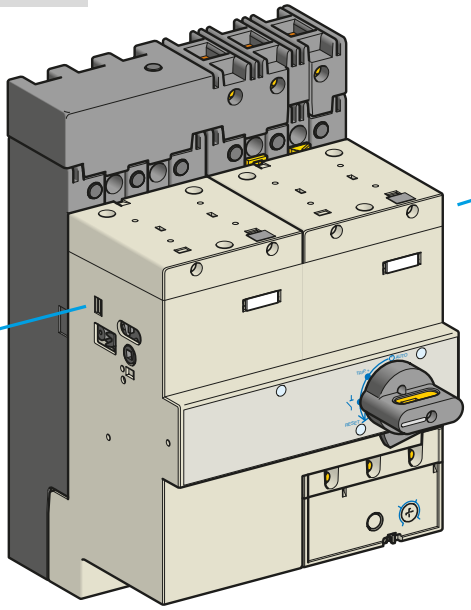
Earthing system	Type of circuit	Equipment scheme	Product references 3-pole all-in-one starter + protection module
TNS (Neutral and PE are separated)	3-pole		LD1LD030● + LB1LD03L●● LD4LD130● + LB1LD03L●● LD4LD030● + LB1LD03L●●

Note: *all live conductors must be isolated. Neutral protection optional.*

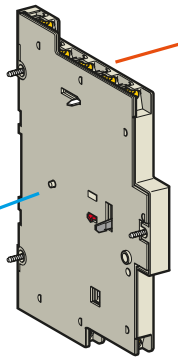




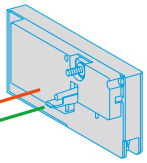
LA1 LC020



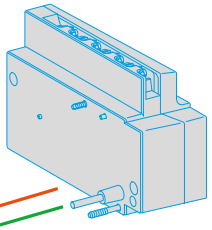
LD5 LD + LB● LD



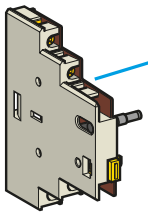
LA1 LC012



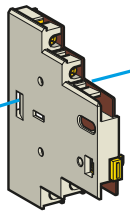
LA1 LC07●●



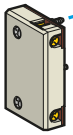
LA1 LC052●



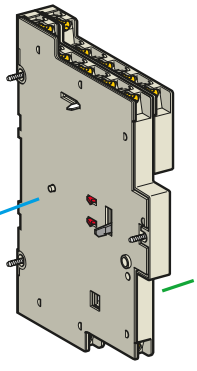
LA1 LC031



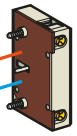
LA1 LC021



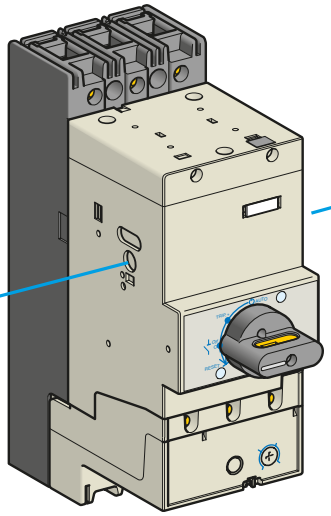
LA1 LC001



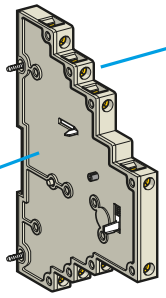
LA1 LC010



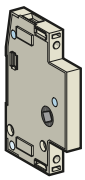
LA1 LC001



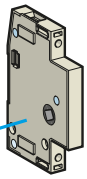
LD1 LD + LB● LD
LD4 LD + LB● LD



LA1 LC025



LA1 LC030
(LD4)



LA1 LC030
(LD4)

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Product references

Instantaneous auxiliary contact blocks (IP 20) (1)

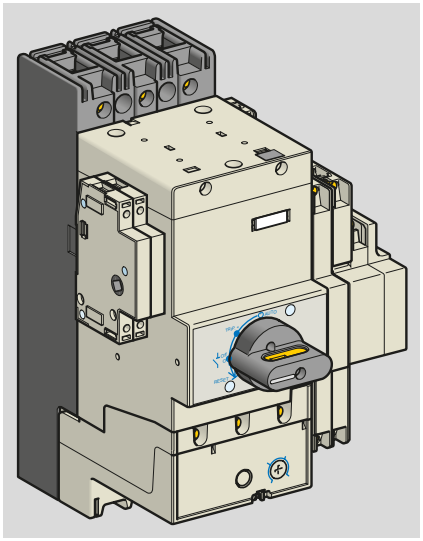
For use on	Type and number of blocks per unit	Composition N/O	N/C	C/O	Reference
LD1D, LD4 or **L5** Mounted on RH side	1 block of 6 contacts comprising:				**LA1LC010**
	■ 3 signalling contacts “contactor state”	**2**	**1**	**–**	
		–	**–**	**1**	
	■ 1 signalling contact “control knob in any position other than Auto”	**–**	**–**	**1**	
	■ 1 signalling contact tripped on short-circuit				
	■ 1 signalling contact “tripped”	**–**	**–**	**1**	
	1 block of 5 contacts comprising:				**LA1LC012**
	■ 3 signalling contacts “contactor state”	**2**	**1**	**–**	
		1	**–**	**–**	
	■ 1 signalling contact tripped on short-circuit	**1**	**–**	**–**	
	■ 1 signalling contact “tripped”				
	1 block of 4 contacts comprising:				**LA1LC025**
	■ 3 signalling contacts “contactor state”	**2**	**1**	**–**	
		1	**1**	**–**	
	■ 1 signalling contact “tripped”, selectable by the user				
	1 block of 3 signalling contacts “contactor state”	**2**	**1**	**–**	**LA1LC020**
LD4 Mounted on LH side	1 control circuit isolating block (1 or 2 blocks per unit)	**1**	**–**	**–**	**LA1LC030**
LD5 Mounted on LH side	1 block of 3 signalling contacts “contactor state”	**2**	**1**	**–**	**LA1LB021**
	1 control circuit isolating block comprising 2 contacts	**2**	**–**	**–**	**LA1LC031**

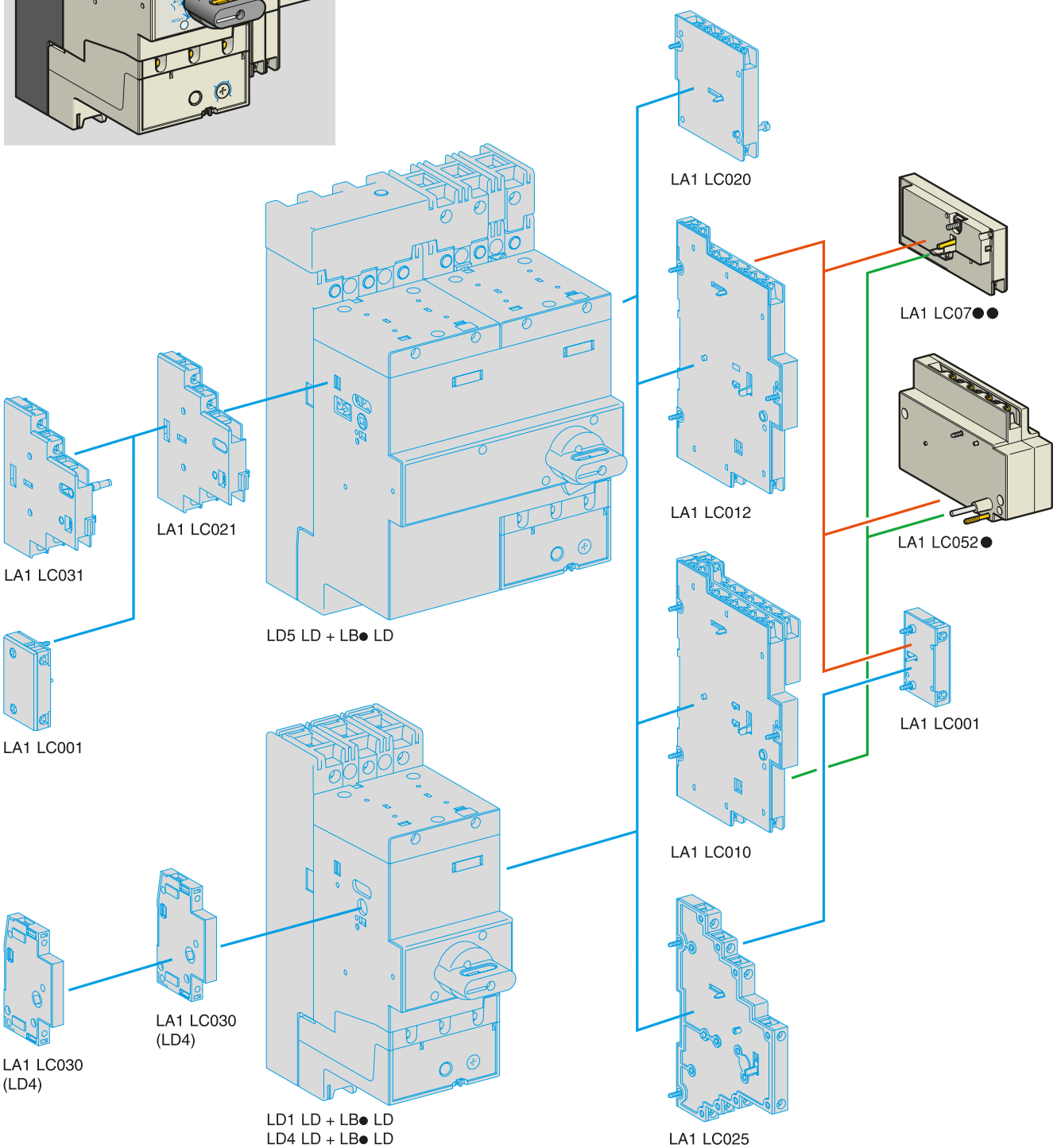
Signalling contact block (IP 10) (1)

For use on	Type and number of blocks per unit	Composition N/O	N/C	C/O	Reference
LD1, LD4 or LD5	1 block comprising 1 signalling contact “contactor state” Mounted on LH or RH side	**–**	**1**	**–**	**LA1LC001**

(1) UL and CSA approved.

DF5111509.eps





Life Is On Schneider Electric

Product references

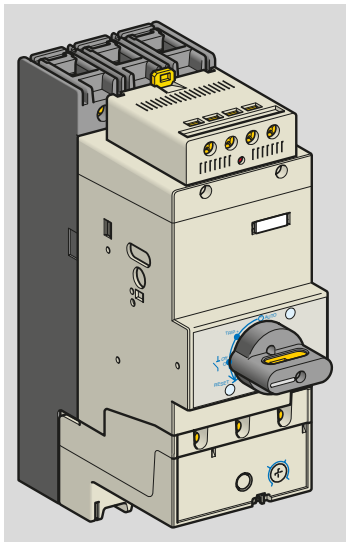
Electrical tripping and reset devices

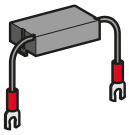
For use on	Type and number of devices per unit		Basic reference. To be completed by adding the control voltage code (1)
LD1, LD4 or **LD5** fitted with an **LA1LC010** or **LA1LC012** block	1 undervoltage trip	Time delay 0.2 s	**LA1LC070●**
		Instantaneous	**LA1LC072●**
	or 1 shunt trip	Instantaneous	**LA1LC071●**
LD1, LD4 or **LD5** fitted with an **LA1LC010** or **LA1LC012** add-on block	1 remote electrical reset device	24 V 50/60 Hz	**LA1LC052B**
		42 V 50 Hz 48 V 50/60 Hz	**LA1LC052E**
		100/127 V 50/60 Hz	**LA1LC052F**
		200/240 V 50/60 Hz	**LA1LC052M**

(1) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

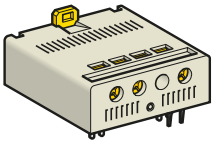
Volts	24	48	110	120	220/230	240	380/400	415	440
50 Hz	B	E	F	–	M	U	Q	N	N
60 Hz	B	E	F	F	M	M	Q	–	N

DF511510.eps

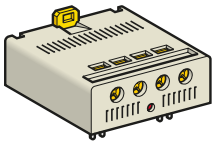




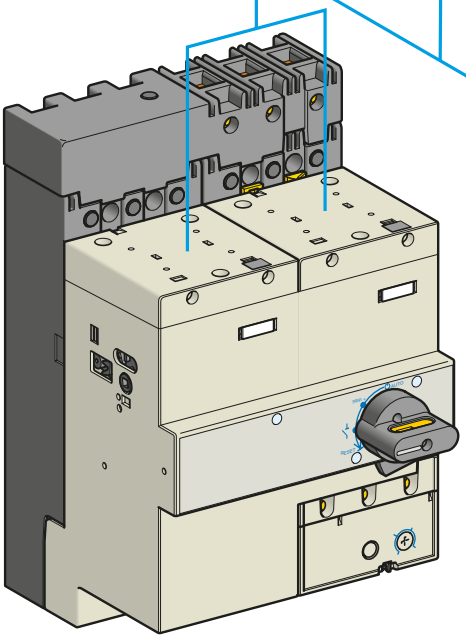
LA9 D09982



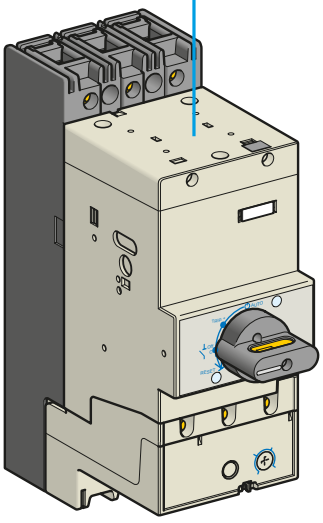
LA1 LD080●D



LA1 LD180BD
LA1 LD580●D



LD5 LD+LB● LD



LD1 LD+LB● LD
LD4 LD+LB● LD

Life Is On Schneider Electric

Interface modules for coil control by a programmable Logic controller [1]

Mounting	Type	Input control voltage ⎓	Output operational voltage 50/60 Hz	Reference
		V	V	
On top of the power base	Solid state	5…24	24…240	**LA1LD180BD**
	Relay output	24	24…240	**LA1LD580BD**
		48	24…240	**LA1LD580ED**

Voltage converters for d.c. control by a PLC

Each converter is dedicated to a specific coil.
The d.c. coil and its voltage converter are automatically delivered with every d.c. power base.

Input voltage ⎓	Consumption (Inrush)	Consumption (Sealed)	Reference
V	W	W	
24	300	8	**LA1LD080BD**
48	300	8	**LA1LD080ED**
110	300	8	**LA1LD080FD**

Suppressor module

Mounting	Type	Operational voltage 50/60 Hz	Reference
		V	
Clip-on	RC circuit (Resistor-Capacitor) [2]	≤ 250	**LA9D09982**

(1) For reversing all-in-one motor starters, order 2 interface modules or 2 voltage converters.
(2) An RC circuit provides effective protection for circuits highly sensitive to high frequency interference. Voltage limited to 3 Uc max. and oscillating frequency limited to 400 Hz max. Slight increase in drop-out time (1.2 to 2 times the normal time).

Product references

PB121274.eps



LA1LC090

PB121275.eps



LA9LD010

Protection accessories

Description	For use on	Sold in lots of	Unit reference
Power terminal protection shroud	Upstream power terminals (L1, L2, L3)	5	**LA9LD701**
Sealing cover	Protection module	1	**LA1LC090**

Mounting accessories

Description	For use on	Mounting on	Reference
Mounting plate	LD1, LD4, LD5	1 x 75 mm ⊐ rail or 2 x 32 mm ⊏⊐ rails	**LA9LD010**

Door interlock mechanisms (IP 54)

Type	For use on	Colour of knob	Unit reference
Adjustable from 0 to 185 mm with extension (control knob mounted on plate or door)	LD1	Red	**LA9LC330**
		Black	**LA9LC331**
	LD4, LD5	Red	**LA9LC530**
		Black	**LA9LC531**

Product references

PB121276.eps



LX1LD●●●

Replacement a.c. coils

Rated control circuit voltages		Average resistance at 20 °C ±10 %	Inductance of closed circuit	Voltage code (1)	Reference
Uc 50 Hz	Uc 60 Hz				
V	V	Ω	H		
–	24	0.213	0.045	**BC**	**LX1LD020**
24	–	0.323	0.071	**B**	**LX1LD024**
–	36	0.503	0.106	**CC**	**LX1LD030**
–	48	0.845	0.19	**CE**	**LX1LD040**
42	–	0.987	0.22	**D**	**LX1LD042**
48	–	1.26	0.29	**E**	**LX1LD048**
–	110	4.88	1	**K**	**LX1LD090**
–	115/120	5.89	1.18	**FC**	**LX1LD100**
110	–	6.48	1.48	**F**	**LX1LD110**
127	–	9.80	2.13	**G**	**LX1LD127**
–	220	19.82	4.2	**LC**	**LX1LD180**
–	230/240	23.24	4.5	**MC**	**LX1LD190**
220/230	–	30.51	6.7	**M**	**LX1LD220**
240	–	37.66	7.9	**U**	**LX1LD240**
–	440	80.46	16.7	**UX**	**LX1LD360**
380/400	460/480	93.63	20	**Q**	**LX1LD380**
415/440	–	116.46	23.7	**N**	**LX1LD415**
500	575/600	152.18	31	**S**	**LX1LD500**
660	–	290.80	60	**Y**	**LX1LD660**

Consumption at 50 Hz: inrush (cos φ: 0.55) 350 to 400 VA; sealed (cos φ: 0.28) 20 to 30 VA.

Consumption at 60 Hz: inrush (cos φ: 0.55) 420 to 500 VA; sealed (cos φ: 0.30) 24 to 36 VA.

(1) Coil voltage code, used to complete the power base basic reference.

Replacement d.c. coils and associated voltage converters (2)

Mounting	For use on power base ref.	Input operational voltage ⎓ (3)	Consumption		Description	Reference (4)
			Inrush	Sealed		
		V	W	W		
On top of power base	LD●LD●●●BD	24	300	8	Coil	**LX1LD0249**
					Converter	**LA1LD080BD**
	LD●LD●●●ED	48 (5)	300	8	Coil	**LX1LD0489**
					Converter	**LA1LD080ED**
	LD●LD●●●FD	110	300	8	Coil	**LX1LD01109**
					Converter	**LA1LD080FD**

(2) For reversing all-in-one motor starters, order 2 interface modules or 2 voltage converters.
(3) When used on rectified single-phase or 3-phase supply, the peak to peak ripple voltage must be equal to or less than 0.14 of the average voltage.
Operating limits 0.8 to 1.1 Uc for an ambient temperature ⩽ 40 °C.
(4) It is essential that the voltage converter be associated with the specific coil indicated.
(5) 24 V and 48 V converters can be operated by "Low level input". In this case, the control circuit voltage must be the same as the supply voltage (24 or 48 V).

Integral 63

Introduction: pages A5/18 to A5/21
Characteristics: pages A5/22 to A5/27
Curves: pages A5/28 to A5/31
Dimensions, schemes: pages A5/34 to A5/37

Integral 63

Technical Data for Designers

Contents

Introduction ..... A5/18 to A5/21
Characteristics ..... A5/22 to A5/27
Curves ..... A5/28 to A5/31
Operating status indication..... A5/32 and A5/33
Dimensions, mounting ..... A5/34 and A5/35
Schemes..... A5/36 and A5/37
Terminology ..... A5/38 to A5/41

When designing an installation, it is essential to take into account precise criteria for determining the conductor c.s.a. and selecting equipment.
In particular:
- permissible currents for the conductors,
- maximum voltage drops,
- short-circuit protection,
- protection against indirect contact.

The latter three criteria must be taken into account when selecting the integral unit.

The principle behind the rules described below is, on the whole, common to all European publications. However, the calculations and values concerning protection against indirect contact are based on French standard NF C 15-100, and it is up to the user to check the regulations in force in the country concerned.

Cable protection against overload

To achieve this, the thermal setting value Irth selected must be greater than the current drawn I_B and less than or equal to the permissible current Iz in the cable to be protected.
$I_B < Irth \leqslant Iz$

Short-circuit protection

Breaking capacity rule

Check that the breaking capacity (BC) of the integral unit is equal to or greater than the prospective short-circuit current (Isc max) at the point where it is to be installed.
BC ⩾ Isc max

Breaking time rule

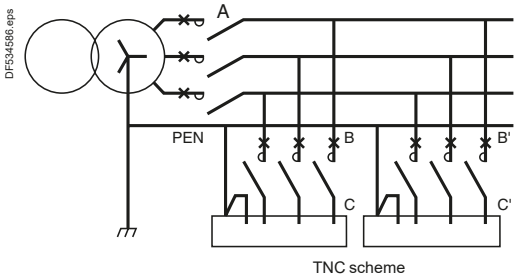
2 conditions must be fulfilled:
- The short-circuit current at the end of the circuit, Isc min, must be greater than or equal to the minimum current required for magnetic tripping of the device,
- The short-circuit current at the start of the circuit, Isc max, must be such that:

$\mathbf{I^2sc\ max\ t_m \leqslant I^2_o t_o}$ $\mathbf{I^2_o t_o}$ = permissible thermal stress limit for the circuit, $\mathbf{t_m}$ = operating time of the integral unit or of the short-circuit protection device.

These 2 checks need only be made when modules with a low rating are used.
Example: for a 6.3/10 A module, a cable c.s.a. ⩾ 2.5 mm² is required to withstand Isc max = 50 kA.

Protection against indirect contact in TN schemes

TN multiple earthed neutral scheme



TNC scheme

- Neutral is connected to earth.
- The earths are connected to neutral.
- Any phase/earth insulation fault causes a short-circuit.
- As contact voltage is dangerous, breaking must occur at the first fault.
- The PE conductor and the neutral conductor may be:
  - combined (TNC scheme),
  - separate (TNS scheme).

Protection against indirect contact in TN schemes

■ Protection against indirect contact (TN schemes), for dead shorts only, requires that the following 2 conditions be fulfilled simultaneously:

□ the fault current Id must be greater than or equal to the minimum current required for magnetic tripping of the integral unit, i.e. 1.12 μ Irth max.

$$Id = c.q.\frac{Uo}{Zb}$$

$$R = \rho\frac{L}{S} = 2\rho\frac{Lc}{S}$$

c = coefficient taking into account the upstream part of the fault loop impedance assumed to be equal to 0.8, unless otherwise indicated.
q = coefficient dependent on the earth connection scheme and equal to 1 in the TN scheme.
Uo = phase-neutral voltage in volts.
Zb = fault loop impedance in mΩ/m such that:
Zb ≠ R (fault loop resistance).
L = length of the fault loop equal to twice the length **Lc** of the circuit.
S = Sph, c.s.a of the phase conductors = S_{PE} = c.s.a. of the protective conductors.
ρ = resistivity of the copper = 0.0225.
μ = ratio between the magnetic tripping current and the maximum setting current of the instantaneous thermal tripping device.

□ the contact voltage (U_L) for a dead short is at most equal to the value determined by the safety curve for the operating time tm of the integral unit in its magnetic tripping zone.
This condition is generally fulfilled for power supplies of 230/415 V.
(In fact, for U_L = 50 V, a tm ⩽ 500 ms would be required and for U_L = 25 V, a tm ⩽ 110 ms would be required).

The first condition allows us to calculate the maximum length of the circuit to provide protection against indirect contact in the TN scheme.
For the TN scheme:

$$L \leqslant \frac{c.q.Uo.Sph}{2\rho.1.\mu\ Irth}$$

i.e. $$L\ max = \frac{0.8 \times Uo \times Sph}{2 \times 0.0225 \times 1.2\ \mu\ Irth\ max}$$

Maximum length of 230/415 V circuits with TN scheme

C.s.a.	Irth max.	μ = 3	μ = 6	μ = 12	μ = 15
mm²	A	m	m	m	m
1.5	10	180	90	45	36
	16	112	56	28	22
2.5	10	298	149	75	60
	16	186	93	47	37
	25	118	59	32	–
	32	92	46	23	–
4	16	296	148	74	60
	25	190	95	48	–
	32	148	74	37	–
	40	118	59	30	–
6	25	284	142	71	–
	32	222	111	56	–
	40	178	89	45	–
	50	142	71	36	–
10	32	370	185	93	–
	40	296	148	74	–
	50	236	118	59	–
	63	188	94	47	–
16	32	590	295	148	–
	40	472	236	118	–
	50	378	189	95	–
	63	300	150	75	–
25	32	922	461	281	–
	40	738	369	185	–
	50	590	295	148	–
	63	468	234	117	–

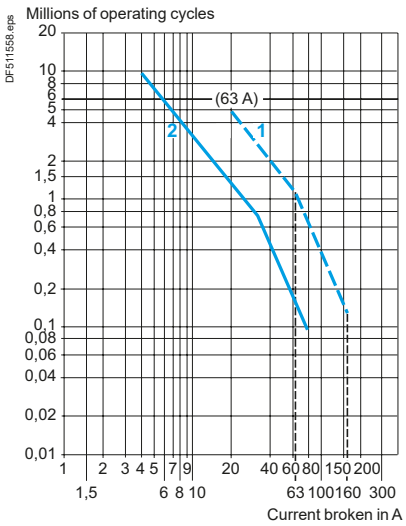
References: pages A5/4 to A5/15
Characteristics: pages A5/22 to A5/27
Curves: pages A5/28 to A5/31
Dimensions, schemes: pages A5/34 to A5/37

Selection for a temperature θ ≤ 40 °C						
Rated operational voltage	**V**	**220/240**	**400/415**	**440**	**480/525**	**600/690**
Rated operational currents (according to the rated operational voltage)						
Integral 63	**A**	63	63	63	63	63
Rated operational powers (for standard motors)						
Integral 63	**kW**	15	33	33	37	55

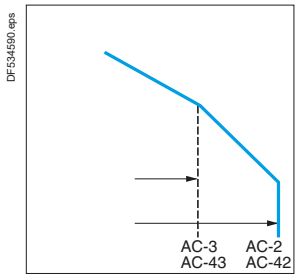
Electrical durability

Control and protection of motors at Ue ≤ 415 V

- in utilisation categories AC2, AC3 conforming to IEC 60947-4-1,
- in utilisation categories AC2, AC3 conforming to IEC 60947-6-2.



1 Not having previously broken a short-circuit current
2 Having broken a short-circuit current 10 times at 30 Ie (most common values of short-circuit current during operation)



a.c. supply, utilisation categories AC-1, AC-3, AC-41, AC-43

Rated operational currents (according to ambient temperature)

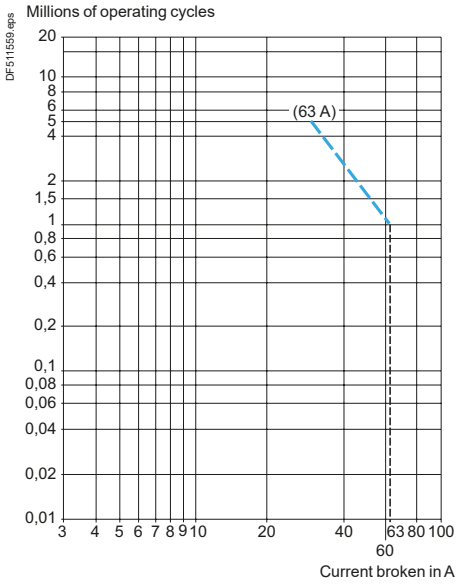
	With cable c.s.a.		θ ≤ 40 °C	θ ≤ 55 °C	θ ≤ 70 °C
Integral 63	16 mm²	**A**	63	55	50

a.c. supply, utilisation categories AC-1, AC-41

Maximum operating rates in operating cycles/hour

		On-load factor 85 %		On-load factor 25 %
		Operation at Ie max	Operation at 0.5 Ie	Operation at Ie max
Integral 63	**Operating cycles/h**	1200	2400	1800

Electrical durability Ue ≤ 415 V



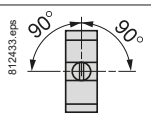
Note: *for use in category AC-44, please consult your Regional Sales Office.*

Ref.
Integral 63

Characteristics

Type			Integral 63
Number of poles			3
Rated operational current (Ie)	In AC-3	**A**	63
Rated operational voltage (Ue)		**V**	690
Electrical durability	In AC-3 at 400 V		1.2 million operating cycles
Mechanical durability at Uc			5 million operating cycles
Maximum operating rate at ambient temperature ≤ 55 °C	~		3600 operating cycles/hour
	⎓ with converter		600 operating cycles/hour

Environment

Conforming to standards				IEC: 158-1, 204-1, 204-2, 364, 947-1/2 and 4
				UTE: NF C 63-110, C 63-120, C 63-130, C 63-650, C 79-100, C 20-040
				VDE: 0100, 0110, 0113, 0170, 0171, 471, 0660
				BS: 5424, 4752, 4941
				NEN, NBN
Product certifications				ASE, ASEFA, ASTA, BV, CSA, DEMKO, DNV, GL NEMKO, NKK, ÖVE, RINA, SCC, SETI, UL, USSR, LROS
Protective treatment				"TH"
Ambient air temperature around the device	~	Operation	**°C**	-20…+60
		Storage	**°C**	-40…+80
	⎓ (1)	Operation	**°C**	-25…+50
		Storage	**°C**	-25…+70
Vibration resistance Permissible acceleration	5…100 Hz			Energised state: 3 gn
				De-energised state: 3 gn
Shock resistance Permissible acceleration	Impulse duration: 11 ms			Energised state: 8 gn
				De-energised state: 8 gn
Degree of protection	Conforming to IEC 60144 & 60529			IP 20B
	Conforming to VDE 0106			Protection against direct finger contact
Flame resistance				Conforming to IEC 60295-2-1, NF C 20-455 and decree of 22-12-81 (JO 27 NC of 1st and 2/2/1982) Conforming to UL 94 - V0 and NF T 51-072
Maximum operating altitude	Without derating		**m**	3000
Operating positions (without derating)	In relation to normal vertical mounting plane			From main axis (left-right tilt) 

Control circuit characteristics

Rated control circuit voltage (Uc)	~ 50 Hz		**V**	24…660
	~ 60 Hz		**V**	24…600
	⎓ with converter		**V**	24, 48, 110
Voltage limits at θ ≤ 55 °C	Operation			0.85…1.1 Uc
	Drop-out			0.25…0.7 Uc
Average consumption at 20 °C and at Uc	~	Inrush	**VA**	375 (50 Hz), 450 (60 Hz)
		Sealed	**VA**	25 (50 Hz or 60 Hz)
	⎓ (1)	Inrush	**W**	300 for 50 ms
		Sealed	**W**	8
Heat dissipation			**W**	8 (50 Hz), 11 (60 Hz)
Operating time (2) at 20 °C and at Uc	~ 50/60 Hz	"C"	**ms**	12…35
		"O"	**ms**	7…20
	⎓ with converter	"C"	**ms**	25…40
		"O"	**ms**	15…25

(1) With converter.
(2) The closing time "C" is measured from the moment the coil supply is switched on to initial contact of the main poles.
The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separate.

Characteristics

Pole characteristics

Type			Integral 63					
Conventional thermal current (Ith)	θ ≤ 40 °C	A	63					
Frequency limits of the operational current		Hz	40…60					
Rated impulse withstand voltage (Uimp)	Conforming to IEC 60947-4	kV	8					
Rated insulation voltage (Ui)	Conforming to IEC 60947-1	V	690					
Heat dissipation in the power circuits of the all-in-one motor starter and its protection module	Operational current	A	25	32	40	50	63	
	Power per pole, hot state	W	4.4	5	5.8	7	9	
Rated making capacity								
I rms	Conforming to IEC 60947-4	A	12 or 15 x Ith (above this value. the breaker trips)					
I peak	Conforming to IEC 60947-2	kA	105					
Rated breaking capacity								
conforming to IEC 60947-2	Operational voltage	V	**220/240**	**380/415**	**440**	**480/525**	**600/690**	
	Value of cos φ		0.25	0.25	0.25	0.25	0.5	
	Cycle P1 (O-t-CO) Icu (1)	kA rms	50	50	50	35	10	
	Cycle P2 (O-t CO-t-CO) Ics (1)	kA rms	50	50	50	35	10	
conforming to IEC 60947-6-2 ensuring reliability of operation	Icu = Ics	kA rms	up to 80 (see table page A5/27)	up to 80 (see table page A5/27)	50	30	10	
Total breaking time		ms	4					
Electrical durability in AC-3 at Ie max and at 415 V after 1 cycle O-CO-r-CO at Isc	Prospective rms short-circuit current at terminals of a new device	kA	3	10	25	35	50	80
	Millions of operating cycles		1	0.9	0.6	0.5	0.2	(2)
Thermal limit	With Isc max. at 415 V, 50 Hz	A^2s	300 x 10^3					
Cabling			Maximum c.s.a.		Minimum c.s.a.			
	Flexible cable without cable end	mm^2	1 x 50 or 2 x 35		1 x 6			
	Flexible cable with cable end	mm^2	2 x 25		1 x 6			
	Solid cable	mm^2	1 x 50		1 x 6			
Tightening torque		N.m	6					

Characteristics of thermal-magnetic or magnetic only protection modules

Module type			LB1LD03P	LB1LD03M	LB6LD03M	LB1LD03L
Protection			Standard motors	Standard motors	Frequent starting	Distribution circuits
	Conforming to standards		NF C 63-650	NF C 63-650	NF C 63-650	NF C 63-120
	Number of poles		3	3	3	3
	Number of protected poles		3	3	3	3
	Rated operational voltage	V	690	690	690	690
	Max. continuous current	A	13…63	13…63	13…63	13…63
Thermal protection	Setting (Irth min./Irth max.)	A	10/13…45/63	10/13…45/63	–	10/13…45/63
	Temperature compensation	°C	-20…+60	20…+60	20…+60	20…+60
	Protection against phase imbalance		With	With	Without	Without
	Tripping class		20	20	–	–
Magnetic protection conforming to IEC 60947-1/2/4/6-2	Instantaneous trip current setting range		Fixed at 15 Irth max	6…12 Irth max (usual setting 9…10 Irth maxi)	6…12 Irth max	3…6 Irth max
	Tripping tolerance		±20 %	±20 %	±20 %	±20 %

Characteristics of versions without control test function, with padlocking facility

Conforming to standards			IEC 60947
Rated operational voltage		V	690
Mechanical durability	Operating cycles		10 000
Padlocking			By 1, 2 or 3 padlocks, Ø8 mm shank

Characteristics of versions with control test function and padlocking facility

Conforming to standards			IEC 60947, NF C 63-130, VDE 0660, VDE 0113
Rated operational voltage		V	690
Mechanical durability	Operating cycles		10 000
Padlocking			1, 2 or 3 padlocks, shank Ø8 mm max and Ø5 mm min. When flush mounting, interlocking of the enclosure or cabinet door is possible.

(1) O: breaking short-circuit current (open),
t: time
CO: closing on short-circuit, breaking short-circuit current (closed-open)

(2) Please consult us.

References: pages A5/4 to A5/15
Introduction: pages A5/18 to A5/21
Curves: pages A5/28 to A5/31
Dimensions, schemes: pages A5/34 to A5/37

Characteristics

Instantaneous auxiliary contacts LA1L●●

Conventional thermal current (Ith)		**A**	6				
Rated insulation voltage (Ui)	Conforming to IEC 60947-5-1	**V**	690				
Switching capacity	With U ≥ 17 V and I ≥ 10 mA	**mVA**	600				
Rated operational power ∼ category AC-15 (1)	**Voltage**	**V**	**48**	**110/127**	**220/240**	**380/415**	**440**
	1 million operating cycles	**VA**	300	500	600	520	500
	1.5 million operating cycles	**VA**	160	300	330	300	280
Making capacity	∼ category AC-15	**VA**	1500	3500	6000	7500	7000
Rated operational power ⎓ category DC-13 (2)	**Voltage**	**V**	**24**	**48**	**110**	**220**	**440**
	1 million operating cycles	**W**	120	90	75	68	61
	1.5 million operating cycles	**W**	70	50	38	33	28
Making capacity	⎓ category DC-13	**W**	800	700	400	260	220
Cabling		**mm²**	Maximum c.s.a.: 2 x 2.5 Minimum c.s.a.: 2 x 1				

Isolating auxiliary contacts LA1LC03●

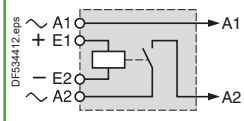
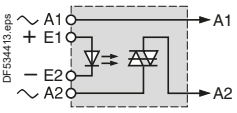
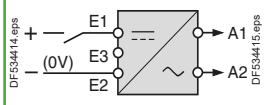
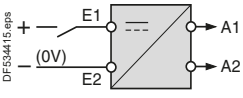
Conventional thermal current (Ith)		**A**	6
Rated insulation voltage (Ui) Conforming to IEC 60947 and NF C 63-130	a.c. supply	**V**	690
	d.c. supply	**V**	125
Cabling		**mm²**	Maximum c.s.a.: 2 x 1.5 or 1 x 2.5

Signalling contacts LA1LC001

Conventional thermal current (Ith)		**A**	3			
Rated insulation voltage (Ui)	Conforming to IEC 60947-5-1	**V**	250			
Operational power for 200000 operating cycles ∼	**Voltage**	**V**	–	–	**110/127**	**220**
	Resistive load	**VA**	–	–	600	750
	Lamp load (3)	**VA**	–	–	90	125
	Inductive load (4)	**VA**	–	–	875	500
	Motor (5)	**VA**	–	–	160	200
⎓	**Voltage**	**V**	**24**	**48**	**110/125**	**200**
	Resistive load	**W**	100	100	50	50
	Lamp load (3)	**W**	50	50	6	7.5
	Inductive load (4)	**W**	75	75	50	50
	Motor (5)	**W**	75	75	6	7.5
Cabling		**mm²**	Maximum c.s.a.: 2 x 2.5 Minimum c.s.a.: 2 x 1			

(1) Electrical durability on an inductive load such as the coil of an electromagnet: making current (cos φ 0.7) = 10 times the power broken (cos φ 0.4).
(2) Electrical durability on an inductive load such as the coil of an electromagnet, the time constant increasing with the load.
(3) Lamp load: peak current = 10 times the rated current.
(4) Inductive load: cos φ 0.4 for a.c. operation; time constant 7 ms for d.c. operation.
(5) Motor: peak current = 6 times the rated current.

Characteristics

Type			Interface modules			Converters						
Used for control of the integral 32			By a programmable controller, with a.c. control of the electromagnet			By a programmable controller, with d.c. control of the electromagnet Control on d.c. supply						
Ambient air temperature around the device												
	Storage	°C	-25…+70			-25…+50						
	Operation	°C	-25…+50			-25…+50						
Isolation		kV	rms voltage between inputs and outputs: 2.5			Common negative terminal						
Cabling	Min.	mm²	1 x 1			1 x 1						
	Max.	mm²	2 x 2.5			2 x 2.5						
Operating limits			0.85...10.1 Uc			0.8...1.1 Uc (2)						
Protection			Against reverse polarity (by diode) and against overvoltage			Against reverse polarity (by diode) and against overvoltage						
Module or converter type			**LA1LC**			**LA1LC**						
			580BD	**580ED**	**180BD**	**080BD**	**080ED**	**080FD**				
Control circuit characteristics												
Schemes			**LA1LC●580●D**		**LA1L●180BD**	**LA1L●080BD LA1L●080ED**		**LA1L●080FD**				
												
Indication of input state			By LED		–	–						
Input signals (logic side)	**Voltage**	**V**	**⎓ 24 (E1-E2)**	**⎓ 48 (E1-E2)**	**⎓ 5…24 (E1-E2)**	**⎓ 24 (E1-E2)**	**⎓ 48 (E1-E2)**	**⎓ 5…24 (E1-E2)**	**⎓ 24 (1) (E3-E2)**	**⎓ 48 (1) (E3-E2)**	**–**	**⎓ 24 (1) (E3-E2)**	**⎓ 48 (1) (E3-E2)**	**–**
	Current	mA	30	20	15…24 V 8.5…5 V	50	25	15…24 V 8.5…5 V	20	10	–	20	10	–
State "0" guaranteed	For U	V	< 2.4	< 4.8	< 2.5	< 2.4	< 4.8	< 2.5	<7	< 14	–	< 7	<14	–
	For I	mA	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2.5	–	< 5	< 2.5	–
State "1" guaranteed	For U	V	> 20.4	> 40.8	> 4	> 20.4	> 4	> 4	> 14	> 28	–	> 14	> 28	–
Supply voltage		V	∼ 24…240 (A1-A2)	∼ 24…240 (A1-A2)	∼ 24…240 (A1-A2)	∼ 24…240 (A1-A2)	∼ 24…240 (A1-A2)	∼ 24…240 (A1-A2)	⎓ 24 (2) (E1-E2)	⎓ 48 (2) (E1-E2)	⎓ 110 (2 (E1-E2)	⎓ 24 (2 (E3-E2)	⎓ 48 (2 (E3-E2)	⎓ 110 (2 (E1-E2)
Operating characteristics														
Electrical durability in millions of operating cycles			5						1					
Average consumption	Inrush 50 Hz	VA	160	160	160	375	375	375	–	–	–	–	–	–
	60 Hz	VA	185	185	185	450	450	450	–	–	–	–	–	–
	⎓	W	–	–	–	–	–	–	250	250	250	300	300	300
	Sealed 50/60 Hz	VA	12	12	12	25	25	25	–	–	–	–	–	–
	⎓	W	–	–	–	–	–	–	4	4	4	8	8	8
Operating time at 20 °C and at Uc	Pull-in	ms	15…30	15…30	10…35	20…40	20…40	10…45	30	30	30	35	35	35
	Drop-out	ms	22…35	22…35	8…30	25…45	25…45	8…30	15	15	15	20	20	20

(1) For direct control by external contact: connect E1-E3.
(2) Warning: for supply from rectified a.c., the 2 following conditions must be met: the power supply must exceed 300 VA and the maximum ripple must be ⩽ 14 %.

References: pages A5/4 to A5/15
Introduction: pages A5/18 to A5/21
Curves: pages A5/28 to A5/31
Dimensions, schemes: pages A5/34 to A5/37

Characteristics

Environment

Conforming to standards			IEC 60337-1
Protective treatment			"TH"
Ambient air temperature around the device	Storage	°C	-40…+80
	Operation	°C	-25…+55
	Permissible for operation at Uc	°C	-25…+70
Protection against direct finger contact			Conforming to VDE 0106

Tripping devices

Type			LA1LC070●, LC072●	LA1LC071●
Pull-in voltage	Uc		0.8…1.1	0.7…1.1
Drop-out voltage	Uc		0.35…0.7	–
Average consumption	Inrush	VA	8	8
	Sealed	VA	4	4
Minimum pulse time		ms	–	10

Reset devices

Type		LA1LC052●
Consumption	VA	9
Duration of a reset cycle	s	9
Minimum pulse duration	s	0.5

Suppressor module LA9D09982

Type of protection		RC (resistor-capacitor)
Connection scheme		
Operational voltage	V	≤ 250

Ref.
Integral 63

Life Is On Schneider Electric

Breaking capacity of Integral 63 all-in-one motor starters, according to the operational voltage and protection module fitted.

Breaking capacity

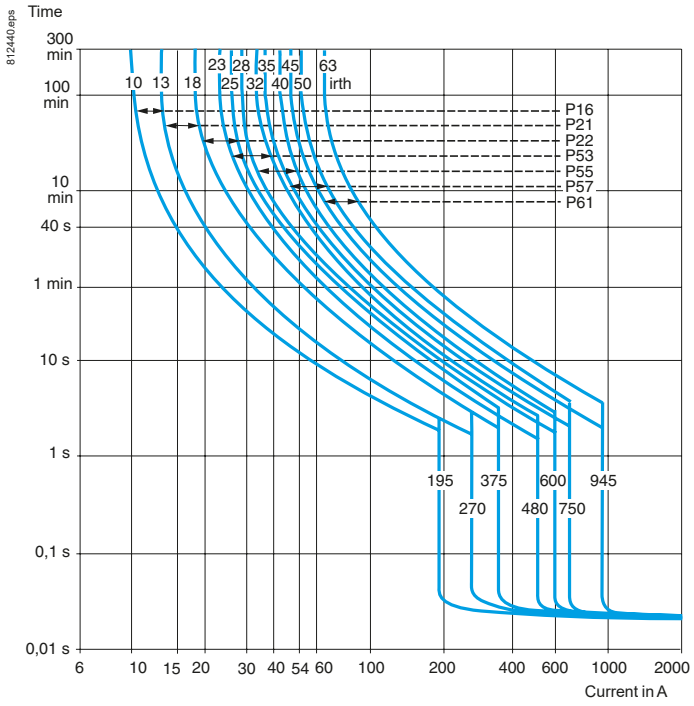
Protection module			Operational voltage				
Reference	Irth		220/240 V	400/415 V	440 V	500 V	600/690 V
	min	max					
	A	A	kA	kA	kA	kA	kA
LB●LD03●16	10	13	⩾ 130	⩾ 130	⩾ 130	⩾ 130	10
LB●LD03●21	13	18	⩾ 130	⩾ 130	⩾ 130	⩾ 130	10
LB●LD03●22	18	25	⩾ 130	⩾ 130	50	35	10
LB●LD03●53	23	32	⩾ 130	80	50	35	10
LB●LD03●55	28	40	⩾ 130	80	50	30	10
LB●LD03●57	35	50	⩾ 130	80	50	30	10
LB●LD03●61	45	63	⩾ 130	50	50	30	10

References:
pages A5/4 to A5/15
Introduction:
pages A5/18 to A5/21
Curves:
pages A5/28 to A5/31
Dimensions, schemes:
pages A5/34 to A5/37

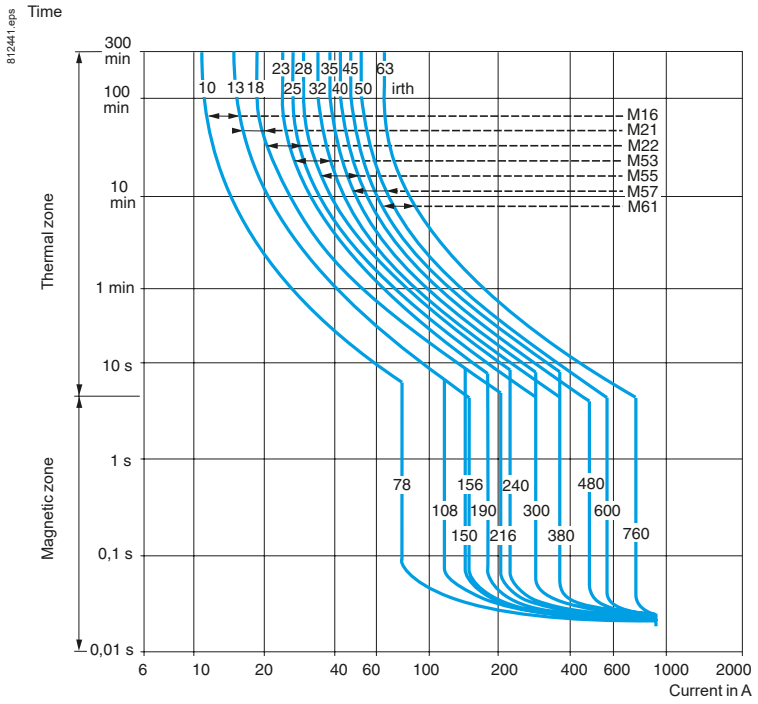
Curves

Motor protection (normal starting) - Tripping curves

By thermal-magnetic modules LB1LD03P (1)



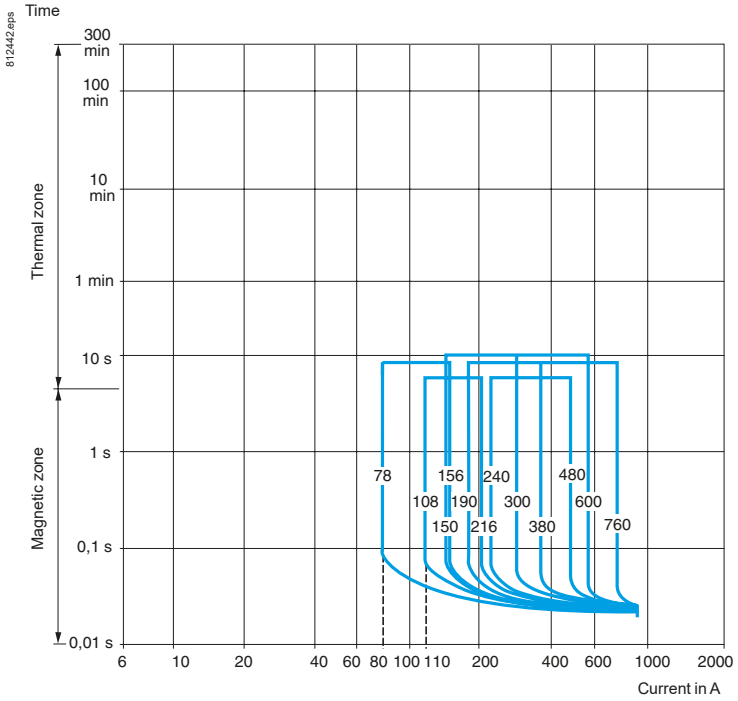
By thermal-magnetic modules LB1LD03M (1)



(1) Thermal protection: the average operating times shown in the above curves are for an ambient air temperature of 20 °C, without prior current flow (cold state). The average operating times after prolonged current flow (hot state) can be calculated by applying the coefficient 0.5.

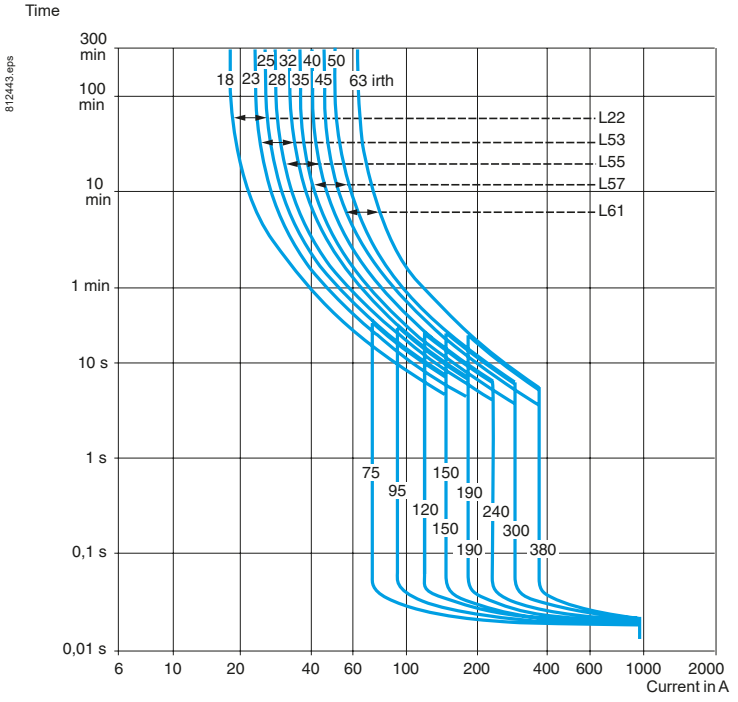
Motor protection (frequent starting) - Tripping curves

By magnetic modules LB6LD03M



Distribution circuit protection - Tripping curves

By thermal-magnetic modules LB1LD03L

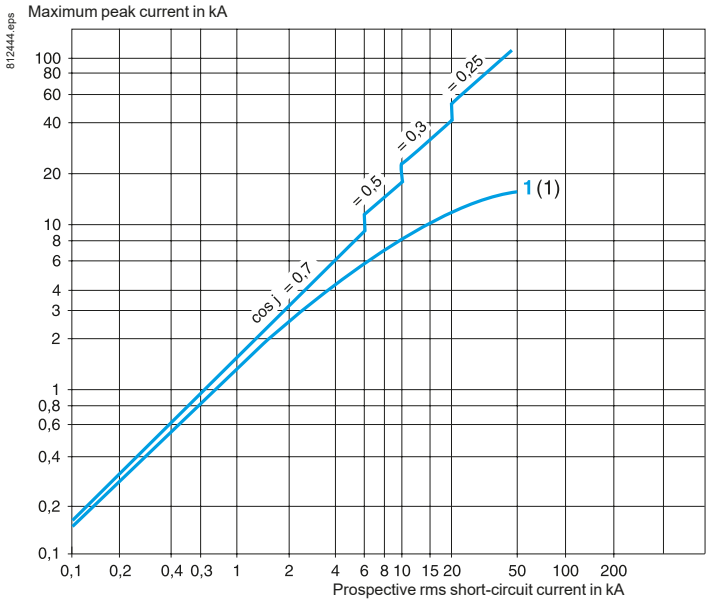


Ref.
Integral 63

Current limitation and thermal limit on short-circuit

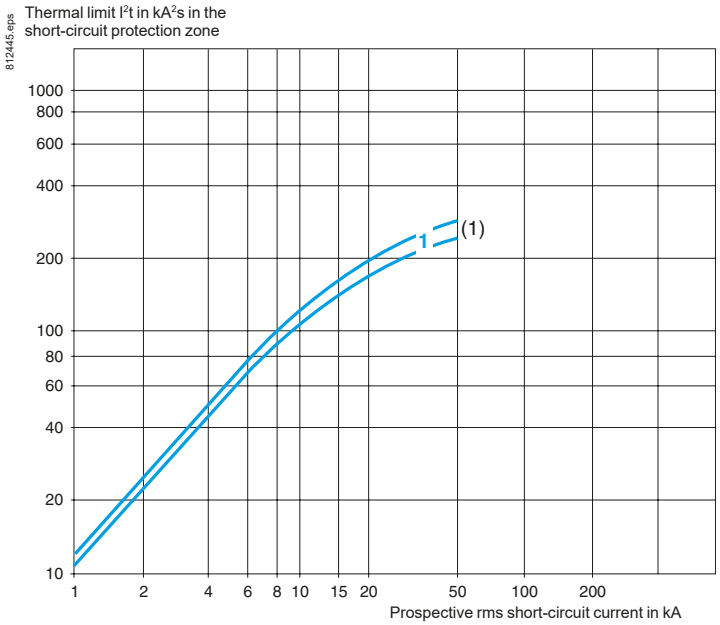
3-phase 400/415 V, 50 Hz

Current limitation on short-circuit



1 18 to 25 A up to 45 to 63 A

Maximum thermal limit on short-circuit



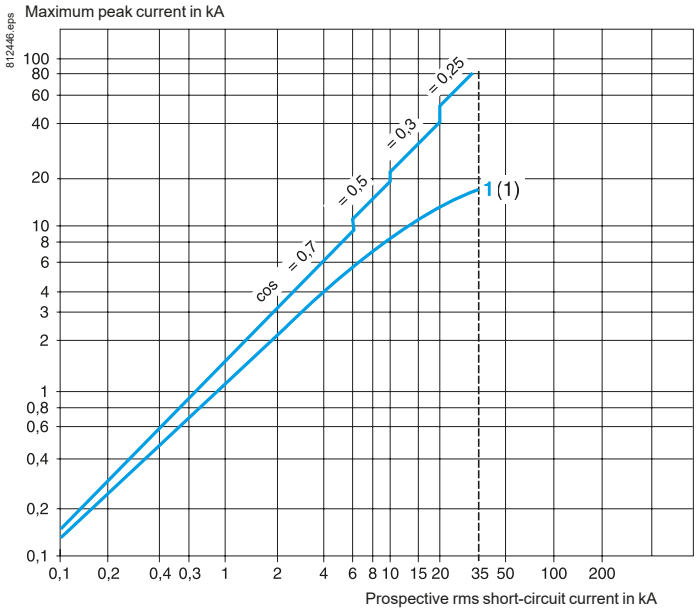
1 18 to 25 A up to 45 to 63 A

(1) ***LB1LD03●22*** *to* ***LD06●61****: rating of associated thermal overload module.*

Current limitation and thermal limit on short-circuit

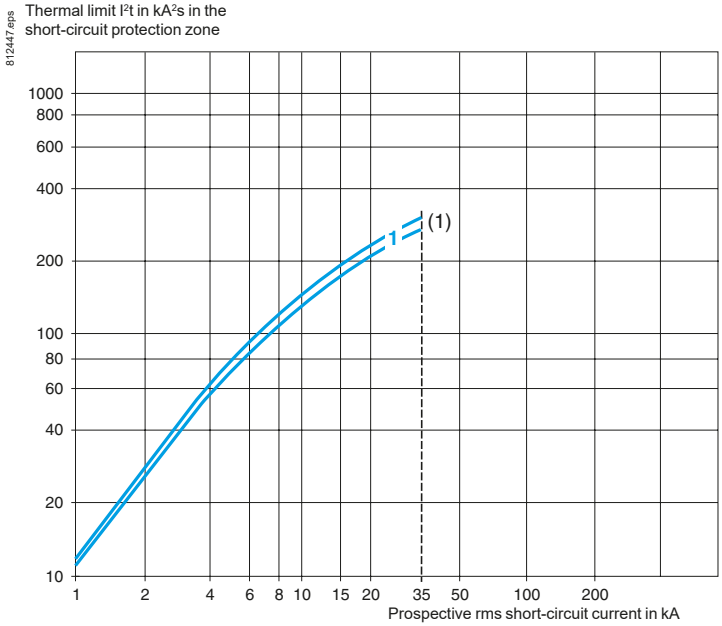
3-phase 480/500 V, 50 Hz

Current limitation on short-circuit



1 18 to 25 A up to 45 to 63 A

Current limitation on short-circuit

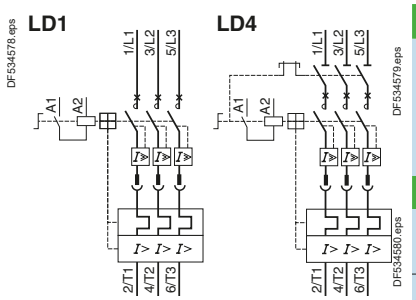


1 18 to 25 A up to 45 to 63 A

(1) ***LB1LD03●22*** *to* ***LD03●61****: rating of associated thermal overload module.*

Ref.
Integral 63

Operating status indication



Contact open

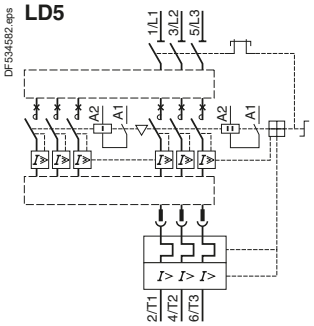
Contact closed

DF534581.eps

	LD1	LD4	Auxiliary contact actuators												
				Auto + 0											
			Auxiliary contacts												
			LA1 LC010				LA1 LC012			LA1 LC025			LA1 LC001	LA1 LC020	LA1 LC030
			13 23 31 14 24 32	16 18 15	06 08 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95		41 42	13 23 31 14 24 32	53 54
Off + control test function			13 23 31 14 24 32	16 18 15	06 08 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95		41 42	13 23 31 14 24 32	53 54
Off			13 23 31 14 24 32	16 18 15	06 08 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95		41 42	13 23 31 14 24 32	53 54
On, contactor open	AUTO	AUTO	13 23 31 14 24 32	16 18 15	06 08 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95		41 42	13 23 31 14 24 32	53 54
On, contactor closed	AUTO	AUTO	13 23 31 14 24 32	16 18 15	06 08 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95		41 42	13 23 31 14 24 32	53 54
Off after overload	TRIP. +	TRIP. +	13 23 31 14 24 32	16 18 15	06 08 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95		41 42	13 23 31 14 24 32	53 54
Tripped on overload	TRIP. +	TRIP. +	13 23 31 14 24 32	16 18 15	06 08 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95		41 42	13 23 31 14 24 32	53 54
Tripped on short-circuit	TRIP. +	TRIP. +	13 23 31 14 24 32	16 18 15	06 08 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95		41 42	13 23 31 14 24 32	53 54
Off after short-circuit	TRIP. +	TRIP. +	13 23 31 14 24 32	16 18 15	06 08 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95		41 42	13 23 31 14 24 32	53 54
Manual reset	TRIP. + RESET	TRIP. + RESET	13 23 31 14 24 32	16 18 15	06 08 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95		41 42	13 23 31 14 24 32	53 54

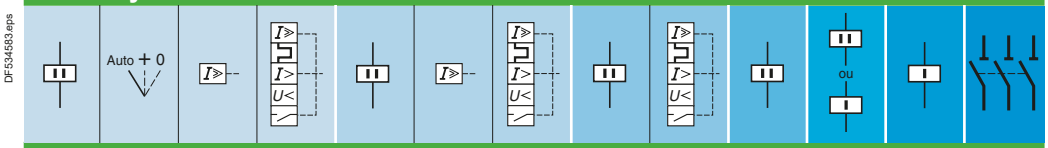
Operating status indication

LD5



Contact open

Contact closed



Auxiliary contact actuators

Auxiliary contacts

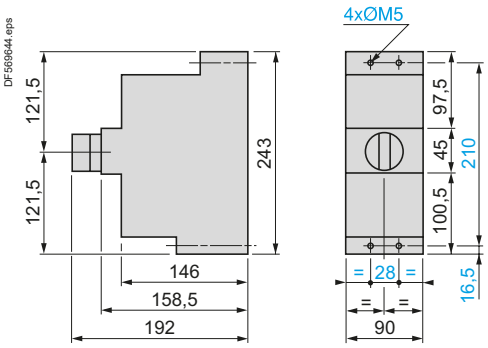
	LA1 LC010				LA1 LC012			LA1 LC025			LA1 LC020	LA1 LC001	LA1 LC021	LA1 LC031
	13 23 31 14 24 32	16 18 15	06 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95		13 23 31 14 24 32	41 42	13 23 31 14 24 32	53 63 54 64
Off + control test function	13 23 31 14 24 32	16 18 15	06 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95		13 23 31 14 24 32	41 42	13 23 31 14 24 32	53 63 54 64
Off	13 23 31 14 24 32	16 18 15	06 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95		13 23 31 14 24 32	41 42	13 23 31 14 24 32	53 63 54 64
On, reversing contactor open	13 23 31 14 24 32	16 18 15	06 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95		13 23 31 14 24 32	41 42	13 23 31 14 24 32	53 63 54 64
On, closed	13 23 31 14 24 32	16 18 15	06 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95		13 23 31 14 24 32	41 42	13 23 31 14 24 32	53 63 54 64
On, closed	13 23 31 14 24 32	16 18 15	06 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95		13 23 31 14 24 32	41 42	13 23 31 14 24 32	53 63 54 64
Tripped on overload	13 23 31 14 24 32	16 18 15	06 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95		13 23 31 14 24 32	41 42	13 23 31 14 24 32	53 63 54 64
Off after overload	13 23 31 14 24 32	16 18 15	06 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95		13 23 31 14 24 32	41 42	13 23 31 14 24 32	53 63 54 64
Tripped on short-circuit	13 23 31 14 24 32	16 18 15	06 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95		13 23 31 14 24 32	41 42	13 23 31 14 24 32	53 63 54 64
Off after short-circuit	13 23 31 14 24 32	16 18 15	06 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95		13 23 31 14 24 32	41 42	13 23 31 14 24 32	53 63 54 64
Manual reset	13 23 31 14 24 32	16 18 15	06 08 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95		13 23 31 14 24 32	41 42	13 23 31 14 24 32	53 63 54 64

Ref.
Integral 63

All-in-one motor starters Integral 63

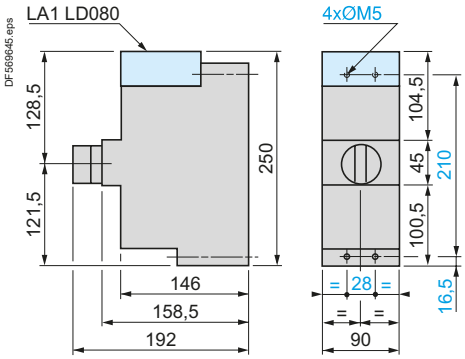
Control circuit: a.c.

LD●LD●30 + LB●LD03



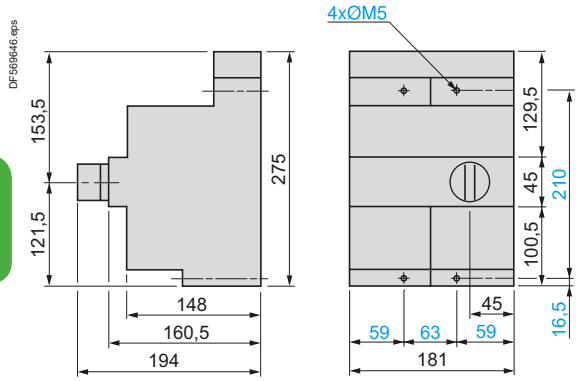
Control circuit: d.c.

LD●LD●30 + LB●LD03 + LA1LD080



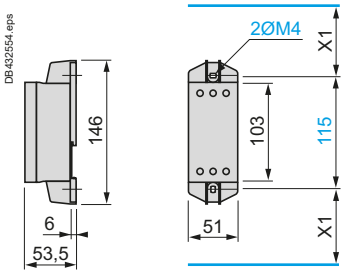
Reversing all-in-one motor starters Integral 63

LD5LD●30 + LB●LD03M



Current limiter

LA9LB920

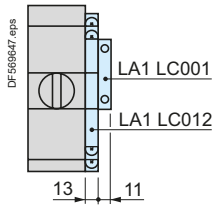


X1: Electrical clearance = 30 mm for Ue ≤ 690 V

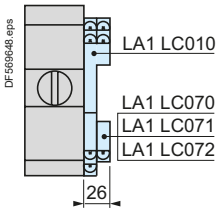
Add-on blocks

For mounting on all-in-one motor starters Integral 63

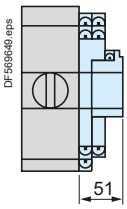
LA1LC012
LA1LC001



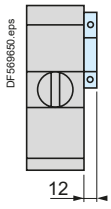
LA1LC010
LA1LC07●



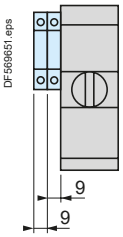
LA1LC052



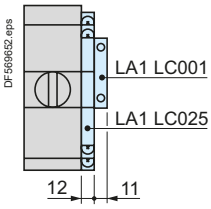
LA1LC020



LA1LC030
(1 ou 2)

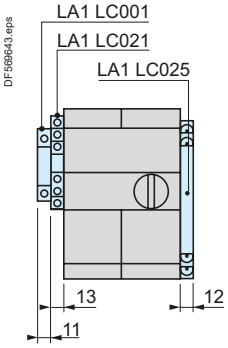


LA1LC025
LALC001

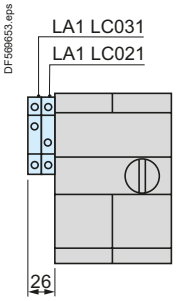


For mounting on reversing all-in-one motor starters Integral 63

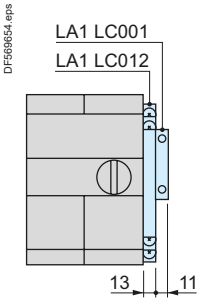
LA1LC021, LC025
LA1LC001



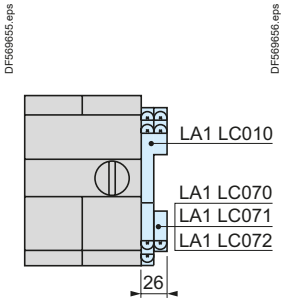
LA1LC031



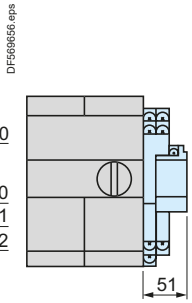
LA1LC012
LA1LC001



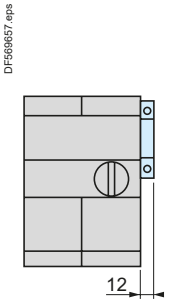
LA1LC010
LA1LC07●●



LA1LC052●

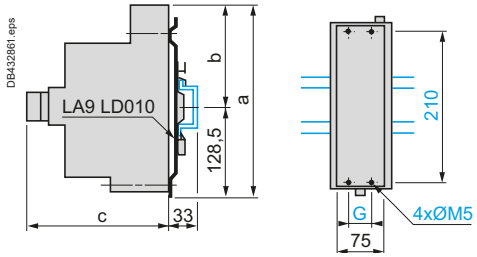


LA1LC020



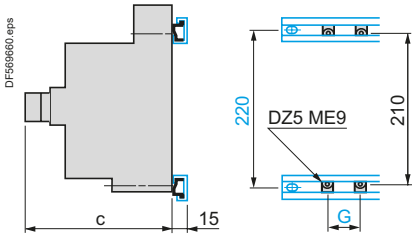
Mounting

On 75 mm ⊔ rail, with mounting plate LA9LD010



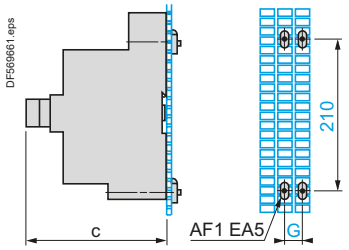
	a	b	c	G
LD1	266	137.5	192	28
LD4	266	137.5	192	28
LD5	282	153.5	194	63

On 32 mm ⊏ rails, at 220 mm centres



	c	G
LD1	192	28
LD4	192	28
LD5	194	63

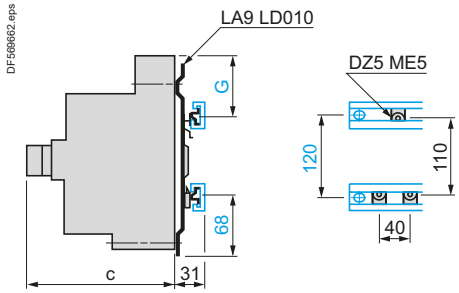
On pre-slotted mounting plate AM1P



	c	G
LD1	192	28
LD4	192	28
LD5	194	63

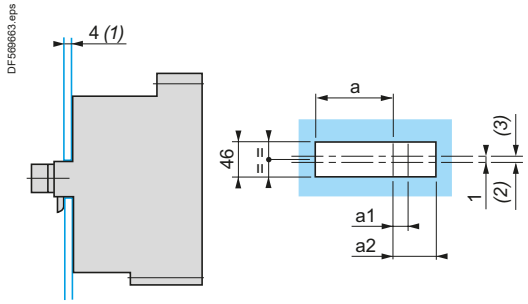
With mounting plate LA9LD010

SOn 32 mm ⊏ rails, at 120 mm centres



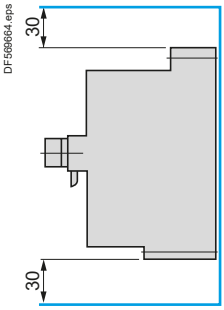
	c	G
LD1	192	78
LD4	192	78
LD5	194	94

Flush mounting (all-in-one motor starters and reversing all-in-one motor starters)



	a	a1	a2
LD1LD030	90	–	–
LD4LD●30	90	–	–
LD5LD●30	181	–	–
LA1LC010	–	13	–
LA1LC012	–	13	–
LA1LC010 + LA1LC052●	–	–	51
LA1LC012 + LA1LC052●	–	–	51

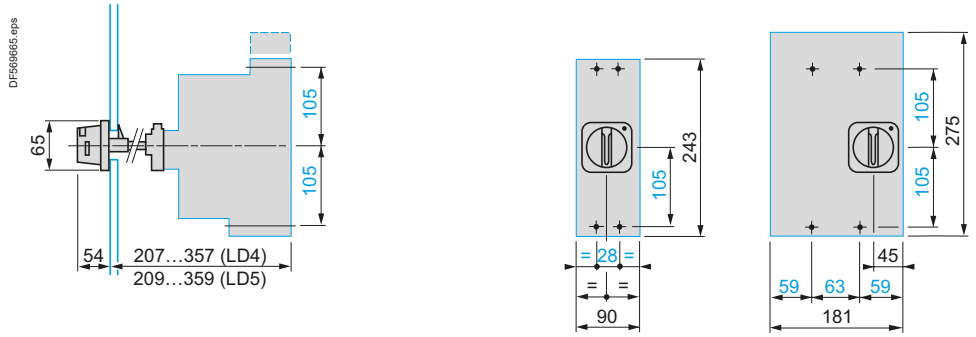
Minimum electrical clearance



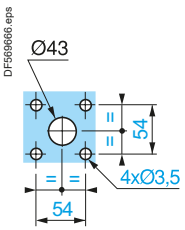
(1) Maximum door thickness for interlocking by LD4 and LD5.
(2) Centre of operating handle.
(3) Fixing centre.

Adjustable door interlock mechanisms LA9LC33● and LA9LC53●

For mounting on LD4LD●30 and LD5LD●30



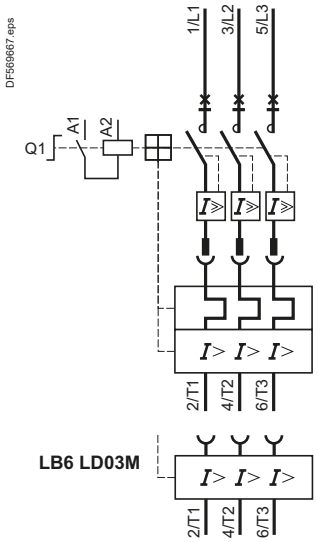
Door drillings



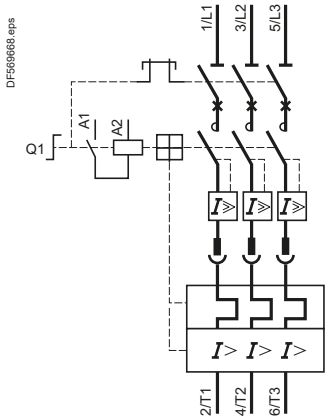
Schemes

All-in-one motor starters Integral 63 with protection module LB●

LD1LD030 + LB1LD03●

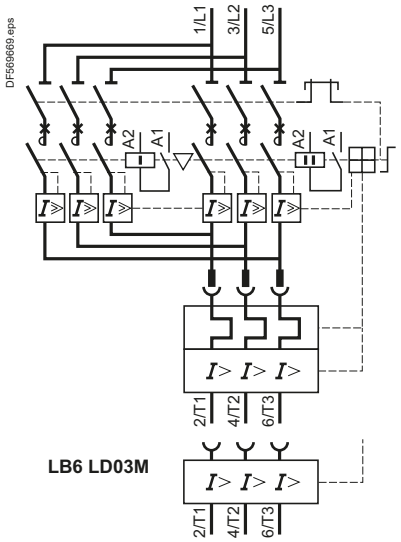


LD4LD●30 + LB1LD03●



Reversing all-in-one motor starters Integral 63 with protection module LB●

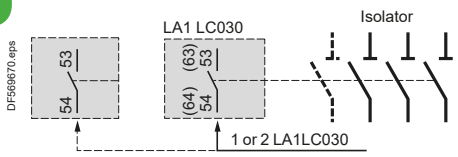
LD5LD●30 + LB1LD03M ou LD03P



Add-on blocks

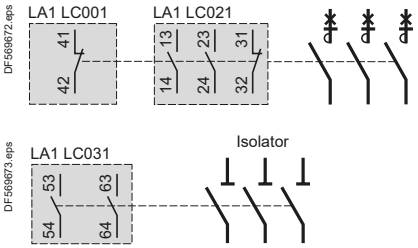
For all-in-one motor starters LD4

Mounted on LH side



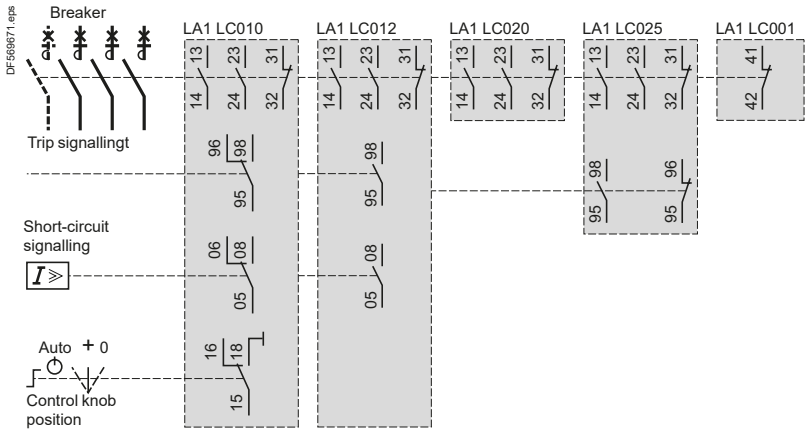
For reversing all-in-one motor starters LD5

Mounted on LH side



For all-in-one motor starters LD1 or LD4 and reversing all-in-one motor starters LD5

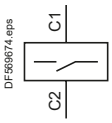
Mounted on RH side



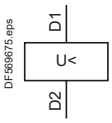
Schemes

Tripping devices (1) for LD1, LD4, LD5

LA1LC071

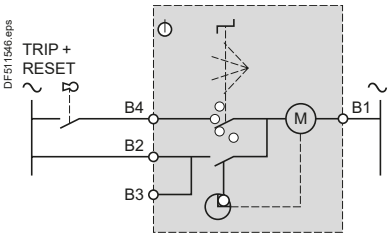


LA1LC070, LC072



Remote electrical reset devices (1) for LD1 to LD5

LA1LC052●

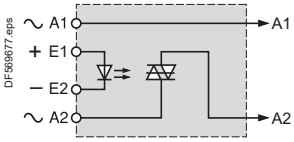


The use of instantaneous auxiliary contact block LA1LC020 prevents the use of tripping devices or electrical reset devices

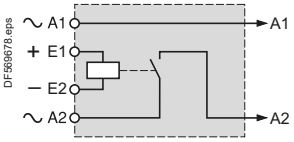
(1) For all-in-one motor starters and reversing all-in-one motor starters already fitted with an LA1 LC010 or LA1 LC012 instantaneous auxiliary contact block.

Interface modules

LA1LD180



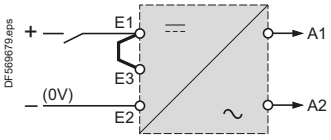
LA1LD580

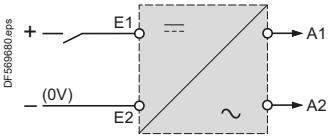


Voltage converter LA1LD080 (supply with all-in-one motor starters for ⎓ control circuit operation)

Switching by control contact

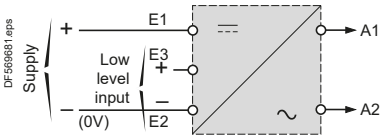
24 or 48 V





Switching by "Low level" input

24 or 48 V



Terminology

Altitude

The rarefied atmosphere at high altitude reduces the dielectric strength of the air and hence the rated operational voltage of the all-in-one motor starter. It also reduces the cooling effect of the air and hence the rated operational current of the all-in-one motor starter (unless the temperature drops at the same time).

No derating is necessary up to 3000 m.

Derating factors to be applied above this altitude for main pole operational voltage and current (a.c. supply) are as follows:

Altitude	3500 m	4000 m	4500 m	5000 m
Rated operational voltage	0.90	0.80	0.70	0.60
Rated operational current	0.92	0.90	0.88	0.86

Ambient air temperature

The temperature of the air surrounding the device, measured near to the device.
The operating characteristics are given:
- with no restriction for temperatures between - 5 and + 55 °C.
- with restrictions, if necessary, for temperatures between - 50 and + 70 °C.

Rated operational current (Ie)

This is defined taking into account the rated operational voltage, operating rate and duty, utilisation category and air temperature around the device.

Conventional rated thermal current (Ith) (1)

The current Ith which a closed all-in-one motor starter can sustain for a minimum of 8 hours without its temperature rise exceeding the limits given in the standards.

Short time rating

The current which a closed all-in-one motor starter can sustain for a short time, after a period of no load, without dangerous overheating.

Rated operational voltage (Ue)

This is the voltage value which, in conjunction with the rated operational current, determines the use of the all-in-one motor starter or starter, and on which the corresponding tests and the utilisation category are based. For 3-phase circuits, it is expressed as the voltage between phases.
Apart from exceptional cases such as rotor short-circuiting, the rated operational voltage Ue is less than or equal to the rated insulation voltage Ui.

Rated control circuit voltage (Uc)

The rated value of the control circuit voltage, on which the operating characteristics are based. For a.c. applications, the values are given for a near sinusoidal wave form (less than 5 % total harmonic distortion).

Rated insulation voltage (Ui)

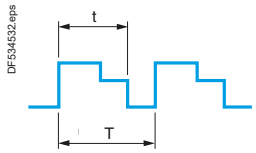
This is the voltage value used to define the insulation characteristics of a device and referred to in dielectric tests determining leakage paths and creepage distances. As the specifications are not identical for all standards, the rated values given for each of them are not necessarily the same.

Rated impulse withstand voltage (Uimp)

This is the highest peak value of an impulse voltage, of prescribed form and polarity, which the device is able to withstand without failure under specified test conditions, and to which isolation clearance values are referred.
The rated impulse withstand voltage of a device must be equal to or higher than the values stated for the transient overvoltages appearing in the circuit in which the device is fitted.

Note: these definitions are based on extracts from standard IEC 60947.

(1) Conventional free air thermal current, conforming to IEC standards.



Terminology

Rated operational power (expressed in kW)

The rated power of the standard motor which can be switched by the all-in-one motor starter, at the stated operational voltage.

Rated breaking capacity (Iq) (1)

This is the current value which the all-in-one motor starter can break in accordance with the breaking conditions specified in the IEC standard.

Rated making capacity (1)

This is the current value which the all-in-one motor starter can make in accordance with the making conditions specified in the IEC standard.

On-load factor (m)

This is the ratio between the time the current flows (t) and the duration of the cycle (T):

$$m = \frac{t}{T}$$

Cycle duration: duration of current flow + time at zero current.

Pole impedance

The impedance of one pole is the sum of the impedance of all the circuit components between the input terminal and the output terminal.

The impedance comprises a resistive component (R) and an inductive component $X = L\omega$). The total impedance therefore depends on the frequency and is normally given for 50 Hz. The average value is given for the pole at its rated operational current.

Electrical durability

This is the average number of on-load operating cycles which the main pole contacts can perform without maintenance. The electrical durability depends on the utilisation category, the rated operational current and the rated operational voltage.

Mechanical durability

This is the average number of no-load operating cycles (i.e. with zero current flow through the main poles) which the all-in-one motor starter can perform without mechanical failure.

Coordination

The coordination of protection devices involves combining, in a selective way, a short-circuit protection device (fuses or magnetic circuit-breakers) with a contactor and an overload protection device. Its objective is to break any abnormal current, in plenty of time, without any danger to personnel, whilst providing adequate protection of the equipment against an overload or short-circuit current.

Type 1 - IEC 60947-4-1

In a short-circuit condition, the contactor or starter must not present any danger to personnel or installations and may not be able to resume operation without repair or the replacement of parts.

Type 2 - IEC 60947-4-1

In a short-circuit condition, the contactor or starter must not present any danger to personnel or installations and must be able to resume operation. The risk of contact welding is permissible if they can be easily separated.

Total, ensuring reliability of operation - IEC 60947-6-2

In the event of a short-circuit, no damage or risk of welding is permissible on the equipment constituting the motor starter. Operation can be resumed without any maintenance.

Note: *these definitions are based on extracts from standard IEC 60947.*

(1) For a.c. applications, the breaking and making capacities are expressed by the rms value of the symmetrical component of the short-circuit current. Taking into account the maximum asymmetry which may exist in the circuit, the contacts therefore have to withstand a peak asymmetrical current which may be twice the rms symmetrical component.

Definition

The standard utilisation categories define the current values which the all-in-one motor starter must be able to make or break. These values depend on:
- the type of load being switched: squirrel cage or slip ring motor, resistors,
- the conditions under which making or breaking takes place: motor stalled, starting or running, reversing, plugging.

Reminder of standards IEC 60947

- **IEC 60947-1**: general rules,
- **IEC 60947-2**: circuit breakers,
- **IEC 60947-3**: isolating devices,
- **IEC 60947-4-1**: contactors and motor starters,
- **IEC 60947-5-1**: control and signalling units,
- **IEC 60947-6-2**: control and protection devices,

Standards for all-in-one motor starters

IEC 60947-4-1

Standard IEC 60947-4-1: covers contactors and electromechanical motor starters.
It concerns:
- types of equipment with main contacts designed for connection to circuits whose rated operational voltage does not exceed 1000 V for a.c. applications or 1500 V for d.c. applications,
- contactors used in conjunction with overload and/or short-circuit protection devices,
- motor starters used in conjunction with separate short-circuit protection devices and/or with separate short-circuit protection devices and built-in overload protection devices,
- contactors and combination motor starters which incorporate their own short-circuit protection device.

IEC 60947-6-2

Standard IEC 60947-6: covers multi-function equipment.
It concerns connection, power switching and protection devices (or equipment) with main contacts designed for connection to circuits whose rated operational voltage is less than or equal to 1000 V for a.c. applications, or 1500 V for d.c. applications.
Such devices are designed to perform both the power switching function and the protection of remotely controlled circuits function; they can also perform other functions, such as isolation.
After short-circuit (Isc) tests, the products must be able to make and break the currents corresponding to the specified utilisation categories, and to the number of operating cycles specified in the standard, without failing. This series of tests is completed by temperature rise tests.
Standard IEC 947-6-2 specifies that, in the event of a short-circuit, no damage or risk of contact welding is permissible on the devices constituting the motor starter.
The integral all-in-one motor starter, through its design, ensures reliability of operation. After eliminating the fault, operation can be resumed instantly without any maintenance work on the product, other than resetting.

Utilisation categories for a.c. applications

Category AC-1

This category applies to all types of a.c. device (load) with a power factor equal to or greater than 0.95 ($\cos \varphi \leqslant 0.95$). Non inductive or slightly inductive loads.
Application examples: heating, distribution.

Category AC-2

This category applies to starting, plugging and inching of slip ring motors.
- On closing, the all-in-one motor starter makes the starting current, which is about 2.5 times the rated current of the motor.
- On opening, it must break the starting current, at a voltage less than or equal to the mains supply voltage.

Category AC-3

This category applies to squirrel cage motors with breaking while motor running.
- On closing the all-in-one motor starter makes the starting current, which is about 5 to 7 times the rated current of the motor.
- On opening, it breaks the rated current drawn by the motor; at this point, the voltage at the all-in-one motor starter terminals is about 20 % of the mains supply voltage. Breaking is light.

Application examples: all standard squirrel cage motors (lifts, escalators, conveyor belts, bucket elevators, compressors, pumps, mixers, air conditioning units, etc.).

Standards for all-in-one motor starter

Utilisation categories for a.c. applications

Category AC-4

This category covers starting, plug braking and inching of squirrel cage motors.
On closing, the all-in-one motor starter makes a current peak which may be as high as 5 to 7 times the rated motor current. On opening, it breaks this same current at a voltage which is higher, the lower the motor speed. This voltage can be the same as the mains voltage. Breaking is severe.
Application examples: printing machines, wire drawing machines, hoisting equipment, metallurgy industry.

Category AC-41

This category applies to all types of a.c. device (load) with a power factor equal to or greater than 0.95 (cos $\varphi \leqslant 0.95$). Non inductive or slightly inductive loads.
Application examples: heating, distribution.

Category AC-42

This category applies to starting, plugging and inching of slip ring motors.
■ On closing, the all-in-one motor starter makes the starting current, which is about 2.5 times the rated current of the motor.
■ On opening, it must break the starting current, at a voltage less than or equal to the mains supply voltage.

Category AC-43

This category applies to squirrel cage motors with breaking while motor running; inching or occasional reversing of limited duration are permissible if the number of operating cycles does not exceed 5 per minute, or 10 within a 10 minute period.
■ On closing the all-in-one motor starter makes the starting current, which is about 5 to 7 times the rated current of the motor.
■ On opening, it breaks the rated current drawn by the motor; at this point, the voltage at the all-in-one motor starter terminals is about 20% of the mains supply voltage. Breaking is light.
Application examples: all standard squirrel cage motors: lifts, escalators, conveyor belts, bucket elevators, compressors, pumps, mixers, air conditioning units, etc.).

Category AC-44

This category covers applications with plug braking and inching of squirrel cage or slip ring motors.
On closing, the all-in-one motor starter makes a current peak which may be as high as 5 to 7 times the rated motor current. On opening, it breaks this same current at a voltage which is higher, the lower the motor speed. This voltage can be the same as the mains voltage. Breaking is severe.
Application examples: printing machines, wire drawing machines, hoisting equipment, metallurgy industry.

Tripping classes of protection modules

The creation of thermal tripping classes allows better adaptation of the thermal protection to suit different motor and application technologies (short or long starting times). Conforming to IEC 60947-4-1 and IEC 60947-6-2.

Class	10 A	10	20	30
Tripping time at 7.2 Ir (1)	2…10 s	4…10 s	6…20 s	9…30 s

Standards for auxiliary contacts

IEC 60947-5

Standard IEC 60947-5-1: covers switching devices and components for control circuits.
It concerns electromechanical devices for control circuits.

Utilisation categories for a.c. applications

Category AC-14 (2)

This category applies to the switching of electromagnetic loads whose power drawn with the electromagnet closed is less than 72 VA.
Application example: switching the operating coil of contactors and relays.

Category AC-15 (2)

This category applies to the switching of electromagnetic loads whose power drawn with the electromagnet closed is greater than 72 VA.
Application example: switching the operating coil of contactors.

Utilisation categories for d.c. applications

Category DC-13 (3)

This category applies to the switching of electromagnetic loads for which the time taken to reach 95 % of the steady state current (T = 0.95) is equal to 6 times the power P drawn by the load (with $P \leqslant 50$ W).
Application example: switching the operating coil of all-in-one motor starters.

(1) Ir = protection module setting current.
(2) Replaces category AC-11.
(3) Replaces category DC-11.

Life Is On Schneider Electric

Complementary technical information

Coordination between protection and control components

Type of information	Page
Types of coordination, according to the standard currents in the circuit to be considered	A6/2
Selection of the coordination type	A6/3

Suggested coordinated Direct-On-Line motor starter combinations

Fuse + contactors + thermal overload relay	A6/4
Circuit breaker (with built in overload protection) + contactors	A6/9
Circuit breaker + contactors + thermal overload relay	A6/11

Suggested coordinated Star-delta motor starter combinations

Fuse + contactors + thermal overload relay	A6/16
Circuit breaker (with built in overload protection) + contactors	A6/19
Circuit breaker + contactors + thermal overload relay	A6/21

Suggested coordinated TeSys island motor starter combinations

Protection Components / Starters - Coordination - IEC	A6/25
Protection Components / Starters - SCCR Ratings - UL	A6/32

Contactors: Utilisation categories – Standard characteristics – Selection tables per categorie

Definition: utilisation categories : AC-1, AC-2, AC-3, etc...	A6/33
Definition: contactor standard characteristics	A6/34
Contactor selection tables per utilisation categorie	A6/36

Contactors for specific application – Design information

Selection of contactors for lighting circuits	A6/50
Selection of contactors for heating circuits	A6/56
Selection of contactors for switching primaries of 3P LV/LV transformers	A6/58
Selection of contactors for switching 3P capacitor banks (factor correction)	A6/59
Selection of contactors auto-transformer starting	A6/60
Selection of contactors for rotor circuit of slip-ring motors	A6/62
Design of long distance remote control for contactors	A6/64
Current of asynchronous squirrel cage motors at nominal load	A6/68

Standards – Protection against contact – Protective treatments

International standards and certifications	A6/69
Protection against accidental direct contacts / IP codes	A6/71

Type 1 and type 2 coordination according to the standard

The standard defines tests at different levels of current; the purpose of these tests is to place the equipment in extreme conditions.
The standard defines 2 types of coordination, according to the condition of the components after testing:
type 1,
type 2.
To determine the type of coordination, the standard requires that the behaviour of the equipment be tested under overload and short-circuit conditions for 3 fault current values, covering overload and short-circuit conditions.

Type 1 coordination

Type 1 coordination requires that in a short-circuit condition, the contactor or starter must not present any danger to personnel or installations and must not be able to resume operation without repair or the replacement of parts.

Type 2 coordination

Type 2 coordination requires that In a short-circuit condition, the contactor or starter must not present any danger to personnel or installations and must subsequently be able to resume operation. The risk of contact welding is permissible; in this case, the manufacturer must indicate measures to be taken regarding maintenance of the equipment.

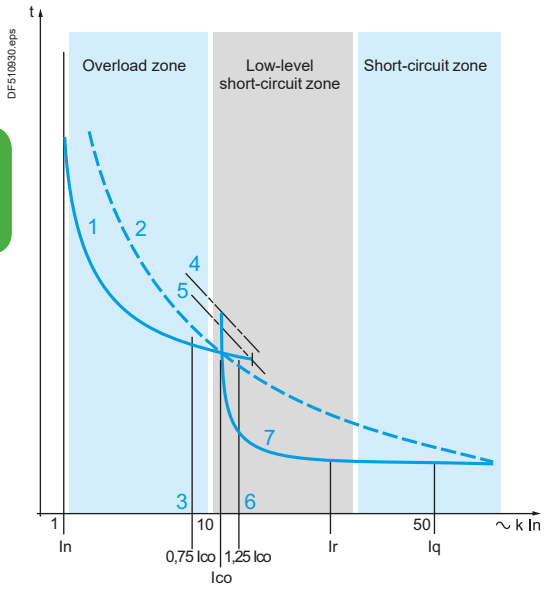
Type 2 coordination increases reliability of operation.

Current values

Current "Ico" (overload I < 10 In)

The thermal overload relay associated with the contactor provides protection against this type of fault, up to a value Ico (see curve) defined by the manufacturer.

Standard IEC 60947-4-1 specifies the 2 current values to be used for checking coordination between the thermal overload relay and the short-circuit protection device:
- at 0.75 Ico only the thermal overload relay must trip,
- at 1.25 Ico the short-circuit protection device must operate.



1 Thermal overload relay curve.
2 Fuse.
3 Tripping of thermal overload relay only.
4 Thermal limit of the circuit breaker.
5 Thermal overload relay limit.
6 Current broken by the SCPD (1).
7 Circuit breaker magnetic trip.

Current "r" (low level short-circuit 10 < I < 50 In)

The main cause of this type of fault is the deterioration of insulating materials. Standard IEC 60947-4-1 defines an intermediate short-circuit current "r". This test current makes it possible to check whether the protection device is providing protection against low-level short-circuits.

Operational current Ie (AC-3) (A)	**Current "r"** (kA)
Ie ⩽ 16	1
16 < Ie ⩽ 63	3
63 < Ie ⩽ 125	5
125 < Ie ⩽ 315	10
315 < Ie ⩽ 630	18
630 < Ie ⩽ 1000	30

Current "Iq" (short-circuit > current "r")

This type of fault corresponds to a dead short and is relatively rare. It can be caused by a connection error during maintenance work. Short-circuit protection is provided by fast operating devices.

Standard IEC 60947-4-1 defines a current "Iq". The coordination tables supplied by Schneider Electric are based on a current "Iq" that is generally ⩾ 50 kA.

(1) SCPD: short-circuit protection device.

Selection

No coordination

Considerable risks to both persons and equipment.

Not authorised by standards:
□ NF C 15-100 and IEC 60364-1, article 133-1
(installation regulations),
□ EN/IEC 60204-1, article 7
(electrical equipment in machines),
□ IEC 60947-4-1, article 8.2.5. (starters)

Type 1 coordination

The most frequently used solution.

■ Equipment costs are lower.
■ Reliability of operation is not a requirement.
■ Before restarting, it may be necessary to repair the motor starter.

Consequences:
□ significant amount of machine downtime,
□ skilled maintenance personnel required to repair, check, obtain supplies.

Example: air conditioning in commercial premises.

Type 2 coordination

This solution ensures reliability of operation.

Consequences:
□ reduced machine downtime,
□ reduced maintenance after a short-circuit.

Example: escalators.

Total coordination

With this solution, no damage or misadjustment is permissible and reliability of operation is guaranteed.

Consequences:
□ immediate return to service,
□ no special precautions required.

Examples: smoke extraction, fire-fighting pumps.

Coordination: Fuse (NFC, DIN type aM) + Contactor + Overload relay

0.06 to 55 kW at 400/415 V: type 1 coordination

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3						Fuse carrier (1) (basic block)	aM fuses		Contactor	Thermal overload relay class 10	
400/415 V		440 V		500 V		Reference	Size	Rating	Reference (2)	Reference	Setting range
P	Ie	P	Ie	P	Ie						
kW	A	kW	A	kW	A			A			A
0.06	0.2	**0.06**	0.19	**–**	–	**LS1D32**	10 x 38	2	**LC1K06**	**LR2K0302**	0.16…0.23
–	–	**0.09**	0.28	**–**	–	**LS1D32**	10 x 38	2	**LC1K06**	**LR2K0303**	0.23…0.36
0.09 **0.12**	0.3 0.44	**–** **0.12**	– 0.37	**–** **–**	– –	**LS1D32**	10 x 38	2	**LC1K06**	**LR2K0304**	0.36…0.54
0.18 **–**	0.6 –	**0.18** **0.25**	0.55 0.76	**–** **–**	– –	**LS1D32**	10 x 38	2	**LC1K06**	**LR2K0305**	0.54…0.8
0.25 **0.37**	0.85 1.1	**–** **0.37**	– 1	**–** **0.37**	– 0.88	**LS1D32**	10 x 38	2	**LC1K06**	**LR2K0306**	0.8…1.2
0.55 **–**	1.5 –	**0.55** **0.75**	1.36 1.68	**0.55** **0.75**	1.2 1.5	**LS1D32**	10 x 38	2	**LC1K06**	**LR2K0307**	1.2…1.8
0.75 **1.1**	1.9 2.7	**–** **1.1**	– 2.37	**1.1** **1.5**	2.2 2.9	**LS1D32**	10 x 38	4	**LC1K06**	**LR2K0308**	1.8…2.6
1.5	3.6	**1.5**	3.06	**–**	–	**LS1D32**	10 x 38	4	**LC1K06**	**LR2K0310**	2.6…3.7
2.2 **–**	4.9 –	**–** **–**	– –	**2.2** **3**	3.9 5.2	**LS1D32**	10 x 38	6	**LC1K06**	**LR2K0312**	3.7…5.5
–	–	**2.2**	4.42	**–**	–	**LS1D32**	10 x 38	8	**LC1K06**	**LR2K0312**	3.7…5.5
3	6.5	**3**	5.77	**4**	6.8	**LS1D32**	10 x 38	8	**LC1K09**	**LR2K0314**	5.5…8
4	8.5	**4**	7.9	**5.5**	9.2	**LS1D32**	10 x 38	12	**LC1K09**	**LR2K0316**	8…11.5

(1) For breaking under load, add a rotary switch-disconnector.
(2) For reversing operation, replace the prefix LC1 with LC2.

Coordination: Fuse (NFC, DIN type aM) + Contactor + Overload relay

0.06 to 55 kW at 400/415 V: type 1 coordination

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3						Fuse carrier [1] (basic block)	aM fuses		Contactor	Thermal overload relay classe 10	
400/415 V		440 V		500 V		Reference	Size	Rating	Reference [2]	Reference	Setting range
P	Ie	P	Ie	P	Ie						
kW	A	kW	A	kW	A			A			A
5.5	11.5	**5.5**	10.4	**7.5**	12.4	**LS1D32**	10 x 38	16	**LC1K12**	**LR2K0321**	10…14
7.5	15.5	**7.5**	13.7	**9**	13.9	**LS1D32**	10 x 38	16	**LC1D18**	**LRD21**	12…18
–	–	**9**	16.9	**–**	–	**LS1D32**	10 x 38	20	**LC1D25**	**LRD21**	12…18
9	18.1	**–**	–	**11**	17.6						
11	22	**11**	20.1	**15**	23	**GK1EK**	14 x 51	25	**LC1D25**	**LRD22**	16…24
15	29	**15**	26.5	**18.5**	28	**GK1EK**	14 x 51	32	**LC1D32**	**LRD32**	23…32
18.5	35	**18.5**	32.8	**22**	33	**GK1EK**	14 x 51	40	**LC1D40A**	**LRD340**	30…40
22	41	**22**	39	**30**	44	**GS●J**	22 x 58	50	**LC1D50A**	**LRD350**	37…50
–	–	**30**	51.5	**–**	–	**GS●J**	22 x 58	80	**LC1D50A**	**LRD365**	48…65
–	–	**–**	–	**37**	53	**GS●J**	22 x 58	80	**LC1D65A**	**LRD365**	48…65
30	55	**37**	64	**–**	–	**GS●J**	22 x 58	80	**LC1D65A**	**LRD365**	48…65
–	–	**–**	–	**45**	64	**GS●J**	22 x 58	80	**LC1D80**	**LRD3361**	55…70
37 [3]	66	**45**	76	**–**	–	**GS●J**	22 x 58	100	**LC1D80**	**LRD3363**	63…80
45	80	**–**	–	**55**	78	**GS●J**	22 x 58	100	**LC1D95**	**LRD3365**	80…93
–	–	**55**	90	**–**	–	**GS●J**	22 x 58	125	**LC1D115**	**LRD4365**	80…104
55	97	**–**	–	**75**	106	**GS●J**	22 x 58	125	**LC1D115**	**LRD4367**	95…120

(1) For breaking under load, add a rotary switch-disconnector.
(2) For reversing operation, replace the prefix LC1 with LC2.
(3) 400 V maximum.

0.06 to 315 kW at 400/415 V: type 2 coordination

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3						Switch-disconnector	aM fuses		Contactor	Thermal overload relay classe 10	
400/415 V		440 V		500 V		Reference (1)	Size	Rating	Reference (2)	Reference	Setting range
P	Ie	P	Ie	P	Ie						
kW	A	kW	A	kW	A			A			A
0.06	0.2	**0.06**	0.19	**–**	–	**GS1DD**	10 x 38	2	**LC1D09**	**LRD02**	0.16…0.25
–	–	**0.09**	0.28	**–**	–	**GS1DD**	10 x 38	2	**LC1D09**	**LRD03**	0.25…0.4
0.09 **0.12**	0.3 0.44	**–** **0.12**	– 0.37	**–** **–**	– –	**GS1DD**	10 x 38	2	**LC1D09**	**LRD04**	0.4…0.63
0.18 **–**	0.6 –	**0.18** **0.25**	0.55 0.76	**–** **–**	– –	**GS1DD**	10 x 38	2	**LC1D09**	**LRD05**	0.63…1
0.25 **0.37** **0.55**	0.85 1.1 1.5	**–** **0.37** **0.55**	– 1 1.36	**0.37** **0.55** **0.75**	0.88 1.2 1.5	**GS1DD**	10 x 38	2	**LC1D09**	**LRD06**	1…1.7
0.75 **–**	1.9 –	**0.75** **1.1**	1.68 2.37	**–** **1.1**	– 2.2	**GS1DD**	10 x 38	4	**LC1D09**	**LRD07**	1.6…2.5
1.1 **1.5**	2.7 3.6	**–** **1.5**	– 3.06	**1.5** **2.2**	2.9 3.9	**GS1DD**	10 x 38	4	**LC1D09**	**LRD08**	2.5…4
2.2	4.9	**2.2**	4.42	**3**	5.2	**GS1DD**	10 x 38	6	**LC1D09**	**LRD10**	4…6
3	6.5	**3**	5.77	**4**	6.8	**GS1DD**	10 x 38	8	**LC1D09**	**LRD12**	5.5…8
4	8.5	**4**	7.9	**5.5**	9.2	**GS1DD**	10 x 38	10	**LC1D09**	**LRD14**	7…10
5.5	11.5	**5.5**	10.4	**7.5**	12.4	**GS1DD**	10 x 38	16	**LC1D12**	**LRD16**	9…13
7.5	15.5	**7.5**	13.7	**9**	13.9	**GS1DD**	10 x 38	16	**LC1D18**	**LRD21**	12…18
–	–	**9**	16.9	**–**	–	**GS●F**	14 x 51	20	**LC1D25**	**LRD21**	12…18
9 **11**	18.1 22	**11** **–**	20.1 –	**11** **15**	17.6 23	**GS●F**	14 x 51	25	**LC1D25**	**LRD22**	16…24
15	29	**15**	26.5	**18.5**	28	**GS●F**	14 x 51	32	**LC1D32**	**LRD32**	23…32
18.5	35	**18.5**	32.8	**22**	33	**GS●F**	14 x 51	40	**LC1D40A**	**LRD340**	30…40
22	41	**22**	39	**30**	44	**GS●J**	22 x 58	50	**LC1D50A**	**LRD350**	37…50
–	–	**30**	51.5	**–**	–	**GS●J**	22 x 58	80	**LC1D65A**	**LRD365**	48…65
–	–	**–**	–	**37**	53	**GS●J**	22 x 58	80	**LC1D65A**	**LRD365**	48…65
30	55	**37**	64	**–**	–	**GS●J**	22 x 58	80	**LC1D65A**	**LRD365**	48…65
–	–	**–**	–	**45**	64	**GS●J**	22 x 58	80	**LC1D95**	**LRD3361**	55…70
37	66	**45**	76	**–**	–	**GS●J**	22 x 58	100	**LC1D80**	**LRD3363**	63…80
–	–	**–**	–	**55**	78	**GS●J**	22 x 58	100	**LC1D115**	**LR9D5367**	60…100
45	80	**–**	–	**–**	–	**GS●J**	22 x 58	100	**LC1D95**	**LRD3365**	80…93
55	97	**55**	90	**75**	106	**GS●L**	T0	125	**LC1D150**	**LR9D5369**	90…150
75	132	**75**	125	**90**	128	**GS●L**	T0	160	**LC1D150**	**LR9D5369**	90…150
90	160	**90**	146	**110**	156	**GS●N**	T1	200	**LC1F185**	**LR9F5371**	132…220
110	195	**110**	178	**132**	184	**GS●N**	T1	250	**LC1F225**	**LR9F5371**	132…220
132	230	**132**	215	**160**	224	**GS●QQ**	T2	315	**LC1F265**	**LR9F7375**	200…330
–	–	**160**	256	**–**	–	**GS●QQ**	T2	315	**LC1F330**	**LR9F7375**	200…330
160	280	**200**	321	**200**	280	**GS●QQ**	T2	400	**LC1F330**	**LR9F7375**	200…330
–	–	**–**	–	**220**	310	**GS●QQ**	T2	400	**LC1F400**	**LR9F7375**	200…330
200 **220**	350 388	**–** **220**	– 353	**–** **250**	– 344	**GS2S**	T3	500	**LC1F400**	**LR9F7379**	300…500
250	430	**250**	401	**–**	–	**GS2S**	T3	500	**LC1F500**	**LR9F7379**	300…500
– **–**	– –	**–** **–**	– –	**315** **355**	432 488	**GS2S**	T3	630	**LC1F500**	**LR9F7381**	380…630
315	540	**315**	505	**–**	–	**GS2S**	T3	630	**LC1F630**	**LR9F7381**	380…630
– **–**	– –	**355** **400**	549 611	**–** **400**	– 552	**GS2V**	T4	800	**LC1F630**	**LR9F7381**	380…630

(1) GS●: GS1 for direct operator or GS2 for external operator.
(2) For reversing operation, replace the prefix LC1 with LC2.

Coordination: Fuse (NFC, DIN type aM) + Contactor + Overload relay

0.75 to 400 kW at 690 V: type 2 coordination

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3		Switch-disconnector	aM fuses		Contactor	Thermal overload relay classe 10	
P	Ie	Reference (1)	Size	Rating	Reference (2)	Reference	Setting range
kW	A			A			A
0.75	1.1	**GS●F**	14 x 51	2	**LC1D09**	**LRD06**	1…1.6
1.1	1.6	**GS●F**	14 x 51	2	**LC1D09**	**LRD06**	1…1.6
1.5	2.1	**GS●F**	14 x 51	4	**LC1D09**	**LRD07**	1.6…2.5
2.2	2.8	**GS●F**	14 x 51	4	**LC1D09**	**LRD08**	2.5…4
3	3.8	**GS●F**	14 x 51	6	**LC1D09**	**LRD08**	2.5…4
4	4.9	**GS●F**	14 x 51	6	**LC1D09**	**LRD10**	4…6
5.5	6.7	**GS●F**	14 x 51	8	**LC1D09**	**LRD12**	5.5…8
7.5	8.9	**GS●F**	14 x 51	10	**LC1D25**	**LRD16**	9…13
11	12.8	**GS●F**	14 x 51	16	**LC1D25**	**LRD16**	9…13
15	17	**GS●F**	14 x 51	20	**LC1D25**	**LRD22**	16…24
18.5	21	**GS●F**	14 x 51	25	**LC1D32**	**LRD22**	16…24
22	24	**GS●J**	22 x 58	32	**LC1D40A**	**LRD332**	23…32
30	32	**GS●J**	22 x 58	40	**LC1D40A**	**LRD340**	30…40
37	39	**GS●J**	22 x 58	50	**LC1D65A**	**LRD350**	37…50
45	47	**GS●J**	22 x 58	63	**LC1D80**	**LRD3357**	37…50
55	57	**GS●J**	22 x 58	80	**LC1D115**	**LRD3359**	48…65
75	77	**GS●KK**	T00	100	**LC1D115**	**LRD3363**	63…80
90	93	**GS●KK**	T00	125	**LC1D150**	**LR9D5369**	90…150
110	113	**GS●KK**	T00	125	**LC1F185**	**LR9D5369**	90…150
132	134	**GS●L**	T0	160	**LC1F265**	**LR9F5371**	132…220
160	162	**GS●N**	T1	200	**LC1F265**	**LR9F5371**	132…220
200	203	**GS●N**	T1	250	**LC1F330**	**LR9F7375**	200…330
220	224	**GS●QQ**	T2	250	**LC1F400**	**LR9F7375**	200…330
250	250	**GS●QQ**	T2	315	**LC1F400**	**LR9F7375**	200…330
315	313	**GS●QQ**	T2	355	**LC1F500**	**LR9F7379**	300…500
355	354	**GS●QQ**	T2	400	**LC1F630**	**LR9F7379**	300…500
400	400	**GS2S**	T3	500	**LC1F630**	**LR9F7379**	300…500

(1) GS●: GS1 for direct operator or GS2 for external operator.
(2) For reversing operation, replace the prefix LC1 with LC2.

0.18 to 55 kW at 400/415 V: type 2 coordination

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3						Switch-disconnector	aM fuses		Contactor	Electronic thermal overload relay	
400/415 V			690 V			Reference	Size	Rating	Reference	Reference	Setting range
P	Ie	Iq	P	Ie	Iq						
kW	A	kA	kW	A	kA			A			A
0.18	0.6	100	**–**	–	–	**GS1DD**	10 x 38	2	**LC1D09**	**LR9D02**	0.4…2.0
0.25	0.85	100	**–**	–	–	**GS1DD**	10 x 38	2	**LC1D09**	**LR9D02**	0.4…2.0
0.37	1.1	100	**–**	–	–	**GS1DD**	10 x 38	2	**LC1D09**	**LR9D02**	0.4…2.0
0.55	1.5	100	**–**	–	–	**GS1DD**	10 x 38	2	**LC1D09**	**LR9D02**	0.4…2.0
0.75	1.9	100	**–**	–	–	**GS1DD**	10 x 38	4	**LC1D09**	**LR9D02**	0.4…2.0
1.1	2.7	100	**–**	–	–	**GS1DD**	10 x 38	4	**LC1D18**	**LR9D08**	1.6…8.0
1.5	3.6	100	**–**	–	–	**GS1DD**	10 x 38	4	**LC1D18**	**LR9D08**	1.6…8.0
2.2	4.9	100	**–**	–	–	**GS1DD**	10 x 38	6	**LC1D18**	**LR9D08**	1.6…8.0
3	6.5	100	**–**	–	–	**GS1DD**	10 x 38	8	**LC1D18**	**LR9D32**	6.4…32
4	8.5	100	**–**	–	–	**GS1DD**	10 x 38	10	**LC1D18**	**LR9D32**	6.4…32
5.5	11.5	100	**–**	–	–	**GS1DD**	10 x 38	16	**LC1D25**	**LR9D32**	6.4…32
7.5	15.5	50	**–**	–	–	**GS1DD**	10 x 38	16	**LC1D25**	**LR9D32**	6.4…32
11	22	50	**–**	–	–	**GS●F**	14 x 51	25	**LC1D25**	**LR9D32**	6.4…32
15	29	50	**–**	–	–	**GS●J**	22 x 58	32	**LC1D65A**	**LR9D110S**	22…110
18.5	35	50	**–**	–	–	**GS●J**	22 x 58	40	**LC1D65A**	**LR9D110S**	22…110
22	41	50	**–**	–	–	**GS●J**	22 x 58	50	**LC1D65A**	**LR9D110S**	22…110
45 (1)	80	100	**–**	–	–	**GS●N**	T 1	100	**LC1D150**	**LR9D110S**	22…110
55 (1)	97	100	**–**	–	–	**GS●N**	T 1	125	**LC1D150**	**LR9D110S**	22…110
–	–	–	**0.37**	0.64	100	**GS●F**	14 x 51	2	**LC1D09**	**LR9D02**	0.4…2.0
–	–	–	**0.55**	0.87	100	**GS●F**	14 x 51	2	**LC1D09**	**LR9D02**	0.4…2.0
–	–	–	**0.75**	1.1	100	**GS●F**	14 x 51	2	**LC1D09**	**LR9D02**	0.4…2.0
–	–	–	**1.1**	1.6	100	**GS●F**	14 x 51	2	**LC1D25**	**LR9D08**	1.6…8.0
–	–	–	**1.5**	2.1	100	**GS●F**	14 x 51	4	**LC1D25**	**LR9D08**	1.6…8.0
–	–	–	**2.2**	2.8	100	**GS●F**	14 x 51	4	**LC1D25**	**LR9D08**	1.6…8.0
–	–	–	**3**	4	100	**GS●F**	14 x 51	6	**LC1D25**	**LR9D08**	1.6…8.0
–	–	–	**4**	5	100	**GS●F**	14 x 51	6	**LC1D25**	**LR9D08**	1.6…8.0
–	–	–	**5.5**	7	50	**GS●F**	14 x 51	8	**LC1D25**	**LR9D32**	6.4…32
–	–	–	**7.5**	8.9	50	**GS●F**	14 x 51	10	**LC1D25**	**LR9D32**	6.4…32
–	–	–	**11**	13	50	**GS●F**	14 x 51	16	**LC1D32**	**LR9D32**	6.4…32
–	–	–	**15**	16.5	50	**GS●F**	14 x 51	20	**LC1D32**	**LR9D32**	6.4…32
–	–	–	**18.5**	21	100	**GS●F**	14 x 51	25	**LC1D95**	**LR9D32**	6.4…32
–	–	–	**18.5**	21	50	**GS●F**	14 x 51	25	**LC1D65A**	**LR9D32**	6.4…32
–	–	–	**22**	25	50	**GS●F**	14 x 51	32	**LC1D65A**	**LR9D32**	6.4…32
–	–	–	**30**	33	100	**GS●F**	14 x 51	40	**LC1D95**	**LR9D110**	22…110
–	–	–	**37**	40	100	**GS●F**	14 x 51	50	**LC1D95**	**LR9D110**	22…110
–	–	–	**45**	49	100	**GS●J**	22 x 58	63	**LC1D95**	**LR9D110**	22…110

(1) Ratings valid up to 400 V AC only.

Coordination: Fuse (BS) + Contactor + Overload relay

0.06 to 375 kW at 415 V: type 2 coordination

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3						Switch-disconnector-fuse	BS fuses		Contactor	Thermal overload relay	
415 V		440 V		500 V		Reference	Size	Rating	Reference (1)	Reference	Setting range
P	Ie	P	Ie	P	Ie						
kW	A	kW	A	kW	kA			A			A
0.06	0.22	**0.06**	0.19	**–**	–	**GS1DDB**	A1	NIT 2	**LC1D09**	**LRD02**	0.16…0.25
–	–	**0.09**	0.28	**–**	–	**GS1DDB**	A1	NIT 2	**LC1D09**	**LRD03**	0.25…0.4
0.09 **0.12**	0.36 0.42	**–** **0.12**	– 0.37	**–** **–**	– –	**GS1DDB**	A1	NIT 2	**LC1D09**	**LRD04**	0.4…0.63
0.18	0.6	**0.18**	0.55	**–**	–	**GS1DDB**	A1	NIT 2	**LC1D09**	**LRD05**	0.63…1
–	–	**0.25**	0.76	**–**	–	**GS1DDB**	A1	NIT 4	**LC1D09**	**LRD05**	0.63…1
0.25 **0.37** **0.55**	0.88 1 1.5	**0.37** **0.55** **0.75**	1 1.36 1.68	**0.37** **0.55** **0.75**	1 1.2 1.5	**GS1DDB**	A1	NIT 6	**LC1D09**	**LRD06**	1…1.7
0.75	2	**–**	–	**–**	–	**GS1DDB**	A1	NIT 10	**LC1D09**	**LRD07**	1.6…2.5
–	–	**–**	–	**1.5**	2.6	**GS1DDB**	A1	NIT 10	**LC1D09**	**LRD08**	2.5…4
1.5	3.5	**1.5**	3.06	**2.2**	3.8	**GS1DDB**	A1	NIT 16	**LC1D09**	**LRD08**	2.5…4
2.2	5	**2.2**	4.42	**3**	5	**GS1DDB**	A1	NIT 16	**LC1D09**	**LRD10**	4…6
3	6.5	**3**	5.77	**4**	6.5	**GS1DDB**	A1	NIT 20	**LC1D09**	**LRD12**	5.5…8
4	8.4	**4**	7.9	**5.5**	9	**GS1DDB**	A1	NIT 20	**LC1D09**	**LRD14**	7…10
5.5	11	**5.5**	10.4	**7.5**	12	**GS1DDB**	A1	NIT 20M25	**LC1D12**	**LRD16**	9…13
7.5	14	**7.5**	13.7	**9**	13.9	**GS1DDB**	A1	NIT 20M32	**LC1D18**	**LRD21**	12…18
9	18.1	**9**	16.9	**–**	–	**GS2GB**	A2	TIA 32M35	**LC1D18**	**LRD21**	12…18
11 **–**	21 –	**11** **–**	20 –	**11** **15**	18.4 23	**GS2GB**	A2	TIA 32M50	**LC1D25**	**LRD22**	16…24
15	28.5	**15**	26.5	**–**	–	**GS2GB**	A2	TIA 32M63	**LC1D32**	**LRD32**	23…32
18.5	35	**18.5**	32.8	**–**	–	**GS2GB**	A3	TIS 63M80	**LC1D40A**	**LRD340**	25…40
22	41	**22**	39	**–**	–	**GS2GB**	A3	TIS 63M80	**LC1D50A**	**LRD350**	37…50
30	55	**30**	51.5	**–**	–	**GS2GB**	A3	TIS 63M100	**LC1D65A**	**LRD365**	48…65
–	–	**37**	64	**–**	–	**GS2GB**	A3	TIS 63M100	**LC1D65A**	**LRD365**	48…65
–	–	**45**	76	**45**	65	**GS2LLB**	A4	TCP 100M125	**LC1D80**	**LRD3363**	63…80
45	81	**–**	–	**55**	80	**GS2LLB**	A4	TCP 100M125	**LC1D95**	**LRD3365**	80…93
55	100	**–**	–	**–**	–	**GS2LLB**	A4	TCP 100M160	**LC1D115**	**LR9D5369**	90…150
–	–	**55**	90	**–**	–	**GS2LLB**	A4	TCP 100M160	**LC1D115**	**LR9D5367**	60…100
–	–	**–**	–	**80**	116	**GS2LB**	B2	TF 200	**LC1D150**	**LR9D5369**	90…150
80	138	**80**	132	**–**	–	**GS2LB**	B2	TF 200M250	**LC1D150**	**LR9D5369**	90…150
– **–**	– –	**–** **–**	– –	**100** **110**	143 156	**GS2LB**	B2	TF 200M250	**LC1F185**	**LR9F5371**	132…220
100	182	**100**	162	**–**	–	**GS2MMB**	B2	TF 200M250	**LC1F185**	**LR9F5371**	132…220
110	196	**110**	178	**–**	–	**GS2MMB**	B2	TF 200M315	**LC1F225**	**LR9F5371**	132…220
–	–	**–**	–	**140**	200	**GS2NB**	B3	TKF 315M355	**LC1F265**	**LR9F5371**	132…220
140	250	**140**	226	**160**	220	**GS2NB**	B3	TKF 315M355	**LC1F265**	**LR9F7375**	200…330
160	285	**160**	256	**–**	–	**GS2QQB**	B4	TKF 315M355	**LC1F330**	**LR9F7375**	200…330
–	–	**–**	–	**220**	310	**GS2QQB**	B4	TMF 400	**LC1F400**	**LR9F7379**	300…500
220	388	**220**	353	**257**	362	**GS2QQB**	B4	TMF 400M450	**LC1F400**	**LR9F7379**	300…500
–	–	**–**	–	**270**	380	**GS2SB**	C2	TTM 500	**LC1F500**	**LR9F7379**	300…500
257 **270**	450 460	**257** **270**	412 433	**–** **–**	– –	**GS2SB**	C2	TTM 500	**LC1F500**	**LR9F7381**	380…630
375 **–**	610 –	**375** **–**	577 –	**375** **425**	508 556	**GS2SB**	C2	TTM 630	**LC1F630**	**LR9F7381**	380…630

(1) For reversing operation, replace the prefix LC1 with LC2.

Coordination: Thermal magnetic circuit breaker + Contactor

0.06 to 250 kW at 400/415 V: type 1 coordination

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Circuit breaker		Contactor
400/415 V			440 V			500 V			Reference *References in italics are available in CEE zone only*	Setting range of thermal trips	Reference (2)
P	Ie	Iq (1)	P	Ie	Iq (1)	P	Ie	Iq (1)			
kW	A	kA	kW	A	kA	kW	A	kA		A	
0.06	0.2	50	**0.06**	0.19	50	–	–	–	**GV2ME02** *GV2ME02AP*	0.16…0.25	**LC1K06** or **LC1D09**
0.09	0.3	50	**0.09** **0.12**	0.28 0.37	50 50	–	–	–	**GV2ME03** *GV2ME03AP*	0.25…0.40	**LC1K06** or **LC1D09**
0.12 **0.18**	0.44 0.6	50 50	– **0.18**	– 0.55	– 50	– –	– –	– –	**GV2ME04** *GV2ME04AP*	0.40…0.63	**LC1K06** or **LC1D09**
0.25 **0.37**	0.85 1.1	50 50	**0.25** **0.37**	0.76 0.99	50 50				**GV2ME05** *GV2ME05AP*	0.63…1	**LC1K06** or **LC1D09**
– **0.55**	– 1.5	– 50	– **0.55**	– 1.36	– 50	**0.37** **0.55**	0.88 1.2	50 50	**GV2ME06** *GV2ME06AP*	1…1.6	**LC1K06** or **LC1D09**
–	–	–	–	–	–	**0.75**	1.5	50	**GV2ME06** *GV2ME06AP*	1…1.6	**LC1K06** or **LC1D09**
0.75 –	1.9 –	50 –	**0.75** **1.1**	1.68 2.37	50 50	– **1.1**	– 2.2	– 50	**GV2ME07** *GV2ME07AP*	1.6….2.5	**LC1K06** or **LC1D09**
1.1 **1.5**	2.7 3.6	50 50	– **1.5**	– 3.06	– 50	**1.5** **2.2**	2.9 3.9	50 50	**GV2ME08** *GV2ME08AP*	2.5…4	**LC1K06** or **LC1D09**
2.2 –	4.9 –	50 –	**2.2** **3**	4.42 5.77	50 50	– **3**	– 5.2	– 50	**GV2ME10** *GV2ME10AP*	4…6.3	**LC1K06** or **LC1D09**
3 **4**	6.5 8.5	50 50	– **4**	– 7.9	– 15	**4** **5.5**	6.8 9.2	10 10	**GV2ME14** *GV2ME14AP*	6…10	**LC1K09** or **LC1D09**
5.5	11.5	15	**5.5**	10.4	8	**7.5**	12.4	6	**GV2ME16** *GV2ME16AP*	9…14	**LC1K12** or **LC1D12**
7.5 –	15.5 –	15 –	**7.5** **9**	13.7 16.9	8 8	**9** –	13.9 –	6 –	**GV2ME20** *GV2ME20AP*	13…18	**LC1D18**
9	18.1	15	**11**	20.1	6	**11**	17.6	4	**GV2ME21** *GV2ME21AP*	17…23	**LC1D25**
11	22	15	–	–	–	**15**	23	4	**GV2ME22** *GV2ME22AP*	20…25	**LC1D25**
15	29	10	**15**	26.5	6	**18.5**	28	4	**GV2ME32** *GV2ME32AP*	24…32	**LC1D32**
18.5	35	50	**18.5**	32.8	50	**22**	33	10	**GV3P40**	30…40	**LC1D40A**
22	41	50	**22**	39	50	**30**	44	10	**GV3P50**	37…50	**LC1D50A**
30	55	50	**30**	51.5	50	**37**	53	10	**GV3P65**	48…65	**LC1D65A**
37	66	50	–	–	–	–	–	–	**GV3P73**	62...73	**LC1D80A**
–	–	–	**37**	64	70	**45**	64	30	**GV4P80**	40…80	**LC1D65A**
37	66	100	**45**	76	70	**55**	78	30	**GV4P80**	40…80	**LC1D80**
45	80	100	–	–	–	–	–	–	**GV4P115**	65...115	**LC1D95**
55	97	100	**55**	90	70	**75**	106	30	**GV4P115**	65...115	**LC1D115**
75	132	36	**75**	125	35	**90**	128	30	**GV5P150F**	70...150	**LC1D150**
–	–	–	**90**	146	35	–	–	–	**GV5P150F**	70...150	**LC1F185**
90	160	36	–	–	–	**110**	156	30	**GV5P220F**	100...220	**LC1F185**
110	195	36	–	–	–	–	–	–	**GV5P220F**	100...220	**LC1F225**
160	280	36	**318**	280	35	–	–	–	**GV6P320F**	160...320	**LC1F330**
–	–	–	–	–	–	**220**	308	30	**GV6P320F**	160...320	**LC1F400**
200	350	36	**220**	318	35	–	–	–	**GV6P500F**	250...500	**LC1F400**
250	430	36	**250**	401	35	**335**	460	30	**GV6P500F**	250...500	**LC1F500**

*(1) The breaking performance of circuit breakers **GV2ME** can be increased by adding a current limiter **GV1L3**.*
(2) For reversing operation, replace the prefix LC1 with LC2.

Coordination: Thermal magnetic circuit breaker + Contactor

0.06 to 250 kW at 400/415 V: type 2 coordination

Standard power ratings of 3-phase motors 50/60 Hz in categ or y AC-3									Circuit breaker		Contactor
400/415 V			440 V			500 V			Reference *References in italics are available in CEE zone only*	Setting range of thermal trips	Reference (2)
P	Ie	Iq (1)	P	Ie	Iq (1)	P	Ie	Iq (1)			
kW	A	kA	kW	A	kA	kW	A	kA		A	
0.06	0.2	130	**0.06**	0.19	130	–	–	–	**GV2P02** or **GV2ME02** or *GV2ME02AP*	0.16…0.25	**LC1D09**
–	–	–	**0.09**	0.28	130	–	–	–	**GV2P03** or **GV2ME03** or *GV2ME03AP*	0.25…0.4	**LC1D09**
0.09	0.3	130	**0.12**	0.37	130	–	–	–			
0.12	0.44	130	–	–	–	–	–	–	**GV2P04** or **GV2ME04** or *GV2ME04AP*	0.4…0.63	**LC1D09**
0.18	0.6	130	**0.18**	0.55	130	–	–	–			
0.25	0.85	130	**0.25**	0.76	130	–	–	–	**GV2P05** or **GV2ME05** or *GV2ME05AP*	0.63…1	**LC1D09**
0.37	1.1	130	**0.37**	0.99	130	–	–	–			
–	–	–	–	–	–	**0.37**	0.88	130	**GV2P06** or **GV2ME06** or *GV2ME06AP*	1…1.6	**LC1D09**
0.55	1.5	130	**0.55**	1.36	130	**0.55**	1.2	130			
–	–	–	–	–	–	**0.75**	1.5	130	**GV2P06** or **GV2ME06** or *GV2ME06AP*	1…1.6	**LC1D09**
0.75	1.9	130	**0.75**	1.68	130	–	–	–	**GV2P07** or **GV2ME07** or *GV2ME07AP*	1.6…2.5	**LC1D09**
–	–	–	**1.1**	2.37	130	**1.1**	2.2	130			
1.1	2.7	130	–	–	–	**1.5**	2.9	130	**GV2P08** or **GV2ME08** or *GV2ME08P*	2.5…4	**LC1D09**
1.5	3.6	130	**1.5**	3.06	130	**2.2**	3.9	130			
–	–	–	–	–	–	–	–	–	**GV2P10** or **GV2ME10** or *GV2ME10AP*	4…6.3	**LC1D09**
2.2	4.9	130	–	–	–	–	–	–			
–	–	–	**2.2**	4.42	50	–	–	–	**GV2ME10** or *GV2ME10AP*	4…6.3	**LC1D09**
–	–	–	**3**	5.77	50	**3**	5.2	50			
–	–	–	**2.2**	4.42	130	–	–	–	**GV2P10**	4…6.3	**LC1D09**
–	–	–	**3**	5.77	130	**3**	5.2	130			
3	6.5	130	–	–	–	–	–	–	**GV2P14** or **GV2ME14** or *GV2ME14AP*	6…10	**LC1D09**
4	8.5	130	–	–	–	–	–	–			
–	–	–	**4**	7.9	15	**4**	6.8	10	**GV2ME14** or *GV2ME14AP*	6…10	**LC1D09**
–	–	–	–	–	–	**5.5**	9.2	10			
–	–	–	–	–	–	**4**	6.8	50	**GV2P14**	6…10	**LC1D12**
–	–	–	**4**	7.9	130	**5.5**	9.2	50			
5.5	11.5	130	**5.5**	10.4	50 or 8	**7.5**	12.4	42 or 6	**GV2P16** or **GV2ME16** or *GV2ME16AP*	9…14	**LC1D25**
–	–	–	**7.5**	13.7	50 or 8	**9**	13.9	42 or 6			
7.5	15.5	50 or 15	**9**	16.9	20 or 8	–	–	–	**GV2P20** or **GV2ME20** or *GV2ME20AP*	13…18	**LC1D25**
9	18.1	50 or 15	**11**	20.1	20 or 8	**11**	17.6	10 or 6	**GV2P21** or **GV2ME21** or *GV2ME21AP*	17…23	**LC1D25**
11	22	50 or 15	–	–	–	–	–	–	**GV2P22** or **GV2ME22** or *GV2ME22AP*	20…25	**LC1D25**
–	–	–	–	–	–	**15**	23	10 or 6	**GV2P22**	20…25	**LC1D32**
15	29	50 or 10	**15**	26.5	20 or 6	**18.5**	28	10 or 4	**GV2P32** or **GV2ME32** or *GV2ME32AP*	24…32	**LC1D32**
18.5	35	50	–	–	–	–	–	–	**GV3P40**	30…40	**LC1D50A**
–	–	–	**18.5**	32.8	50	**22**	33	10	**GV3P40**	30…40	**LC1D65A**
22	41	50	–	–	–	–	–	–	**GV3P50**	37…50	**LC1D50A**
–	–	–	**22**	39	50	**30**	44	10	**GV3P50**	37…50	**LC1D65A**
30	55	50	**30**	51.5	50	–	–	–	**GV3P65**	48…65	**LC1D65A**
–	–	–	–	–	–	**37**	53	10	**GV3P65**	48…65	**LC1D65A**
37	66	50	–	–	–	–	–	–	**GV3P73**	62...73	**LC1D80A**
–	–	–	**37**	64	70	–	–	–	**GV4P80**	40…80	**LC1D65A**
37	66	100	**45**	76	70	(3)	(3)	(3)	**GV4P80**	40…80	**LC1D80**
45	80	100	**55**	90	70	(3)	(3)	(3)	**GV4P115**	65 …115	**LC1D115/F115**
55	97	100	–	–	–	(3)	(3)	(3)			
75	132	70	**75**	125	65	–	–	–	**GV5P150H**	70...150	**LC1D150**
			90	146	65	–	–	–			
90	160	70	**110**	178	65	–	–	–	**GV5P220H**	100...220	**LC1F225**
110	195	70	–	–	–	–	–	–	**GV5P220H**	100...220	**LC1F225**
132	230	70	**160**	256	65	–	–	–	**GV6P320H**	160...320	**LC1F265**
160	280	70	**200**	318	65	–	–	–	**GV6P320H**	160...320	**LC1F330**
220	385	70	**250**	450	65	–	–	–	**GV6P500H**	250...500	**LC1F500**
250	450	70	**300**	473	65	–	–	–			

*(1) The breaking performance of circuit breakers **GV2P** can be increased by adding a current limiter **GV1L3**.*
*(2) Combinations with circuit breaker **GV2ME** are type 2 co or dinated only at 400/415 V and 440 V.*
(3) Please consult your regional sales office.

Coordination (UL): Thermal magnetic circuit breaker + Contactor

½ to 80 hp at 460 V - 3P

GV2P + contactor: compact, high SCCR solution.
GV3P + contactor: medium power, Everlink (long lasting power connection).
GV4PB + contactor: high power, advanced protection settings, Everlink (long lasting power connection), 18 (GV4PB●●●B), 35 (GV4PB●●●N) or 65 (GV4PB●●●S) kA SCCR.

Standard power ratings						Circuit breaker		Contactor		Circuit breaker		Contactor		Circuit breaker		Contactor	
200 V 3P		230 V 3P		460 V 3P		Product reference (2)	Dial range	Product reference (3)	Comb. SCCR 480Y	Product reference (4)	Dial range	Product reference (3)	Comb. SCCR 480Y	Product reference	Dial range	Product reference (3)	SCCR 480Y As applied
HP	FLA (1)	HP	FLA (1)	HP	FLA (1)		A		kA		A		kA		A		kA
				½	1.1	GV2P06	1 to 1.6	LC1D09	100					GV4PB02S	0.8 to 2	LC1D09	65
				¾	1.6	GV2P06	1 to 1.6	LC1D09	100					GV4PB02S	0.8 to 2	LC1D09	65
½	2.5	½	2.2	1	2.1	GV2P07	1.6 to 2.5	LC1D09	100					GV4PB03S	1.4 to 3.5	LC1D09	65
				1½	3	GV2P08	2.5 to 4	LC1D09	100					GV4PB03S	1.4 to 3.5	LC1D09	65
¾	3.7	¾	3.2	2	3.4	GV2P08	2.5 to 4	LC1D09	100					GV4PB07S	2.9 to 7	LC1D09	65
1	4.6	1	4.2	3	4.8	GV2P10	4 to 6.3	LC1D09	100					GV4PB07S	2.9 to 7	LC1D09	65
		1½	6			GV2P10	4 to 6.3	LC1D09	100					GV4PB12S	5 to 12.5	LC1D12	65
1½	6.9	2	6.8			GV2P14	6 to 10	LC1D12	100					GV4PB12S	5 to 12.5	LC1D12	65
2	7.8			5	7.6	GV2P14	6 to 10	LC1D12	100					GV4PB12S	5 to 12.5	LC1D12	65
		3	9.6			GV2P14	6 to 10	LC1D12	100	GV3P13	9 to 13	LC1D18	65	GV4PB12S	5 to 12.5	LC1D12	65
3	11			7½	11	GV2P16	9 to 14	LC1D18	50 (5)	GV3P13	9 to 13	LC1D18	65	GV4PB25S	10 to 25	LC1D25	65
				10	14	GV2P16	9 to 14	LC1D18	50 (5)	GV3P18	12 to 18	LC1D18	65	GV4PB25S	10 to 25	LC1D25	65
5	17.5	5	15.2			GV2P20	13 to 18	LC1D18	50 (5)	GV3P18	12 to 18	LC1D18	65	GV4PB25S	10 to 25	LC1D25	65
		7½	22	15	21	GV2P21	17 to 23	LC1D25	50 (5)	GV3G25	17 to 25	LC1D25	65	GV4PB25S	10 to 25	LC1D25	65
7½	25.3					GV2P22	20 to 25	LC1D25	50 (5)	GV3P32	23 to 32	LC1D32	65	GV4PB50S	20 to 50	LC1D50A	65
		10	28	20	27					GV3P32	23 to 32	LC1D32	65	GV4PB50S	20 to 50	LC1D50A	65
10	32.2			25	34					GV3P40	30 to 40	LC1D40A	65	GV4PB50S	20 to 50	LC1D50A	65
		15	42	30	40					GV3P50	37 to 50	LC1D50A	65	GV4PB50S	20 to 50	LC1D50A	65
15	48									GV3P65	48 to 65	LC1D65A	65	GV4PB50S	20 to 50	LC1D50A	65
		20	54	40	52					GV3P65	48 to 65	LC1D65A	65	GV4PB80S	40 to 80	LC1D80	65
20	62.1													GV4PB115S	40 to 80	LC1D80	65
25	78.2	25	68	50	65									GV4PB115S	40 to 80	LC1D80	65
30	92	30	80	60	77									GV4PB115S	65 to 115	LC1D115	65

(1) Motor Full Load Amp Sizes are based on NEC Table 430.250.
(2) Requires use of GV1G09 or GV2GH7 line spacer for Type F rating.
(3) Add coil suffix to complete reference part number. For example, an LC1D09G7 includes a 120 V AC coil.
(4) Requires use of GV3G66 line spacer and GVAM11 short-circuit signaling contact for Type F rating.
(5) SCCR is 42 kA at 480Y when using GV2G busbar links.

Coordination: Magnetic circuit breaker + Contactor + Overload relay

0.06 to 250 kW at 400/415 V: type 1 coordination

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Circuit breaker			Contactor	Thermal overload relay	
400/415 V			440 V			500 V			Reference	Rating	Irm [1]	Reference [2]	Reference	Setting range
P	Ie	Iq	P	Ie	Iq	P	Ie	Iq						
kW	A	kA	kW	A	kA	kW	A	kA		A	A			A
0.06	0.2	50	0.06	0.19	50	–	–	–	**GV2LE03**	0.4	5	**LC1K06**	**LR2K0302**	0.16…0.23
–	–	–	0.09	0.28	50	–	–	–	**GV2LE03**	0.4	5	**LC1K06**	**LR2K0303**	0.23…0.36
0.09	0.3	50	0.12	0.37	50	–	–	–	**GV2LE03**	0.4	5	**LC1K06**	**LR2K0304**	0.36…0.54
0.12	0.44	50				–	–	–	**GV2LE04**	0.63	8	**LC1K06**	**LR2K0304**	0.36…0.54
0.18	0.6	50	0.18	0.55	50	–	–	–	**GV2LE04**	0.63	8	**LC1K06**	**LR2K0305**	0.54…0.8
–	–	–	0.25	0.76	50	–	–	–	**GV2LE05**	1	13	**LC1K06**	**LR2K0305**	0.54…0.8
0.25 0.37	0.85 1.1	50 50	– 0.37	– 1	– 50	– 0.37	– 0.88	– 50	**GV2LE05**	1	13	**LC1K06**	**LR2K0306**	0.8…1.2
0.55 –	1.5 –	50 –	0.55 –	1.36 –	50 –	0.55 0.75	1.2 1.5	50 50	**GV2LE06**	1.6	22.5	**LC1K06**	**LR2K0307**	1.2…1.8
–	–	–	0.75	1.68	50	–	–	–	**GV2LE07**	2.5	33.5	**LC1K06**	**LR2K0307**	1.2…1.8
0.75 1.1	1.9 2.7	50 50	– 1.1	– 2.37	– 50	– 1.1	– 2.2	– 50	**GV2LE07**	2.5	33.5	**LC1K06**	**LR2K0308**	1.8…2.6
1. 5	3.6	50	1.5	3.06	50	1.5	2.9	50	**GV2LE08**	4	51	**LC1K06**	**LR2K0310**	2.6…3.7
–	–	–	–	–	–	2.2	3.9	50	**GV2LE08**	4	51	**LC1K06**	**LR2K0312**	3.7…5.5
2.2	4.9	50	2.2	4.4	50	3	5.2	50	**GV2LE10**	6.3	78	**LC1K06**	**LR2K0312**	3.7…5.5
–	–	–	3	5.77	50	–	–	–	**GV2LE10**	6.3	78	**LC1K06**	**LR2K0314**	5.5…8
–	–	–	4	7.9	15	–	–	–	**GV2LE14**	10	138	**LC1K09**	**LR2K0314**	5.5…8
3	6.5	50	–	–	–	4	6.8	10	**GV2LE14**	10	138	**LC1K09**	**LR2K0314**	5.5…8
4	8.5	50	–	–	–	–	–	–	**GV2LE14**	10	138	**LC1K09**	**LR2K0316**	8…11.5
5.5	11.5	15	5.5	10.4	8	7.5	12.4	6	**GV2LE16**	14	170	**LC1K12**	**LR2K0321**	10…14
–	–	–	7.5	13.7	8	9	13.9	6	**GV2LE16**	14	170	**LC1D18**	**LRD21**	12…18
7.5	15.5	15	9	16.9	8	–	–	–	**GV2LE20**	18	223	**LC1D18**	**LRD21**	12…18
9	18.1	15	–	–	–	11	17.6	4	**GV2LE22**	25	327	**LC1D25**	**LRD22**	16…24
11	22	15	11	20.1	6	15	23	4	**GV2LE22**	25	327	**LC1D25**	**LRD22**	16…24
15	29	10	15	26.5	6	18.5	28	4	**GV2LE32**	32	416	**LC1D32**	**LRD32**	23…32
18.5	35	50	18.5	32.5	50	22	33	10	**GV3L40**	40	560	**LC1D40A**	**LRD340**	30…40
22	41	50	22	39	50	30	44	10	**GV3L50**	50	700	**LC1D50A**	**LRD350**	37…50

(1) Irm: setting current of the magnetic trip.
(2) For reversing operation, replace the prefix LC1 with LC2.

Coordination: Magnetic circuit breaker + Contactor + Overload relay

0.06 to 250 kW at 400/415 V: type 1 coordination

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Circuit breaker			Contactor	Thermal overload relay	
400/415 V			440 V			500 V			Reference	Rating	Irm (1)	Reference (2)	Reference	Setting range
P	Ie	Iq	P	Ie	Iq	P	Ie	Iq						
kW	A	kA	kW	A	kA	kW	A	kA		A	A			A
30	55	50	**30**	51.5	50	**37**	53	10	**GV3L65**	65	910	**LC1D65A**	**LRD365**	48…65
–	–	–	**37**	64	50	**37**	53	10	**GV3L65**	65	910	**LC1D65A**	**LRD365**	48…65
–	–	–	–	–	–	**45**	64	50	**GV3L65**	65	910	**LC1D80**	**LRD3361**	48…65
37	66	50	–	–	–	–	–	–	**GV3L73**	73	1120	**LC1D80A**	**LRD380**	62...80
–	–	–	**37**	64	70	–	–	–	**GV4L80**	80	880	**LC1D65A**	**LRD365**	48…65
–	–	–	–	–	–	**45**	64	30	**GV4L80**	80	880	**LC1D80**	**LRD3361**	48…65
37	66	100	–	–	–	–	–	–	**GV4L80**	80	1040	**LC1D80**	**LRD3361**	48…65
–	–	–	**45**	76	70	**55**	78	30	**GV4L80**	80	1040	**LC1D80**	**LRD3363**	63…80
45	80	100	–	–	–	–	–	–	**GV4L115**	115	1380	**LC1D95**	**LRD3365**	80…104
–	–	–	–	–	–	**75**	106	30	**GV4L115**	115	1380	**LC1D115**	**LRD4367**	95…120
–	–	–	**55**	90	70	–	–	–	**GV4L115**	115	1380	**LC1D115**	**LRD4365**	80…104
55	97	100	–	–	–	–	–	–	**GV4L115**	115	1495	**LC1D115**	**LRD4367**	95…120
–	–	–	–	–	–	**50**	90	(3)	**NSX100●MA** (3)	100	1200	**LC1D115**	**LRD4365**	80…104
–	–	–	–	–	–	**75**	106	(3)	**NSX160●MA** (3)	150	1500	**LC1D115**	**LRD4367**	95…120
55	97	(3)	–	–	–	–	–	–	**NSX160●MA** (3)	150	1350	**LC1D115**	**LRD4367**	95…120
75	132	(3)	**75**	125	(3)	**90**	128	(3)	**NSX160●MA** (3)	150	1800	**LC1D150**	**LRD4369**	110…140
–	–	–	**90**	146	(3)	–	–	–	**NSX160●MA** (3)	150	1950	**LC1F185**	**LR9F5371**	132…220
90	160	(3)	–	–	–	**110**	156	(3)	**NSX250●MA** (3)	220	2200	**LC1F185**	**LR9F5371**	132…220
110	195	(3)	–	–	–	–	–	–	**NSX250●MA** (3)	220	2640	**LC1F225**	**LR9F5371**	132…220
–	–	–	**110**	178	(3)	–	–	–	**NSX250●MA** (3)	220	2420	**LC1F225**	**LR9F5371**	132…220
–	–	–	–	–	–	**132**	184	(3)	**NSX250●MA** (3)	220	2640	**LC1F265**	**LR9F5371**	132…220
–	–	–	**132**	215	(3)	–	–	–	**NSX250●MA** (3)	220	2860	**LC1F265**	**LR9F5371**	132…220
132	230	(3)	–	–	–	–	–	–	**NSX400●** + **Micrologic 1.3M** (3)	320	3200	**LC1F265**	**LR9F7375**	200…330
–	–	–	–	–	–	**160**	224	(3)	**NSX400●** + **Micrologic 1.3M** (3)	320	2860	**LC1F265**	**LR9F7375**	200…330
–	–	–	**160**	256	(3)	–	–	–	**NSX400●** + **Micrologic 1.3M** (3)	320	3520	**LC1F330**	**LR9F7375**	200…330
160	280	(3)	**200**	321	(3)	–	–	–	**NSX400●** + **Micrologic 1.3M** (3)	320	4160	**LC1F330**	**LR9F7375**	200…330
–	–	–	–	–	–	**200**	280	(3)	**NSX400●** + **Micrologic 1.3M** (3)	320	3840	**LC1F330**	**LR9F7375**	200…330
–	–	–	–	–	–	**220**	310	(3)	**NSX400●** + **Micrologic 1.3M** (3)	320	4160	**LC1F400**	**LR9F7379**	300…500
200	350	(3)	**220**	353	(3)	–	–	–	**NSX400●** + **Micrologic 1.3M** (3)	500	5000	**LC1F400**	**LR9F7379**	300…500
–	–	–	**250**	401	(3)	–	–	–	**NSX630●** + **Micrologic 1.3M** (3)	500	5550	**LC1F400**	**LR9F7379**	300…500
–	–	–	–	–	–	**250**	344	(3)	**NSX630●** + **Micrologic 1.3M** (3)	500	5000	**LC1F400**	**LR9F7379**	300…500
220	388	(3)	–	–	–	–	–	–	**NSX630●** + **Micrologic 1.3M** (3)	500	5500	**LC1F400**	**LR9F7379**	300…500
250	430	(3)	**280**	470	(3)	**315**	432	(3)	**NSX630●** + **Micrologic 1.3M** (3)	500	6000	**LC1F500**	**LR9F7379**	300…500
–	–	–	–	–	–	**355**	488	(3)	**NSX630●** + **Micrologic 1.3M** (3)	500	6500	**LC1F500**	**LR9F7381**	380…630

(1) Irm: setting current of the magnetic trip.
(2) For reversing operation, replace the prefix LC1 with LC2.
(3) Reference to be completed by replacing the ● with the breaking performance code:

Breaking performance Iq (kA)	NSX100●MA		NSX160●MA and NSX250●MA		NSX400● and NSX630●	
400/415 V	36	70	36	70	70	150
440 V	35	65	35	65	65	130
500 V	25	50	25	50	50	70
660/690 V	8	10	8	10	20	20
Code	**F**	**H**	**F**	**H**	**H**	**L**

Coordination: Magnetic circuit breaker + Contactor + Overload relay

0.06 to 250 kW at 400/415 V: type 2 coordination

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Circuit breaker			Contactor	Thermal overload relay	
400/415 V			440 V			500 V			Reference	Rating	Irm (1)	Reference (2)	Reference	Setting range
P	Ie	Iq	P	Ie	Iq	P	Ie	Iq						
kW	A	kA	kW	A	kA	kW	A	kA		A	A			A
0.06	0.2	130	**0.06**	0.19	130	**–**	–	–	**GV2L03** or **LE03**	0.4	5	**LC1D09**	**LRD02**	0.16…0.25
0.09	0.3	130	**0.09**	0.28	130	**–**	–	–	**GV2L03** or **LE03**	0.4	5	**LC1D09**	**LRD03**	0.25…0.40
–	–	–	**0.12**	0.37	130	**–**	–	–						
0.12	0.44	130	**–**	–	–	**–**	–	–	**GV2L04** or **LE04**	0.63	8	**LC1D09**	**LRD04**	0.4…0.63
0.18	0.6	130	**0.18**	0.55	130	**–**	–	–						
0.25	0.85	130	**0.25**	0.76	130	**–**	–	–	**GV2L05** or **LE05**	1	13	**LC1D09**	**LRD05**	0.63…1
0.37	1.1	130	**0.37**	0.99	130	**–**	–	–						
–	–	–	**–**	–	–	**0.37**	0.88	130	**GV2L05** or **LE05**	1	13	**LC1D09**	**LRD06**	1…1.7
0.55	1.5	130	**–**	–	–	**0.55**	1.2	130	**GV2L06** or **LE06**	1.6	22.5	**LC1D09**	**LRD06**	1…1.7
–	–	–	**0.55**	1.36	130	**0.75**	1.5	130						
0.75	1.9	130	**0.75**	1.68	130	**1.1**	2.2	130	**GV2L07** or **LE07**	2.5	33.5	**LC1D09**	**LRD07**	1.6…2.5
1.1	2.7	130	**1.1**	2.37	130	**1.5**	2.9	130	**GV2L08** or **LE08**	4	51	**LC1D09**	**LRD08**	2.5…4
1.5	3.6	130	**–**	–	–	**2.2**	3.9	130						
–	–	–	**1.5**	3.06	130	**–**	–	–	**GV2L08** or **LE08**	4	51	**LC1D09**	**LRD10**	4…6
2.2	4.9	130	**–**	–	–	**–**	–	–	**GV2L10** or **LE10**	6.3	78	**LC1D09**	**LRD10**	4…6
–	–	–	**–**	–	–	**3**	5.2	13						
–	–	–	**2.2**	4.42	50	**–**	–	–	**GV2LE10**	6.3	78	**LC1D09**	**LRD10**	4…6
–	–	–	**3**	5.77	50	**3**	5.2	50						
–	–	–	**2.2**	4.42	130	**–**	–	–	**GV2L10**	6.3	78	**LC1D09**	**LRD10**	4…6
–	–	–	**3**	5.77	130	**3**	5.2	130						
3	6.5	130	**–**	–	–	**–**	–	–	**GV2L14** or **LE14**	10	10	**LC1D09**	**LRD12**	5.5…8
–	–	–	**–**	–	–	**4**	6.8	10	**GV2LE14**	10	138	**LC1D12**	**LRD12**	5.5…8
–	–	–	**–**	–	–	**4**	6.8	50	**GV2L14**	10	138	**LC1D12**	**LRD12**	5.5…8
4	8.5	130	**–**	–	–	**–**	–	–	**GV2L14** or **LE14**	10	138	**LC1D09**	**LRD14**	7…10
–	–	–	**4**	7.9	15	**–**	–	–	**GV2LE14**	10	138	**LC1D09**	**LRD14**	7…10
–	–	–	**4**	7.9	130	**–**	–	–	**GV2L14**	10	138	**LC1D09**	**LRD14**	7…10
–	–	–	**–**	–	–	**5.5**	9.2	10	**GV2LE14**	10	138	**LC1D09**	**LRD14**	7…10
–	–	–	**–**	–	–	**5.5**	9.2	50	**GV2L14**	10	138	**LC1D09**	**LRD14**	7…10
5.5	11.5	130	**5.5**	10.4	50	**7.5**	12.4	42	**GV2L16**	14	170	**LC1D25**	**LRD16**	9…13
–	–	–	**7.5**	13.7	50	**–**	–	–	**GV2L16**	14	170	**LC1D25**	**LRD21**	12…18
7.5	15.5	50	**9**	16.9	20	**9**	13.9	10	**GV2L20**	18	223	**LC1D25**	**LRD21**	12…18
9	18.1	50	**–**	–	–	**–**	–	–	**GV2L22**	25	327	**LC1D25**	**LRD22**	16…24
11	22	50	**11**	20.1	20	**–**	–	–						
–	–	–	**–**	–	–	**11**	17.6	10	**GV2L22**	25	327	**LC1D32**	**LRD22**	16…24
–	–	–	**–**	–	–	**15**	23	10						
15	29	50	**15**	26.5	50	**–**	–	–	**GV3L32**	32	448	**LC1D40A**	**LRD332**	23…32
–	–	–	**–**	–	–	**18.5**	28	10	**GV3L32**	32	448	**LC1D65A**	**LRD332**	23…32

(1) Irm: setting current of the magnetic trip.
(2) For reversing operation, replace the prefix LC1 with LC2.

Coordination: Magnetic circuit breaker + Contactor + Overload relay

0.06 to 250 kW at 400/415 V: type 2 coordination

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Circuit breaker			Contactor	Thermal overload relay	
400/415 V			440 V			500 V			Reference	Rating	Irm (1)	Reference (2)	Reference	Setting range
P	Ie	Iq	P	Ie	Iq	P	Ie	Iq						
kW	A	kA	kW	A	kA	kW	A	kA		A	A			A
18.5	35	50	–	–	–	–	–	–	**GV3L40**	40	560	**LC1D50A**	**LRD340**	30…40
–	–	–	**18.5**	32.5	50	–	–	–	**GV3L40**	40	560	**LC1D65A**	**LRD340**	30…40
22	41	50	–	–	–	–	–	–	**GV3L50**	50	700	**LC1D50A**	**LRD350**	37…50
–	–	–	**22**	39	50	**30**	44	10	**GV3L50**	50	700	**LC1D65A**	**LRD350**	37…50
30	55	50	**30**	51.5	50	**37**	53	10	**GV3L65**	65	910	**LC1D65A**	**LRD365**	48…65
37	66	50	–	–	–	–	–	–	**GV3L73**	73	1120	**LC1D80A**	**LRD380**	62...80
45	60	50	–	–	–	–	–	–	**GV3L80**	80	1120	**LC1D95**	**LRD3363**	63...80
–	–	–	**37**	64	70	–	–	–	**GV4L80**	80	880	**LC1D65A**	**LRD365**	48…65
37	66	100	**45**	76	70	(4)	(4)	(4)	**GV4L80**	80	1040	**LC1D80**	**LRD3363**	63…80
45	80	100	**55**	90	70	(4)	(4)	(4)	**GV4L115**	115	1380	**LC1D115** **LC1F115**	**LR9D5367** **LR9F5367**	60…100 60…100
55	97	100	–	–	–	(4)	(4)	(4)	**GV4L115**	115	1495	**LC1D115** **LC1F115**	**LR9D5369** **LR9F5369**	90…150 90…150
–	–	–	–	–	–	**55**	78	(3)	**NSX100●MA** (3)	100	1040	**LC1D80**	**LRD3363**	63…80
45	80	(3)	**55**	90	(3)	–	–	–	**NSX100●MA** (3)	100	1300	**LC1D115**	**LR9D5367**	60…100
55	97	(3)	–	–	–	–	–	–	**NSX160●MA** (3)	150	1500	**LC1D115**	**LR9D5369**	90…150
–	–	–	–	–	–	**75**	106	(3)	**NSX160●MA** (3)	150	1950	**LC1D115**	**LR9D5369**	90…150
75	132	(3)	**75**	125	(3)	–	–	–	**NSX160●MA** (3)	150	1950	**LC1D150**	**LR9D5369**	90…150
–	–	–	**90**	146	(3)	–	–	–	**NSX160●MA** (3)	150	1950	**LC1D150**	**LR9D5369**	90…150
–	–	–	–	–	–	**90**	128	(3)	**NSX160●MA** (3)	150	1200	**LC1D150**	**LR9D5369**	90…150
90	160	(3)	**110**	178	(3)	–	–	–	**NSX250●MA** (3)	220	2420	**LC1F185**	**LR9F5371**	132…220
–	–	–	–	–	–	**110**	156	(3)	**NSX250●MA** (3)	220	1540	**LC1F185**	**LR9F5371**	132…220
110	195	(3)	–	–	–	–	–	–	**NSX250●MA** (3)	220	2860	**LC1F225**	**LR9F5371**	132…220
–	–	–	**132**	215	(3)	**132**	184	(3)	**NSX400●** + **Micrologic 1.3M** (3)	320	3500	**LC1F265**	**LR9F5371**	132…220
132	230	(3)	**160**	256	(3)	–	–	–	**NSX400●** + **Micrologic 1.3M** (3)	320	3520	**LC1F265**	**LR9F7375**	200…330
–	–	–	–	–	–	**160**	224	(3)	**NSX400●** + **Micrologic 1.3M** (3)	320	2200	**LC1F265**	**LR9F7375**	200…330
160	280	(3)	–	–	–	–	–	–	**NSX400●** + **Micrologic 1.3M** (3)	320	4000	**LC1F330**	**LR9F7375**	200…330
–	–	–	**200**	321	(3)	–	–	–	**NSX400●** + **Micrologic 1.3M** (3)	320	4000	**LC1F330**	**LR9F7379**	300…500
–	–	–	–	–	–	**200**	280	(3)	**NSX400●** + **Micrologic 1.3M** (3)	320	3500	**LC1F400**	**LR9F7375**	200…330
–	–	–	–	–	–	**220**	310	(3)	**NSX400●** + **Micrologic 1.3M** (3)	320	3500	**LC1F400**	**LR9F7379**	300…500
– **200**	– 350	– (3)	**220** **250**	353 401	(3) (3)	– –	– –	– –	**NSX630●** + **Micrologic 1.3M** (3)	500	5500	**LC1F400**	**LR9F7379**	300…500
– –	– –	– –	– –	– –	– –	**250** **315**	344 432	(3) (3)	**NSX630●** + **Micrologic 1.3M** (3)	500	4500	**LC1F500**	**LR9F7379**	300…500
220 **250**	388 430	(3) (3)	– –	– –	– –	– –	– –	– –	**NSX630●** + **Micrologic 1.3M** (3)	500	6250	**LC1F500**	**LR9F7379**	300…500
–	–	–	–	–	–	**355**	488	(3)	**NSX630●** + **Micrologic 1.3M** (3)	500	5000	**LC1F630**	**LR9F7381**	380…630

(1) Irm: setting current of the magnetic trip.
(2) For reversing operation, replace the prefix LC1 with LC2.
(3) Reference to be completed by replacing the ● with the breaking performance code:

Breaking performance Iq (kA)	NSX100●MA		NSX160●MA and NSX250●MA		NSX400● and NSX630●	
400/415 V	36	70	36	70	70	150
440 V	35	65	35	65	65	130
500 V	25	50	25	50	50	70
660/690 V	8	10	8	10	20	20
Code	**F**	**H**	**F**	**H**	**H**	**L**

(4) Please consult your regional sales office.

Coordination: Magnetic circuit breaker + Contactor + Overload relay

0.06 to 30 kW at 400/415 V: type 2 coordination

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3						Circuit breaker			Contactor	Electronic thermal overload relay	
400/415 V			690 V			Reference	Rating	Irm	Reference	Reference	Setting range
P	Ie	Iq	P	Ie	Iq						
kW	A	kA	kW	A	kA		A	A			A
0.06	0.2	100	**–**	–	–	**GV2L03**	0.4	5	**LC1D09**	**LR9D01**	0.1…0.5
0.09	0.3	100	**–**	–	–	**GV2L03**	0.4	5	**LC1D09**	**LR9D01**	0.1…0.5
0.12	0.44	100	**–**	–	–	**GV2L04**	0.63	8	**LC1D18**	**LR9D02**	0.4…2.0
0.18	0.6	100	**–**	–	–	**GV2L04**	0.63	8	**LC1D18**	**LR9D02**	0.4…2.0
0.25	0.85	100	**–**	–	–	**GV2L05**	1	13	**LC1D18**	**LR9D02**	0.4…2.0
0.37	1.1	100	**–**	–	–	**GV2L05**	1	13	**LC1D18**	**LR9D02**	0.4…2.0
0.55	1.5	100	**–**	–	–	**GV2L06**	1.6	22.5	**LC1D18**	**LR9D02**	0.4…2.0
0.75	1.9	100	**–**	–	–	**GV2L07**	2.5	33.5	**LC1D18**	**LR9D08**	1.6…8.0
1.1	2.7	100	**–**	–	–	**GV2L08**	4	51	**LC1D18**	**LR9D08**	1.6…8.0
1.5	3.6	100	**–**	–	–	**GV2L08**	4	51	**LC1D18**	**LR9D08**	1.6…8.0
2.2	4.9	100	**–**	–	–	**GV2L10**	6.3	78	**LC1D18**	**LR9D08**	1.6…8.0
3	6.5	100	**–**	–	–	**GV2L14**	10	138	**LC1D25**	**LR9D32**	6.4…32
4	8.5	100	**–**	–	–	**GV2L14**	10	138	**LC1D25**	**LR9D32**	6.4…32
5.5	11.5	100	**–**	–	–	**GV2L16**	14	170	**LC1D25**	**LR9D32**	6.4…32
7.5	15.5	50	**–**	–	–	**GV2L20**	18	223	**LC1D25**	**LR9D32**	6.4…32
11	22	50	**–**	–	–	**GV2L22**	25	327	**LC1D25**	**LR9D32**	6.4…32
15	29	50	**–**	–	–	**GV3L32**	40	448	**LC1D65A**	**LR9D110S**	22…110
18.5	35	50	**–**	–	–	**GV3L40**	40	560	**LC1D65A**	**LR9D110S**	22…110
22	41	50	**–**	–	–	**GV3L50**	50	700	**LC1D65A**	**LR9D110S**	22…110
30	55	50	**–**	–	–	**GV3L65**	65	910	**LC1D65A**	**LR9D110S**	22…110
–	–	–	**0.37**	0.64	50	**GV2L05**	1	13	**LC1D09**	**LR9D02**	0.4…2.0
–	–	–	**0.55**	0.87	50	**GV2L05**	1	13	**LC1D09**	**LR9D02**	0.4…2.0
–	–	–	**0.75**	1.1	50	**GV2L06**	1.6	22.5	**LC1D09**	**LR9D02**	0.4…2.0
–	–	–	**1.1**	1.6	50	**GV2L07 + LA9LB920**	2.5	33.5	**LC1D25**	**LR9D08**	1.6…8.0
–	–	–	**1.5**	2.1	50	**GV2L07 + LA9LB920**	2.5	33.5	**LC1D25**	**LR9D08**	1.6…8.0
–	–	–	**2.2**	2.8	50	**GV2L08 + LA9LB920**	4	51	**LC1D25**	**LR9D08**	1.6…8.0
–	–	–	**3**	4	50	**GV2L08 + LA9LB920**	4	51	**LC1D25**	**LR9D08**	1.6…8.0
–	–	–	**4**	5	50	**GV2L10 + LA9LB920**	6.3	78	**LC1D25**	**LR9D08**	1.6…8.0
–	–	–	**5.5**	7	50	**GV2L14 + LA9LB920**	10	138	**LC1D25**	**LR9D32**	6.4…32
–	–	–	**7.5**	8.9	50	**GV2L14 + LA9LB920**	10	138	**LC1D25**	**LR9D32**	6.4…32
–	–	–	**11**	13	3	**GV3L18+ LA9LB920**	14	252	**LC1D32**	**LR9D32**	6.4…32
–	–	–	**15**	16.5	3	**GV2L22 + LA9LB920**	18	327	**LC1D32**	**LR9D32**	6.4…32
–	–	–	**18.5**	21	3	**GV3L25 + LA9LB920**	25	350	**LC1D65A**	**LR9D32**	6.4…32
–	**–**	**–**	**22**	25	3	**GV2L32 + LA9LB920**	32	416	**LC1D65A**	**LR9D32**	6.4…32

1.5 to 315 kW at 400/415 V: type 1 coordination

Maximum operating rate: LC3K and LC3F: 12 starts/hour; LC3D: 30 starts/hour.
Maximum starting time: LC3K and LC3D: 30 seconds; LC3F: 20 seconds.

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3								Fuse carrier (basic block)	aM fuses		Star-delta contactors	Thermal overload relay	
400/415 V				440 V				Reference	Size	Rating	Reference	Reference	Setting range
P	Ie	IrD (1)	Iq	P	Ie	IrD (1)	Iq						
kW	A	A	kA	kW	A	A	kA			A			A
1.5	3.5	2	50	1.5	3.06	2	50	LS1D32	10 x 38	4	LC3K06	LR2K0308	1.8…2.6
2.2	5	3	50	–	–	–	–	LS1D32	10 x 38	6	LC3K06	LR2K0310	2.6…3.7
–	–	–	–	2.2	4.42	3	50						
–	–	–	–	3	5.77	3	50	LS1D32	10 x 38	8	LC3K06	LR2K0310	2.6…3.7
3	6.5	4	50	–	–	–	–	LS1D32	10 x 38	8	LC3K06	LR2K0312	3.7…5.5
4	8.4	5	50	4	7.9	5	50	LS1D32	10 x 38	12	LC3K06	LR2K0312	3.7…5.5
5.5	11	6	50	5.5	10.4	6	50	LS1D32	10 x 38	16	LC3K06	LR2K0314	5.5…8
7.5	14.8	9	50	7.5	13.7	8	50	LS1D32	10 x 38	16	LC3K09	LR2K0316	8…11.5
9	18.1	10	100	9	16.9	10	50	LS1D32	10 x 38	20	LC3D12A	LRD16	9…13
11	21	12	100	11	20.1	12	100	GK1EK	14 x 51	25	LC3D12A	LRD16	9…13
15	28.5	16	100	15	26.5	15	100	GK1EK	14 x 51	32	LC3D18A	LRD21	12…18
18.5	35	20	100	18.5	32.8	19	100	GK1EK	14 x 51	40	LC3D18A	LRD22	16…24
–	–	–	–	22	39	23	100	GS●J	22 x 58	50	LC3D18A	LRD22	16…24
22	42	24	100	–	–	–	–	GS●J	22 x 58	50	LC3D32A	LRD32	23…32
–	–	–	–	30	51.5	30	100	GS●J	22 x 58	63	LC3D32A	LRD32	23…32
30	57	33	100	37	64	37	100	GS●J	22 x 58	80	3 x LC1D40A	LRD340	30…40
37	69	40	100	–	–	–	–	GS●J	22 x 58	80	3 x LC1D40A	LRD350	37…50
–	–	–	–	45	76	44	100	GS●J	22 x 58	80	3 x LC1D50A	LRD350	37…50
45	81	47	100	–	–	–	–	GS●J	22 x 58	100	3 x LC1D50A	LRD350	37…50
–	–	–	–	55	90	52	100	GS●K	22 x 58	100	3 x LC1D50A	LRD365	48…65
55	100	58	100	–	–	–	–	GS●K	22 x 58	125	3 x LC1D65A	LRD365	48…65
75	135	78	100	75	125	72	100	GS●L	T0	160	LC3D80	LRD3363	63…80
–	–	–	–	90	146	84	100	GS●L	T0	160	LC3D115	LRD4365	80…104
90	165	95	100	–	–	–	–	GS●N	T1	200	LC3D115	LRD4367	95…120
110	200	115	100	110	178	103	100	GS●N	T1	200	LC3D115	LRD4367	95…120
132	240	139	100	132	215	124	100	GS●QQ	T2	250	LC3D150	LRD4369	110…140
160	285	165	100	160	256	148	100	GS●QQ	T2	315	LC3F185	LR9F5371	132…220
–	–	–	–	200	321	185	100	GS●QQ	T2	400	LC3F225	LR9F5369	132…220
220	388	225	100	–	–	–	–	GS●QQ	T2	400	LC3F265	LR9F7375	200…330
–	–	–	–	250	401	233	100	GS2S	T3	500	LC3F265	LR9F7375	200…330
280	480	278	100	–	–	–	–	GS2S	T3	500	LC3F330	LR9F7375	200…330
–	–	–	–	315	505	293	100						
315	555	322	100	355	518	300	100	GS2S	T3	630	LC3F330	LR9F7375	200…330
–	–	–	–	375	575	334	100	GS2S	T3	630	LC3F400	LR9F7379	300…500

(1) IrD: current in the motor windings in delta connection.

Coordination: Star-delta with NF C or DIN fuses + Contactors + Overload relay

1.5 to 355 kW at 400/415 V: type 2 coordination

Maximum operating rate: LC1D: 30 starts/hour; LC1F: 12 starts/hour.
Maximum starting time: LC1D: 30 seconds; LC1F: 20 seconds.

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3						Switch-disconnector-fuse	aM fuses		Star-delta contactors	Thermal overload relay	
400/415 V			440 V			Reference	Size	Rating	Reference	Reference	Setting range
P	Ie	Iq	P	Ie	Iq						
kW	A	kA	kW	A	kA			A			A
1.5	3.5	50	**1.5**	3.06	50	**GS1DD**	10 x 38	4	3 x **LC1D09**	**LRD08**	2.5…4
2.2	5	50	**2.2**	4.42	50	**GS1DD**	10 x 38	6	3 x **LC1D09**	**LRD10**	4…6
3	6.5	50	**3**	5.77	50	**GS1DD**	10 x 38	8	3 x **LC1D09**	**LRD12**	5.5…8
4	8.4	50	**4**	7.9	50	**GS1DD**	10 x 38	10	3 x **LC1D09**	**LRD14**	7…10
5.5	11	50	**5.5**	10.4	50	**GS1DD**	10 x 38	16	3 x **LC1D12**	**LRD16**	9…13
7.5	14.8	50	**7.5**	13.7	50	**GS1DD**	10 x 38	16	3 x **LC1D18**	**LRD21**	12…18
9	18.1	100	**9**	16.9	100						
11	21	100	**11**	20.1	100	**GS●F**	14 x 51	25	3 x **LC1D25**	**LRD22**	16…24
15	28.5	100	**15**	26.5	100	**GS●F**	14 x 51	32	3 x **LC1D32**	**LRD32**	23…32
18.5	35	100	**18.5**	32.8	100	**GS●F**	14 x 51	40	3 x **LC1D40A**	**LRD340**	30…40
22	42	100	**22**	39	100	**GS●J**	22 x 58	50	3 x **LC1D50A**	**LRD350**	37…50
30	57	100	**30**	51.5	100	**GS●J**	22 x 58	80	3 x **LC1D65A**	**LRD365**	48…65
37	69	100	**37**	64	100	**GS●J**	22 x 58	80	3 x **LC1D80**	**LRD3363**	63…80
–	–	–	**45**	76	100	**GS●J**	22 x 58	80	3 x **LC1D80**	**LRD3365**	80…93
45	81	100	–	–	–	**GS●J**	22 x 58	100	3 x **LC1D115**	**LR9D5367**	60…100
–	–	–	**55**	90	100	**GS●L**	T0	125	3 x **LC1D115**	**LR9D5369**	90…150
55	100	100	–	–	–	**GS●L**	T0	125	3 x **LC1D150**	**LR9D5369**	90…150
–	–	–	**75**	125	100	**GS●L**	T0	160	3 x **LC1D150**	**LR9D5369**	90…150
75	135	100	–	–	–	**GS●L**	T0	160	3 x **LC1F185**	**LR9D5369**	90…150
90	165	100	**90**	146	100	**GS●N**	T1	200	3 x **LC1F185**	**LR9F5371**	132…220
110	200	100	**110**	178	100	**GS●N**	T1	250	3 x **LC1F225**	**LR9F5371**	132…220
132	240	100	**132**	215	100	**GS●QQ**	T2	315	3 x **LC1F265**	**LR9F7375**	200…330
160	285	100	**160**	256	100	**GS●QQ**	T2	400	3 x **LC1F330**	**LR9F7375**	200…330
–	–	–	**200**	321	100	**GS●QQ**	T2	400	3 x **LC1F330**	**LR9F7379**	300…500
200	352	100	**220**	353	100						
220	388	100	**250**	401	100	**GS2S**	T3	500	3 x **LC1F400**	**LR9F7379**	300…500
250	437	100	–	–	–	**GS2S**	T3	500	3 x **LC1F500**	**LR9F7379**	300…500
315	555	100	**315**	505	100	**GS2S**	T3	630	3 x **LC1F630**	**LR9F7381**	380…630
–	–	–	**355**	549	100						
–	–	–	**400**	611	100	**GS2V**	T4	800	3 x **LC1F630**	**LR9F7381**	380…630
355	605	100	–	–	–	**GS2V**	T4	800	3 x **LC1F780**	**LR9F7381**	380…630

Coordination: Star-delta with BS fuses + Contactors + Overload relay

1.5 to 375 kW at 415 V: type 2 coordination

Maximum operating rate: LC1D: 30 starts/hour; LC1F: 12 starts/hour.
Maximum starting time: LC1D: 30 seconds; LC1F: 20 seconds.

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3						Switch-disconnector-fuse	BS fuses		Star-delta contactors	Thermal overload relay	
415 V			440 V			Reference	Size	Rating	Reference	Reference	Setting range
P	Ie	Iq	P	Ie	Iq						
kW	A	kA	kW	A	kA			A			A
1.5	3.5	50	**1.5**	3.06	50	**GS1DDB**	A1	NIT 16	3 x **LC1D09**	**LRD08**	2.5…4
2.2	5	50	**2.2**	4.42	50	**GS1DDB**	A1	NIT 16	3 x **LC1D09**	**LRD10**	4…6
3	6.5	50	**3**	5.77	50	**GS1DDB**	A1	NIT 20	3 x **LC1D09**	**LRD12**	5.5…8
4	8.4	50	**4**	7.9	50	**GS1DDB**	A1	NIT 20	3 x **LC1D09**	**LRD14**	7…10
5.5	11	50	**5.5**	10.4	50	**GS1DDB**	A1	NIT 20M25	3 x **LC1D12**	**LRD16**	9…13
7.5	14.8	50	**7.5**	13.7	50	**GS1DDB**	A1	NIT 20M32	3 x **LC1D18**	**LRD21**	12…18
9	18.1	50	**9**	16.9	50	**GS2GB**	A2	TIA 32M35	3 x **LC1D18**	**LRD21**	12…18
11	21	50	**11**	20.1	50	**GS2GB**	A2	TIA 32M50	3 x **LC1D25**	**LRD22**	16…24
15	28.5	50	**15**	26.5	50	**GS2GB**	A2	TIA 32M63	3 x **LC1D32**	**LRD32**	23…32
22	42	50	**22**	39	50	**GS2GB**	A3	TIS 63M80	3 x **LC1D50A**	**LRD350**	37…50
–	–	–	**30**	51.5	50	**GS2GB**	A3	TIS 63M100	3 x **LC1D65A**	**LRD365**	48…65
30	57	50	**–**	–	–	**GS2GB**	A3	TIS 63M100	3 x **LC1D65A**	**LRD365**	48…65
45	81	50	**45**	76	50	**GS2LLB**	A4	TCP 100M125	3 x **LC1D80**	**LRD3363**	63…80
55	100	80	**55**	90	80	**GS2LLB**	A4	TCP 100M160	3 x **LC1D115**	**LR9D5369**	90…150
80	138	80	**80**	132	80	**GS2LB**	B2	TF 200M250	3 x **LC1D150**	**LR9D5369**	90…150
100	182	80	**100**	162	80	**GS2MMB**	B2	TF 200M250	3 x **LC1F185**	**LR9F5371**	132…220
110	196	80	**110**	178	80	**GS2MMB**	B2	TF 200M315	3 x **LC1F225**	**LR9F5371**	132…220
140	250	80	**140**	226	80	**GS2NB**	B3	TFK 315M355	3 x **LC1F265**	**LR9F7375**	200…330
160	285	80	**160**	256	80	**GS2QQB**	B3	TFK 315M355	3 x **LC1F330**	**LR9F7375**	200…330
220	388	80	**220**	353	80	**GS2QQB**	B4	TMF 400M450	3 x **LC1F400**	**LR9F7379**	300…500
257 **270**	450 460	80 80	**257** **270**	412 433	80 80	**GS2SB**	C2	TTM 500	3 x **LC1F500**	**LR9F7379**	300…500
375	610	80	**375**	577	80	**GS2SB**	C2	TTM 630	3 x **LC1F630**	**LR9F7381**	380…630

Coordination: Star-delta with Thermal magnetic circuit breaker + Contactors

1.5 to 110 kW at 400/415 V: type 1 coordination

Maximum operating rate: LC3K: 12 starts/hour; LC3D: 30 starts/hour.
Maximum starting time: 30 seconds.

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3								Circuit breaker		Star-delta contactors
400/415 V				440 V				Reference *References in italics are available in CEE zone only*	Setting range of thermal trips	Reference
P	Ie	IrD (1)	Iq (2)	P	Ie	IrD (1)	Iq (2)			
kW	A	A	kA	kW	A	A	kA		A	
1.5	3.6	2	50	**1.5**	3.06	1.8	50	**GV2ME08** *GV2ME08AP*	2.5…4	**LC3K06**
2.2 –	4.9 –	2.9 –	50 –	**2.2** **3**	4.42 5.77	2.6 3.3	50 50	**GV2ME10** *GV2ME10AP*	4…6.3	**LC3K06**
3 **4**	6.5 8.5	3.8 4.9	50 50	– **4**	– 7.9	– 4.6	– 15	**GV2ME14** *GV2ME14AP*	6…10	**LC3K06**
5.5	11.5	6.4	15	**5.5**	10.4	6	8	**GV2ME16** *GV2ME16AP*	9…14	**LC3K06**
7.5	15.5	8.6	15	**7.5**	13.7	7.9	8	**GV2ME20** *GV2ME20AP*	13…18	**LC3K09**
–	–	–	–	**9**	16.9	9.8	8	**GV2ME20** *GV2ME20AP*	13…18	**LC3D12A**
9	18.1	10	15	**11**	20.1	12	6	**GV2ME21** *GV2ME21AP*	17…23	**LC3D12A**
11	22	12	15	–	–	–	–	**GV2ME22** *GV2ME22AP*	20…25	**LC3D12A**
15	29	17	10	**15**	26.5	15	6	**GV2ME32** *GV2ME32AP*	24…32	**LC3D18A**
18.5	35	20	50	**18.5**	32.8	19	50	**GV3P40**	30…40	**LC3D18A**
–	–	–	–	**22**	39	23	50	**GV3P50**	37…50	**LC3D32A**
22	41	24	50	**30**	51.5	30	50	**GV3P50**	37…50	**LC3D32A**
30	55	33	50	**30**	51.5	30	50	**GV3P65**	48…65	**LC3D32A**
37	66	40	50	**37**	64	37	50	**GV3P65**	48…65	3 x **LC1D40A** (3)
37	66	40	100	**37**	64	37	70	**GV4P80**	40…80	3 x **LC1D40A** (3)
–	–	–	–	**45**	76	44	70	**GV4P80**	40…80	2 x **LC1D50A** **+1 x LC1D40A** (3)
45	80	47	100	–	–	–	–	**GV4P115**	65…115	2 x **LC1D50A** **+1 x LC1D40A** (3)
55	97	58	100	**55**	90	52	70	**GV4P115**	65…115	2 x **LC1D65A** **+1 x LC1D40A** (3)
75	132	78	35	**75**	125	72	35	**GV5P150F**	70…150	**LC3D80**
–	–	–	–	**90**	146	84	35	**GV5P150F**	0…150	**LC3D115**
90 **110**	160 195	95 115	35 35	**110**	178	103	35	**GV5P220F**	100…220	**LC3D115**
–	–	–	–	**132**	215	124	35	**GV5P220F**	100…220	**LC3D150**
132	230	135	36	–	–	–	–	**GV6P320F**	160...320	**LC3D150** or 3 x **LC1F150**
160	270	158	36	**160**	256	94	35	**GV6P320F**	160...320	3 x **LC1F185**
220	380	220	36	**250**	401	146	35	**GV6P500F**	250...500	3 x **LC1F265**
250	430	250	36	**300**	480	175	35	**GV6P500F**	250...500	3 x **LC1F330**

(1) IrD: current in the motor windings in delta connection.
*(2) The breaking performance of circuit breakers **GV2ME** can be increased by adding a current limiter **GV1L3**, see page B6/23.*
*(3) For mounting 3 contactors **LC1D●●A**, star-delta starter kit **LAD9SD3** must be ordered separately, see page B8/29.*

1.5 to 250 kW at 400/415 V: type 2 coordination

Maximum operating rate: LC1D: 30 starts/hour; LC1F: 12 starts/hour.
Maximum starting time: LC1D: 30 seconds; LC1F: 20 seconds.

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3								Circuit breaker		Star-delta contactors
400/415 V				440 V				Reference	Setting range of thermal trips	Reference
P	Ie	IrD (8)	Iq	P	Ie	IrD (8)	Iq (1)			
kW	A	A	kA	kW	A	A	kA		A	
1.5	3.6	–	130	**1.5**	3.06	–	130	**GV2P08**	2.5…4	3 x **LC1D09** (2)
2.2	4.9	–	130	**2.2**	4.42	–	130	**GV2P10**	4…6.3	3 x **LC1D18** (3)
–	–	–	–	**3**	5.77	–	130	**GV2P10**	4...6.3	3 x **LC1D18** (3)
3	6.5	–	130	–	–	–	–	**GV2P14**	6…10	3 x **LC1D18** (3)
4	8.5	–	130	**4**	7.9	–	130	**GV2P14**	6…10	3 x **LC1D18** (3)
5.5	11.5	–	130	**5.5**	10.4	–	50	**GV2P16**	9…14	3 x **LC1D25** (3)
–	–	–	–	**7.5**	13.7	–	50	**GV2P16**	9…14	3 x **LC1D25** (3)
7.5	15.5	–	50	**9**	16.9	–	20	**GV2P20**	13…18	3 x **LC1D25** (3)
9	18.1	–	50	**11**	20.1	–	20	**GV2P21**	17…23	3 x **LC1D25** (3)
11	22	–	50	–	–	–	–	**GV2P22**	20…25	3 x **LC1D25** (3)
15	29	–	50	**15**	26.5	–	50	**GV3P32**	23…32	3 x **LC1D40A** (4)
18.5	35	–	50	–	–	–	–	**GV3P40**	30…40	2 x **LC1D50A** **+1 x LC1D40A** (3)
–	–	–	–	**18.5**	32.8	–	50	**GV3P40**	30…40	2 x **LC1D65A** **+1 x LC1D40A** (4)
22	41	–	50	–	–	–	–	**GV3P50**	37…50	2 x **LC1D50A** **+1 x LC1D40A** (3)
–	–	–	–	**22**	39	–	50	**GV3P50**	37…50	2 x **LC1D65A** **+1 x LC1D40A** (4)
30	55	–	50	**30**	51.5	–	50	**GV3P65**	48…65	2 x **LC1D65A** **+1 x LC1D40A** (4)
37	66	–	100	**45**	76	–	70	**GV4P80**	40…80	3 x **LC1D80** (5)
–	–	–	–	**37**	64	–	70	**GV4P80**	40…80	3 x **LC1D65A** (4)
45	80	–	100	–	–	–	–	**GV4P115**	65…115	3 x **LC1D115** (6)
55	97	–	100	**55**	90	–	70	**GV4P115**	65…115	3 x **LC1D115** (6)
75	132	78	70	**75**	125	74	65	**GV5P150H**	70…150	3 x **LC1D150** (6)
–	–	–	–	**90**	146	86	65	**GV5P150H**	70…150	3 x **LC1D150** (6)
90	160	95	70	**110**	178	104	65	**GV5P220H**	100…220	3 x **LC1F185** (7)
110	195	115	70	**132**	215	126	65	**GV5P220H**	100…220	3 x **LC1F225** (7)
132	230	135	70	–	–	–	–	**GV6P320H**	160...320	3 x **LC1F265**
160	270	156	70	**160**	256	150	65	**GV6P320H**	160...320	3 x **LC1F265**
220	380	220	70	**250**	401	234	65	**GV6P500H**	250...500	3 x **LC1F500**
250	430	250	70	**300**	480	279	65	**GV6P500H**	250...500	3 x **LC1F500**

*(1) The breaking performance of circuit breakers **GV2P** can be increased by adding a current limiter **GV1L3**, see page B6/54.*
*(2) For mounting 3 contactors **LC1D09**, star-delta starter kit **LAD91217** must be ordered separately, see page B8/29.*
*(3) For mounting 3 contactors **LC1D18** or **LC1D25**, star-delta starter kit **LAD93217** must be ordered separately, see page B8/29.*
*(4) For mounting 3 contactors **LC1D●●A**, star-delta starter kit **LAD9SD3** must be ordered separately, see page B8/29.*
*(5) For mounting 3 contactors **LC1D80**, star-delta starter kit **LA9D8017** must be ordered separately, see page B8/29.*
*(6) For mounting 3 contactors **LC1D115** or **LC1D150**, see A2/13.*
*(7) For mounting 3 contactors **LC1F185** or **LC1F225**, see pages A2/15 and A2/17.*
(8) IrD: current in the motor windings in delta connection.

Coordination: Star-delta with Magnetic circuit breaker + Contactors + Thermal overload relay

1.5 to 315 kW at 400/415 V: type 1 coordination

Maximum operating rate: LC3K and LC3F: 12 starts/hour; LC3D: 30 starts/hour.
Maximum starting time: LC3K and LC3D: 30 seconds; LC3F: 20 seconds.

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3								Circuit breaker			Star-delta contactors	Thermal overload relay	
400/415 V				440 V				Reference	Rating	Irm (2)	Reference	Reference	Setting range
P	Ie	IrD (1)	Iq	P	Ie	IrD (1)	Iq						
kW	A	A	kA	kW	A	A	kA		A	A			A
–	–	–	–	**1.5**	3.06	1.8	50	**LC3D32A**	4	51	**LC3K06**	**LR2K0308**	1.8…2.6
1.5	3.6	2	50	**2.2**	4.42	3	50						
2.2	4.9	3	50	**3**	5.77	3	50	**GV2LE10**	6.3	78	**LC3K06**	**LR2K0310**	2.6…3.7
3	6.5	4	50	–	–	–	–	**GV2LE14**	10	138	**LC3K06**	**LR2K0312**	3.7…5.5
–	–	–	–	**4**	7.9	5	50	**GV2LE10**	6.3	78	**LC3K06**	**LR2K0312**	3.7…5.5
4	8.5	5	50	–	–	–	–	**GV2LE14**	10	138	**LC3K06**	**LR2K0312**	3.7…5.5
–	–	–	–	**5.5**	10.4	6	15	**GV2LE14**	10	138	**LC3K06**	**LR2K0314**	5.5…8
5.5	11.5	6	15	–	–	–	–	**GV2LE16**	14	170	**LC3K06**	**LR2K0314**	5.5…8
–	–	–	–	**7.5**	13.7	8	8	**GV2LE16**	14	170	**LC3K09**	**LR2K0316**	8…11.5
7.5	15.5	9	15	–	–	–	–	**GV2LE20**	18	223	**LC3K09**	**LR2K0316**	8…11.5
–	–	–	–	**9**	16.9	1	8	**GV2LE16**	14	170	**LC3D12A**	**LRD16**	9…13
9	18.1	10	15	–	–	–	–	**GV2LE22**	25	327	**LC3K12**	**LR2K0316**	8…11.5
–	–	–	–	**11**	20.1	12	8	**GV2LE20**	18	223	**LC3K12**	**LR2K0321**	10…14
11	22	12	15	–	–	–	–	**GV2LE22**	25	327	**LC3K12**	**LR2K0321**	10…14
–	–	–	–	**15**	26.5	15	6	**GV2LE22**	25	327	**LC3D18A**	**LRD21**	12…18
15	29	16	10	–	–	–	–	**GV2LE32**	32	384	**LC3D18A**	**LRD21**	12…18
18.5	35	20	50	**18.5**	32.8	19	50	**GV3L40**	40	560	**LC3D18A**	**LRD22**	16…24
22	41	24	50	**22**	39	23	50	**GV3L50**	50	700	**LC3D32A**	**LRD32**	23…32
–	–	–	–	**30**	51.5	30	50	**GV3L65**	65	910	**LC3D32A**	**LRD32**	23…32
30	55	33	50	–	–	–	–	**GV3L65**	65	910	**LC3D32A**	**LRD35**	30…38
–	–	–	–	**37**	64	37	50	**GV3L65**	65	910	3 x **LC1D40A** (4)	**LRD340**	30…40
37	66	40	100	–	–	–	–	**GV4L80**	80	640	3 x **LC1D40A** (4)	**LRD350**	37…50
–	–	–	–	**37**	64	37	70	**GV4L80**	80	640	3 x **LC1D40A** (4)	**LRD340**	30…40
–	–	–	–	**45**	76	44	70	**GV4L80**	80	800	2 x **LC1D50A** +1 x **LC1D40A** (4)	**LRD350**	30…40
45	80	47	100	–	–	–	–	**GV4L115**	115	805	2 x **LC1D50A** +1 x **LC1D40A** (4)	**LRD350**	30…40
55	97	58	100	**55**	90	52	70	**GV4L115**	115	805	2 x **LC1D50A** +1 x **LC1D40A** (4)	**LRD350**	30…40
–	–	–	–	**75**	125	72	(3)	**NSX160●MA** (3)	150	1200	**LC3D80**	**LRD3363**	63…80
75	132	78	(3)	–	–	–	–	**NSX160●MA** (3)	150	1200	**LC3D80**	**LRD3363**	63…80
–	–	–	–	**90**	146	85	(3)	**NSX160●MA** (3)	150	1200	**LC3D115**	**LRD4365**	80…104
90	160	96	(3)	**110**	178	103	(3)	**NSX250●MA** (3)	220	1760	**LC3D115**	**LRD4365**	80…104
–	–	–	–	**132**	215	125	(3)	**NSX250●MA** (3)	220	1760	**LC3D150**	**LRD4369**	110…140
110	195	116	(3)	–	–	–	–	**NSX250●MA** (3)	220	1760	**LC3D115**	**LRD4367**	95…120
–	–	–	–	**160**	256	148	(3)	**NSX400●** + **Micrologic 1.3M** (3)	320	2240	**LC3D150**	**LR9D5369**	90…150
–	–	–	–	**200**	321	186	(3)	**NSX630●** + **Micrologic 1.3M** (3)	500	3150	**LC3F225**	**LR9F5371**	132…220
132	230	139	(3)	–	–	–	–	**NSX400●** + **Micrologic 1.3M** (3)	320	2240	**LC3D150**	**LRD4369**	110…140
160	280	165	(3)	–	–	–	–	**NSX400●** + **Micrologic 1.3M** (3)	320	2560	**LC3F185**	**LR9F5371**	132…220
200	350	204	(3)	**220**	353	204	(3)	**NSX630●** + **Micrologic 1.3M** (3)	500	3150	**LC3F225**	**LR9F5371**	132…220
220	388	225	(3)	**250**	401	233	(3)	**NSX630●** + **Micrologic 1.3M** (3)	500	3500	**LC3F265**	**LR9F7375**	200…330
280	480	278	(3)	–	–	–	–	**NSX630●** + **Micrologic 1.3M** (3)	500	4000	**LC3F330**	**LR9F7375**	200…330
–	–	–	–	**315**	505	295	(3)	**NSX800●** + **Micrologic 5.0 - LR off**	800	4000	**LC3F330**	**LR9F7375**	200…330
315	540	322	(3)	**355**	518	300	(3)	**NSX800●** + **Micrologic 5.0 - LR off**	800	4500	**LC3F330**	**LR9F7375**	200…330
–	–	–	–	**375**	575	334	(3)	**NSX800●** + **Micrologic 5.0 - LR off**	800	5000	**LC3F400**	**LR9F7379**	300…500

(1) IrD: current in the motor windings in delta connection.
(2) Irm: setting current of the magnetic trip.
(3) Products marketed under the Merlin Gerin brand. Reference to be completed by replacing the ● with the breaking performance code:

Breaking performance Iq (kA)	NSX100●MA		NSX160●MA, NSX250●MA		NSX400●, NSX630●		NS800●	
400/415 V	36	70	36	70	70	150	70	150
440 V	35	65	35	65	65	130	65	130
Code	**F**	**H**	**F**	**H**	**H**	**L**	**H**	**L**

*(4) For mounting 3 contactors **LC1D●●A**, star-delta starter kit **LAD9SD3** must be ordered separately, see page B8/29.*

Coordination: Star-delta with Magnetic circuit breaker + Contactors + Thermal overload relay

1.5 to 250 kW at 400/415 V: type 2 coordination

Maximum operating rate: LC3D: 30 starts/hour; LC3F: 12 starts/hour.
Maximum starting time: LC3D: 30 seconds; LC3F: 20 seconds.

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3						Circuit breaker			Star-delta contactors	Thermal overload relay	
400/415 V			440 V			Reference	Rating	Irm (1)	Reference	Reference	Setting range
P	Ie	Iq	P	Ie	Iq						
kW	A	kA	kW	A	kA		A	A			A
1.5	3.6	130	**1.5**	3.06	130	**GV2L08**	4	51	3 x **LC1D09**	**LRD08**	2.5…4
2.2 **3**	4.9 6.5	130 130	**2.2** **3**	4.42 5.77	130 130	**GV2L10**	6.3	78	3 x **LC1D09**	**LRD10**	4…6
–	–	–	**4**	7.9	20	**GV2L14**	10	138	3 x **LC1D18**	**LRD14**	7…10
4	8.5	130	–	–	–	**GV2L14**	10	138	3 x **LC1D18**	**LRD16**	9…13
5.5	11.5	50	**5.5**	10.4	20	**GV2L16**	14	170	3 x **LC1D25**	**LRD16**	9…13
7.5	15.5	50	**7.5**	13.7	20	**GV2L20**	18	223	3 x **LC1D25**	**LRD21**	12…18
–	–	–	**9**	16.9	20	**GV2L22**	25	327	3 x **LC1D25**	**LRD21**	12…18
9 **11**	18.1 22	50 50	– **11**	– 20.1	– 20	**GV2L22**	25	327	3 x **LC1D25**	**LRD22**	16…24
15	29	50	**15**	26.5	50	**GV3L32**	32	448	3 x **LC1D40A** (2)	**LRD332**	23…32
18.5	35	50	–	–	–	**GV3L40**	40	560	2 x **LC1D50A** +1 x **LC1D40A** (2)	**LRD340**	30…40
–	–	–	**18.5**	32.8	50	**GV3L40**	40	560	2 x **LC1D65A** +1 x **LC1D40A** (2)	**LRD340**	30…40
22	41	50	–	–	–	**GV3L50**	50	700	2 x **LC1D50A** +1 x **LC1D40A** (2)	**LRD350**	37…50
–	–	–	**22**	39	50	**GV3L50**	50	700	2 x **LC1D65A** +1 x **LC1D40A** (2)	**LRD350**	37…50
30	55	50	**30**	51.5	50	**GV3L65**	65	910	2 x **LC1D65A** +1 x **LC1D40A** (2)	**LRD365**	48…65
–	–	–	**37**	64	50	**GV3L65**	65	910	3 x **LC1D80**	**LRD3359**	48…65
37	66	100	–	–	–	**GV4L80**	80	640	3 x **LC1D80**	**LRD3363**	63…80
–	–	–	**45**	76	70	**GV4L80**	80	800	3 x **LC1D80**	**LRD3363**	63…80
45	80	100	–	–	–	**GV4L115**	115	805	3 x **LC1D115**	**LR9D5367**	60…100
–	–	–	**55**	90	70	**GV4L115**	115	920	3 x **LC1D115**	**LR9D5367**	60…100
55	97	100	–	–	–	**GV4L115**	115	920	3 x **LC1D115**	**LR9D5369**	90…150
55	97	(3)	–	–	–	**NSX160●MA** (3)	150	1200	3 x **LC1D115**	**LR9D5369**	90…150
–	–	–	**75**	125	(3)	**NSX160●MA** (3)	150	1200	3 x **LC1D150**	**LR9D5369**	90…150
75	132	(3)	**90**	146	(3)	**NSX160●MA** (3)	150	1200	3 x **LC1D150**	**LR9D5369**	90…150
90	160	(3)	**110**	178	(3)	**NSX250●MA** (3)	220	1760	3 x **LC1F185**	**LR9F5371**	132…220
110	195	(3)	–	–	–	**NSX250●MA** (3)	220	1760	3 x **LC1F225**	**LR9F5371**	132…220
–	–	–	**132**	215	(3)	**NSX250●MA** (3)	220	1760	3 x **LC1F225**	**LR9F7375**	200…330
132	230	(3)	**160**	256	(3)	**NSX400●** + **Micrologic 1.3M** (3)	320	2240	3 x **LC1F265**	**LR9F7375**	200…330
160	280	(3)	–	–	–	**NSX400●** + **Micrologic 1.3M** (3)	320	2560	3 x **LC1F330**	**LR9F7375**	200…330
–	–	–	**200**	321	(3)	**NSX400●** + **Micrologic 1.3M** (3)	320	2880	3 x **LC1F330**	**LR9F7379**	300…500
200	350	(3)	**220**	353	(3)	**NSX630●** + **Micrologic 1.3M** (3)	500	3150	3 x **LC1F400**	**LR9F7379**	300…500
220	388	(3)	**250**	401	(3)	**NSX630●** + **Micrologic 1.3M** (3)	500	3500	3 x **LC1F400**	**LR9F7379**	300…500
250	430	(3)	–	–	–	**NSX630●** + **Micrologic 1.3M** (3)	500	4000	3 x **LC1F500**	**LR9F7379**	300…500

(1) Irm: setting current of the magnetic trip.
*(2) For mounting 3 contactors **LC1D●●A**, star-delta starter kit **LAD9SD3** must be ordered separately, see page B8/29.*
(3) Products marketed under the Merlin Gerin brand. Reference to be completed by replacing the ● with the breaking performance code:

Breaking performance Iq (kA)	NSX100●MA		NSX160●MA, NSX250●MA		NSX400●, NSX630●	
400/415 V	36	70	36	70	70	150
440 V	35	65	35	65	65	130
Code	**F**	**H**	**F**	**H**	**H**	**L**

IEC - Type 1 or 2 coordination with fuses - 690 V

690 V - Type 1 or 2 coordination with fuses

Applications with 3-phase motors 50-60 Hz in category AC-3	aM fuses	Standard Starters SIL Starters Power Inteface Modules	
690 V	Rating	References	Setting range
Iq			
kA	A		A
80	≤10	**TPRST009** **TPRSS009** **TPRPM009**	0.18-9
	≤25	**TPRST025** **TPRSS025** -	0.5-25
	≤40	**TPRST038** **TPRSS038** **TPRPM038**	0.76-38
	≤80	**TPRST065** **TPRSS065** -	3.25-65
	≤80	**TPRST080** **TPRSS080** **TPRPM080**	4-80

0.06 to 22 kW at 230 V: Type 1 coordination

Applications power ratings of 3-phase motors 50-60 Hz in category AC-3			Circuit breaker (Trip class 5 to 15)	Standard Starters SIL Starters Power Inteface Modules	
230 V			References	References	Setting range
P	Ie	Iq			
kW	A	kA			A
0.06	0.35	100	**GV2L03**	**TPRST009 TPRSS009 TPRPM009**	0.18-9
0.09	0.52	100	**GV2L04**	**TPRST009 TPRSS009 TPRPM009**	0.18-9
0.12	0.7	100	**GV2L05**	**TPRST009 TPRSS009 TPRPM009**	0.18-9
0.18	1	100	**GV2L06**	**TPRST009 TPRSS009 TPRPM009**	0.18-9
0.25	1.5	100	**GV2L06**	**TPRST009 TPRSS009 TPRPM009**	0.18-9
0.37	1.9	100	**GV2L07**	**TPRST009 TPRSS009 TPRPM009**	0.18-9
0.55	2.6	100	**GV2L08**	**TPRST009 TPRSS009 TPRPM009**	0.18-9
0.75	3.3	100	**GV2L08**	**TPRST009 TPRSS009 TPRPM009**	0.18-9
1.1	4.7	100	**GV2L10**	**TPRST009 TPRSS009 TPRPM009**	0.18-9
1.5	6.3	100	**GV2L14**	**TPRST009 TPRSS009 TPRPM009**	0.18-9
2.2	8.5	100	**GV2L14**	**TPRST009 TPRSS009 TPRPM009**	0.18-9
3	11.3	100	**GV2L16**	**TPRST025 TPRSS025 TPRPM038**	0.5-25 / 0.76-38
4	15	100	**GV2L20**	**TPRST025 TPRSS025 TPRPM038**	0.5-25 / 0.76-38
5.5	20	50	**GV2L22**	**TPRST025 TPRSS025 TPRPM038**	0.5-25 / 0.76-38
7.5	27	50	**GV2L32**	**TPRST038 TPRSS038 TPRPM038**	0.76-38
9	32	100	**GV3L40**	**TPRST038 TPRSS038 TPRPM038**	0.76-38
11	38	100	**GV3L40**	**TPRST065 TPRSS065 TPRPM080**	3.25-65 / 4-80
15	51	100	**GV3L65**	**TPRST065 TPRSS065 TPRPM080**	3.25-65 / 4-80
18.5	61	100	**GV3L65**	**TPRST065 TPRSS065 TPRPM080**	3.25-65 / 4-80
22	72	100	**GV3L73**	**TPRPM080**	4-80

IEC - Type 2 coordination with circuit breakers - 230 V

0.06 to 22 kW at 230 V: Type 2 coordination

Applications power ratings of 3-phase motors 50-60 Hz in category AC-3			Circuit breaker (Trip class 5 to 15)	Standard Starters SIL Starters	
230 V			References	References	Setting range
P	Ie	Iq			
kW	A	kA			A
0.06	0.35	100	**GV2L03**	**TPRST009 TPRSS009**	0.18-9
0.09	0.52	100	**GV2L04**	**TPRST009 TPRSS009**	0.18-9
0.12	0.7	100	**GV2L05**	**TPRST009 TPRSS009**	0.18-9
0.18	1	100	**GV2L06**	**TPRST009 TPRSS009**	0.18-9
0.25	1.5	100	**GV2L06**	**TPRST009 TPRSS009**	0.18-9
0.37	1.9	100	**GV2L07**	**TPRST009 TPRSS009**	0.18-9
0.55	2.6	100	**GV2L08**	**TPRST009 TPRSS009**	0.18-9
0.75	3.3	100	**GV2L08**	**TPRST025 TPRSS025**	0.5-25
1.1	4.7	100	**GV2L10**	**TPRST025 TPRSS025**	0.5-25
1.5	6.3	100	**GV2L14**	**TPRST025 TPRSS025**	0.5-25
2.2	8.5	100	**GV2L14**	**TPRST025 TPRSS025**	0.5-25
3	11.3	100	**GV2L16**	**TPRST025 TPRSS025**	0.5-25
4	15	100	**GV2L20**	**TPRST025 TPRSS025**	0.5-25
5.5	20	50	**GV2L22**	**TPRST025 TPRSS025**	0.5-25
7.5	27	50	**GV2L32**	**TPRST038 TPRSS038**	0.76-38
9	32	100	**GV3L40**	**TPRST038 TPRSS038**	0.76-38
11	38	100	**GV3L40**	**TPRST065 TPRSS065**	3.25-65
15	51	100	**GV3L65**	**TPRST065 TPRSS065**	3.25-65
18.5	61	100	**GV3L65**	**TPRST065 TPRSS065**	3.25-65

0.06 to 37 kW at 400/415 - 440 - 500 V: Type 1 coordination

Applications power ratings of 3-phase motors 50-60 Hz in category AC-3									Circuit breaker (Trip class 5 to 15)	Standard Starters SIL Starters Power Inteface Modules	
400/415 V			440 V			500 V			References	References	Setting range
P	Ie	Iq	P	Ie	Iq	P	Ie	Iq			
kW	A	kA	kW	A	kA	kW	A	kA			A
0.06	0.2	100	0.06	0.18	100	-	-	-	**GV2L03**	**TPRST009 TPRSS009 TPRPM009**	0.18-9
0.09	0.3	100	0.09	0.27	100	-	-	-			
0.12	0.44	100	0.12	0.4	100	-	-	-	**GV2L04**	**TPRST009 TPRSS009 TPRPM009**	0.18-9
0.18	0.6	100	0.18	0.55	100	-	-	-			
0.25	0.85	100	0.25	0.77	100	-	-	-	**GV2L05**	**TPRST009 TPRSS009 TPRPM009**	0.18-9
0.37	1.1	100	-	-	-	0.37	0.88	100			
-	-	-	0.37	1	100	-	-	-	**GV2L06**	**TPRST009 TPRSS009 TPRPM009**	0.18-9
0.55	1.5	100	0.55	1.4	100	0.55	1.2	100			
-	-	-	-	-	-	0.75	1.5	100	**GV2L07**	**TPRST009 TPRSS009 TPRPM009**	0.18-9
0.75	1.9	100	0.75	1.7	100	-	-	-			
1.1	2.7	100	-	-	-	1.1	2.2	100			
-	-	-	1.1	2.4	100	-	-	-	**GV2L08**	**TPRST009 TPRSS009 TPRPM009**	0.18-9
1.5	3.6	100	1.5	3.3	100	1.5	2.9	100			
2.2	4.9	100	2.2	4.5	100	2.2	3.9	100	**GV2L10**	**TPRST009 TPRSS009 TPRPM009**	0.18-9
-	-	-	3	5.9	100	3	5.2	100			
3	6.5	100	-	-	-	-	-	-	**GV2L14**	**TPRST009 TPRSS009 TPRPM009**	0.18-9
4	8.5	100	4	7.7	20	4	6.8	10			
-	-	-	-	-	-	5.5	9.2	10			
5.5	11.5	50	5.5	10.5	20	-	-	-	**GV2L16**	**TPRST025 TPRSS025 TPRPM038**	0.5-25 / 0.76-38
-	-	-	-	-	-	7.5	12.4	10			
7.5	15.5	50	7.5	14.1	20	-	-	-	**GV2L20**	**TPRST025 TPRSS025 TPRPM038**	0.5-25 / 0.76-38
-	-	-	9	16.5	20	9	13.9	10			
9	18.1	50	-	-	-	-	-	-	**GV2L22**	**TPRST025 TPRSS025 TPRPM038**	0.5-25 / 0.76-38
11	22	50	11	20	20	11	17.6	10			
-	-	-	-	-	-	15	23	10			
15	29	50	15	26.4	20	-	-	-	**GV2L32**	**TPRST038 TPRSS038 TPRPM038**	0.76-38
-	-	-	-	-	-	18.5	28	10			
18.5	35	50	18.5	31.8	50	-	-	-	**GV3L40**	**TPRST065 TPRSS065 TPRPM080**	3.25-65 / 4-80
-	-	-	-	-	-	22	33	12			
22	41	50	22	37.3	50	-	-	-	**GV3L50**	**TPRST065 TPRSS065 TPRPM080**	3.25-65 / 4-80
-	-	-	-	-	-	30	44	12			
30	55	50	30	50	50	-	-	-	**GV3L65**	**TPRST065 TPRSS065 TPRPM080**	3.25-65 / 4-80
-	-	-	37	60	50	37	53	12			
37	66	50	-	-	-	-	-	-	**GV3L73**	**TPRST065 TPRSS065 TPRPM080**	3.25-65 / 4-80

IEC - Type 2 coordination with circuit breakers - 400/415 - 440 - 500 V

0.06 to 37 kW at 400/415 - 440 - 500 V: Type 2 coordination

Applications power ratings of 3-phase motors 50-60 Hz in category AC-3									Circuit breaker (Trip class 5 to 15)	Standard Starters SIL Starters	
400/415 V			440 V			500 V			References	References	Setting range
P	Ie	Iq	P	Ie	Iq	P	Ie	Iq			
kW	A	kA	kW	A	kA	kW	A	kA			A
0.06	0.2	100	0.06	0.18	100	-	-	-	**GV2L03**	**TPRST009 TPRSS009**	0.18-9
0.09	0.3	100	0.09	0.27	100	-	-	-			
0.12	0.44	100	0.12	0.4	100	-	-	-	**GV2L04**	**TPRST009 TPRSS009**	0.18-9
0.18	0.6	100	0.18	0.55	100	-	-	-			
0.25	0.85	100	0.25	0.77	100	-	-	-	**GV2L05**	**TPRST009 TPRSS009**	0.18-9
0.37	1.1	100	-	-	-	0.37	0.88	100			
-	-	-	0.37	1	100	-	-	-	**GV2L06**	**TPRST009 TPRSS009**	0.18-9
0.55	1.5	100	0.55	1.4	100	0.55	1.2	100			
-	-	-	-	-	-	0.75	1.5	100	**GV2L07**	**TPRST009 TPRSS009**	0.18-9
0.75	1.9	100	0.75	1.7	100	-	-	-			
						1.1	2.2	100			
1.1	2.7	100	-	-	-	-	-	-	**GV2L07**	**TPRST025 TPRSS025**	0.5-25
-	-	-	1.1	2.4	100	-	-	-	**GV2L08**	**TPRST009 TPRSS009**	0.18-9
-	-	-	-	-	-	1.5	2.9	100			
1.5	3.6	100	1.5	3.3	100	-	-	-	**GV2L08**	**TPRST025 TPRSS025**	0.5-25
2.2	4.9	100	2.2	4.5	100	2.2	3.9	100	**GV2L10**	**TPRST025 TPRSS025**	0.5-25
-	-	-	3	5.9	100	3	5.2	100			
3	6.5	100	-	-	-	-	-	-	**GV2L14**	**TPRST025 TPRSS025**	0.5-25
4	8.5	100	4	7.7	20	4	6.8	10			
-	-	-	-	-	-	5.5	9.2	10			
5.5	11.5	50	5.5	10.5	20	-	-	-	**GV2L16**	**TPRST025 TPRSS025**	0.5-25
-	-	-	-	-	-	7.5	12.4	10			
7.5	15.5	50	7.5	14.1	20	-	-	-	**GV2L20**	**TPRST025 TPRSS025**	0.5-25
-	-	-	9	16.5	20	9	13.9	10			
9	18.1	50	-	-	-	-	-	-	**GV2L22**	**TPRST025 TPRSS025**	0.5-25
11	22	50	11	20	20	11	17.6	10			
-	-	-	-	-	-	15	23	10			
15	29	50	15	26.4	20	-	-	-	**GV2L32**	**TPRST038 TPRSS038**	0.76-38
-	-	-	-	-	-	18.5	28	10			
18.5	35	50	18.5	31.8	50	-	-	-	**GV3L40**	**TPRST065 TPRSS065**	3.25-65
-	-	-	-	-	-	22	33	12			
22	41	50	22	37.3	50	-	-	-	**GV3L50**	**TPRST065 TPRSS065**	3.25-65
-	-	-	-	-	-	30	44	12			
30	55	50	30	50	50	-	-	-	**GV3L65**	**TPRST065 TPRSS065**	3.25-65
-	-	-	37	60	50	37	53	12			
37	66	50	-	-	-	-	-	-	**GV3L73**	**TPRST065 TPRSS065**	3.25-65

0.06 to 37 kW at 690 V: Type 1 coordination

Applications power ratings of 3-phase motors 50-60 Hz in category AC-3			Circuit breaker (Trip class 5 to 15)	Standard Starters SIL Starters Power Inteface Modules	
690 V			References	References	Setting range
P	Ie	Iq			
kW	A	kA			A
0.37	0.64	100	**GV2L05**	**TPRST009 TPRSS009 TPRPM009**	0.18-9
0.55	0.87	4	**GV2L05**	**TPRST009 TPRSS009 TPRPM009**	0.18-9
0.75	1.1	4	**GV2L06**	**TPRST009 TPRSS009 TPRPM009**	0.18-9
1.1	1.6	4	**GV2L07**	**TPRST009 TPRSS009 TPRPM009**	0.18-9
1.5	2.1	4	**GV2L07**	**TPRST009 TPRSS009 TPRPM009**	0.18-9
2.2	2.8	4	**GV2L08**	**TPRST009 TPRSS009 TPRPM009**	0.18-9
3	3.8	4	**GV2L08**	**TPRST009 TPRSS009 TPRPM009**	0.18-9
4	4.9	4	**GV2L10**	**TPRST009 TPRSS009 TPRPM009**	0.18-9
5.5	6.7	4	**GV2L14**	**TPRST009 TPRSS009 TPRPM009**	0.18-9
7.5	8.9	4	**GV2L14**	**TPRST025 TPRSS025 TPRPM038**	0.5-25 / 0.76-38
9	10.5	4	**GV2L16**	**TPRST025 TPRSS025 TPRPM038**	0.5-25 / 0.76-38
11	12.8	4	**GV2L16**	**TPRST025 TPRSS025 TPRPM038**	0.5-25 / 0.76-38
15	17	4	**GV2L20**	**TPRST025 TPRSS025 TPRPM038**	0.5-25 / 0.76-38
18.5	21	4	**GV2L22**	**TPRST038 TPRSS038 TPRPM038**	0.76-38
22	24	4	**GV2L22**	**TPRST065 TPRSS065 TPRPM080**	3.25-65 / 4-80
30	32	6	**GV3L40**	**TPRST065 TPRSS065 TPRPM080**	3.25-65 / 4-80
37	39	6	**GV3L50**	**TPRST065 TPRSS065 TPRPM080**	3.25-65 / 4-80

IEC - Type 2 coordination with circuit breakers - 690 V

0.06 to 37 kW at 690 V: Type 2 coordination

Applications power ratings of 3-phase motors 50-60 Hz in category AC-3			Circuit breaker (Trip class 5 to 15)	Standard Starters SIL Starters	
690 V			References	References	Setting range
P	Ie	Iq			
kW	A	kA			A
0.37	0.64	100	**GV2L05**	**TPRST009 TPRSS009**	0.18-9
0.55	0.87	4	**GV2L05**	**TPRST009 TPRSS009**	0.18-9
0.75	1.1	4	**GV2L06**	**TPRST009 TPRSS009**	0.18-9
1.1	1.6	4	**GV2L07**	**TPRST009 TPRSS009**	0.18-9
1.1	1.6	50	**GV2L07 + LA9LB920**	**TPRST025 TPRSS025**	0.5-25
1.5	2.1	4	**GV2L07**	**TPRST009 TPRSS009**	0.18-9
1.5	2.1	50	**GV2L07 + LA9LB920**	**TPRST025 TPRSS025**	0.5-25
2.2	2.8	4	**GV2L08**	**TPRST025 TPRSS025**	0.5-25
2.2	2.8	50	**GV2L08 + LA9LB920**	**TPRST025 TPRSS025**	0.5-25
3	3.8	4	**GV2L08**	**TPRST025 TPRSS025**	0.5-25
3	3.8	50	**GV2L08 + LA9LB920**	**TPRST025 TPRSS025**	0.5-25
4	4.9	4	**GV2L10**	**TPRST025 TPRSS025**	0.5-25
4	4.9	50	**GV2L10 + LA9LB920**	**TPRST025 TPRSS025**	0.5-25
5.5	6.7	4	**GV2L14**	**TPRST025 TPRSS025**	0.5-25
5.5	6.7	50	**GV2L14 + LA9LB920**	**TPRST025 TPRSS025**	0.5-25
7.5	8.9	4	**GV2L14**	**TPRST025 TPRSS025**	0.5-25
7.5	8.9	50	**GV2L14 + LA9LB920**	**TPRST025 TPRSS025**	0.5-25
9	10.5	4	**GV2L16**	**TPRST025 TPRSS025**	0.5-25
11	12.8	4	**GV2L16**	**TPRST025 TPRSS025**	0.5-25
11	12.8	3	**GV3L18+LA9LB920**	**TPRST038 TPRSS038**	0.76-38
15	17	4	**GV2L20**	**TPRST025 TPRSS025**	0.5-25
15	17	3	**GV2L22 + LA9LB920**	**TPRST038 TPRSS038**	0.76-38
18.5	21	4	**GV2L22**	**TPRST038 TPRSS038**	0.76-38
18.5	21	3	**GV3L25 + LA9LB920**	**TPRST065 TPRSS065**	3.25-65
22	24	4	**GV2L22**	**TPRST065 TPRSS065**	3.25-65
22	24	3	**GV2L32 + LA9LB920**	**TPRST065 TPRSS065**	3.25-65
30	32	6	**GV3L40**	**TPRST065 TPRSS065**	3.25-65
37	39	6	**GV3L50**	**TPRST065 TPRSS065**	3.25-65

UL - SCCR Ratings

Short Circuit Current Ratings (SCCR)

UL File E39281 and File E48539
Suitable for use on a circuit delivering not more than:

High SCCR						Standard SCCR		Standard Starters SIL Starters Power Inteface Modules	
Max Voltage 600 V Class J Fuse (1)		Max Voltage 480 V Circuit Breaker		Max Voltage 600 V Circuit Breaker		Max Voltage 600 V Circuit Breaker or Fuse		References	Setting range
SCCR	Maximum Amperage	SCCR	Maximum Amperage	SCCR	Maximum Amperage	SCCR	Maximum Amperage		
kA	A	kA	A	kA	A	kA	A		A
100	25	85	35	50	35	5	35	**TPRST009** **TPRSS009** **TPRPM009**	0.18-9
100	60	85	60	50	60	5	100	**TPRST025** **TPRSS025**	0.5-25
100	100	85	60	50	60	5	125	**TPRST038** **TPRSS038** **TPRPM038**	0.76-38
100	125	85	110	50	110	5	250	**TPRST065** **TPRSS065**	3.25-65
100	125	85	110	50	110	5	250	**TPRST080** **TPRSS080** **TPRPM080**	4-80

(1) When protected by any Class J or CC time-delay fuse (Class CC applicable up to 30 A only).

Group Motor Rating

Suitable for group installation on a circuit delivering not more than:

Max voltage 600 V - Class J Fuse (1)		Max voltage 480 V - Circuit Breaker		Standard Starters SIL Starters	
SCCR	Maximum Amperage	SCCR	Maximum Amperage	References	Setting range
kA	A	kA	A		A
5	90	5	90	**TPRST009** **TPRSS009**	0.18-9
5	175	5	175	**TPRST025** **TPRSS025**	0.5-25
5	175	5	175	**TPRST038** **TPRSS038**	0.76-38
5	600	5	600	**TPRST065** **TPRSS065**	3.25-65
5	600	5	600	**TPRST080** **TPRSS080**	4-80

(1) When protected by any Class J or CC time-delay fuse.

Contactor utilisation categories conforming to IEC 60947-1

The standard utilisation categories define the current values which the contactor must be able to make or break.

These values depend on:
- the type of load being switched: squirrel cage or slip ring motor, resistors,
- the conditions under which making or breaking takes place: motor stalled, starting or running, reversing, plugging.

a.c. applications

Category AC-1	This category applies to all types of a.c. load with a power factor equal to or greater than 0.95 (cos φ ≥ 0.95). Application examples: heating, distribution.
Category AC-2	This category applies to starting, plugging and inching of slip ring motors. ■ On closing, the contactor makes the starting current, which is about 2.5 times the rated current of the motor. ■ On opening, it must break the starting current, at a voltage less than or equal to the mains supply voltage.
Category AC-3	This category applies to squirrel cage motors with breaking during normal running of the motor. ■ On closing, the contactor makes the starting current, which is about 5 to 7 times the rated current of the motor. ■ On opening, it breaks the rated current drawn by the motor. Application examples: all standard squirrel cage motors: lifts, escalators, conveyor belts, bucket elevators, compressors, pumps, mixers, air conditioning units, etc... .
Category AC-4	This category covers applications with plugging and inching of squirrel cage and slip ring motors. The contactor closes at a current peak which may be as high as 5 or 7 times the rated motor current. On opening it breaks this same current at a voltage which is higher, the lower the motor speed. This voltage can be the same as the mains voltage. Breaking is severe. Application examples: printing machines, wire drawing machines, cranes and hoists, metallurgy industry.

d.c. applications

Category DC-1	This category applies to all types of d.c. load with a time constant (L/R) of less than or equal to 1 ms.
Category DC-3	This category applies to starting, counter-current braking and inching of shunt motors. Time constant ≤ 2 ms. ■ On closing, the contactor makes the starting current, which is about 2.5 times the rated motor current. ■ On opening, the contactor must be able to break 2.5 times the starting current at a voltage which is less than or equal to the mains voltage. The slower the motor speed, and therefore the lower its back e.m.f., the higher this voltage. Breaking is difficult.
Category DC-5	This category applies to starting, counter-current braking and inching of series wound motors. Time constant ≤ 7.5 ms. On closing, the contactor makes a starting current peak which may be as high as 2.5 times the rated motor current. On opening, the contactor breaks this same current at a voltage which is higher, the lower the motor speed. This voltage can be the same as the mains voltage. Breaking is severe.

Utilisation categories for auxiliary contacts & control relays conforming to IEC 60947-1

a.c. applications

Category AC-14 (1)	This category applies to the switching of electromagnetic loads whose power drawn with the electromagnet closed is less than 72 VA. Application example: switching the operating coil of contactors and relays.
Category AC-15 (1)	This category applies to the switching of electromagnetic loads whose power drawn with the electromagnet closed is more than 72 VA. Application example: switching the operating coil of contactors.

d.c. applications

Category DC-13 (2)	This category applies to the switching of electromagnetic loads for which the time taken to reach 95 % of the steady state current (T = 0.95) is equal to 6 times the power P drawn by the load (with P ≤ 50 W). Application example: switching the operating coil of contactors without economy resistor.

(1) Replaces category AC-11.
(2) Replaces category DC-11.

Definitions

Altitude

The rarefied atmosphere at high altitude reduces the dielectric strength of the air and hence the rated operational voltage of the contactor. It also reduces the cooling effect of the air and hence the rated operational current of the contactor (unless the temperature drops at the same time).

No derating is necessary up to 3000 m.

Derating factors to be applied above this altitude for main pole operational voltage and current (a.c. supply) are as follows.

Altitude	3500 m	4000 m	4500 m	5000 m
Rated operetional voltage	0.90	0.80	0.70	0.60
Rated operational current	0.92	0.90	0.88	0.86

Ambient air temperature

The temperature of the air surrounding the device, measured near to the device.
The operating characteristics are given:
- with no restriction for temperatures between -5 and +55 °C,
- with restrictions, if necessary, for temperatures between -50 and +70 °C.

Rated operational current (Ie)

This is defined taking into account the rated operational voltage, operating rate and duty, utilisation category and ambient temperature around the device.

Rated conventional thermal current (Ith) (1)

The current which a closed contactor can sustain for a minimum of 8 hours without its temperature rise exceeding the limits given in the standards.

Permissible short time rating

The current which a closed contactor can sustain for a short time after a period of no load, without dangerous overheating.

Rated operational voltage (Ue)

This is the voltage value which, in conjunction with the rated operational current, determines the use of the contactor or starter, and on which the corresponding tests and the utilisation category are based. For 3-phase circuits it is expressed as the voltage between phases.
Apart from exceptional cases such as rotor short-circuiting, the rated operational voltage Ue is less than or equal to the rated insulation voltage Ui.

Rated control circuit voltage (Uc)

The rated value of the control circuit voltage, on which the operating characteristics are based. For a.c. applications, the values are given for a near sinusoidal wave form (less than 5 % total harmonic distortion).

Rated insulation voltage (Ui)

This is the voltage value used to define the insulation characteristics of a device and referred to in dielectric tests determining leakage paths and creepage distances. As the specifications are not identical for all standards, the rated value given for each of them is not necessarily the same.

Rated impulse withstand voltage (Uimp)

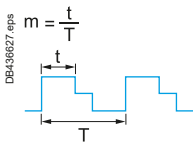
The peak value of a voltage surge which the device is able to withstand without breaking down.

Rated operational power (expressed in kW)

The rated power of the standard motor which can be switched by the contactor, at the stated operational voltage.

(1) Conventional thermal current, in free air, conforming to IEC standards.
Note: *these definitions are extracted from standard IEC 60947-1.*

Definitions

Rated breaking capacity (1)	This is the current value which the contactor can break in accordance with the breaking conditions specified in the IEC standard.
Rated making capacity (1)	This is the current value which the contactor can make in accordance with the making conditions specified in the IEC standard.
On-load factor (m)	 This is the ratio between the time the current flows (t) and the duration of the cycle (T). Cycle duration: duration of current flow + time at zero current.
Pole impedance	The impedance of one pole is the sum of the impedance of all the circuit components between the input terminal and the output terminal. The impedance comprises a resistive component (R) and an inductive component (X = Lω). The total impedance therefore depends on the frequency and is normally given for 50 Hz. This average value is given for the pole at its rated operational current.
Electrical durability	This is the average number of on-load operating cycles which the main pole contacts can perform without maintenance. The electrical durability depends on the utilisation category, the rated operational current and the rated operational voltage.
Mechanical durability	This is the average number of no-load operating cycles (i.e. with zero current flow through the main poles) which the contactor can perform without mechanical failure.

(1) For a.c. applications, the breaking and making capacities are expressed by the rms value of the symmetrical component of the short-circuit current. Taking into account the maximum asymmetry which may exist in the circuit, the contacts therefore have to withstand a peak asymmetrical current which may be twice the rms symmetrical component.

***Note:** these definitions are extracted from standard IEC 60947-1.*

Operational current and power conforming to IEC (θ ≤ 60 °C)

Contactor size			LC1/ LP1 K06	LC1/ LP1 K09	LC1 K12	LC1 K16	LC1 D09	LC1 D12	LC1 D18	LC1 D25	LC1 D32	LC1 D38	LC1 D40A
Maximum operational current in AC-3	≤ 440 V	**A**	6	9	12	16	9	12	18	25	32	38	40
Rated operational power P (standard motor power ratings)	220/240 V	**kW**	1.5	2.2	3	3	2.2	3	4	5.5	7.5	9	11
	380/400 V	**kW**	2.2	4	5.5	7.5	4	5.5	7.5	11	15	18.5	18.5
	415 V	**kW**	2.2	4	5.5	7.5	4	5.5	9	11	15	18.5	22
	440 V	**kW**	3	4	5.5	7.5	4	5.5	9	11	15	18.5	22
	500 V	**kW**	3	4	4	5.5	5.5	7.5	10	15	18.5	18.5	22
	660/690 V	**kW**	3	4	4	4	5.5	7.5	10	15	18.5	18.5	30
	1000 V	**kW**	–	–	–	–	–	–	–	–	–	–	–

Maximum operating rate in operating cycles/hour (1)

On-load factor	Operational power						LC1 D09	LC1 D12	LC1 D18	LC1 D25	LC1 D32	LC1 D38	LC1 D40A
≤ 85 %	P		–	–	–	–	1200	1200	1200	1200	1000	1000	1000
	0.5 P		–	–	–	–	3000	3000	2500	2500	2500	2500	2500
≤ 25 %	P		–	–	–	–	1800	1800	1800	1800	1200	1200	1200

Operational current and power conforming to UL, CSA (θ ≤ 60 °C)

Contactor size			LC1/ LP1 K06	LC1/ LP1 K09	LC1/ LP1 K12	LC1 D09	LC1 D12	LC1 D18	LC1 D25	LC1 D32	LC1 D38	LC1 D40A
Maximum operational current in AC-3	≤ 440 V	**A**	6	9	12	9	12	18	25	32	–	40
Rated operational power P (standard motor power ratings 60 Hz)	200/208 V	**HP**	1.5	2	3	2	3	5	7.5	10	–	10
	230/240 V	**HP**	1.5	3	3	2	3	5	7.5	10	–	10
	460/480 V	**HP**	3	5	7.5	5	7.5	10	15	20	–	30
	575/600 V	**HP**	3	5	10	7.5	10	15	20	25	–	30

(1) Depending on the operational power and the on-load factor (θ ≤ 60 °C).
(2) Other values: please contact us.

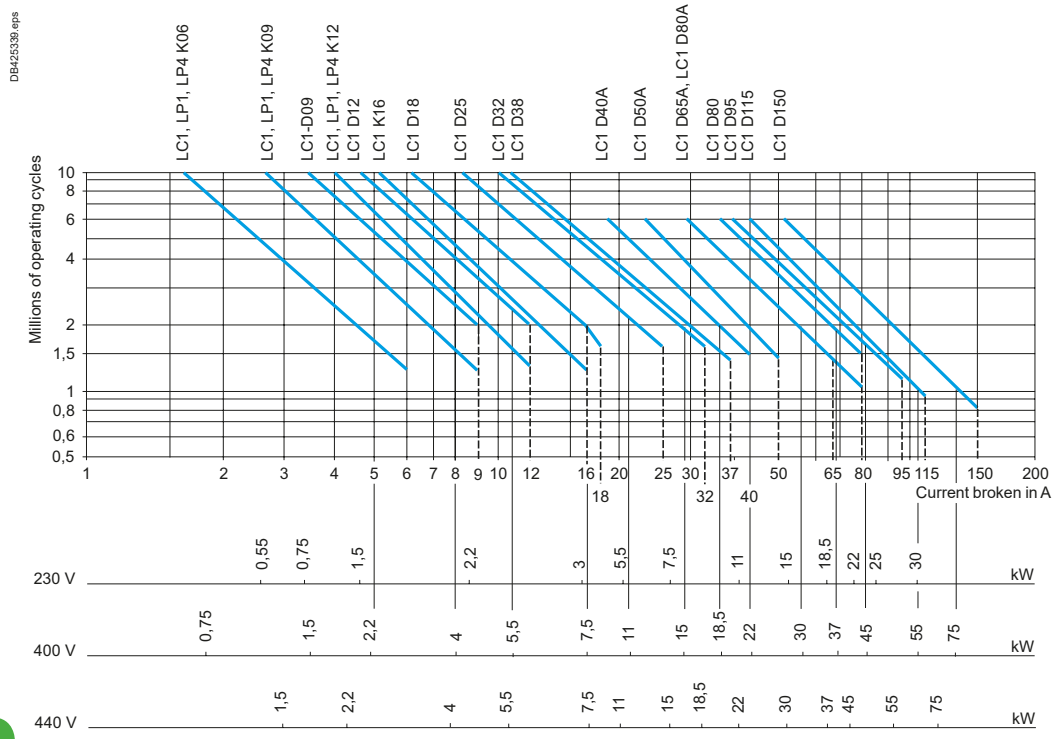
LC1 D50A	LC1 D65A	LC1 D80A	LC1 D80	LC1 D95	LC1 D115	LC1 D150	LC1 F185	LC1 F225	LC1 F265	LC1 F330	LC1 F400	LC1 F500	LC1 F630	LC1 F780	LC1 F800	LC1 F1000	LC1 BL	LC1 BM	LC1 BP	LC1 BR
50	65	80	80	95	115	150	185	225	265	330	400	500	630	780	800	1000	750	1000	1500	1800
15	18,5	22	22	25	30	40	55	63	75	100	110	147	200	220	250	315	220	280	425	500
22	30	37	37	45	55	75	90	110	132	160	200	250	335	400	450	560	400	500	750	900
25	37	37	45	45	59	80	100	110	140	180	220	280	375	425	450	630	425	530	800	900
30	37	37	45	45	59	80	100	110	140	200	250	295	400	425	450	670	450	560	800	900
30	37	37	55	55	75	90	110	129	160	200	257	355	400	450	450	–	500	600	750	900
33	37	37	45	45	80	100	110	129	160	220	280	335	450	475	475	–	560	670	750	900
–	–	–	45	45	65	75	–	–	–	160	185	–	450	450	450	–	530	530	670	750

LC1 D50A	LC1 D65A	LC1 D80A	LC1 D80	LC1 D95	LC1 D115	LC1 D150	LC1 F185	LC1 F225	LC1 F265	LC1 F330	LC1 F400	LC1 F500	LC1 F630	LC1 F780	LC1 F800	LC1 F1000	LC1 BL	LC1 BM	LC1 BP	LC1 BR
1000	1000	1000	750	750	750	750	750	750	750	750	500	500	500	500	500	(2)	120	120	120	120
2500	2500	2500	2000	2000	2000	1200	2000	2000	2000	2000	1200	1200	1200	1200	600	(2)	120	120	120	120
1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	600	600	(2)	120	120	120	120

LC1 D50A	LC1 D65A	LC1 D80A	LC1 D80	LC1 D95	LC1 D115	LC1 D150	LC1 F185	LC1 F225	LC1 F265	LC1 F330	LC1 F400	LC1 F500	LC1 F630	LC1 F780	LC1 F800	LC1 F1000
50	65	65	80	95	115	150	185	225	265	330	400	500	630	780	800	1000
15	20	20	30	30	30	40	50	60	60	75	100	150	250	–	350	350
15	20	20	30	30	40	50	60	75	75	100	125	200	300	450	400	400
40	40	40	60	60	75	100	125	150	150	200	250	400	600	900	900	900
40	50	50	60	60	100	125	150	150	200	250	300	500	800	900	900	–

Selection according to required electrical durability, in category AC-3 (Ue ≤ 440 V)

Control of 3-phase asynchronous squirrel cage motors with breaking whilst running.
The current broken (Ic) in category AC-3 is equal to the rated operational current (Ie) of the motor.



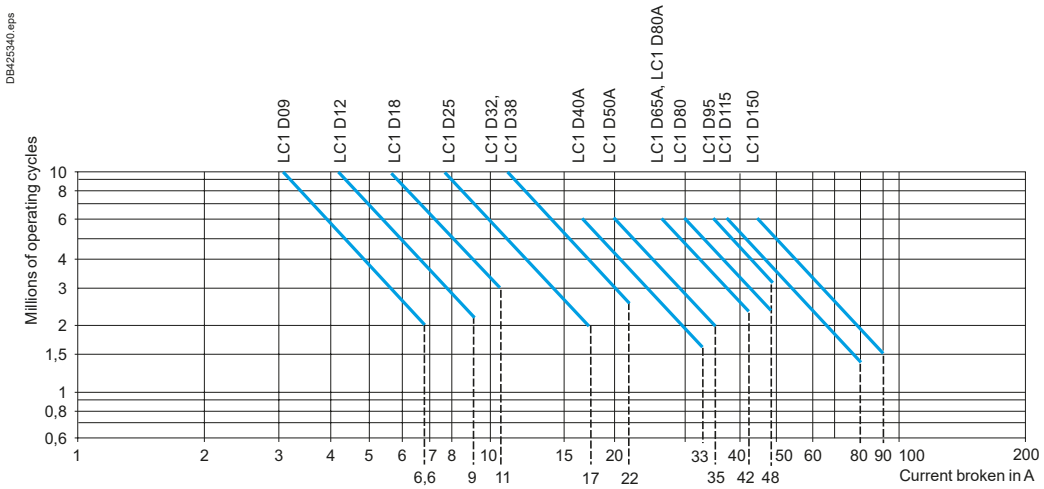
Operational power in kW-50 Hz.

Example:

Asynchronous motor with P = 5.5 kW - Ue = 400 V - Ie = 11 A - Ic = Ie = 11 A
or asynchronous motor with P = 5.5 kW - Ue = 415 V - Ie = 11 A - Ic = Ie = 11 A
3 million operating cycles required.
The above selection curves show the contactor rating needed: LC1D18.

Selection according to required electrical durability, in category AC-3 (Ue = 660/690 V) (1)

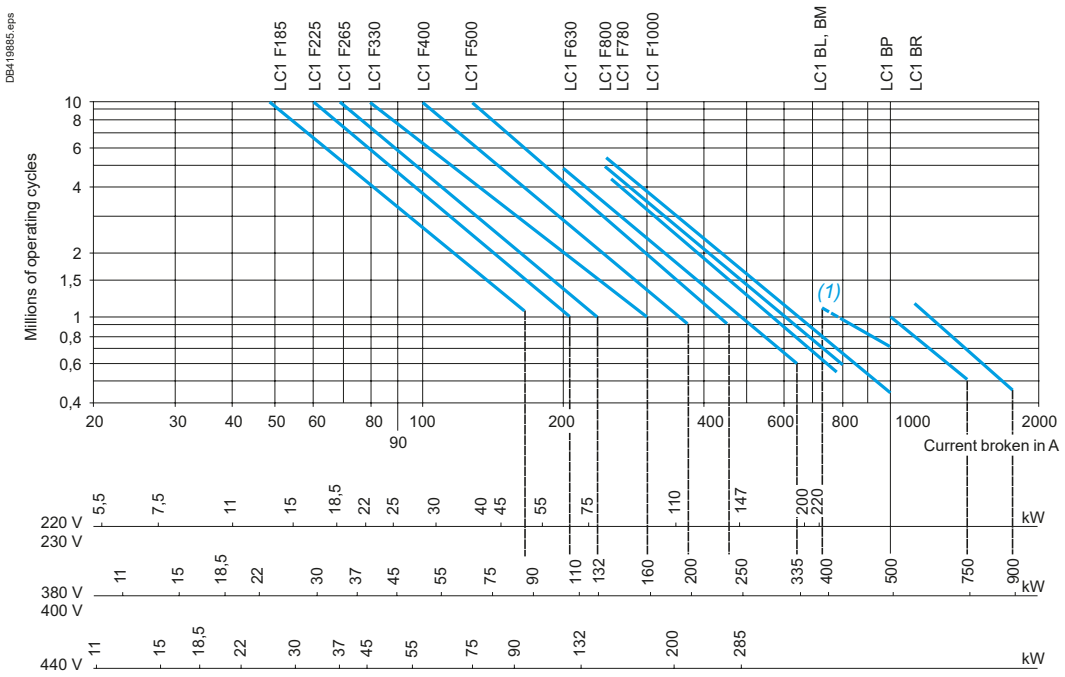
Control of 3-phase asynchronous squirrel cage motors with breaking whilst running.
The current broken (Ic) in category AC-3 is equal to the rated operational current (Ie) of the motor.



(1) For Ue = 1000 V, use the 660/690 V curves, but do not exceed the operational current at the operational power indicated for 1000 V.

Selection according to required electrical durability, in category AC-3 (Ue ≤ 440 V)

Control of 3-phase asynchronous squirrel cage motors with breaking whilst running.
The current broken (Ic) in category AC-3 is equal to the rated operational current (Ie) of the motor.



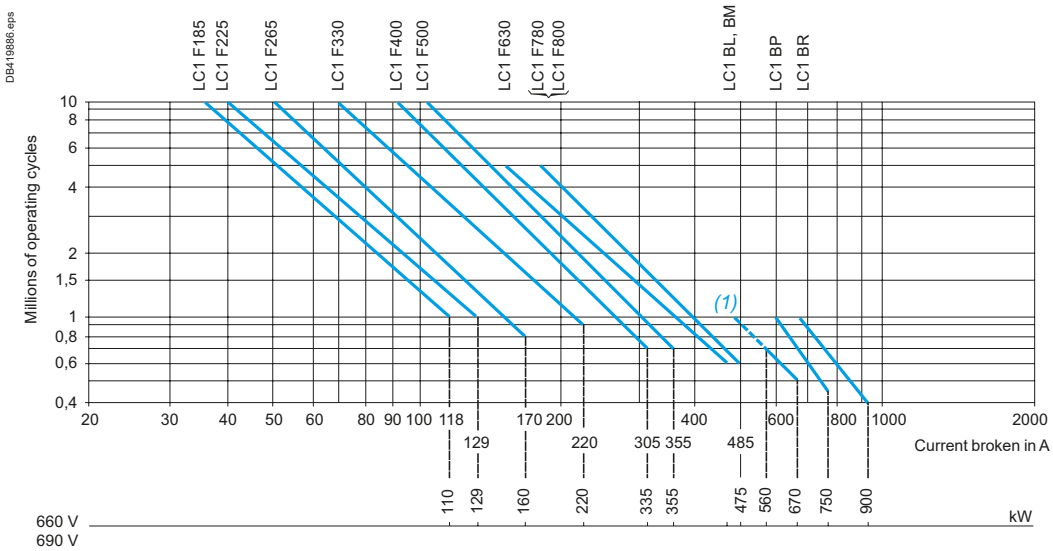
Operational power in kW-50 Hz.

Example:
Asynchronous motor with P = 132 kW - Ue = 380 V - Ie = 245 A - Ic = Ie = 245 A
or asynchronous motor with P = 132 kW - Ue = 415 V - Ie = 240 A - Ic = Ie = 240 A
1.5 million operating cycles required.
The above selection curves show the contactor rating needed: LC1F330.

(1) The dotted lines are only applicable to LC1BL contactors.

Selection according to required electrical durability, in category AC-3 (Ue = 660/690 V)

Control of 3-phase asynchronous squirrel cage motors with breaking whilst running.
The current broken (Ic) in category AC-3 is equal to the rated operational current (Ie) of the motor.



Example:
Asynchronous motor with P = 132 kW - Ue = 660 V - Ie = 140 A - Ic = Ie = 140 A
1.5 million operating cycles required.
The above selection curves show the contactor rating needed: LC1F330.

(1) The dotted lines are only applicable to LC1BL contactors.

Maximum operational current (open-mounted device)

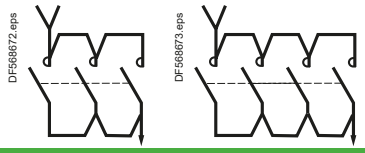
Contactor size			LC1/ LP1 K09	LC1/ LP1 K12	LC1 D09	LC1 DT20	LC1 D12 DT25	LC1 D18 DT32	LC1 D25 DT40	LC1 D32	LC1 D38	LC1 D40A DT60A	LC1 D50A
Maximum operating rate in operating cycles/hour			600	600	600	600	600	600	600	600	600	600	600
Connection conforming to IEC 60947-1	Cable c.s.a.	mm²	4	4	4	4	4	6	6	10	10	35	35
	Bar c.s.a.	mm	–	–	–	–	–	–	–	–	–	–	–
Operational current in AC-1 in A, according to the ambient temperature conforming to IEC 60947-1	≤ 40 °C	A	20	20	25	20	25	32	40	50	50	60	80
	≤ 60 °C	A (4)	20	20	25	20	25	32	40	50	50	60	80
	≤ 70 °C	A (4)	(1)	(1)	17	(1)	17	22	28	35	35	42	56
Maximum operational power ≤ 60 °C	220/230 V	kW	8	8	9	8	9	11	14	18	18	21	29
	240 V	kW	8	8	9	8	9	12	15	19	19	23	31
	380/400 V	kW	14	14	15	14	15	20	25	31	31	37	50
	415 V	kW	14	14	17	14	17	21	27	34	34	41	54
	440 V	kW	15	15	18	15	18	23	29	36	36	43	58
	500 V	kW	17	17	20	17	20	23	33	41	41	49	65
	660/690 V	kW	22	22	27	22	27	34	43	54	54	65	80
	1000 V	kW	–	–	–	–	–	–	–	–	–	–	–

(1) Please consult your Regional Sales Office.
*(2) With set of right-angled connectors **LA9F2100.***
*(3) With set of right-angled connectors **LA9F2600**.*
*(4) **LC1F115** to **LC1F2600**: maximum coil control voltage must not exceed rated Uc for temperature ≥ 60 °C.*

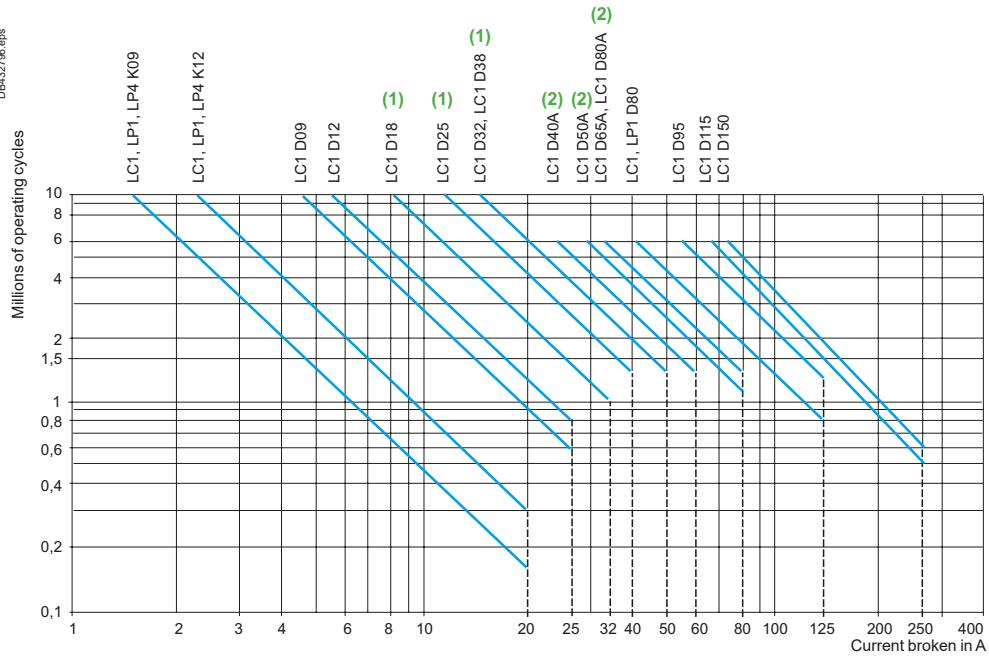
Increase in operational current by parallel connection of poles

Apply the following coefficients to the currents or power values given above; these coefficients take into account an often unbalanced current distribution between the poles:

- 2 poles in parallel: K = 1.6
- 3 poles in parallel: K = 2.25
- 4 poles in parallel: K = 2.8



Selection according to required electrical durability, in category AC-1 (Ue ≤ 690 V)



(1) For TeSys D Green, *consult online datasheets for values.*
(2) For TeSys D Green *or DC coil, consult online datasheets for values.*

Control of resistive circuits (cos ϕ ≥ 0.95).
The current broken (Ic) in category AC-1 is equal to the current (Ie) normally drawn by the load.

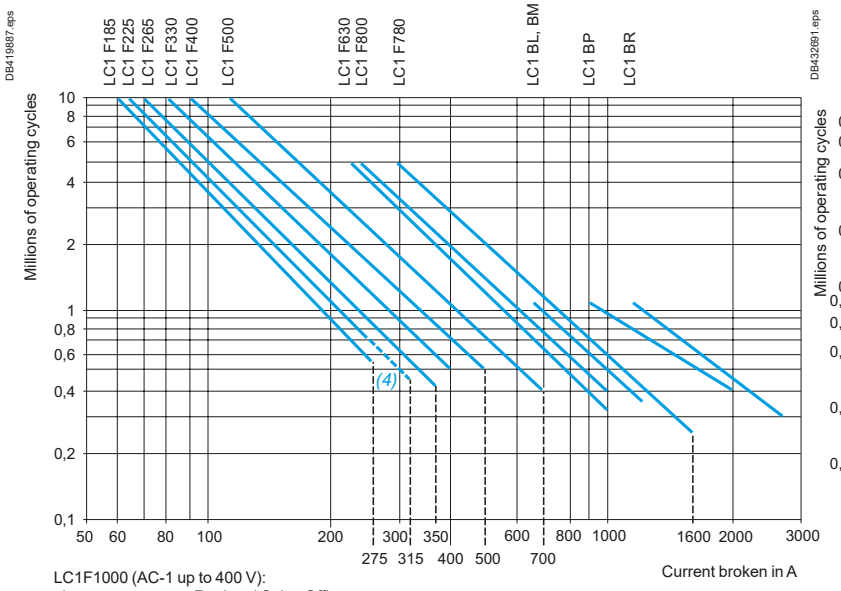
Example:

- Ue = 220 V - Ie = 50 A θ ≤ 40 °C - Ic = Ie = 50 A
- 2 million operating cycles required
- the above selection curves show the contactor rating needed: LC1D50A.

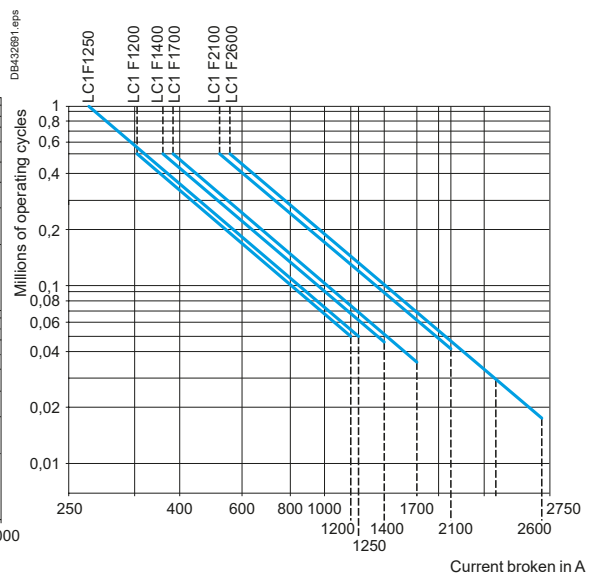
LC1 D65A D80A DT80A	LC1/ LP1 D80	LC1 D95	LC1 D115	LC1 D150	LC1 F185	LC1 F225	LC1 F265	LC1 F330	LC1 F400	LC1 F500	LC1 F630	LC1 F780	LC1 F800	LC1 F1000	LC1S F1200	LC1 F1250	LC1 F1400	LC1 F1700	LC1 F2100	LC1 F2600	LC1 BL	LC1 BM	LC1 BP	LC1 BR
600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	300	300	200	200	200	200	120	120	120	120
35	50	50	120	120	150	185	185	240	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	2 30x5	2 40x5	2 60x5	2 100x5	2 60x5	3 100x5	2 50x8	2 100x5	2 100x5	3 100x5	4 100x5	3 100x10	2 50x5	2 80x5	2 100x5	2 100x10
80	125	125	250	250	275	315	350	400	500	700	1000	1600	1000	1250	1200	1260	1400	1700	2100(2)	2600	800	1250	2000	2750
80	125	125	200	200	240	280	300	360	430	580	850	1350	850	(1)	1110	1060	1190	1450	1750(2)	2600(3)	700	1100	1750	2400
56	80	80	160	160	180	200	250	290	340	500	700	1100	700	(1)	1020	900	1080	1300	1500(2)	2150(3)	600	900	1500	2000
29	45	45	80	80	90	100	120	145	170	240	350	550	350	(1)	400	420	474	570	700	840	300	425	700	1000
31	49	49	83	83	100	110	125	160	180	255	370	570	370	(1)	410	440	490	600	780	920	330	450	800	1100
50	78	78	135	135	165	175	210	250	300	430	600	950	600	(1)	700	730	820	1000	1200	1450	500	800	1200	1600
54	85	85	140	140	170	185	220	260	310	445	630	1000	630	(1)	720	760	850	1050	1300	1580	525	825	1250	1700
58	90	90	150	150	180	200	230	290	330	470	670	1050	670	(1)	750	810	910	1100	1350	1680	550	850	1400	2000
65	102	102	170	170	200	220	270	320	380	502	750	1200	750	–	850	920	1000	1250	1550	1910	600	900	1500	2100
80	135	135	235	235	280	300	370	400	530	740	1000	1650	1000	–	1200	1260	1400	1700	2100	2520	800	1100	1900	2700
–	120	120	345	345	–	–	540	640	760	950	1500	2400	1500	–	–	–	2100	2500	3100(2)	3820	1100	1700	3000	4200

(1) Please consult your Regional Sales Office.
*(2) With set of right-angled connectors **LA9F2100.***
*(3) With set of right-angled connectors **LA9F2600.***
*(4) **LC1F115** to **LC1F2600**: maximum coil control voltage must not exceed rated Uc for temperature ⩾ 60 °C.*

Selection according to required electrical durability, in category AC-1 (Ue ⩽ 690 V)



LC1F1000 (AC-1 up to 400 V):
please contact your Regional Sales Office.



Example:
- Ue = 220 V - Ie = 500 A - θ ⩽ 40 °C - Ic = Ie = 500 A
- 2 million operating cycles required
- the above selection curves show the contactor rating needed: LC1F780.

(1) Please consult your Regional Sales Office
(2) With set of right-angled connectors LA9F2100
(3) With set of right-angled connectors LA9F2600
*(4) The dotted lines are only applicable to **LC1F225**.*

Maximum breaking current

Category AC-2: slip ring motors - breaking the starting current.
Category AC-4: squirrel cage motors - breaking the starting current.

Contactor size			LC1/ LP1 K06	LC1/ LP1 K09	LC1/ LP1 K12	LC1 D09	LC1 D12	LC1 D18	LC1 D25	LC1 D32	LC1 D38	LC1 D40A
In category AC-4 (Ie max)	Ue ≤ 440 V Ie max broken = 6 x I motor	**A**	36	54	54	54	72	108	150	192	192	240
	440 V < Ue ≤ 690 V Ie max broken = 6 x I motor	**A**	26	40	40	40	50	70	90	105	105	150
Depending on the maximum operating rate (1) **and the on-load factor,** θ ≤ 60 °C (2)												
From 150 and 15 % to 300 and 10 %		**A**	20	30	30	30	40	45	75	80	80	110
From 150 and 20 % to 600 and 10 %		**A**	18	27	27	27	36	40	67	70	70	96
From 150 and 30 % to 1200 and 10 %		**A**	16	24	24	24	30	35	56	60	60	80
From 150 and 55 % to 2400 and 10 %		**A**	13	19	19	19	24	30	45	50	50	62
From 150 and 85 % to 3600 and 10 %		**A**	10	16	16	16	21	25	40	45	45	53

(1) Do not exceed the maximum number of operating cycles.
(2) For temperatures higher than 60 °C, use a maximum operating rate value equal to 80 % of the actual value when selecting from the tables.

Counter current braking (plugging)

The current varies from the maximum plug-braking current to the rated motor current.
The making current must be compatible with the rated making and breaking capacities of the contactor.

As breaking normally takes place at a current value at or near the locked rotor current, the contactor can be selected using the criteria for categories AC-2 and AC-4.

Permissible AC-4 power rating for 200 000 operating cycles

Operational voltage		LC●/ LP● K06	LC●/ LP● K09	LC● LP● K12	LC● D09	LC● D12	LC● D18	LC● D25	LC● D32	LC● D38	LC● D40A
220/230 V	**kW**	0.75	1.1	1.1	1.5	1.5	2.2	3	4	4	4
380/400 V	**kW**	1.5	2.2	2.2	2.2	3.7	4	5.5	7.5	7.5	9
415 V	**kW**	1.5	2.2	2.2	2.2	3	3.7	5.5	7.5	7.5	9
440 V	**kW**	1.5	2.2	2.2	2.2	3	3.7	5.5	7.5	7.5	11
500 V	**kW**	2.2	3	3	3	4	5.5	7.5	9	9	11
660/690 V	**kW**	3	4	4	4	5.5	7.5	10	11	11	15

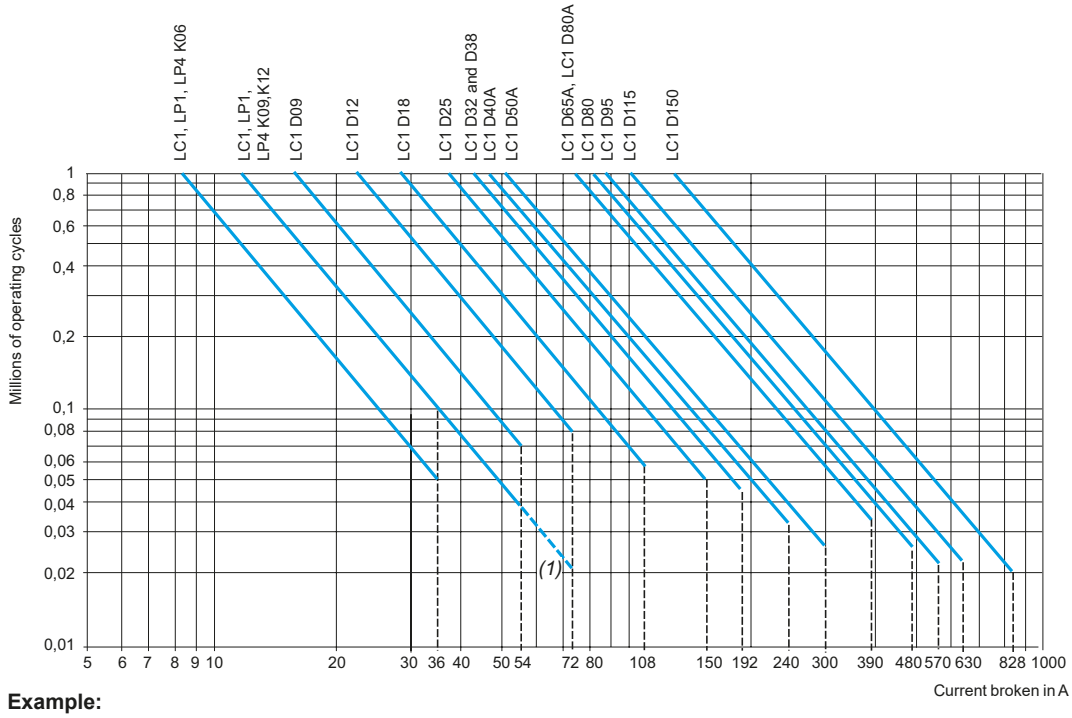
LC1 D50A	LC1 D65A	LC1 D80A	LC1 D80	LC1 D95	LC1 D115	LC1 D150	LC1 F185	LC1 F225	LC1 F26	LC1 F330	LC1 F40	LC1 F500	LC1 F630	LC1 F780	LC1 F800	LC1 BL	LC1 BM	LC1 BP	LC1 BR
300	390	390	480	570	630	830	1020	1230	1470	1800	2220	2760	3360	4260	3690	4320	5000	7500	9000
170	210	210	250	250	540	640	708	810	1020	1410	1830	2130	2760	2910	2910	4000	4800	5400	6600
140	160	160	200	200	280	310	380	420	560	670	780	1100	1400	1600	1600	2250	3000	4500	5400
120	148	148	170	170	250	280	350	400	500	600	700	950	1250	1400	1400	2000	2400	3750	5000
100	132	132	145	145	215	240	300	330	400	500	600	750	950	1100	1100	1500	2000	3000	3600
80	110	110	120	120	150	170	240	270	320	390	450	600	720	820	820	1000	1500	2000	2500
70	90	90	100	100	125	145	170	190	230	290	350	500	660	710	710	750	1000	1500	1800

LC● D50A	LC● D65A	LC1 D80A	LC● D80	LC● D95	LC1 D115	LC1 D150	LC1 F185	LC1 F225	LC1 F265	LC1 F330	LC1 F400	LC1 F500	LC1 F630	LC1 F780	LC1 F800	LC1 BL	LC1 BM	LC1 BP	LC1 BR
5.5	7.5	7.5	7.5	9	9	11	18.5	22	28	33	40	45	55	63	63	90	110	150	200
11	11	11	15	15	18.5	22	33	40	51	59	75	80	100	110	110	160	160	220	250
11	11	11	15	15	18.5	22	37	45	55	63	80	90	100	110	110	160	160	250	280
11	15	15	15	15	18.5	22	37	45	59	63	80	100	110	132	132	160	200	250	315
15	15	15	22	22	30	37	45	55	63	75	90	110	132	150	150	180	200	250	355
15	18.5	18.5	25	25	30	45	63	75	90	110	129	140	160	185	185	200	250	315	450

Selection according to required electrical durability, in categories AC-2 or AC-4 (Ue ≤ 440 V)

Control of 3-phase asynchronous squirrel cage motors (AC-4) or slip ring motors (AC-2) with breaking whilst motor stalled.
The current broken (Ic) in AC-2 is equal to 2.5 x Ie.
The current broken (Ic) in AC-4 is equal to 6 x Ie (Ie = rated operational current of the motor).

DB425342.eps



Example:

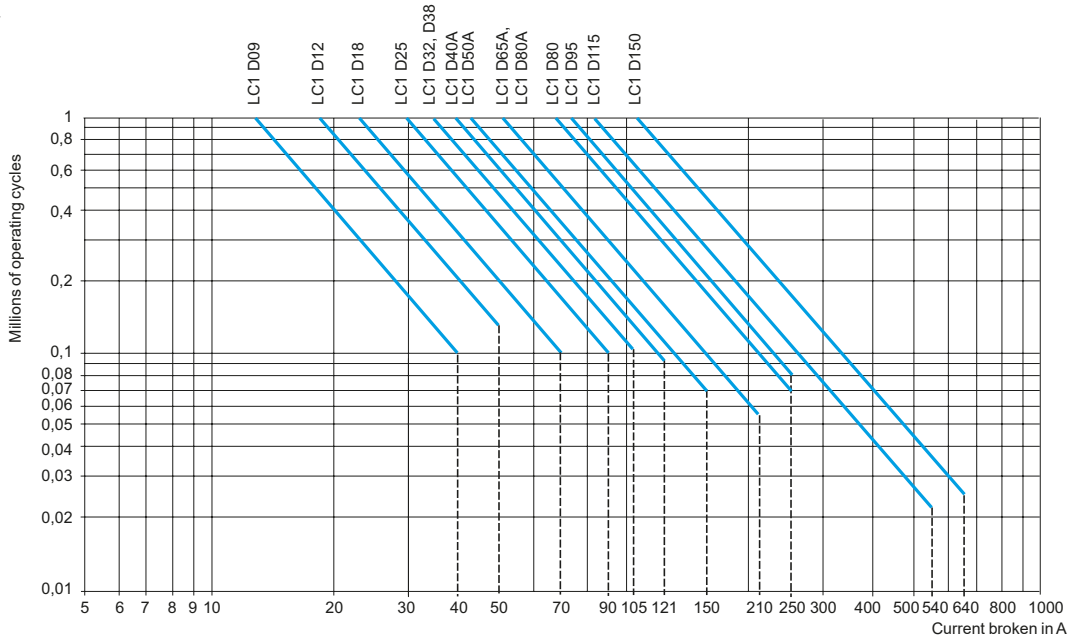
- asynchronous motor with P = 5.5 kW - Ue = 400 V - Ie = 11 A. Ic = 6 x Ie = 66 A
- or asynchronous motor with P = 5.5 kW - Ue = 415 V - Ie = 11 A. Ic = 6 x Ie = 66 A
- 200 000 operating cycles required
- the above selection curves show the contactor rating needed: LC1D25.

(1) The dotted lines are only applicable to LC1, LP1K12 contactors.

Selection according to required electrical durability, use in category AC-4 (440 V < Ue ≤ 690 V)

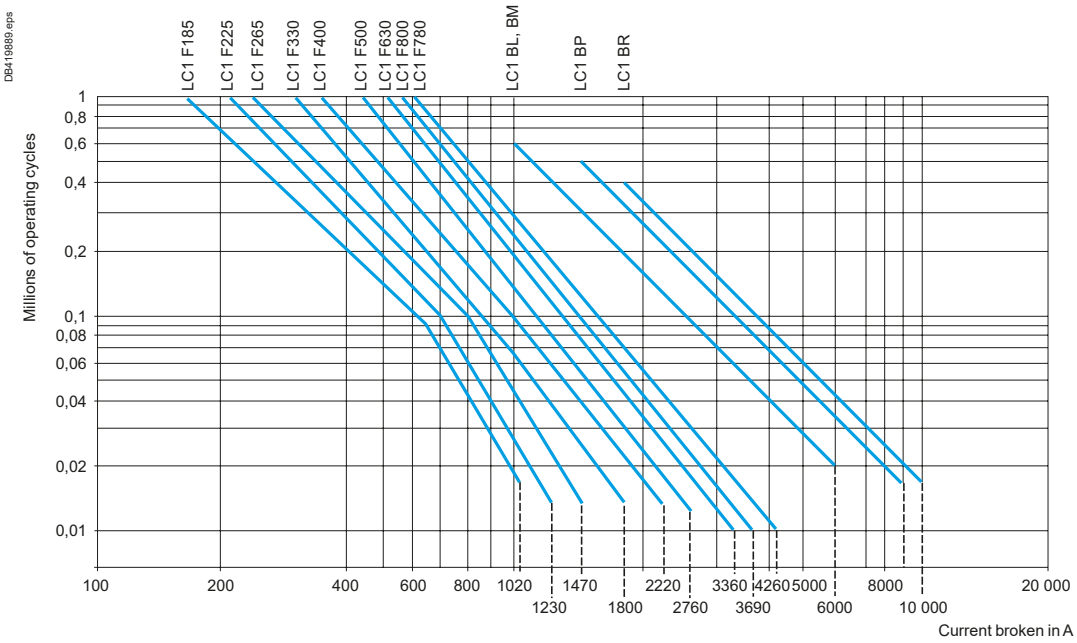
Control of 3-phase asynchronous squirrel cage motors with breaking whilst motor stalled.
The current broken (Ic) in AC-2 is equal to 2.5 x Ie.
The current broken (Ic) in AC-4 is equal to 6 x Ie (Ie = rated operational current of the motor).

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Selection according to required electrical durability, in categories AC-2 or AC-4 (Ue ≤ 440 V)

Control of 3-phase asynchronous squirrel cage motors (AC-4) or slip ring motors (AC-2) with breaking whilst motor stalled.
The current broken (Ic) in AC-4 is equal to 6 x Ie.
(Ie = rated operational current of the motor).



Example:

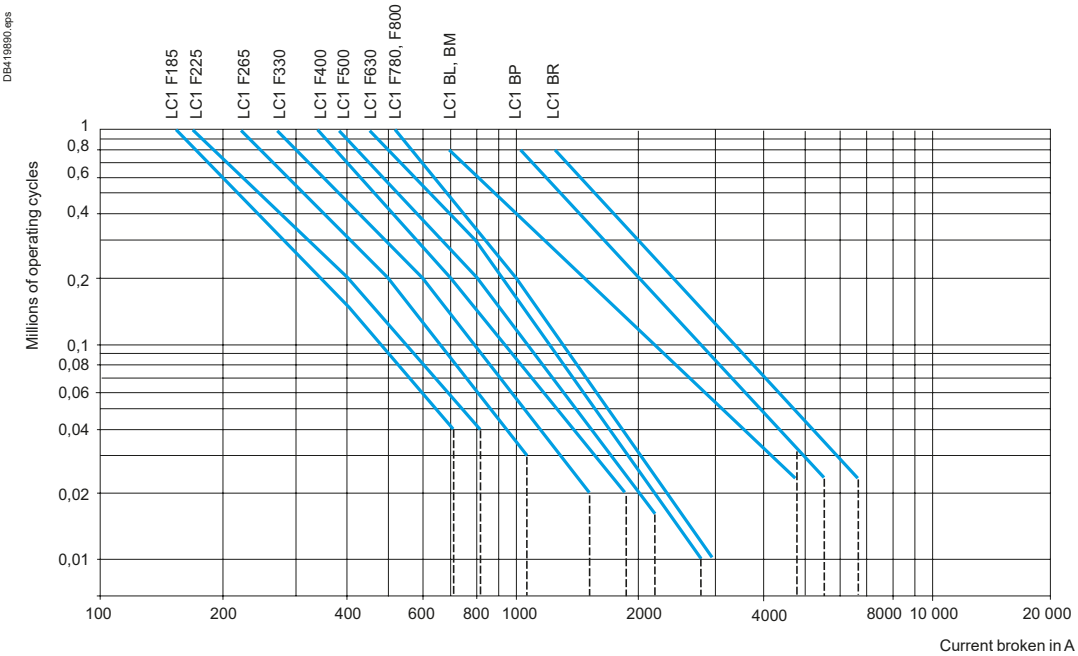
- asynchronous motor with P = 90 kW - Ue = 380 V - Ie = 170 A. Ic = 6 x Ie = 1020 A.

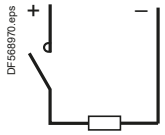
or asynchronous motor with P = 90 kW - Ue = 415 V - Ie = 165 A. Ic = 6 x Ie = 990 A.

- 60 000 operating cycles required.
- the above selection curves show the contactor rating needed: LC1F265.

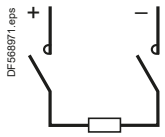
Selection according to required electrical durability, use in category AC-4 (440 V < Ue ≤ 690 V)

Control of 3-phase asynchronous squirrel cage motors with breaking whilst motor stalled.
The current broken (Ic) in AC-4 is equal to 6 x Ie (Ie = rated operational current of the motor).

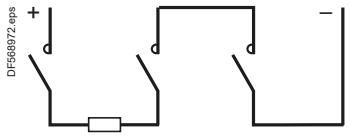




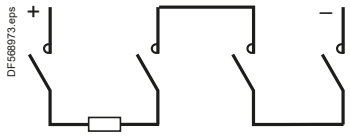
1 pole



2 poles



3 poles



4 poles

Rated operational current (Ie) in Amperes, in utilisation category DC-1, resistive loads: time constant $\frac{L}{R}$ ≤ 1 ms, ambient temperature ≤ 60 °C

Rated operational voltage Ue	No. of poles connected in series	Contactor rating (1)								
		LC1 D09	LC1 DT20	LC1 D12 DT25	LC1 D18 DT32	LC1 D25 DT40	LC1 D32	LC1 D38	LC1 D40A	LC1 DT60A
V										
24	1	20	20	20	25	32	40	40	50	50
	2	20	20	20	25	32	40	40	50	50
	3	20	20	20	25	32	40	40	50	50
	4	–	20	20	25	32	–	–	–	50
48/75	1	20	20	20	25	32	40	40	50	50
	2	20	20	20	25	32	40	40	50	50
	3	20	20	20	25	32	40	40	50	50
	4	–	20	20	25	32	–	–	–	50
125	1	4	4	4	4	7	7	7	7	7
	2	20	20	20	25	32	40	40	50	50
	3	20	20	20	25	32	40	40	50	50
	4	–	20	20	25	32	–	–	–	50
250	1	1	1	1	1	1	1	1	1	1
	2	4	4	4	4	7	7	7	7	7
	3	20	20	20	25	32	40	40	50	50
	4	–	20	20	25	32	–	–	–	50
300	3	4	4	4	4	7	7	7	7	–
	4	–	20	20	25	32	–	–	–	50
460	1	–	–	–	–	–	–	–	–	–
	4	–	–	–	–	–	–	–	–	–
900	2	–	–	–	–	–	–	–	–	–
1200	3	–	–	–	–	–	–	–	–	–
1500	4	–	–	–	–	–	–	–	–	–

Rated operational current (Ie) in Amperes, in utilisation category DC-2 to DC-5, inductive loads: time constant $\frac{L}{R}$ ≤ 15 ms, ambient temperature ≤ 60 °C

Rated operational voltage Ue	No. of poles connected in series	Contactor rating (1)								
		LC1 D09	LC1 DT20	LC1 D12 DT25	LC1 D18 DT32	LC1 D25 DT40	LC1 D32	LC1 D38	LC1 D40A	LC1 DT60A
V										
24	1	20	20	20	25	32	40	40	50	50
	2	20	20	20	25	32	40	40	50	50
	3	20	20	20	25	32	40	40	50	50
	4	–	20	20	25	32	–	–	–	50
48/75	1	20	20	20	25	32	40	40	50	50
	2	20	20	20	25	32	40	40	50	50
	3	20	20	20	25	32	40	40	50	50
	4	–	20	20	25	32	–	–	–	50
125	1	2	2	2	2	3	3	3	4	4
	2	20	20	20	25	32	40	40	50	50
	3	20	20	20	25	32	40	40	50	50
	4	–	20	20	25	32	–	–	–	50
250	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	1
	2	2	2	2	2	3	3	3	4	4
	3	8	8	8	8	32	40	40	50	50
	4	–	20	20	25	32	–	–	–	50
300	3	2	2	2	2	3	3	3	3	3
	4	–	8	8	8	32	–	–	–	50
460	1	–	–	–	–	–	–	–	–	–
	4	–	–	–	–	–	–	–	–	–
900	2	–	–	–	–	–	–	–	–	–
1200	3	–	–	–	–	–	–	–	–	–
1500	4	–	–	–	–	–	–	–	–	–

(1) TeSys D Green *contactors are not validated for DC-1 to DC-5 applications.*

LC1 D50A	LC1 D65A D80A	LC1 DT80A	LC1 D80	LC1 D95	LC1 D115	LC1 D150	LC1 F185	LC1 F225	LC1 F265	LC1 F330	LC1 F400	LC1 F500	LC1 F630	LC1 F780	LC1 F800	LC1 BL	LC1 BM	LC1 BP	LC1 BR
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
–	–	65	100	–	200	–	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
–	–	65	100	–	200	–	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
7	7	7	12	12	12	12	210	230	270	320	380	520	760	1180	760	700	1100	1750	2400
65	65	65	100	100	200	200	210	230	270	320	380	520	760	1180	760	700	1100	1750	2400
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
–	–	65	100	–	200	–	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
1	1.5	1.5	2	2	10	10	–	–	–	–	–	–	–	–	–	700	1100	1750	2400
7	7	7	12	12	200	200	190	200	250	280	350	450	700	1000	700	700	1100	1750	2400
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
–	–	65	100	–	200	–	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
7	7	7	12	12	200	200	190	200	250	280	350	450	700	1000	700	700	1100	1750	2400
–	–	65	100	–	200	–	240	260	300	360	430	580	850	1000	850	700	1100	1750	2400
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	700	1100	1750	2400
–	–	–	–	–	200	–	190	200	250	280	350	450	700	1000	700	700	1100	1750	2400
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	700	1100	1750	2400
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	700	1100	1750	2400
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	700	1100	1750	2400

LC1 D50A	LC1 D65A D80A	LC1 DT80A	LC1 D80	LC1 D95	LC1 D115	LC1 D150	LC1 F185	LC1 F225	LC1 F265	LC1 F330	LC1 F400	LC1 F500	LC1 F630	LC1 F780	LC1 F800	LC1 BL	LC1 BM	LC1 BP	LC1 BR
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
–	–	65	100	–	200	–	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	–	–	–	–
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
–	–	65	100	–	200	–	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
4	4	4	5	5	10	10	–	–	–	–	–	–	–	–	–	700	1100	1750	2400
65	65	65	100	100	200	200	160	180	250	300	350	500	700	1000	700	700	1100	1750	2400
65	65	65	100	100	200	200	240	240	280	310	350	550	850	1000	850	700	1100	1750	2400
–	–	65	100	–	200	–	240	240	280	310	350	550	850	1000	850	700	1100	1750	2400
1	1.5	1.5	1	1	3	3	–	–	–	–	–	–	–	–	–	700	1100	1750	2400
4	4	4	5	5	200	200	140	160	220	280	310	480	680	900	680	700	1100	1750	2400
65	65	65	100	100	200	200	160	180	250	300	350	500	700	1000	700	700	1100	1750	2400
–	–	65	100	–	200	–	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
3	3	3	5	5	200	200	140	160	220	280	310	480	680	900	680	700	1100	1750	2400
–	–	65	100	–	200	–	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	700	1100	1750	2400
–	–	–	–	–	200	–	140	160	220	280	310	480	680	800	680	700	1100	1750	2400
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	700	1100	1750	2400
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	700	1100	1750	2400
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	700	1100	1750	2400

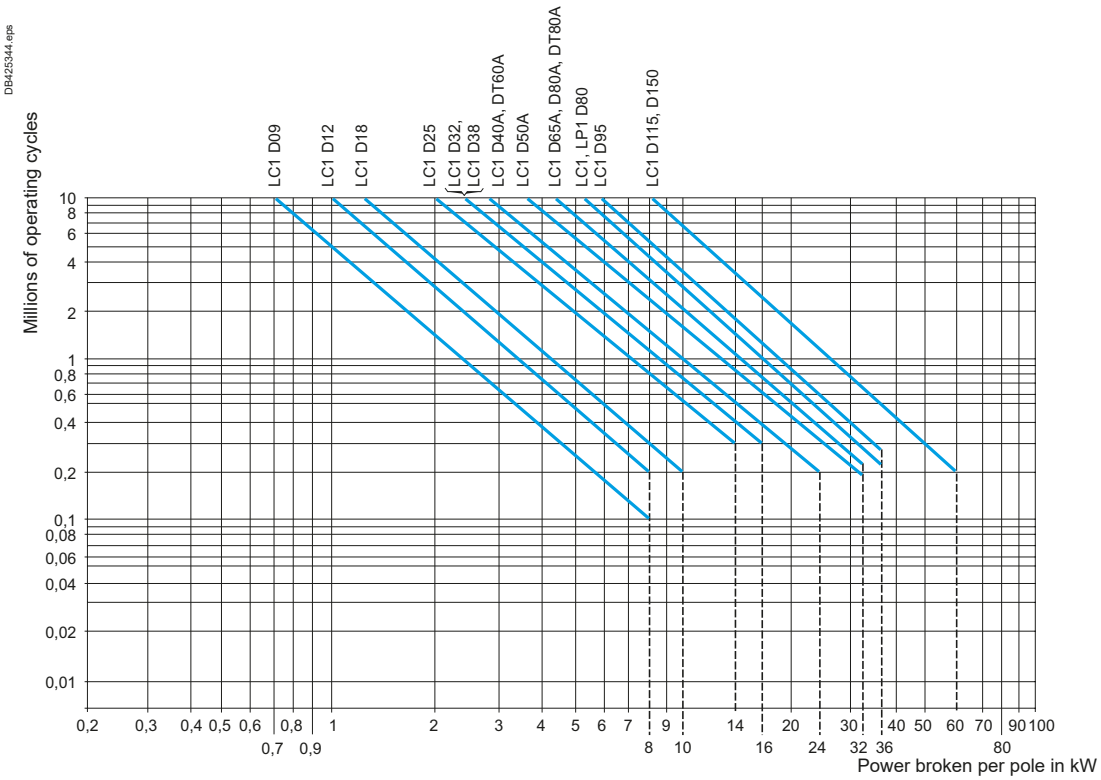
Selection according to required electrical durability, use in categories DC-1 to DC-5

The criteria for contactor selection are:
- the rated operational current Ie
- the rated operational voltage Ue
- the utilisation category and the time constant L/R
- the required electrical durability.

Maximum operating rate (operating cycles)

The following limits must not be exceeded: 120 operating cycles/hour at rated operational current Ie.

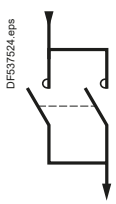
Electrical durability (1)



(1) TeSys D Green *contactors are not validated for DC-1 to DC-5 applications*

Example

Series wound motor - P = 1.5 kW - Ue = 200 V - Ie = 7.5 A.
Utilisation: reversing, inching.
- Utilisation category = DC-5.
- Select contactor LC1D09 with 3 poles in series.
- The power broken is: Pc total = 2.5 x 200 x 7.5 = 3.75 kW.
- The power broken per pole is: 1.25 kW.
- The electrical durability read from the curve is ≥ 3 millions of operating cycles.



Use of poles in parallel

Electrical durability can be increased by using poles connected in parallel.

With N poles connected in parallel, the electrical durability becomes: electrical durability read from the curves x N x 0.7.

Note:
When the poles are connected in parallel, the maximum operational currents indicated on pages A6/46 and A6/47 must not be exceeded.

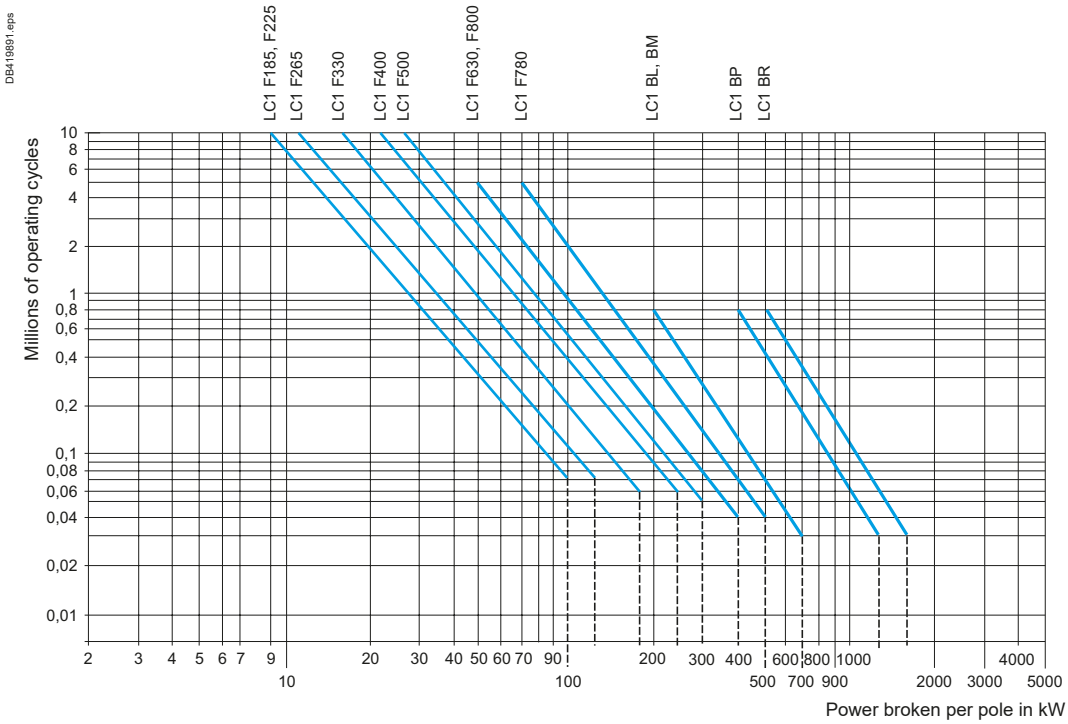
Note:
Ensure that the connections are made in such a way as to equalise the currents in each pole.

Selection according to required electrical durability, use in categories DC-1 to DC-5

Determining the electrical durability

The electrical durability can be read directly from the curves below, having previously calculated the power broken as follows:
P broken = U broken x I broken.
The tables below give the values of Uc and Ic for the various utilisation categories.

Power broken			
Utilisation categories	**U broken**	**I broken**	**P broken**
DC-1 Non inductive or slightly inductive loads	Ue	Ie	Ue x Ie
DC-2 Shunt wound motors, breaking whilst motor running	0.1 Ue	Ie	0.1 Ue x Ie
DC-3 Shunt wound motors, reversing, inching	Ue	2.5 Ie	Ue x 2.5 Ie
DC-4 Series wound motors, breaking whilst motor running	0.3 Ue	Ie	0.3 Ue x Ie
DC-5 Series wound motors, reversing, inching	Ue	2.5 Ie	Ue x 2.5 Ie



Example
Series wound motor: P = 40 kW - Ue = 200 V - Ie = 200 A.
Utilisation: reversing, inching.
Utilisation category = DC-5.
- Select contactor LC1 F265 with 2 poles in series.
- The power broken is: Pc total = 2.5 x 200 x 200 = 100 kW.
- The power broken per pole is 50 kW.
- The electrical durability read from the curve is 500000 operating cycles.



General

The operating conditions of lighting circuits have the following characteristics:
■ continuous duty: the switching device can remain closed for several days or even months
■ a dispersion factor of 1: all luminaires in the same group are switched on or off simultaneously
■ a relatively high temperature around the device due to the enclosure, the presence of fuses, or an unventilated control panel location.
This is why the operational current for lighting is lower than the value given for AC-1 duty.

Protection

The continuous duty current drawn by a lighting circuit is constant. In fact:
■ it is unlikely that the number of luminaires of an existing circuit will be modified
■ this type of circuit cannot create an overload of long duration.
It is therefore only necessary to provide short-circuit protection.
This can be provided by:
■ gG type fuses, or
■ modular circuit breakers.
Nevertheless, it is always possible and sometimes more economical (smaller cable size) to protect the circuit by a thermal overload relay and associated aM type uses.

Distribution system

Single-phase circuit, 220/240 V

The tables on pages A6/51 to A6/55 are based on a single-phase 220/240 V circuit and can therefore be applied directly in this case.

3-phase circuit, 380/415 V (with neutral)

The total number of lamps (N) to be switched simultaneously is divided into three equal groups, each connected between one phase and neutral. The contactor can then be selected from the 220/240 V single-phase tables for a number of lamps equal to $\frac{N}{3}$ lamps.

3-phase circuit, 220/240 V

The total number of lamps (N) to be switched simultaneously is divided into three equal groups, each connected between 2 phases (L1-L2), (L2-L3), (L3-L1).
The contactor can then be selected from the 220/240 V single-phase table for a number of lamps equal to $\frac{N}{\sqrt{3}}$ lamps.

Contactor selection tables

For the different types of lamps, the tables on pages A6/51 to A6/55 give the maximum number of lamps of unit power P (in Watts), which can be switched simultaneously for each size of contactor.
They are based on:
■ a 220/240 V single-phase circuit
■ an ambient temperature of 55 °C [2], taking into account the operating conditions (see General paragraph)
■ an electrical life of more than 10 years (200 days' operation per year).
They take into account:
■ the total current drawn (including ballast)
■ transient phenomena which occur at switch-on
■ the starting currents and their duration
■ the circulation of any harmonics which may be present.

Lamps with compensating capacitor C (µF) connected in parallel

Parallel connected compensating capacitors **C** cause a current peak at the moment of switch-on. To ensure that the value of this current peak remains compatible with the making characteristics of the contactors, the unit value of the capacitance must not exceed the following:

Switching contactor rating [1]	**LC1 K09**	**LP1 K09**	**LC1 D09**	**LC1 D12**	**LC1 D18**	**LC1 D25**	**LC1 D32**	**LC1 D38**	**LC1 D40A**	**LC1 D50A**	**LC1 D65A**	**LC1 D80A**	**LC1 D80**
Maximum unit value C (µF) of parallel connected compensating capacitor	7	3	18	18	25	60	96	96	120	120	240	240	240
Switching contactor rating [1]	**LC1 D80**	**LC1 D95**	**LC1 D115**	**LC1 D150**	**LC1 F185**	**LC1 F225**	**LC1 F265**	**LC1 F330**	**LC1 F400**	**LC1 F500**	**LC1 F630**	**LC1 F800**	
Maximum unit value C (µF) of parallel connected compensating capacitor	240	240	300	360	800	1200	1700	2500	4000	6000	9000	10800	

This value is independent of the number of lamps switched by the contactor.
(1) Validation tests have not been carried out with TeSys D Green *contactors.*
(2) For an ambient temperature of 40 °C, multiply the number by 1.2.



Usual values

The tables show the following values:
- IB: value of current drawn by each lamp at its rated voltage,
- C: unit capacitance for each lamp,

corresponding to the values normally quoted by lamp manufacturers.

These values are given for an ambient temperature of 55 °C (for 40 °C, multiply the number by 1.2).

Incandescent and halogen lamps

P (W)	60	75	100	150	200	300	500	750	1000	
IB (A)	**0.27**	**0.34**	**0.45**	**0.68**	**0.91**	**1.40**	**2.30**	**3.40**	**4.60**	**LC1 (1)**
Max. no. of lamps according to P (W)	35	28	21	14	10	6	4	2	2	**K09**
	59	47	35	23	17	11	7	4	3	**D09, D12**
	77	61	46	30	23	15	9	6	4	**D18**
	92	73	55	36	27	18	11	7	5	**D25**
	129	103	77	51	38	25	15	10	7	**D32, D38**
	163	129	97	64	48	31	19	13	9	**D40A**
	207	164	124	82	62	40	24	16	12	**D50A, D65A, D80A**
	296	235	177	117	88	57	34	23	17	**D80, D95**
	430	340	256	170	126	82	50	34	24	**D115**
	466	370	280	184	138	90	54	36	26	**D150**
	710	564	426	282	210	136	82	56	40	**F185**
	770	610	462	304	228	148	90	60	44	**F225**
	888	704	532	352	262	170	104	70	52	**F265**
	1006	800	604	400	298	194	118	80	58	**F330**
	1274	1010	764	504	378	244	148	100	74	**F400**
	1718	1364	1030	682	508	330	200	136	100	**F500**
	2328	1850	1396	924	690	448	272	184	136	**F630**
	2776	2204	1666	1102	824	534	326	220	162	**F800**

Mixed lighting lamps

P (W)	100	160	250	500	1000	
IB (A)	**0.45**	**0.72**	**1.10**	**2.30**	**4.50**	**LC1 (1)**
Max. no. of lamps according to P (W)	21	13	8	4	2	**K09**
	35	22	14	7	3	**D09, D12**
	46	29	18	9	4	**D18**
	55	36	23	11	5	**D25**
	77	48	30	15	7	**D32, D38**
	97	61	38	19	9	**D40A**
	124	77	49	24	12	**D50A, D65A, D80A**
	177	111	70	34	17	**D80, D95**
	256	160	104	50	26	**D115**
	280	174	114	54	28	**D150**
	426	266	174	82	42	**F185**
	462	288	188	90	46	**F225**
	532	332	218	104	52	**F265**
	604	378	246	118	60	**F330**
	764	478	312	150	76	**F400**
	1030	644	422	202	102	**F500**
	1398	874	572	272	140	**F630**
	1666	1040	680	326	166	**F800**

(1) Validation tests have not been carried out with TeSys D Green *contactors.*



Usual values

The tables show the following values:
- IB: value of current drawn by each lamp at its rated voltage
- C: unit capacitance for each lamp

corresponding to the values normally quoted by lamp manufacturers.

These values are given for an ambient temperature of 55 °C (for 40 °C, multiply the number by 1.2).

Fluorescent lamps with starter. Single fitting

	Non corrected				With parallel correction						
P (W)	**20**	**40**	**65**	**80**	**110**	**20**	**40**	**65**	**80**	**110**	
IB (A)	**0.39**	**0.45**	**0.70**	**0.80**	**1.2**	**0.17**	**0.26**	**0.42**	**0.52**	**0.72**	
C (µF)	**–**	**–**	**–**	**–**	**–**	**5**	**5**	**7**	**7**	**16**	**LC1 (1)**
Max. no. of lamps according to P (W)	24	21	13	12	8	56	36	22	18	–	**K09**
	41	35	22	20	13	94	61	38	30	22	**D09, D12**
	53	46	30	26	17	123	80	50	40	29	**D18**
	66	57	37	32	21	152	100	61	50	36	**D25**
	89	77	50	43	29	205	134	83	67	48	**D32, D38**
	112	97	62	55	36	258	169	104	84	61	**D40A**
	143	124	80	70	46	329	215	133	107	77	**D50A, D65A, D80A**
	205	177	114	100	66	470	367	190	153	111	**D80, D95**
	410	354	228	200	132	940	614	380	306	222	**D115, D150**
	492	426	274	240	160	1128	738	456	368	266	**F185**
	532	462	296	260	172	1224	800	490	400	288	**F225**
	614	532	342	300	200	1412	922	570	462	332	**F265**
	696	604	388	340	226	1600	1046	648	522	378	**F330**
	882	764	490	430	286	2024	1322	818	662	478	**F400**
	1190	1030	662	580	386	2728	1724	1104	892	644	**F500**
	1612	1398	698	786	524	3700	2418	1498	1210	874	**F630, F800**

Fluorescent lamps with starter. Twin fitting

	Non corrected					With series correction					
P (W)	**2x20**	**2x40**	**2x65**	**2x80**	**2x110**	**2x20**	**2x40**	**2x65**	**2x80**	**2x110**	
IB (A)	**2x0.22**	**2x0.41**	**2x0.67**	**2x0.82**	**2x1.1**	**2x0.13**	**2x0.24**	**2x0.39**	**2x0.48**	**2x0.65**	**LC1 (1)**
Max. no. of lamps according to P (W)	2x21	2x11	2x7	2x5	2x4	2x36	2x20	2x12	2x10	2x7	**K09**
	2x36	2x18	2x10	2x8	2x6	2x60	2x32	2x20	2x16	2x12	**D09, D12**
	2x46	2x24	2x14	2x12	2x8	2x80	2x42	2x26	2x20	2x16	**D18**
	2x58	2x30	2x18	2x14	2x10	2x100	2x54	2x32	2x26	2x20	**D25**
	2x78	2x42	2x26	2x20	2x14	2x134	2x72	2x44	2x36	2x26	**D32, D38**
	2x100	2x52	2x32	2x26	2x18	2x168	2x90	2x56	2x44	2x32	**D40A**
	2x126	2x68	2x40	2x34	2x24	2x214	2x116	2x70	2x58	2x42	**D50A, D65A, D80A**
	2x180	2x96	2x58	2x48	2x36	2x306	2x166	2x102	2x82	2x60	**D80, D95**
	2x360	2x194	2x118	2x96	2x72	2x614	2x332	2x204	2x166	2x122	**D115, D150**
	2x436	2x234	2x142	2x116	2x86	2x738	2x400	2x246	2x200	2x148	**F185**
	2x472	2x254	2x154	2x126	2x94	2x800	2x432	2x266	2x216	2x160	**F225**
	2x544	2x292	2x178	2x146	2x108	2x922	2x500	2x308	2x250	2x184	**F265**
	2x618	2x332	2x202	2x166	2x124	2x1046	2x566	2x348	2x282	2x208	**F330**
	2x782	2x420	2x256	2x210	2x156	2x1322	2x716	2x440	2x358	2x264	**F400**
	2x1054	2x566	2x346	2x282	2x210	2x1784	2x966	2x594	2x482	2x356	**F500**
	2x1430	2x766	2x468	2x384	2x286	2x2418	2x1310	2x806	2x654	2x484	**F630, F800**

(1) Validation tests have not been carried out with TeSys D Green *contactors.*



Usual values

The tables show the following values:
- IB: value of current drawn by each lamp at its rated voltage
- C: unit capacitance for each lamp

corresponding to the values normally quoted by lamp manufacturers.

These values are given for an ambient temperature of 55 °C (for 40 °C, multiply the number by 1.2).

Fluorescent lamps without starter. Single fitting

	Non corrected					With parallel correction					
P (W)	**20**	**40**	**65**	**80**	**110**	**20**	**40**	**65**	**80**	**110**	
IB (A)	**0.43**	**0.55**	**0.80**	**0.95**	**1.4**	**0.19**	**0.29**	**0.46**	**0.57**	**0.79**	
C (µF)	**–**	**–**	**–**	**–**	**–**	**5**	**5**	**7**	**7**	**16**	**LC1 [1]**
Max. no. of lamps according to P (W)	22	17	12	10	6	50	33	20	16	–	**K09**
	37	29	20	16	11	84	55	34	28	20	**D09, D12**
	48	38	26	22	15	110	72	45	36	26	**D18**
	60	47	32	27	18	136	89	56	45	32	**D25**
	97	63	43	36	25	184	101	76	61	44	**D32, D38**
	102	80	55	46	31	231	151	95	77	55	**D40A**
	130	101	70	58	40	294	193	121	98	70	**D50A, D65A, D80A**
	186	145	100	84	57	421	275	173	140	101	**D80, D95**
	372	290	200	168	114	842	550	346	280	202	**D115, D150**
	446	348	240	202	136	1010	662	416	336	242	**F185**
	484	378	260	218	148	1094	716	452	364	262	**F225**
	558	436	300	252	170	1262	828	522	420	304	**F265**
	632	494	340	286	194	1432	938	590	476	344	**F330**
	800	624	430	362	246	1810	1186	748	604	434	**F400**
	1078	844	580	488	330	2442	1600	1008	814	586	**F500**
	1462	1144	786	662	448	3310	2168	1366	1104	796	**F630, F800**

Fluorescent lamps without starter. Twin fitting

	Non corrected					With series correction					
P (W)	**2x20**	**2x40**	**2x65**	**2x80**	**2x110**	**2x20**	**2x40**	**2x65**	**2x80**	**2x110**	
IB (A)	**2x0.25**	**2x0.47**	**2x0.76**	**2x0.93**	**2x1.3**	**2x0.14**	**2x0.26**	**2x0.43**	**2x0.53**	**2x0.72**	**LC1 [1]**
Max. no. of lamps according to P (W)	2x19	2x10	2x6	2x5	2x3	2x34	2x18	2x11	2x9	2x6	**K09**
	2x32	2x16	2x10	2x8	2x6	2x56	2x30	2x18	2x14	2x10	**D09, D12**
	2x42	2x22	2x12	2x10	2x8	2x74	2x40	2x24	2x18	2x14	**D18**
	2x52	2x26	2x16	2x12	2x10	2x92	2x50	2x30	2x24	2x18	**D25**
	2x70	2x36	2x22	2x18	2x12	2x124	2x66	2x40	2x32	2x24	**D32, D38**
	2x88	2x46	2x28	2x22	2x16	2x156	2x84	2x50	2x40	2x30	**D40A**
	2x112	2x58	2x36	2x30	2x20	2x200	2x106	2x64	2x52	2x38	**D50A, D65A, D80A**
	2x160	2x84	2x52	2x42	2x30	2x234	2x152	2x92	2x74	2x54	**D80, D95**
	2x320	2x170	2x104	2x86	2x60	2x570	2x306	2x186	2x150	2x110	**D115, D150**
	2x384	2x204	2x126	2x102	2x74	2x686	2x368	2x222	2x180	2x132	**F185**
	2x416	2x220	2x136	2x112	2x80	2x742	2x400	2x242	2x196	2x144	**F225**
	2x480	2x254	2x158	2x128	2x92	2x856	2x462	2x278	2x226	2x166	**F265**
	2x544	2x288	2x178	2x146	2x104	2x970	2x522	2x316	2x256	2x188	**F330**
	2x688	2x366	2x226	2x184	2x132	2x1228	2x662	2x400	2x324	2x238	**F400**
	2x928	2x494	2x304	2x248	2x178	2x1656	2x892	2x540	2x438	2x322	**F500**
	2x1258	2x668	2x414	2x338	2x242	2x2246	2x1210	2x730	2x592	2x436	**F630, F800**

(1) Validation tests have not been carried out with TeSys D Green *contactors.*



Usual values

The tables show the following values:
- IB: value of current drawn by each lamp at its rated voltage
- C: unit capacitance for each lamp

corresponding to the values normally quoted by lamp manufacturers.

These values are given for an ambient temperature of 55 °C (for 40 °C, multiply the number by 1.2).

Low pressure sodium vapour lamps

	Non corrected							With parallel correction							
P (W)	**35**	**55**	**90**	**135**	**150**	**180**	**200**	**35**	**55**	**90**	**135**	**150**	**180**	**200**	
IB (A)	**1.2**	**1.6**	**2.4**	**3.1**	**3.2**	**3.3**	**3.4**	**0.3**	**0.4**	**0.6**	**0.9**	**1**	**1.2**	**1.3**	
C (µF)	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**17**	**17**	**25**	**36**	**36**	**36**	**36**	**LC1 (1)**
Max. no. of lamps according to P (W)	6	5	3	2	2	2	2	–	–	–	–	–	–	–	**K09**
	10	7	5	3	3	3	3	40	30	–	–	–	–	–	**D09, D12**
	12	9	6	4	4	4	4	50	37	25	–	–	–	–	**D18**
	15	11	7	6	5	5	5	63	47	31	21	19	15	14	**D25**
	21	16	10	8	8	7	7	86	65	43	28	26	21	20	**D32, D38**
	27	20	13	10	10	10	9	110	82	55	36	33	27	25	**D40A**
	35	26	17	13	13	12	12	140	105	70	46	42	35	32	**D50A, D65A, D80A**
	50	37	25	19	18	18	17	200	150	100	66	60	50	46	**D80, D95**
	100	75	50	38	36	36	34	400	300	200	132	120	100	92	**D115, D150**
	140	104	70	54	52	50	48	560	420	280	186	168	140	128	**F185**
	152	114	76	58	56	54	54	606	454	302	202	182	152	140	**F225**
	174	130	88	68	66	64	62	700	524	350	232	210	174	162	**F265**
	198	148	98	76	74	72	70	792	594	396	264	238	198	182	**F330**
	250	188	124	96	94	90	88	1002	752	502	334	300	250	252	**F400**
	338	254	168	130	126	122	118	1352	1014	676	450	406	338	312	**F500**
	496	372	248	192	186	180	174	1982	1488	992	660	594	496	458	**F630, F800**

High pressure sodium vapour lamps

	Non corrected					With parallel correction					
P (W)	**150**	**250**	**400**	**700**	**1000**	**150**	**250**	**400**	**700**	**1000**	
IB (A)	**1.9**	**3.2**	**5**	**8.8**	**12.4**	**0.84**	**1.4**	**2.2**	**3.9**	**5.5**	
C (µF)	**–**	**–**	**–**	**–**	**–**	**20**	**32**	**48**	**96**	**120**	**LC1 (1)**
Max. no. of lamps according to P (W)	4	2	1	–	–	–	–	–	–	–	**K09**
	6	3	2	1	–	–	–	–	–	–	**D09, D12**
	7	4	3	1	1	17	–	–	–	–	**D18**
	10	5	3	2	1	22	13	8	–	–	**D25**
	13	8	5	2	2	30	18	11	6	–	**D32, D38**
	17	10	6	3	2	39	23	15	8	6	**D40A**
	22	13	8	4	3	50	30	19	10	7	**D50A, D65A, D80A**
	31	18	12	6	4	71	42	27	15	10	**D80, D95**
	62	36	24	12	8	142	84	54	30	20	**D115, D150**
	88	52	34	18	14	200	120	76	42	30	**F185**
	96	56	36	20	16	216	130	82	46	32	**F225**
	110	66	42	24	18	250	150	94	54	38	**F265**
	124	74	48	26	20	282	170	108	60	42	**F330**
	158	94	60	34	24	358	214	136	76	54	**F400**
	214	126	80	46	32	482	290	184	104	74	**F500**
	312	186	118	68	48	708	424	270	152	108	**F630, F800**

(1) Validation tests have not been carried out with TeSys D Green *contactors.*



Usual values

The tables show the following values:
- IB: value of current drawn by each lamp at its rated voltage
- C: unit capacitance for each lamp

corresponding to the values normally quoted by lamp manufacturers.

These values are given for an ambient temperature of 55 °C (for 40 °C, multiply the number by 1.2).

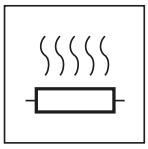
High pressure mercury vapour lamps

	Non corrected							With parallel correction							
P (W)	50	80	125	250	400	700	1000	50	80	125	250	400	700	1000	
IB (A)	0.54	0.81	1.20	2.30	4.10	6.80	9.90	0.3	0.45	0.67	1.3	2.3	3.8	5.5	
C (µF)	–	–	–	–	–	–	–	10	10	10	18	25	40	60	LC1 (1)
Max. no. of lamps according to P (W)	14	9	6	3	1	–	–	–	–	–	–	–	–	–	K09
	22	14	9	5	2	1	1	40	26	17	9	–	–	–	D09, D12
	27	18	12	6	3	2	1	50	33	22	11	6	–	–	D18
	35	23	15	8	4	2	1	63	42	28	14	8	5	3	D25
	48	32	21	11	6	3	2	86	57	38	20	11	6	4	D32, D38
	61	40	27	14	8	4	3	110	73	49	25	14	8	6	D40A
	77	51	34	17	10	6	4	140	93	62	32	18	11	7	D50A, D65A, D80A
	111	74	49	26	14	8	6	200	133	89	46	26	15	10	D80, D95
	222	148	100	52	28	16	12	400	266	178	92	52	30	20	D115, D150
	310	206	140	72	40	24	17	560	372	250	128	72	44	30	F185
	336	224	152	78	44	26	18	606	404	272	140	78	48	32	F225
	388	258	174	90	50	30	20	700	466	312	162	90	54	38	F265
	440	294	198	102	58	34	24	792	528	354	182	102	62	42	F330
	556	372	250	130	72	44	30	1002	668	448	232	130	78	54	F400
	752	500	338	176	98	60	40	1352	902	606	312	176	106	74	F500
	1102	734	496	258	144	88	60	1982	1322	888	458	258	156	108	F630, F800

Metal iodine vapour lamps

	Non corrected				With parallel correction				
P (W)	250	400	1000	2000	250	400	1000	2000	
IB (A)	2.5	3.6	9.5	20	1.4	2	5.3	11.2	
C (µF)	–	–	–	–	32	32	64	140	LC1 (1)
Max. no. of lamps according to P (W)	3	2	–	–	–	–	–	–	K09
	4	3	1	–	–	–	–	–	D09, D12
	6	4	1	–	–	–	–	–	D18
	7	5	2	–	13	9	–	–	D25
	10	7	2	1	18	13	4	–	D32, D38
	13	9	3	1	23	16	6	–	D40A
	16	11	4	2	30	21	7	–	D50A, D65A, D80A
	24	16	6	3	42	30	11	5	D80, D95
	48	32	12	6	84	60	22	10	D115, D150
	66	46	18	8	120	84	32	14	F185
	72	50	20	10	130	90	34	16	F225
	84	58	22	12	150	104	40	18	F265
	94	66	24	14	170	118	44	20	F330
	120	84	32	16	214	150	56	26	F400
	162	112	42	20	290	202	76	36	F500
	238	164	62	30	424	298	112	52	F630, F800

(1) Validation tests have not been carried out with TeSys D Green *contactors.*



Selection

General

A heating circuit is a power switching circuit supplying one or more resistive heating elements switched by a contactor. The same general rules apply as for motor circuits, except that heating circuits are not normally subjected to overload currents. It is therefore only necessary to provide short-circuit protection.

Characteristics of heating elements

The examples below are based on resistive heating elements used for industrial furnaces or for the heating of buildings (infra-red or resistive radiant type, convector heaters, closed loop heating circuits, etc.). The variation in resistance values between hot and cold states causes a current peak at switch-on which never exceeds 2 to 3 times the rated operational current (In). This initial peak does not recur during normal operation where subsequent switching is thermostatically controlled. The rated power and current of a heater are given for the normal operating temperature.

Protection

The steady state current drawn by a heating circuit is constant when the voltage is stable. In fact:

- it is unlikely that the number of loads in an existing circuit will be modified
- this type of circuit cannot create overloads. It is therefore only necessary to provide short-circuit protection.

This can be provided by:

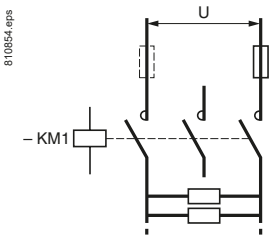
- gG type fuses, or
- modular circuit breakers.

Nevertheless, it is always possible and sometimes more economical (smaller cable size) to protect the circuit by a thermal overload relay and associated aM type fuses.

Switching, control, protection

A heating element or group of heating elements of a given power may be either single-phase or 3-phase and may be supplied from a 220/127 V or a 400/230 V distribution system. Excluding a single-phase 127 V system (which is no longer commonly used), the following 3 types of circuit arrangement are possible:

- single-phase, 2-pole switching
- single-phase, 4-pole switching
- 3-phase switching

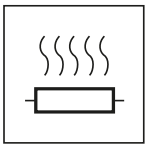


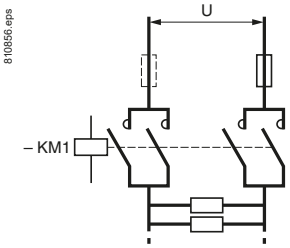
Circuit controlled by 2 poles of the contactor.

Component selection according to the power switched

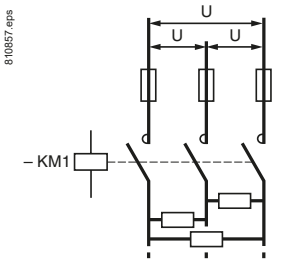
The combinations suggested below are based on an ambient temperature of 55 °C and for powers at the nominal voltage, but they also ensure switching in the event of prolonged overloads up to 1.05 Ue.

Single-phase, 2-pole switching				
Maximum power (kW)				Contactor rating
220/240 V	380/415 V	660/690 V	1000 V	
3.5	6.5	11	–	**LC1, LP1K09**
4.5	8	14	–	**LC1D12**
6	10.5	18.5	–	**LC1D18**
7	13	22.5	–	**LC1D25**
10	18	30.5	–	**LC1D32, LC1D38**
13	22.5	39.5	–	**LC1D40A**
16.5	28.5	43.5	–	**LC1D65A, LC1D80A**
24	42	73	82.5	**LC1, LP1D80**
44	76	118	157	**LC1D115, LC1D150**
48	83	130	–	**LC1F185**
52	90	145	–	**LC1F225**
60	104	160	210	**LC1F265**
75	130	200	250	**LC1F330**
86	145	230	300	**LC1F4002**
116	200	310	400	**LC1F5002**
170	290	450	695	**LC1F6302, LC1F800**
270	460	715	945	**LC1F780**
140	242	370	490	**LC1BL32**
220	380	580	770	**LC1BM32**
350	605	925	1225	**LC1BP32**
480	830	1270	1680	**LC1BR32**





Circuit controlled by a 4-pole contactor with the poles parallel connected in pairs using appropriate connecting links.
This solution enables the control of power values approximately equivalent to those controlled by the same contactor on 3-phase.



Circuit controlled by 3 poles of the contactor.

Component selection according to the power switched

Single-phase, 4-pole switching

Maximum power (kW)				Contactor rating
220/240 V	380/415 V	660/690 V	1000 V	
4.5	8	13.5	–	**LC1, LP1K09004**
7	13	22.5	–	**LC1DT25**
12	21	36.5	–	**LC1DT40**
26	45.5	79.5	–	**LC1DT80A**
38	66	117.5	132	**LC1, LP1D80004**
70	121	190	251	**LC1D115004**
76	132	202	–	**LC1F1854**
80	142	230	–	**LC1F2254**
96	166	253	335	**LC1F2654**
120	205	320	400	**LC1F3304**
137	236	363	480	**LC1F4004**
185	320	490	650	**LC1F5004**
272	470	718	950	**LC1F6304**
425	735	1140	1520	**LC1F7804**
224	387	590	785	**LC1BL34**
352	608	930	1230	**LC1BM34**
560	968	1478	1960	**LC1BP34**
768	1328	2025	2685	**LC1BR34**

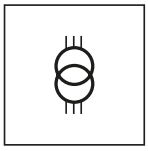
3-phase switching

Maximum power (kW)				Contactor rating
220/240 V	380/415 V	660/690 V	1000 V	
4.5	8	13.5	–	**LC1, LP1K09**
7	13	22.5	–	**LC1D12**
10	18	30.5	–	**LC1D18**
13	22.5	39.5	–	**LC1D25**
18	31	52.5	–	**LC1D32, LC1D38**
22.5	38	68	–	**LC1D40A**
28.5	49	86	–	**LC1D65A, LC1D80A**
40.5	70.5	126	135.5	**LC1, LP1D80**
83	140	235	345	**LC1D115, LC1D150**
100	170	280	–	**LC1F185**
110	185	300	–	**LC1F225**
125	220	370	540	**LC1F265**
160	260	400	640	**LC1F330**
180	310	530	760	**LC1F400**
255	445	740	950	**LC1F500**
370	630	1000	1500	**LC1F630, LC1F800**
570	1000	1650	2400	**LC1F780**
242	419	640	850	**LC1BL33**
380	658	1005	1350	**LC1BM33**
606	1047	1600	2150	**LC1BP33**
830	1437	2200	2950	**LC1BR33**

Application example

For a 220 V, 50 Hz, single-phase circuit supplying a total heating load of 12.5 kW. Select a 3-pole contactor **LC1D65A**.

(1) See complete contactor references on pages B8/8 to B8/13 or consult your Regional Sales Office.



Operating conditions

Maximum ambient temperature: 55 °C.

When a transformer is switched on, there is generally an initial current surge which reaches its peak value almost instantaneously and then decreases in a largely exponential manner to quickly reach its steady state value.

The value of this current depends on:
- the characteristics of the magnetic circuit and of the windings (cross sectional area of the core, rated inductance, number of turns, layout and size of the windings, ...)
- the performance of the magnetic laminations used
- the magnetic state of the circuit and the instantaneous value of the a.c. mains voltage at the moment of switch-on.

The inrush current at the moment of switch-on can reach 20 to 40 times the rated current for the various kVA power ratings in the tables below. This value is independent of the “no-load” or “on-load” state of the transformer.

Contactor selection

The peak magnetising current of the transformer must be lower than the values given in the tables below.
Maximum operating rate: 120 operating cycles/hour.

Contactor rating [1]			**LC1/ LP1 K06**	**LC1/ LP1 K09**	**LC1 D09**	**LC1 D12**	**LC1 D18**	**LC1 D25**	**LC1 D32**	**LC1 D38**	**LC1 D40A**	**LC1 D50A**	**LC1 D65A D80A**	**LC1 D80**	**LC1 D95**	**LC1 D115**	**LC1 D150**
Maximum permissible current peak at switch-on		**A**	160	225	350	350	420	630	770	770	1100	1250	1400	1550	1650	1800	2000
Maximum operational power [2]	220 V 240 V	**kVA**	2	2.5	4	4	5	7	8.5	8.5	14	16	18	19.5	19.5	25	25
	380 V 400 V	**kVA**	3.5	5	7	7	8	12.5	15	15	24	27	31	34	34	50	50
	415 V 440 V	**kVA**	4	5.5	8	8	9	14	17	17	28	32	36	39	39	55	55
	500 V	**kVA**	5	7	9	9	11	16.5	20	20	32	36	40	45	45	65	65
	660 V 690 V	**kVA**	6	8.5	12	12	14	21.5	26.5	26.5	42	48	53	59	59	80	80
	1000 V	**kVA**	–	–	–	–	–	–	–	–	–	–	–	85	95	100	100

Contactor rating [1]			**LC1 F185**	**LC1 F225**	**LC1 F265**	**LC1 F330**	**LP1 F400**	**LC1 F500**	**LC1 F630**	**LC1 F780**	**LC1 F800**	**LC1 BL**	**LC1 BM**	**LC1 BP**	**LC1 BR**
Maximum permissible current peak at switch-on		**A**	2900	3300	3800	5000	6300	7700	9000	12 000	11 000	18 000	18 000	24 000	30 000
Maximum operational power [2]	220 V 240 V	**kVA**	40	45	50	65	75	100	120	175	145	230	230	300	380
	380 V 400 V	**kVA**	75	80	90	120	130	170	200	280	245	400	400	530	660
	415 V 440 V	**kVA**	80	90	100	130	140	190	220	310	270	450	450	560	700
	500 V	**kVA**	95	100	110	140	170	225	260	350	315	480	480	600	750
	660 V 690 V	**kVA**	120	130	140	170	200	270	350	400	425	600	600	800	950
	1000 V	**kVA**	–	–	–	225	250	–	470	650	550	700	700	1000	1200

(1) TeSys D Green *contactors have not been validated for switching the primaries of 3-phase LV/LV transformers.*
(2) Maximum operational power corresponding to a current peak at switch-on of 30 In.



Standard contactors

Capacitors, together with the circuits to which they are connected, form oscillatory circuits which can, at the moment of switch-on, give rise to high transient currents (> 180 In) at high frequencies (1 to 15 kHz).
As a general rule, the peak current on energisation is lower when:

- the mains inductances are high
- the line transformer ratings are low
- the transformer short-circuit voltage is high
- the ratio between the sum of the ratings of the capacitors already switched into the circuit and that of the capacitor to be switched in is small (for multiple step capacitor banks).

In accordance with standards IEC 60070, NF C 54-100, VDE 0560, the switching contactor must be able to withstand a continuous current of 1.43 times the rated current of the capacitor bank step being switched.
The rated operational powers given in the tables below take this overload into account.
Short-circuit protection is normally provided by gI type HPC fuses rated at 1.7 to 2 In.

Contactor applications

Operating conditions

Capacitors are directly switched. **The values of peak current at switch-on must not exceed the values indicated opposite.**
An inductor may be inserted in each of the three phases supplying the capacitors to reduce the peak current, if necessary.
Inductance values are determined according to the selected operating temperature.

Power factor correction by a single-step capacitor bank

The use of a choke inductor is unnecessary: the inductance of the mains supply is adequate to limit the peak to a value compatible with the contactor characteristics.

Power factor correction by a multiple-step capacitor bank

Select a special contactor as defined on page B8/20.
If a standard contactor is used, it is essential to insert a choke inductor in each of the three phases of each step.

Maximum operational power of contactors

Standard contactors

Maximum operating rate: 120 operating cycles/hour.
Electrical durability at maxiumum load: 100 000 operating cycles.
With choke inductors connected, where necessary.

Operational power at 50/60 Hz						Max. peak current	Contactor rating (1)
θ ≤ 40 °C (2)			θ ≤ 55 °C (2)				
220/240 V	400/440 V	600/690 V	220/240 V	400/440 V	600/690 V		
kVAR	kVAR	kVAR	kVAR	kVAR	kVAR	A	
6	11	15	6	11	15	560	**LC1D09, D12**
9	15	20	9	15	20	850	**LC1D18**
11	20	25	11	20	25	1600	**LC1D25**
14	25	30	14	25	30	1900	**LC1D32, D38**
17	30	37	17	30	37	2160	**LC1D40**
22	40	50	22	40	50	2160	**LC1D50**
22	40	50	22	40	50	3040	**LC1D65**
35	60	75	35	60	75	3040	**LC1D80, D95**
50	90	125	38	75	80	3100	**LC1D115**
60	110	135	40	85	90	3300	**LC1D150**
70	125	160	50	100	100	3500	**LC1F185**
80	140	190	60	110	110	4000	**LC1F225**
90	160	225	75	125	125	5000	**LC1F265**
100	190	275	85	140	165	6500	**LC1F330**
125	220	300	100	160	200	8000	**LC1F400**
180	300	400	125	220	300	10 000	**LC1F500**
250	400	600	190	350	500	12 000	**LC1F630**
250	400	600	190	350	500	14 200	**LC1F800**
200	350	500	180	350	500	25 000	**LC1BL**
300	550	650	250	500	600	25 000	**LC1BM**
500	850	950	400	750	750	25 000	**LC1BP**
600	1100	1300	500	1000	1000	25 000	**LC1BR**

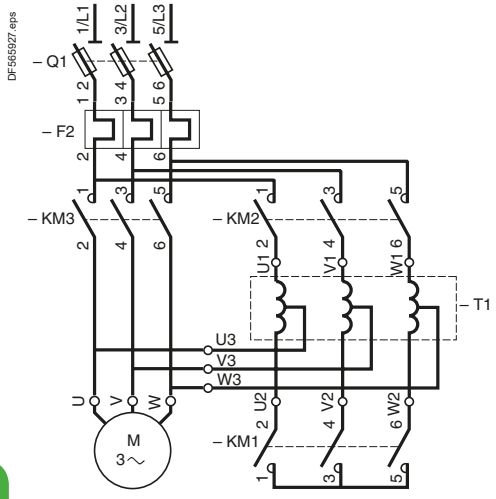
(1) TeSys D Green *contactors have not been validated for switching the primaries of 3-phase LV/LV transformers.*
(2) Upper limit of temperature category conforming to IEC 60070.

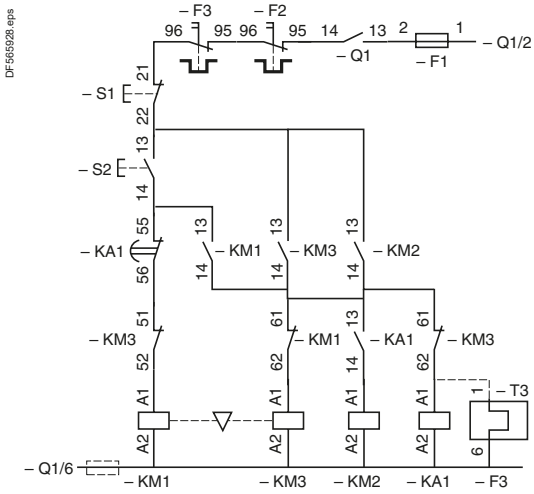
TeSys contactors (1)
For auto-transformer starting
Recommended wiring scheme, operation, curves
Coordination and standards

Applications

Auto-transformer starting is suitable for starting all types of squirrel cage motors: with 3, 6 or even 9 terminals according to North American technology.
Starting is performed at reduced voltage and produces maximum torque at minimum line current.
It allows the starting torque ($C = f(U)^2$) to be adapted to the resistive torque of the driven machine by means of the 2 or 3 intermediate voltage take-off connections on the auto-transformer (0.65 and 0.8 Un or 0.5, 0.65 and 0.8 Un). In general, only one take-off connection is used.
This type of starting is used for high power and/or high inertia machines.
The motor is never disconnected from its power supply during starting (closed transition) and transient phenomena are eliminated.

Recommended wiring scheme



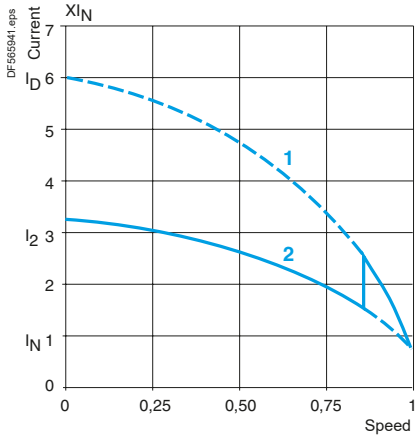


Operation

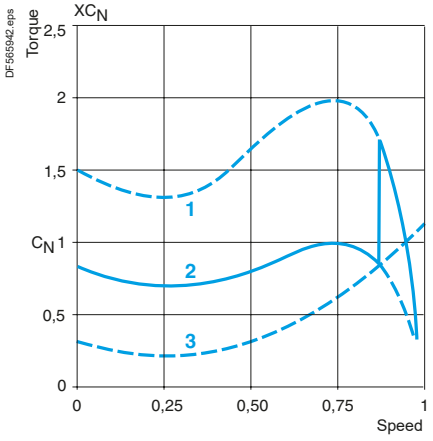
Starting is performed in 3 stages:
■ star connection of the auto-transformer is made by KM1, then contactor KM2 closes and the motor starts under reduced voltage
■ the neutral point is opened by KM1; part of the auto-transformer winding is switched into each phase for a short moment, constituting a stator starting inductance
■ KM3 switches the motor to full mains voltage and causes the auto-transformer to be shunted out of circuit by KM2.

The auto-transformer used generally has an air gap (adjusted or not) in order to obtain, during the second phase of starting, a series inductance whose value is compatible with correct starting.

Operating curves

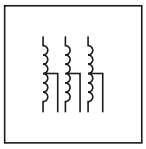


1 Direct switching current
2 Current with auto-transformer



1 Direct motor torque
2 Torque with auto-transformer
3 Resistive torque of the machine

(1) TeSys D Green *contactors have not been validated for auto-transformer starting.*



Auto-transformer starters from 59 to 900 kW up to 440 V (type 1 coordination)

The components recommended in the table below have been determined according to the following characteristics:
- auto-transformer: on 0.65 Un connection with non adjusted air gap
- 3 starts per hour, of which 2 consecutive
- motor starting current: Id/In = 6
- Iq = 70 kA
- transient current on closing of KM3 ⩽ 7 $\sqrt{2}$ In
- maximum starting time: 30 seconds
- ambient temperature θ ⩽ 40 °C.

Switch-disconnector-fuses: operators and accessories, please consult your Regional Sales Office.
Contactors: 3-pole.
LC1D: see pages B8/8 and B8/13,
LC1F: please consult your Regional Sales Office,
LC1B: please consult your Regional Sales Office.

Auxiliary contact blocks:
- for contactors LC1D: one LADN11 (1 N/O + 1 N/C) on KM1
- for contactors LC1F: one LADN22 (2 N/O + 2 N/C) on KM1, KM2 and KM3.

Thermal overload relays:
- LR: see pages B11/4 to B11/9
- LR9D: see pages B11/5 to B11/9
- LR9F: please consult your Regional Sales Office.

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3					Switch-disconnector-fuse Reference	aM fuses		Contactors [1]			Overload relays	
						Size	Rating	KM3 LC1	KM2 LC1	KM1 LC1	Reference [2]	Setting range
220/ 230 V	380/ 400 V	415 V	440 V	In max								
kW	kW	kW	kW	A			A					A
30	55	59	59	105	**GS●K**	22 x 58	125	**D115**	**D115**	**D3210**	**LR9D5369**	90…150
											LRD4367	95…120
40	75	80	80	138	**GS●L**	T0	160	**D150**	**D115**	**D5011**	**LR9D5369**	90…150
											LRD4369	110…140
51	90	90	100	170	**GS●N**	T1	200	**F185**	**D115**	**D5011**	**LR9F5371**	132…220
63	110	110	110	205	**GS●N**	T1	250	**F225**	**D150**	**D8011**	**LR9F5371**	132…220
75	132	132	150	245	**GS●N**	T1	250	**F265**	**F185**	**D115**	**LR9F7375**	200…330
90	160	160	185	300	**GS●QQ**	T2	315	**F330**	**F265**	**D115**	**LR9F7375**	200…330
110	200	200	220	370	**GS●QQ**	T2	400	**F400**	**F330**	**D115**	**LR9F7379**	300…500
140	250	257	280	460	**GS2S**	T3	500	**F500**	**F400**	**D115**	**LR9F7379**	300…500
180	315	355	375	584	**GS2S**	T3	630	**F630**	**F400**	**D185**	**LR9F7381**	380…630
200	355	375	400	635	**GS2V**	T4	800	**F800**	**F500**	**F185**	**TC800/1 + LRD05**	505…800
220	400	425	450	710	**GS2V**	T4	800	**F800**	**F500**	**F265**	**TC800/1 + LRD05**	505…800
250	450	475	500	800	**GS2V**	T4	800	**F800**	**F500**	**F265**	**TC1000/1 + LRD05**	630…1000
280	500	530	560	900	**GS2V**	T4	1000	**BM33●22**	**F630**	**F330**	**TC1000/1 LRD05**	630…1000
315	560	600	630	1000	**GS2V**	T4	1000	**BM33●22**	**F630**	**F400**	**TC1250/1 LRD05**	790…1250
335	630	670	710	1100	**GS2V**	T4	1250	**BP33●22**	**F630**	**F400**	**TC1250/1 LRD05**	790…1250
400	710	750	800	1260	**On base**	T4	2 x 800 [3]	**BP33●22**	**F780**	**F400**	**TC1500/1 LRD05**	945…1500
450	800	800	800	1450	**On base**	T4	2 x 800 [3]	**BP33●22**	**F780**	**F400**	**TC1750/1 LRD05**	100…1750
500	900	900	900	1600	**On base**	T4	2 x 800 [3]	**BR33●22**	**F780**	**F500**	**TC2000/1 LRD05**	260…2000

(1) TeSys D Green *contactors have not been validated for auto-transformer starting.*
(2) For power ratings greater than or equal to 400 kW at 415 V, use one LRD-05 on the current transformer.
(3) Check with the motor manufacturer whether the fuses should be fitted in parallel.

Applications

These contactors are used to eliminate starting resistance in the rotor circuit of slip-ring motors.

The most common application is for starters without inching and without rotor speed adjustment: pumps, fans, conveyors, compressors, ...

In the case of control by means of a manually operated master controller, the use of contactors with magnetic blow-out is recommended. Please consult your Regional Sales Office.

For hoisting applications, contactor selection must take into account the type of motor duty, the operating rate, the rotor voltage and current, the type of connection, the ambient temperature, etc.
Please consult your Regional Sales Office.

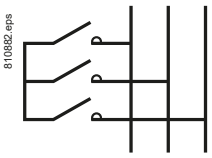
Operation

The rotor circuit contactors are interlocked with the stator contactor and therefore do not open until after the stator contactor has opened, when the rotor voltage has disappeared, or virtually disappeared.

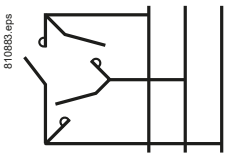
They make the current corresponding to the normal starting peak (1.5 to 2.5 times the rated rotor current) and open the circuit under no-load. Making and breaking are easy.

Different types of rotor connection

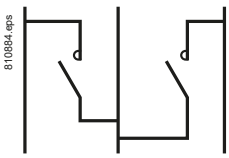
Star connection



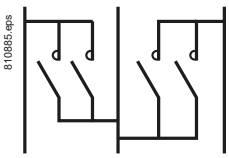
Delta connection



'V' connection



'W' connection



(1) TeSys D Green *contactors have not been validated for rotor circuits of slip-ring motors.*

Contactor selection according to the type of connection

Rotor current and voltage coefficients

Coefficients to be applied to the operational current values shown in the table below.

Type of connection	Rotor I coefficient	3-phase rotor Ue (2)			
		Maximum		With counter-current	
	Operational I	LC1 F	LC1B	LC1 F	LC1B
Star	1	2000 V	2000 V	1000 V	1000 V
Delta	1.4	1700 V	1700 V	850 V	850 V
In V	1	1700 V	1700 V	850 V	850 V
In W	1.6	1700 V	1700 V	850 V	850 V

Selection according to the operational current

The selection examples below take into account:

- a ratio of 2 between the maximum operational rotor voltage (Uer) and the rated stator operational voltage (Ues). This ratio is given in standard IEC 60947-4,
- a guarantee of occasional duty (making and breaking capacities) specified in the above standards.

Time current flowing	Contactor rating										
	LC1 D150	LC1 F185	LC1 F265	LC1 F400	LC1 F500	LC1 F630	LC1 F780	LC1 BL	LC1 BM	LC1 BP	LC1 BR
Intermediate contactor: with number of operating cycles ≤ 30/h											
10 s	450 A	550 A	800 A	1100 A	1500 A	2000 A	2500 A	2000 A	2400 A	3750 A	5000 A
30 s	280 A	400 A	550 A	730 A	1000 A	1500 A	2000 A	1200 A	1800 A	2600 A	3600 A
60 s	220 A	300 A	400 A	550 A	750 A	1200 A	1500 A	1000 A	1500 A	2200 A	3000 A
Intermediate contactor: with number of operating cycles ≤ 60/h											
5 s	450 A	550 A	800 A	1100 A	1500 A	2000 A	2500 A	2000 A	2400 A	3750 A	5000 A
10 s	330 A	450 A	620 A	860 A	1250 A	1800 A	2300 A	1600 A	2200 A	3400 A	4500 A
30 s	220 A	300 A	400 A	550 A	750 A	1200 A	1500 A	1000 A	1500 A	2200 A	3000 A
Intermediate contactor: with number of operating cycles ≤ 150/h for LC1F and 120/h for LC1B											
5 s	300 A	420 A	580 A	820 A	1150 A	1650 A	2200 A	1500 A	2100 A	3200 A	4200 A
10 s	250 A	350 A	430 A	600 A	850 A	1300 A	1600 A	1100 A	1600 A	2300 A	3200 A
Rotor short-circuit contactor and intermediate contactor: with number of operating cycles > 150/h for LC1F and 120/h for LC1B											
–	200 A	270 A	350 A	500 A	700 A	1000 A	1600 A	800 A	1250 A	2000 A	2750 A
Electrical durability											
For automatic starting, the electrical durability is in the region of 1 million operating cycles.											

(1) TeSys D Green *contactors have not been validated for rotor circuits of slip-ring motors.*
(2) For use up to 3000 V, please consult your Regional Sales Office.

Voltage drop caused by the inrush current

When the operating coil of a contactor is energised, the inrush current produces a voltage drop in the control circuit cable caused by the resistance of the conductors, which can adversely affect closing of the contactor.
An excessive voltage drop in the control supply cables (both a.c. and d.c.) can lead to non closure of the contactor poles or even destruction of the coil due to overheating.
This phenomenon is aggravated by:

- a long line
- a low control circuit voltage
- a cable with a small c.s.a.
- a high inrush power drawn by the coil.

The maximum length of cable, depending on the control voltage, the inrush power and the conductor c.s.a., is indicated in the graphs below.

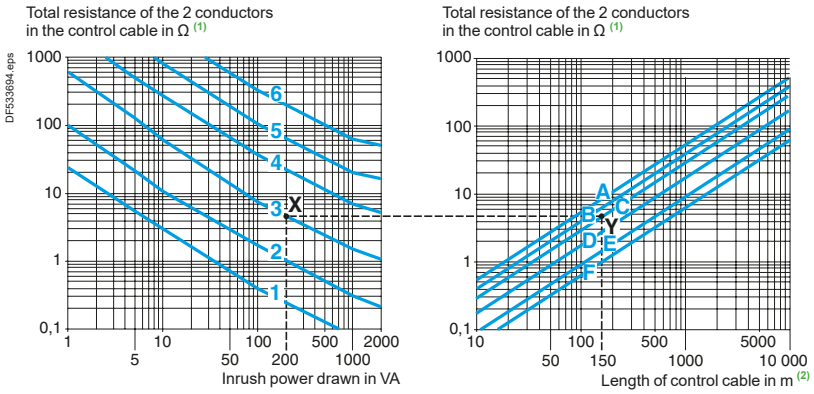
Remedial action

To reduce the voltage drop at switch-on:

- increase the conductor c.s.a.
- use a higher control circuit voltage
- use an intermediate control relay.

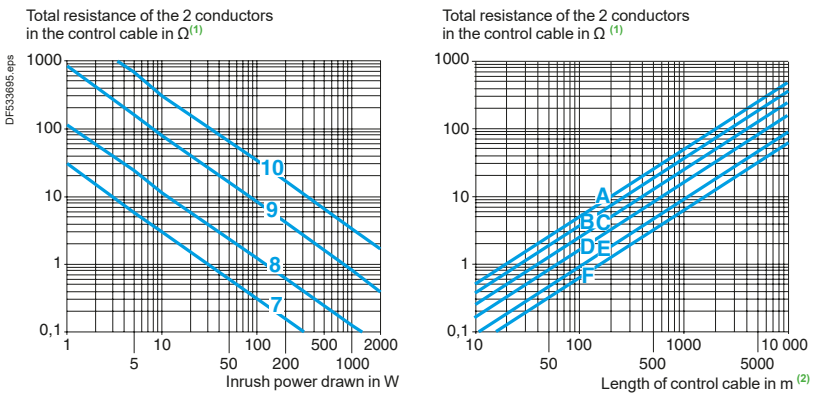
Selection of conductor c.s.a.

These graphs are for a maximum line voltage drop of 5 %. They give a direct indication of the copper conductor c.s.a. to be used for the control cable, depending on its length, the inrush power drawn by the contactor coil and the control circuit voltage (see example page A6/65).



1 ∼ 24 V	3 ∼ 115 V	5 ∼ 400 V

C.s.a. of copper cables		
A 0.75 mm²	C 1.5 mm²	E 4 mm²



2 ∼ 48 V	4 ∼ 230 V	6 ∼ 690 V

B 1 mm²	D 2.5 mm²	F 6 mm²

7 ⎓ 24 V	9 ⎓ 125 V
8 ⎓ 48 V	10 ⎓ 250 V

C.s.a. of copper cables		
A 0.75 mm²	C 1.5 mm²	E 4 mm²
B 1 mm²	D 2.5 mm²	F 6 mm²

(1) For 3-wire control, the current only flows in 2 of the conductors.
(2) This is the length of the cable comprising 2 or 3 conductors. (Distance between the contactor and the control device).

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Voltage drop caused by the inrush current

What cable c.s.a. is required for the control circuit of an LC1 D40A, 115 V contactor, operated from a distance of 150 metres?

■ Contactor LC1D40A, voltage 115 V, 50 Hz: inrush power: 200 VA.

On the left-hand graph on the page opposite, point X is at the intersection of the vertical line corresponding to 200 VA and the ∿ 115 V voltage curve.

On the right-hand graph on the page opposite, point Y is at the intersection of the vertical line corresponding to 150 m and the horizontal line passing through point X.

Use the conductor c.s.a. indicated by the curve which passes through point Y, i.e.: 1.5 mm^2.

If point Y lies between two c.s.a. curves, choose the larger of the c.s.a. values.

Calculating the maximum cable length

The maximum permissible length for acceptable line voltage drop is calculated by the formula:

$$L = \frac{U^2}{SA} .s.K$$

where:

L : distance between the contactor and the control device in m (length of the cable)
U : supply voltage in V
SA : apparent inrush power drawn by the coil in VA
s : conductor c.s.a. in mm^2
K : factor given in the table below.

a.c. supply	**SA in VA**	**20**	**40**	**100**	**150**	**200**
	K	1.38	1.5	1.8	2	2.15

d.c. supply	Irrespective of the apparent inrush power SA, expressed in W
	K = 1.38

Residual current in the coil due to cable capacitance

When the control contact of a contactor is opened, the control cable capacitance is effectively in series with the coil of the electromagnet. This capacitance can cause a residual current to be maintained in the coil, with the risk that the contactor will remain closed.

This only applies to contactors operating on an a.c. supply.

This phenomenon is aggravated by:
- a long line length between the coil control contact and the contactor, or between the coil control contact and the power supply,
- a high control circuit voltage,
- a low coil consumption, sealed,
- a low value of contactor drop-out voltage.

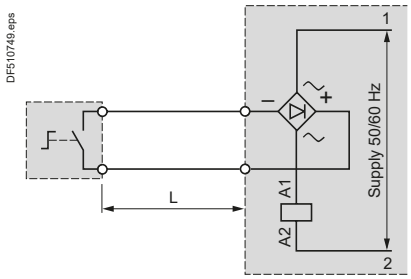
The maximum control cable length, according to the contactor coil supply voltage, is indicated in the graph on the page opposite.

Remedial action

Various solutions can be adopted to avoid the risk of the contactor remaining closed due to cable capacitance:
- use a d.c. control voltage, or
- add a rectifier, connected as shown in the scheme below, but retaining an a.c. operating coil: in this way, rectified a.c. current flows in the control cable.

When calculating the maximum cable length, take the resistance of the conductors into account.

.



- Connect a resistor in parallel with the contactor coil (1).

Value of the resistance:

$$R\ \Omega = \frac{1}{10^{-3}\ C\ (\mu F)}\ \text{(C capacitance of the control cable)}$$

Power to be dissipated:

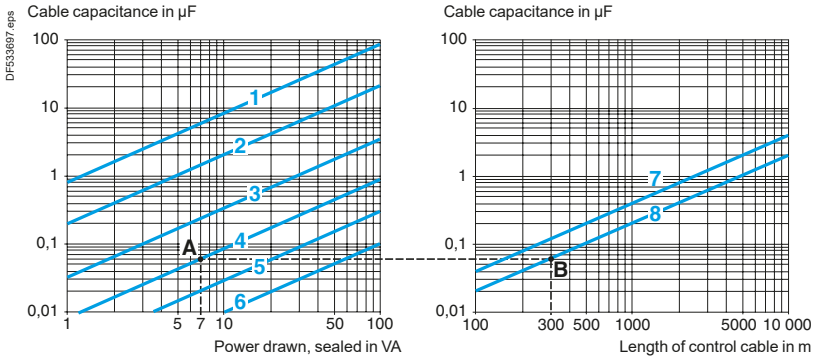
$$PW = \frac{U^2}{R}$$

(1) To avoid increasing the voltage drop due to inrush current, this resistor must be brought into operation after the contactor has closed by using an N/O contact.

Life Is On Schneider Electric

Residual current in the coil due to cable capacitance

These graphs are for a capacitance, between 2 conductors, of 0.2 µF/km. They make it possible to determine whether there is a risk of the contactor remaining closed due to the power drawn by the coil when sealed, as well as the control circuit voltage, according to the length of the control cable.



1	∼ 24 V	3	∼ 115 V	5	∼ 400 V	7	3-wire control
2	∼ 48 V	4	∼ 230 V	6	∼ 690 V	8	2-wire control

In the zones below the straight lines for 3-wire and 2-wire control respectively, there is a risk of the contactor remaining closed.

Examples

What is the maximum length for the control cable of an LC1D12 contactor, operating on 230 V, with 2-wire control?

■ Contactor LC1D12, voltage 230 V, 50 Hz: power sealed 7 VA.

On the left-hand graph, point A is at the intersection of the vertical line for 7 VA with the ∼ 230 V voltage curve.

On the right-hand graph, point B is at the intersection of the horizontal line with the 2-wire control curve.

The maximum cable length is therefore 300 m.

In the same example, with a 600 m cable, the point lies in the risk zone. A resistor must therefore be connected in parallel with the contactor coil.

$$R = \frac{1}{10^{-3} \cdot C} = \frac{1}{10^{-3} \cdot 0.12} = 8.3\ \Omega$$

Value of this resistance:

$$P = \frac{U^2}{R} = \frac{(220)^2}{8300} = 6\ W$$

Power to be dissipated:

Alternative solution: use a d.c. control supply.

Calculating the cable length

The maximum permitted length of control cable to avoid the effects of capacitance is calculated using the formula:

$$L = 455 \cdot \frac{S}{U^2.Co}$$

L : distance between the contactor and the control device in km (length of the cable),
S : apparent power, sealed, in VA,
U : control voltage in V,
Co : line capacitance of the cable in µF/km.

3-phase 4-pole motors

Current values for power in kW

Rated operational power (1)	Indicative rated operational current values at:			
	230 V	400 V	500 V	690 V
kW	A			
0.06	0.35	0.2	0.16	0.12
0.09	0.52	0.3	0.24	0.17
0.12	0.7	0.44	0.32	0.23
0.18	1	0.6	0.48	0.35
0.25	1.5	0.85	0.68	0.49
0.37	1.9	1.1	0.88	0.64
0.55	2.6	1.5	1.2	0.87
0.75	3.3	1.9	1.5	1.1
1.1	4.7	2.7	2.2	1.6
1.5	6.3	3.6	2.9	2.1
2.2	8.5	4.9	3.9	2.8
3	11.3	6.5	5.2	3.8
4	15	8.5	6.8	4.9
5.5	20	11.5	9.2	6.7
7.5	27	15.5	12.4	8.9
11	38	22	17.6	12.8
15	51	29	23	17
18.5	61	35	28	21
22	72	41	33	24
30	96	55	44	32
37	115	66	53	39
45	140	80	64	47
55	169	97	78	57
75	230	132	106	77
90	278	160	128	93
110	340	195	156	113
132	400	230	184	134
160	487	280	224	162
200	609	350	280	203
250	748	430	344	250
315	940	540	432	313
355	1061	610	488	354
400	1200	690	552	400
500	1478	850	680	493
560	1652	950	760	551
630	1844	1060	848	615
710	2070	1190	952	690
800	2340	1346	1076	780
900	2640	1518	1214	880
1000	2910	1673	1339	970

Current values for power in hp

Rated operational power (2)	Indicative rated operational current values at:						
	110 - 120 V	200 V	208 V	220 - 240 V	380 - 415 V	440 - 480 V	550 - 600 V
hp	A						
1/2	4.4	2.5	2.4	2.2	1.3	1.1	0.9
3/4	6.4	3.7	3.5	3.2	1.8	1.6	1.3
1	8.4	4.8	4.6	4.2	2.3	2.1	1.7
1 1/2	12	6.9	6.6	6	3.3	3	2.4
2	13.6	7.8	7.5	6.8	4.3	3.4	2.7
3	19.2	11	10.6	9.6	6.1	4.8	3.9
5	30.4	17.5	16.7	15.2	9.7	7.6	6.1
7 1/2	44	25.3	24.2	22	14	11	9
10	56	32.2	30.8	28	18	14	11
15	84	48.3	46.2	42	27	21	17
20	108	62.1	59.4	54	34	27	22
25	136	78.2	74.8	68	44	34	27
30	160	92	88	80	51	40	32
40	208	120	114	104	66	52	41
50	260	150	143	130	83	65	52
60	-	177	169	154	103	77	62
75	-	221	211	192	128	96	77
100	-	285	273	248	165	124	99
125	-	359	343	312	208	156	125
150	-	414	396	360	240	180	144
200	-	552	528	480	320	240	192
250	-	-	-	604	403	302	242
300	-	-	-	722	482	361	289
350	-	-	-	828	560	414	336
400	-	-	-	954	636	477	382
450	-	-	-	1030	–	515	412
500	-	-	-	1180	786	590	472

(1) Values conforming to standard IEC 60072-1 (at 50 Hz).
(2) Values conforming to standard UL 508 (at 60 Hz).

***Note:** These values are given as a guide. They may vary depending on the type of motor, its polarity and the manufacturer.*

Standardisation

Conformity to standards

Schneider Electric products satisfy, in the majority of cases, national (for example: BS in Great Britain, NF in France, DIN in Germany), European (for example: CENELEC) or international (IEC) standards. These product standards precisely define the performance of the designated products (such as IEC 60947 series for low voltage equipment).
When used correctly, as designated by the manufacturer and in accordance with regulations and correct practices, these products will allow users to build equipment, machine systems or installations that conform to their appropriate standards (for example: IEC 60204-1, relating to electrical equipment used on industrial machines).
Schneider Electric is able to provide proof of conformity of its production to the standards it has chosen to comply with, through its quality assurance system.
On request, and depending on the situation, Schneider Electric can provide the following:

- a declaration of conformity,
- a certificate of conformity (CB certificate, Asefa/Lovag),
- a homologation certificate or approval, in the countries where this procedure is required or for particular specifications, such as those existing in the merchant navy.

Standard	Certification authority		Country
	Name	Regulation authority	
ANSI	American National Standards Institute	ANSI	USA
BS	British Standards Institution	BSI	Great Britain
CEI	Comitato Elettrotecnico Italiano	CEI	Italy
DIN/VDE	Verband Deutscher Electrotechniker	VDE	Germany
EN	Comité Européen de Normalisation Electrotechnique	CENELEC	Europe
TR Regulation	Eurasian Customs Union	EAC	Russia, Belarus, Kazakhstan
IEC	International Electrotechnical Commission	IEC	Worldwide
JIS	Japanese Industrial Standards Committee	JISC	Japan
NBN	Institut Belge de Normalisation	IBN	Belgium
NEN	Nederlands Normalisatie Institut	NNI	Netherlands
NF	Union Technique de l'Electricité	UTE	France
SAA	Standards Association of Australia	SAA	Australia
UNE	Asociacion Española de Normalizacion y Certificacion	AENOR	Spain

European EN standards

These are technical specifications established in conjunction with, and with approval of, the relative bodies within the various CENELEC member countries (European Union, European Free Trade Association and many central and eastern European countries having «member» or «affiliated» status). Prepared in accordance with the principle of consensus, the European standards are the result of a weighted majority vote. Such adopted standards are then integrated into the national collection of standards, and contradictory national standards are withdrawn.
European standards incorporated within the French collection of standards carry the prefix NF EN. At the 'Union Technique de l'Electricité' *(Technical Union of Electricity)* (UTE), the French version of a corresponding European standard carries a dual number: European reference (NF EN …) and classification index (C …).
Therefore, the standard NF EN 60947-4-1 relating to motor contactors and starters, effectively constitutes the French version of the European standard EN 60947-4-1 and carries the UTE classification C 63-110.
This standard is identical to the British standard BS EN 60947-4-1 or the German standard DIN EN 60947-4-1.
Whenever reasonably practical, European standards reflect the international standards (IEC).
With regard to automation system components and distribution equipment, in addition to complying with the requirements of French NF standards, Schneider Electric brand components conform to the standards of all other major industrial countries.

Regulations

European Directives

Opening up of European markets assumes harmonisation of the regulations pertaining to each of the member countries of the European Union.
The purpose of the European Directive is to eliminate obstacles hindering the free circulation of goods within the European Union, and it must be applied in all member countries. Member countries are obliged to transcribe each Directive into their national legislation and to simultaneously withdraw any contradictory regulations. The Directives, in particular those of a technical nature which concern us, only establish the objectives to be achieved, referred to as "essential requirements".
The manufacturer must take all the necessary measures to ensure that his products conform to the requirements of each Directive applicable to his production.
As a general rule, the manufacturer certifies conformity to the essential requirements of the Directive(s) for his product by affixing the CE marking.
The CE marking is affixed to Schneider Electric brand products concerned, in order to confirm compliance with French and European regulations.

Significance of the CE marking

- The CE marking affixed to a product signifies that the manufacturer declares that the product conforms to the relevant European Directive(s) which concern it; this condition must be met to allow free distribution and circulation within the countries of the European Union of any product subject to one or more of the E.U. Directives.
- The CE marking is intended solely for national market control authorities.
- The CE marking must not be confused with a conformity mark.

European Directives

For electrical equipment, only conformity to standards signifies that the product is suitable for its designated function, and only the guarantee of an established manufacturer can provide a high level of quality assurance.
For Schneider Electric brand products, one or several Directives are likely to be applicable, depending on the product, and in particular:

- the Low Voltage Directive 2014/35/EU: the CE marking relating to this Directive has been compulsory since April 2016.
- the Electromagnetic Compatibility Directive 2014/30/EU: the CE marking on products covered by this Directive has been compulsory since April 2016.

CB certificate, Asefa/Lovag certificate

- CB certification is issued according to IEC standards in respect to a multilateral agreement between almost industrial countries called CB scheme. It allows international certification of electrical and electronic products so that a single certification facilitates a worldwide market access.
- The function of ASEFA (Association des Stations d'Essais Française d'Appareils électriques - *Association of French Testing Stations for Low Voltage Industrial Electrical Equipment)* is to carry out tests of conformity to standards and to issue certificates of conformity and test reports. ASEFA laboratories are authorised by the French authorisation committee (COFRAC). ASEFA is now a member of the European agreement group LOVAG (Low Voltage Agreement Group). This means that any certificates issued by LOVAG/ASEFA are recognised by all the authorities which are members of the group and carry the same validity as those issued by any of the member authorities.

Quality labels

When components can be used in domestic and similar applications, it is sometimes recommended that a "Quality label" be obtained, which is a form of certification of conformity.

Code	Quality label	Country
CEBEC	Comité Electrotechnique Belge	Belgium
KEMA-KEUR	Keuring van Electrotechnische Materialen	Netherlands
NF	Union Technique de l'Electricité	France
ÖVE	Österreichischer Verband für Electrotechnik	Austria
SEMKO	Svenska Electriska Materiel Kontrollanatalten	Sweden

Product certifications

In some countries, the certification of certain electrical components is a legal requirement. In this case, a certificate of conformity to the standard is issued by the official test authority.
Each certified device must bear the relevant certification symbols when these are mandatory:

Code	Certification authority	Country
CSA	Canadian Standards Association	Canada
UL	Underwriters Laboratories	USA
CCC	China Compulsory Certification	China

Note on certifications issued by the Underwriters Laboratories (UL). There are two levels of approval:

"Recognized" (VL) The component is fully approved for inclusion in equipment built in a workshop, where the operating limits are known by the equipment manufacturer and where its use within such limits is acceptable by the Underwriters Laboratories.
The component is not approved as a "Product for general use" because its manufacturing characteristics are incomplete or its application possibilities are limited.
A "Recognized" component does not necessarily carry the certification symbol.

"Listed" (UL) The component conforms to all the requirements of the classification applicable to it and may therefore be used both as a "Product for general use" and as a component in assembled equipment. A "Listed" component must carry the certification.

Marine classification societies

Prior recognition by certain marine classification societies is generally required for electrical equipment which is intended for use on board merchant vessels.
Europe community has emitted regulation No. 391/2009 for common rules for Type approval of Marine equipment.
MR TA Mutual Recognition Type Approval is a certificate that is mutually recognized by all 12 classification societies from the **EU RO MR group** (European Recognized Organizations).
Renewal of marine certifications, or new products certification is now covered by EU-MR (Mutual Recognition) process and therefore removes the need for multiple marine certifications.
Current EU RO members include all major societies like DNV-GL, BV, ABS, LR as well as non-European societies like CCS, KR, NK, RMRS, etc.

Rules	Classification authority	Country
ABS	American Bureau of Shipping	Unites States of America
KRoS	Korean register of Shipping	South Korea
BV	Bureau Veritas	France
DNV-GL	Det Norske Veritas - Germanischer Lloyd	Norway - Germany
LRoS	Lloyd's Register of Shipping	Great Britain
NKK	Nippon Kaiji Kyokaï	Japan
RINA	Registro Italiano Navale	Italy
RMRoS	Russian Maritime Register of Shipping	Russia
CCS	China Classification Society	Republic of China

Note: *for further details on a specific product, please refer to the "Characteristics" pages in this catalogue or consult your Regional Sales Office.*

Degrees of protection against the penetration of solid bodies, water and personnel access to live parts

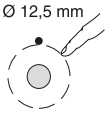
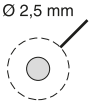
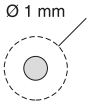
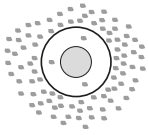
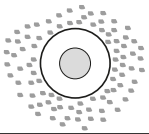
The European standard EN 60529 dated October 1991, IEC publication 529 (2nd edition - November 1989), defines a coding system (IP code) for indicating the degree of protection provided by electrical equipment enclosures against accidental direct contact with live parts and against the ingress of solid foreign objects or water. This standard does not apply to protection against the risk of explosion or conditions such as humidity, corrosive gasses, fungi or vermin.
Certain equipment is designed to be mounted on an enclosure which will contribute towards achieving the required degree of protection (example : control devices mounted on an enclosure).
Different parts of an equipment can have different degrees of protection (example : enclosure with an opening in the base).
Standard NF C 15-100 (May 1991 edition), section 512, table 51 A, provides a cross-reference between the various degrees of protection and the environmental conditions classification, relating to the selection of equipment according to external factors.
Practical guide UTE C 15-103 shows, in the form of tables, the characteristics required for electrical equipment (including minimum degrees of protection), according to the locations in which they are installed.

IP ●●● code

The IP code comprises **2 characteristic numerals** (e.g. **IP 55**) and may include **an additional letter** when the actual protection of personnel against direct contact with live parts is better than that indicated by the first numeral (e.g. IP 20C).
Any characteristic numeral which is unspecified is replaced by an X (e.g. IP XXB).

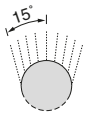
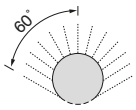
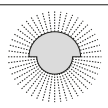
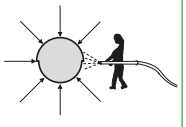
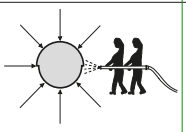
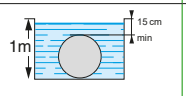
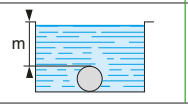
1st characteristic numeral

corresponds to protection of the equipment against penetration of solid objects and protection of personnel against direct contact with live parts.

	Protection of the equipment		Protection of personnel
0	Non-protected		Non-protected
1	Ø 50 mm 	Protected against the penetration of solid objects having a diameter greater than or equal to 50 mm	Protected against direct contact with the back of the hand (accidental contacts).
2	Ø 12,5 mm 	Protected against the penetration of solid objects having a diameter greater than or equal to 12.5 mm.	Protected against direct finger contact.
3	Ø 2,5 mm 	Protected against the penetration of solid objects having a diameter greater than or equal to 2.5 mm.	Protected against direct contact with a Ø2.5 mm tool.
4	Ø 1 mm 	Protected against the penetration of solid objects having a diameter greater than or equal to 1 mm.	Protected against direct contact with a Ø1 mm wire.
5		Dust protected (no harmful deposits).	Protected against direct contact with a Ø1 mm wire.
6		Dust tight.	Protected against direct contact with a Ø1 mm wire.

2nd characteristic numeral

corresponds to protection of the equipment against penetration of water with harmful effects.

0	Non-protected	
1		Protected against vertical dripping water, (condensation).
2		Protected against dripping water at an angle of up to 15°.
3		Protected against rain at an angle of up to 60°.
4		Protected against splashing water in all directions.
5		Protected against water jets in all directions.
6		Protected against powerful jets of water and waves.
7		Protected against the effects of temporary immersion.
8		Protected against the effects of prolonged immersion under specified conditions.

Additional letter

corresponds to protection of personnel against direct contact with live parts.

A	With the back of the hand.
B	With the finger.
C	With a Ø2.5 mm tool.
D	With a Ø1 mm wire.

Degrees of protection against mechanical impact

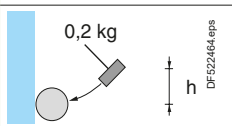
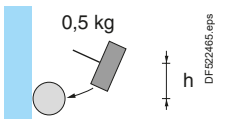
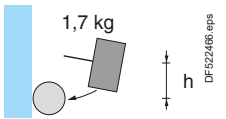
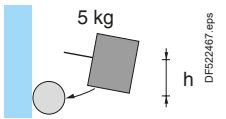
The European standard EN 50102 dated March 1995 defines a coding system (IK code) for indicating the degree of protection provided by electrical equipment enclosures against external mechanical impact.
Standard NF C 15-100 (May 1991 edition), section 512, table 51 A, provides a cross-reference between the various degrees of protection and the environmental conditions classification, relating to the selection of equipment according to external factors.
Practical guide UTE C 15-103 shows, in the form of tables, the characteristics required for electrical equipment (including minimum degrees of protection), according to the locations in which they are installed.

IK ●● code

The IK code comprises **2 characteristic numerals** (e.g. **IK 05**).

2 characteristic numerals

corresponding to a value of impact energy.

		h (cm)	Energy (J)
00	Non-protected		
01		7.5	0.15
02		10	0.2
03		17.5	0.35
04		25	0.5
05		35	0.7
06		20	1
07		40	2
08		30	5
09		20	10
10		40	20

Part B

COMPONENTS
FOR CUSTOMER MADE SOLUTIONS

Linergy BZ, HK
Busbar systems
Up to 630 A

B1/1
Power busbar systems

TeSys GV, LAD, U
Motor starter wiring systems

B2/1
Wiring systems

TeSys Vario
Switch-disconnectors
Up to 175 A

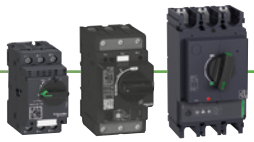
B3/1
Switch-disconnectors

TeSys DF, LS, GK
Fuse carriers
Up to 125 A

B4/1
Fuse carriers

TeSys GS
Switch-disconnector fuses
Up to 1250 A

B5/1
Switch-disconnectors fuses

TeSys GB, GV
Circuit breakers
Up to 250 kW

B6/1
Circuit breakers

TeSys SK, K, D
Control relays

B7/1
Control relays

TeSys D, SK, K, SKGC, GC, GY, GF
Contactors
Up to 200 A

B8/1
Contactors

TeSys F
High power contactors
Up to 2100 A

B9/1
High power contactors

TeSys B
Bar mounted contactors
Up to 16300 A

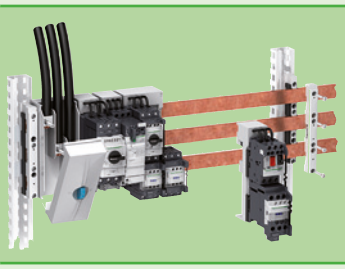
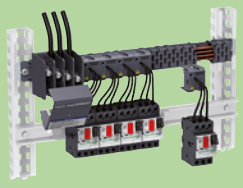
B10/1
Bar mounted contactors

TeSys LR, RM1X, LRD
Overload relays
Up to 630 A

B11/1
Overload relays

Linergy BZ, HK Busbar systems

Busbar systems for electrical distribution and motors starters

Type of product	Range		Pages
Introduction Linergy BZ			B1/2
Multistandard power busbar Linergy BZ	From 160 to 630 A		B1/4
Introduction Linergy HK			B1/10
Multistandard hot-plug distribution system Linergy HK	Up to 160 A		B1/12

Technical Data for Designers B1/17

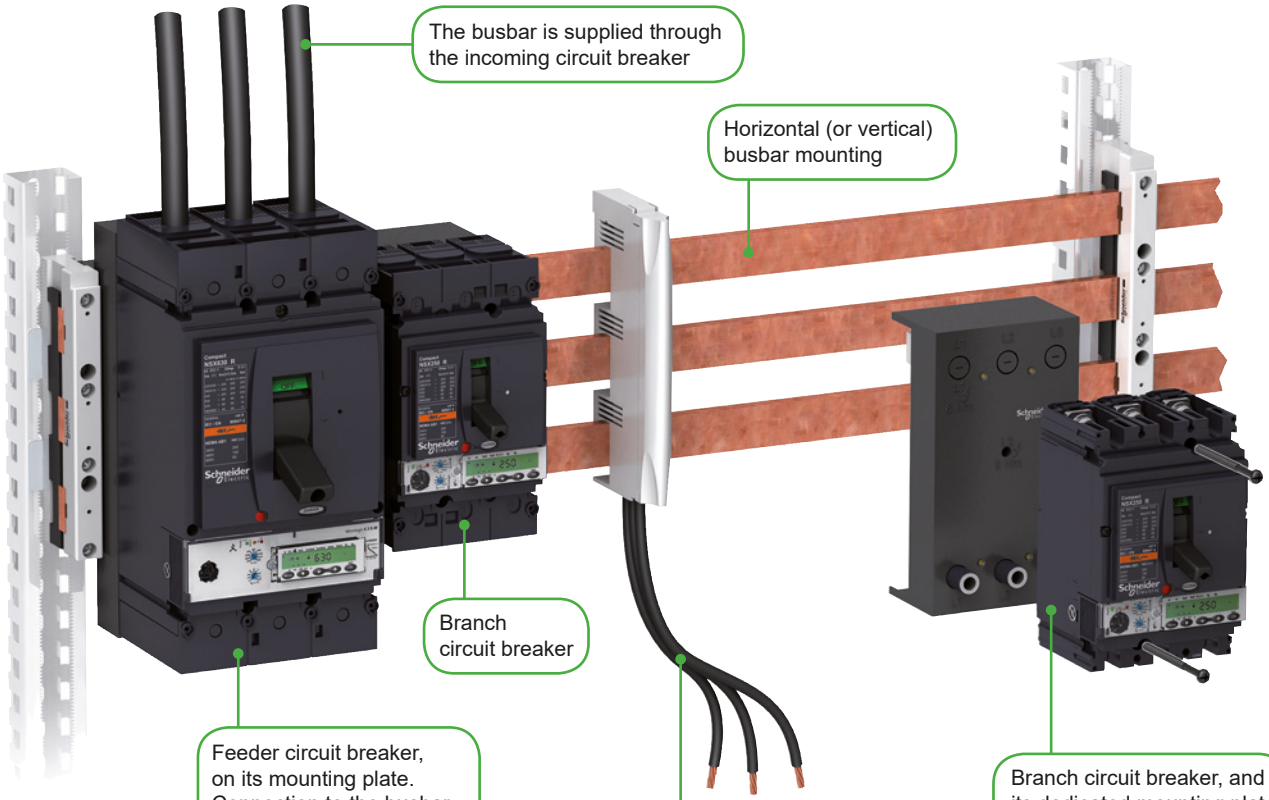


All Schneider Electric **distribution and connection systems** are brought together into a single brand name: **Linergy**

Distribution blocks
Device feeders
Power busbars
Hot plug busbar system
Terminal blocks and bars.

Catalogue reference: **LVYED213001EN**

In enclosures, when space saving and fast connection are a strong requirement



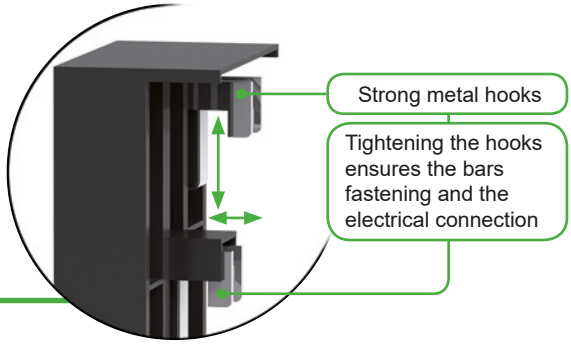
Ideal for industrial process application

Advantages

- Considerable space saving: components are directly mounted on the busbar
- Quick connection, deconnection: a metal hook combines mechanical fastening and electrical connection
- Multi standard: conform to IEC and UL standards

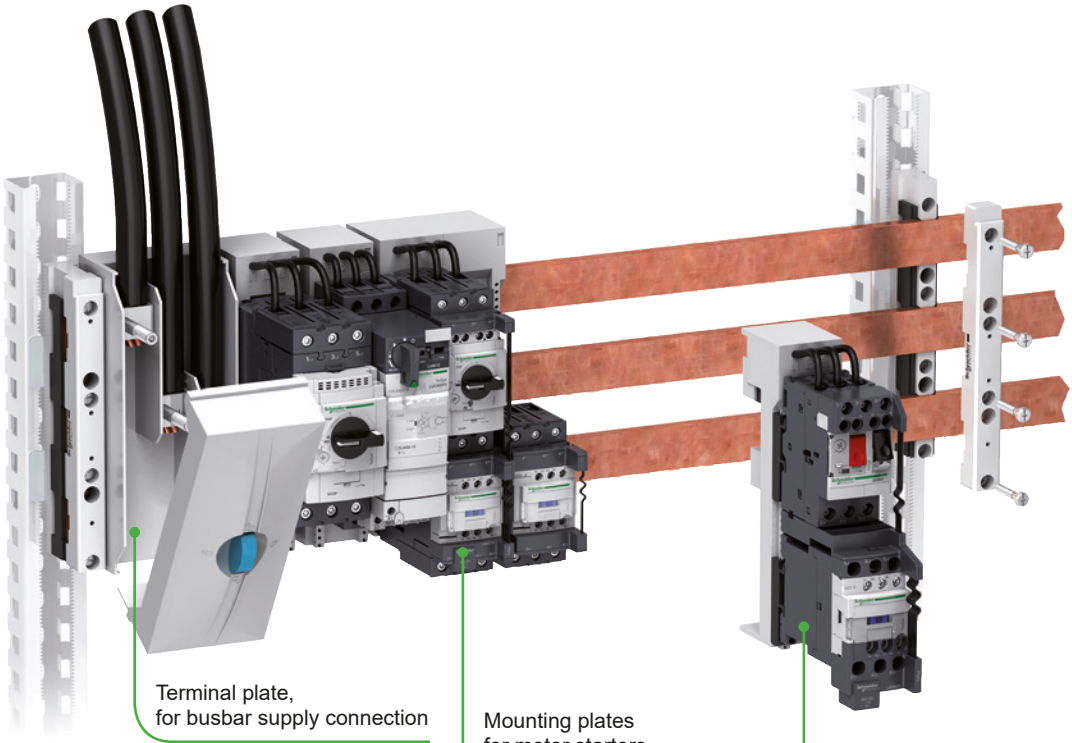
Detailed view: back face of a mounting plate

- Mounting plates, for Compact NSX, Powerpact and GV5 circuit breakers
- Compatible with bars:
  - Height 12, 15, 20, 25 or 30 mm,
  - Width 5 or 10 mm



Introduction

In control switchboards, when space saving, quick mounting and replacement are required

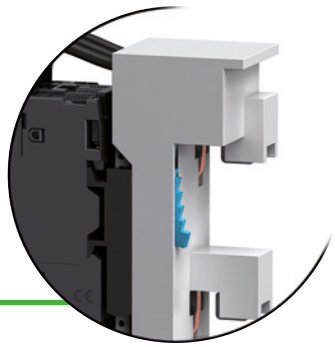


Advantages

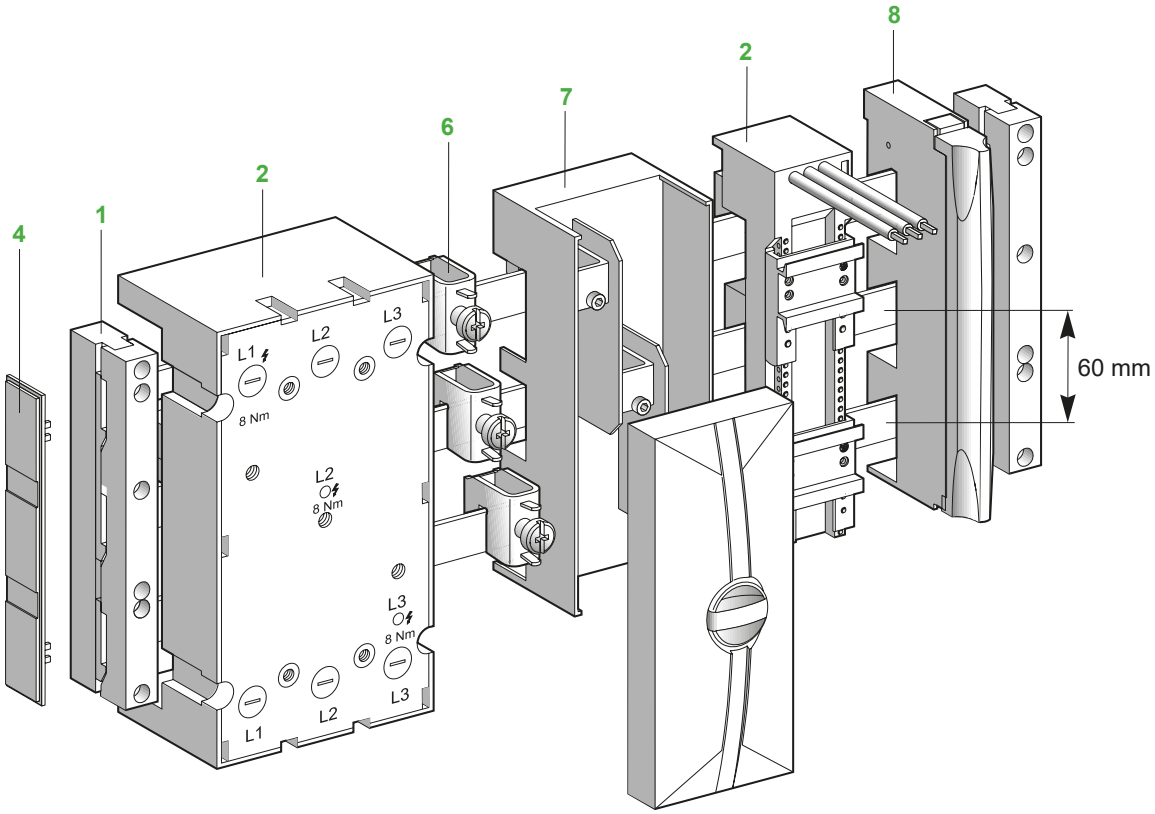
- Considerable space saving: components are directly mounted on the busbar
- Large choice of mounting plates (for GV2, GV3 motor circuit breakers and assemblies, GV5, TeSys U)
- Quick connection, deconnection (power off): clip-on mounting plates
- Vibration resistant busbar connections: no periodical re-tightening required
- Multi standard: conform to IEC and UL standards

Detailed view: back face of a motor starter mounting plate

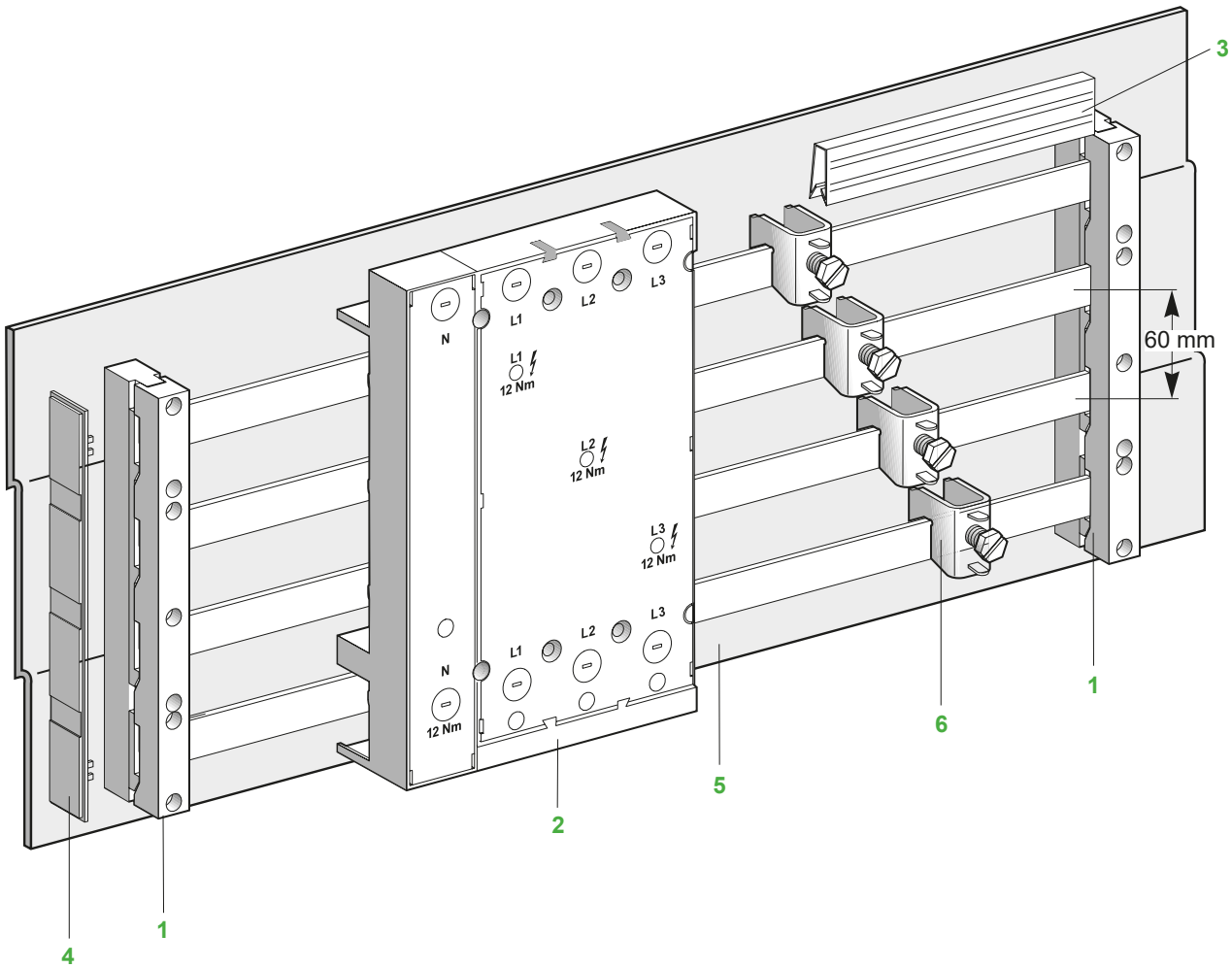
- A reliable electrical contact is ensured by copper blades
- The blue part locks the mounting plate on the busbar, compatibility is provided with the standard profiles:
  - Height 12, 15, 20, 25 or 30 mm,
  - Width 5 or 10 mm



DB400244.eps

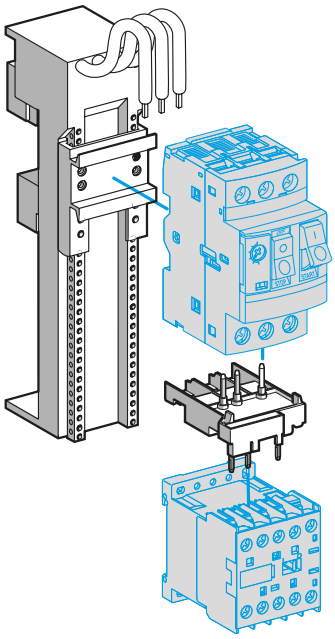


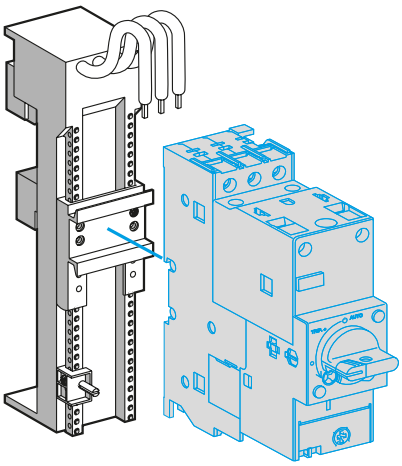
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Life Is On Schneider Electric

Introduction





Installation examples.

Description

The TeSys mounting plate system for busbars simplifies the installation of motor feeder components used in your electrical installations.
Power distribution is performed by a busbar.

The mounting plates are fitted directly on this busbar, by snap-on mounting, thus implementing mechanical and electrical connection.

This system offers numerous benefits:
- space saving in cabinets
- fast, safe and reliable electrical and mechanical connection
- easy connection
- protection for users against electric shocks by direct contacts (IP20) by using busbars end covers
- equipment flexibility and modularity
- increased equipment availability: easier maintenance
- power supply without drilling (connectors) from 1.5 to 120 mm^2.

Busbars system
The busbar interaxis is 60 mm. Depending on the cross section of the bars, the busbar can withstand a maximum current of 630 A.

Note: *The bars forming the busbar are not part of the* TeSys LA9Z *offer. They are not supplied by us. Their selection depends on the maximum current needed for your installation (see next page).*

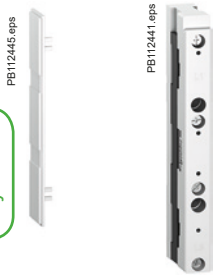
Support for 3P and 4P busbar (1)
These are available in 2 versions: three-pole and four-pole.
For applications having to comply with the UL standard, use the LA9ZX01508 support (3P only).

The mounting plates (2)
These allow mounting of the power feeder components consisting of:
- a GV2 motor circuit breaker, mounted alone or in conjunction with a TeSys K or TeSys D contactor
- a GV3 motor circuit breaker, mounted alone or in conjunction with a TeSys D contactor
- a TeSys U starter-controller
- a TeSys GV5 motor circuit breaker
- an LD63 integral contactor-circuit breaker
- a NSX100-250 or NSX400-630 A circuit breaker
- H/J/L PowerPact circuit breaker frame.

Accessories
Accessories complete the offer:
- covers (3) for 5 and 10 mm bars
- end covers (4)
- a base plate (5)
- 1P connectors (6)
- 3P connectors on mounting plate (7)
- a spring terminal 3P connection module (8).

References:
pages B1/6 to B1/9
Characteristics:
page B1/18
Curves:
page B1/19

Product references



LA9ZX01573 *LA9ZX01495*

IEC busbar supports and accessories

		Min. order qty	Unit reference
3-pole	For 12, 15, 20, 25, 30 x 5/10 mm busbars	10	**LA9ZX01495**
	End covers for 3-pole busbar support	10	**LA9ZX01573**
4-pole	For 12, 15, 20, 25, 30 x 5/10 mm busbars	10	**LA9ZX01485**
	End covers for 4-pole busbar support (5 left, 5 right)	10	**LA9ZX01131**



LA9ZX01131 *LA9ZX01485*

UL busbar supports and accessories

		Min. order qty	Unit reference
3-pole	For 12, 20, 30 x 5/10 mm busbars	10	**LA9ZX01508**
	Base plate 240 x 700	2	**LA9ZX01515**
	End covers for busbar support	10	**LA9ZX01573**

Other accessories

		Min. order qty	Unit reference
Covers, length 1 m			
	For 12-30 x 5 mm busbars	10	**LA9ZX01244**
	For 12-30 x 10 mm busbars	10	**LA9ZX01245**



LA9ZX01573 *LA9ZX01508*

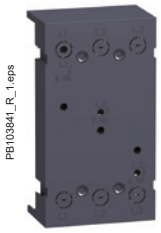


LA9ZX01244

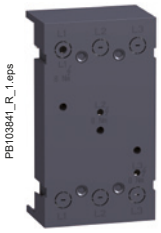
Product references



LA9ZA32627



LV429372



LA9ZA32600



LV432624

For TeSys integral contactor-circuit breakers

Operating current AC-3 440 V	Protection by contactor-circuit breaker	Mounting plate l x h x d	Min. order qty	Unit reference
Mounting plate, 1-way				
63 A	LD1, LD4LD●	108 x 260 x 63	1	**LA9ZA32627**

For TeSys GV5/GV6 motor circuit breakers

Ratings		Mounting plate l x h x d	Min. order qty	Unit reference
Mounting plate for 3P				
150/220 A	GV5	104 x 190 x 63	1	**LV429372**
320/500 A	GV6	139 x 270 x 63	1	**LV432623**

For TeSys GV5/GV6 circuit breakers

Ratings		Mounting plate l x h x d	Min. order qty	Unit reference
100-250 A	Mounting plate for 3P circuit breakers	104 x 190 x 63	1	**LV429372**
	Mounting plate for 4P circuit breakers	139 x 251 x 63	1	**LV429373**
400-630 A	Mounting plate for 3P circuit breakers	139 x 270 x 63	1	**LV432623**
	Mounting plate for 4P circuit breakers	184 x 284 x 63	1	**LV432624**

For PowerPact 3P circuit breakers

Ratings		Mounting plate l x h x d	Min. order qty	Unit reference
60-100-150 A	Mounting plate for H frame circuit breakers	104 x 190 x 63	1	**LA9ZA32600**
250 A	Mounting plate for J frame circuit breakers	104 x 190 x 63	1	**LV429372**
250-400-600 A	Mounting plate for L frame circuit breakers	139 x 270 x 63	1	**LV432623**

Characteristics of busbar mounting plates

Type of mounting plate		LA9ZA32621 LA9ZA32622	LA9ZA32427 LA9ZA32428 LA9ZA32434 LA9ZA32623 LA9ZA32442 LA9ZA32443	LA9ZA32624 LA9ZA32625 LA9ZA32626 LA9ZA32627	LV429372 LV429373	LV432623 LV432624	LA9ZA32600
Degree of protection as per IEC 60529	IP	20					
Rated insulation voltage	V	690					
Permissible current	A	25	32	63	80-100-250	400-630	60-100-150
Peak rated current	kA	50	50 (1)	50	50	50	50
SCCR (UL) with Compact NSX circuit breaker protection	mm²	The reinforced breaking capacity due to cascading in circuit breaker combination is maintained					
Conductor cross section (color: black)	mm²	4	6	10	NA		
	AWG	12	10	8	NA		
Type of conductor insulating material	PVC	105°			NA		

(1) 35 kA with LUB12 for LA9ZA32427 and LA9ZA32428.

Introduction: page B1/5
Characteristics: page B1/18
Curves: page B1/19

Product references

PB112418_R_1.eps



LA9ZA32443, LA9ZA32621

PB112417_R_1.eps



LA9ZA32434, LA9ZA32442

PB112420_R_1.eps



LA9ZA32622

PB112421_R_1.eps



LA9ZA32623

PB112416_R_1.eps



LA9ZA32427

PB112419_R_1.eps



LA9ZA32428

PB112422_R_1.eps



LA9ZA32624

PB112423_R_1.eps



LA9ZA32625

PB112426_R_1.eps



LA9ZA32626

For TeSys GV2 motor circuit breakers

Operating current AC-3 440 V	Protection by motor circuit breaker	For contactor	Mounting plate l x h x d	Min. order qty	Unit reference
Mounting plate, 1-way					
25 A	GV2ME GV2P GV2LE	LC1D LC1K LP4K06-K12	45 x 200 x 63	4	**LA9ZA32621**
32 A	GV2LE		63 x 200 x 63	4	**LA9ZA32443**
Mounting plate, 2-way (3)					
25 A	GV2ME GV2P GV2LE	LC1D LC1K LP4K06-K12	90 x 200 x 63	2	**LA9ZA32622**
32 A	GV2ME GV2P GV2LE	LC1D	45 x 200 x 63	4	**LA9ZA32434**
			54 x 200 x 63	4	**LA9ZA32442**
			90 x 200 x 63	2	**LA9ZA32623**

TeSys U starter-controllers

Operating current AC-3 440 V	Protection by power base	Mounting plate l x h x d	Min. order qty	Unit reference
Mounting plate, 1-way				
32 A	LUB12, LUB32	45 x 200 x 63	4	**LA9ZA32427**
Mounting plate, 2-way				
32 A	LUB12, LUB32	45 x 260 x 63	4	**LA9ZA32428**

For TeSys GV3 motor circuit breakers

Operating current AC-3 440 V	Protection by power base	For contactor	Mounting plate l x h x d	Min. order qty	Unit reference
Mounting plate, 1-way (1)					
63 A	GV3P	–	54 x 200 x 63	4	**LA9ZA32624**
	GV3P	LC1D40A…65 A	54 x 260 x 63	4	**LA9ZA32625**
Mounting plate, 2-way (1) (2)					
63 A	GV3P	LC2D40A…65 A	117 x 260 x 63	4	**LA9ZA32626**

(1) Contactor-circuit breaker combination without additional part.
(2) Use the LAD9R3 kit for the execution of changeover contactors.
(3) Use the LAD9R1 or LAD9R1V kit for the execution of changeover contactors.

***Note:** the mounting plate rails can be shifted vertically in 1.25 mm increments.*

Product references



LA9ZX01285



LA9ZX01287

Terminals

	I max		Set of	Unit reference
One-pole for flat bars, 5 mm	270 A	Capacity 4-35 mm²	50	LA9ZX01285
	400 A	Capacity 16-70 mm²	25	LA9ZX01287
3P cover, width 84 mm			10	LA9ZX01413



LA9ZX01413



LA9ZX01243

Terminals on mounting plate

	I max		Min. order qty	Unit reference
3P, on mounting plate + cover, for 12 x 5 to 30 x 10 busbars, width 81 mm	440 A	Capacity 35-120 mm²	1	LA9ZX01243
3P, on mounting plate + cover, for 20 x 5 to 30 x 10 busbars, width 135 mm	560 A	Capacity 120-300 mm²	1	LA9ZX01754



LA9ZX01563

Connection module

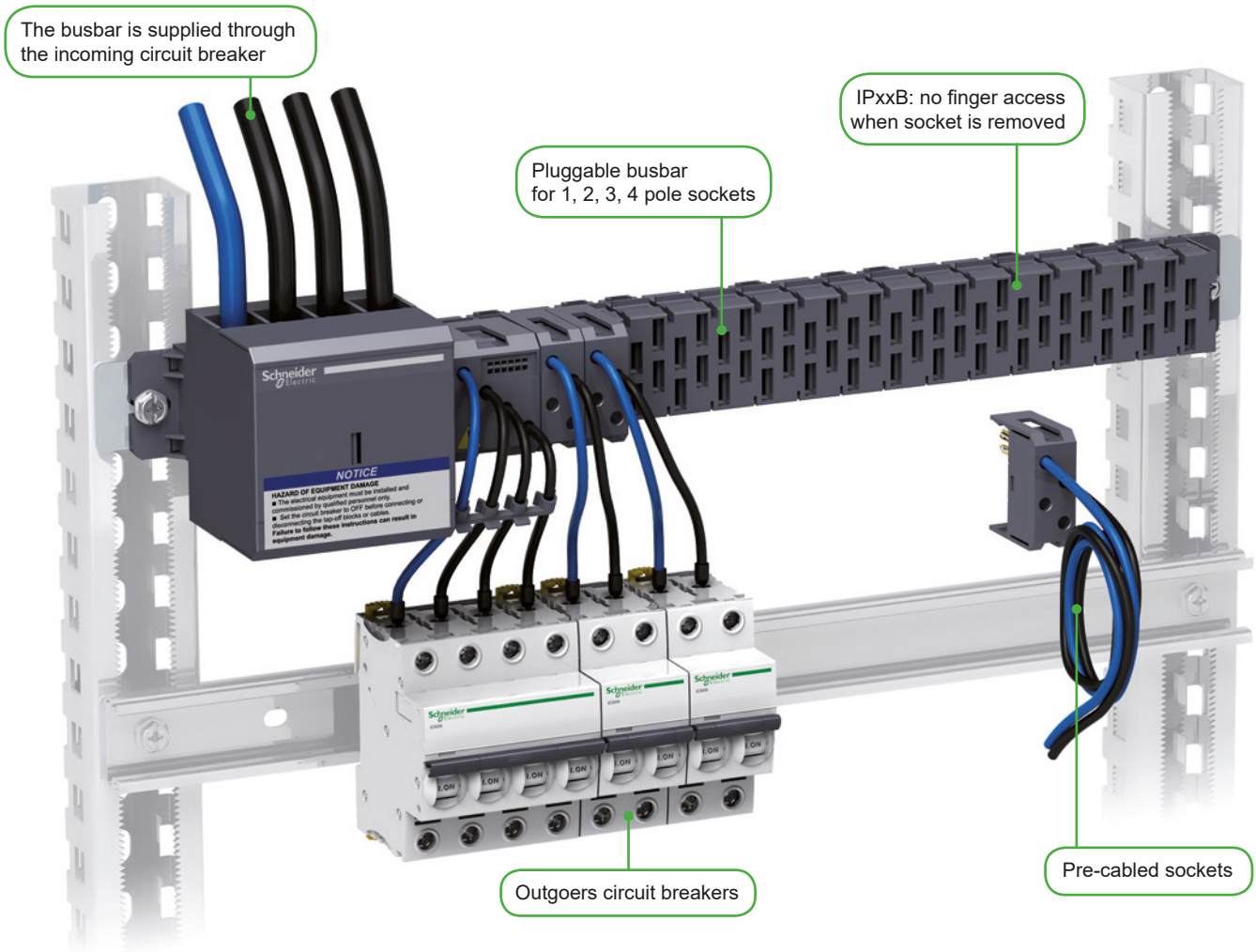
	I max		Min. order qty	Unit reference
3P, spring terminal connection + cover, for 12 x 5 to 30 x 10 busbars, width 20 mm	80 A	Capacity 1.5-16 mm²	8	LA9ZX01563

Connection by connectors

		LA9ZX01285		LA9ZX01287		LA9ZX01243		LA9ZX01563		LA9ZX01754	
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Flexible wire	mm²	4	35	16	70	35	120	1.5	16	120	300
Multi-strand wire	mm²	4	35	16	70	35	120	1.5	16	120	300
Rigid wire	mm²	4	35	–	–	–	–	1.5	16	-	-
Tightening torque	N.m	... x 5		... x 5		... x 5-10		... x 5-10		... x 5-10	
Cover		LA9ZX01413		LA9ZX01413		Supplied without cover		Supplied without cover		Supplied without cover	

Introduction: page B1/5
Characteristics: page B1/18
Curves: page B1/19

Hot-plug distribution: when continuity of service is required



Advantages

- Considerable time saving: stand alone busbar, fixed to the chassis with 2 screws
- Preserved continuity of service during modification: live connection, disconnection (off load)
- Wide adaptability: 6 busbar lengths from 344 to 1100 mm, 12 models of sockets
- Multi standard: conform to IEC and UL standards

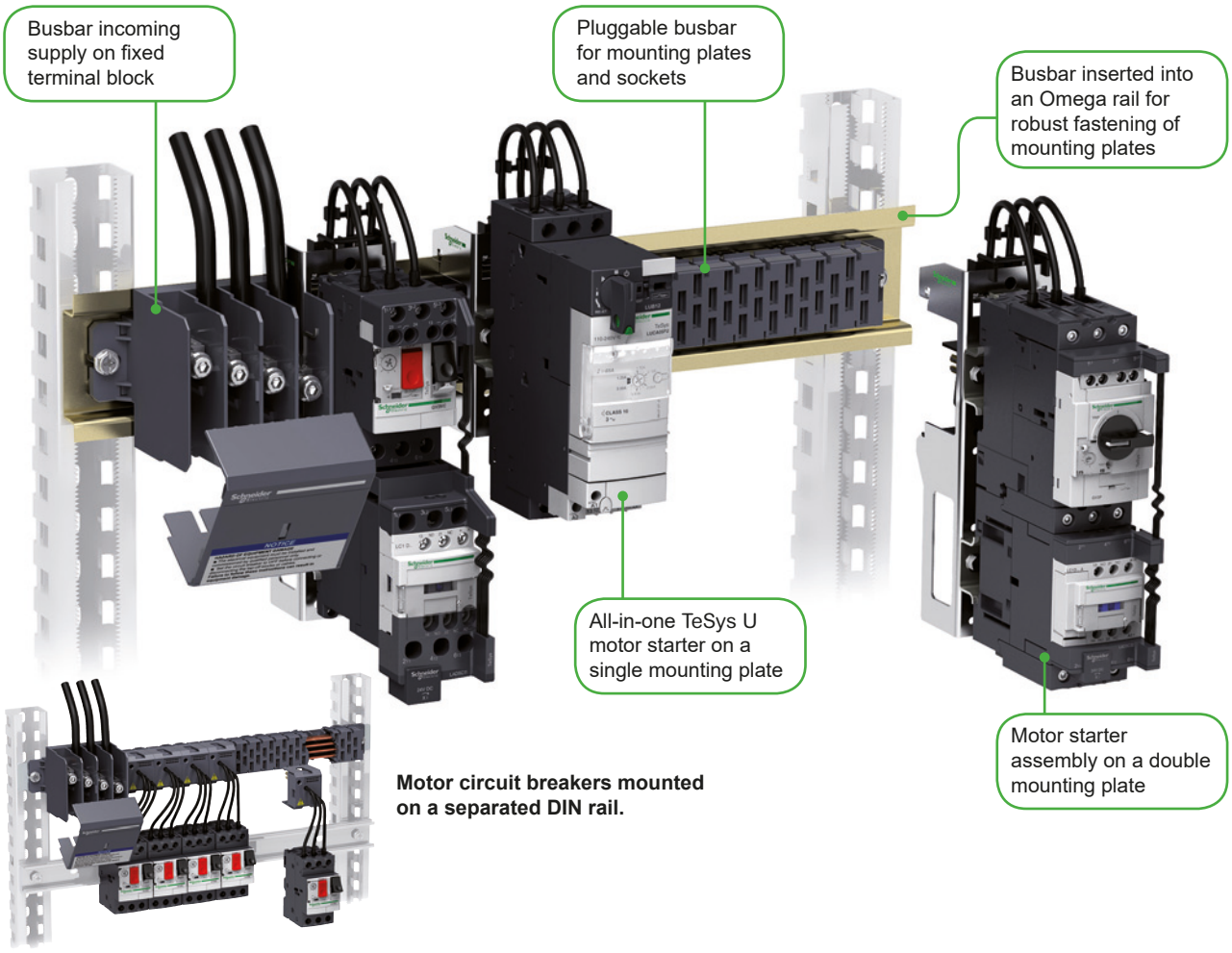
Detailed view: pre cabled socket

- The assembling process and the technological choices ensure a long-lasting reliability
- Each wire is welded on a spring clip providing robustness to the socket and vibration resistant contacts



Introduction

When compactness and continuity of service are required



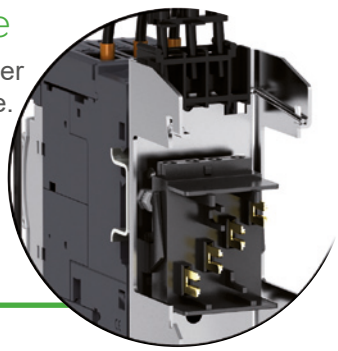
Motor circuit breakers mounted on a separated DIN rail.

Advantages

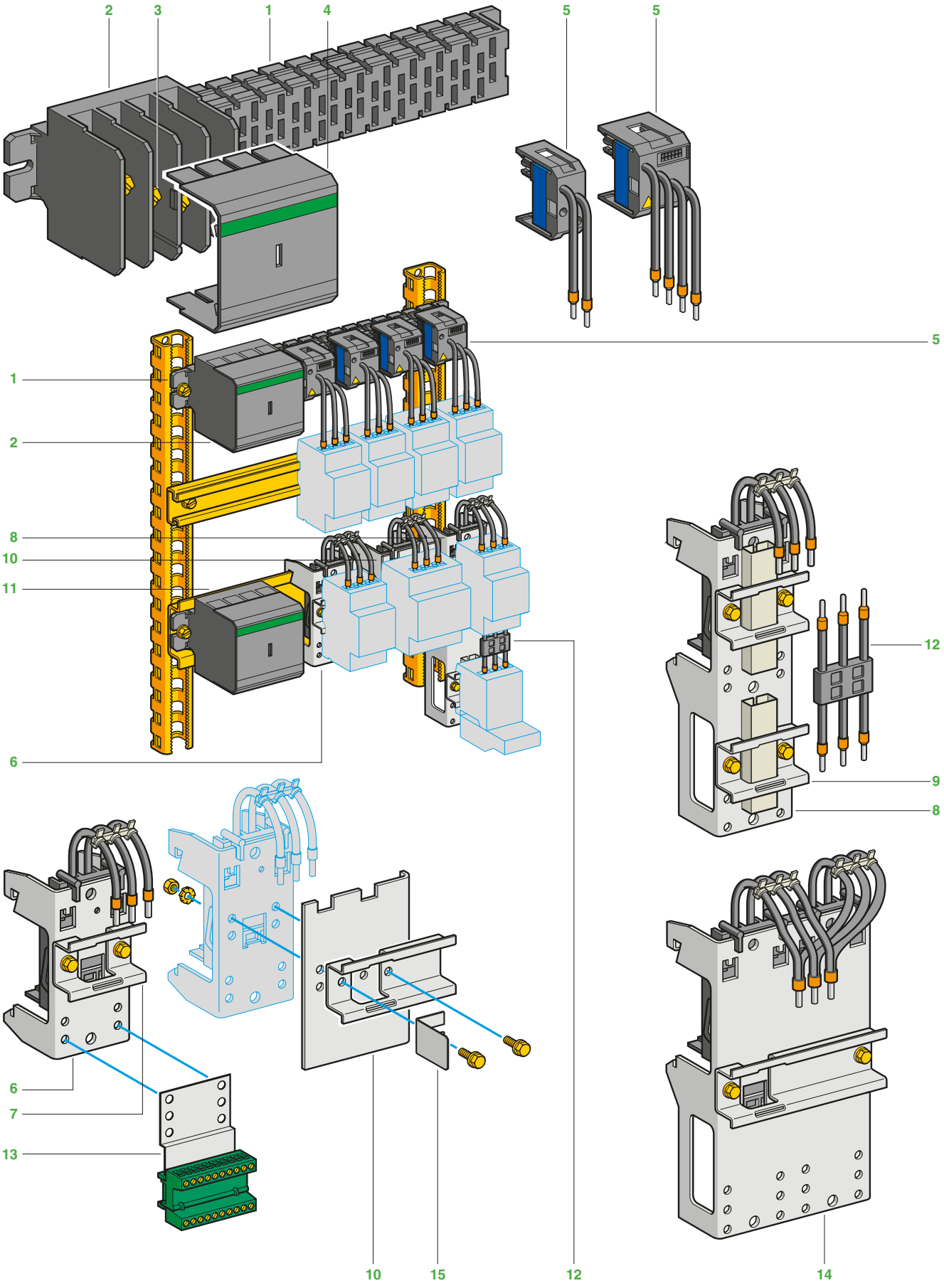
- Space saving in compact enclosures: the total volume is reduced to that of the motor starter assemblies
- Preserved continuity of service during modification and maintenance: live connection, disconnection (off load)
- Wide adaptability: 6 busbar lengths from 344 to 1100 mm, 12 models of sockets, 23 mounting plates for motor starters up to 25 or 50 A
- Multi standard: conform to IEC and UL standards

Detailed view: mounting plate back face

- Thanks to the plug and its pre-cabled wires the motor starter is safely assembled in the workshop, for immediate or later use.
- A piece of DIN profile rail is attached on the front face of the mounting plate for fastening the components.
- The metal mounting plate ensures a rigid and robust fastening on the omega rail.



DB404140.eps



Life Is On Schneider Electric

The assembly of automated control and distribution panels requires the use of products that are not only safe but also simple and quick to mount and cable.

The Linergy HK pre-assembled busbar system meets all these criteria by incorporating prefabricated components which cater for 3 principal functions:

Carrying of electric current

By the pre-assembled 4-pole busbar system **1**, 160 A at 35 °C.

4-pole busbars can be used for 3-phase + Neutral or 3-phase + Common.

The busbars are available in 6 lengths: 344, 452, 560, 668, 992, 1100 mm.

An incoming supply terminal block **2** is located at the extreme left of the busbar.

"Knock-out" partitions allow connection of the power supply from above or below to connectors **3** which are protected by a removable cover **4**.
Upstream protection of the busbar is shown on page B1/20.

Current distribution

Tap-off units **5** (factory assembled) are available in 4 versions:
- 2-pole,
- 3-pole,
- 4-pole (3-phase + Neutral),
- 4-pole (3-phase + Common).

The tap-offs clip onto the busbar with instantaneous mechanical and electrical connection to the busbars.
2 ratings are available: 16 and 32 A.
The tap-off units ensure not only rapid mounting, but also a neat appearance for the power distribution system and complete safety when accessing under live circuit conditions.

Component mounting

Component mounting plates with incorporated tap-off allow mounting of and supply of power to components.
They are available in 25 A or 50 A ratings.

These mounting plates clip onto the mounting rail **11**, which also supports the busbar, and at the same time make electrical connection via the incorporated tap-off.

2 types of mounting plate are available:
- single plates **6** (height 105 mm), with bolt-on 35 mm wide ⎓ rail **7**, which may be bolted on in one of two positions, allowing height adjustment of 10 mm.
- double plates **8** and **14** (height 190 mm), with two bolt-on, 35 mm wide ⎓ rails **9** mounted on 100 mm fixing centres; each rail may be bolted on in one of 4 positions, allowing height adjustment in 10 mm steps. These plates are supplied with connectors **12** to allow wiring between control and protection devices.

Single mounting plates enable the following types of distribution:
- 2-pole (Ph + N) and (Ph + Ph)
- 3-pole,
- 4-pole (3 Ph + N or 3 Ph + common).

Double mounting plates enable the following types of distribution: 2-pole (Ph + N, Ph + Ph), 3-pole or 4-pole (3Ph+N and 3Ph + common).

Extension plates **10** can be bolted onto single and double mounting plates to enable mounting of wider components. Using a side stop **15** in conjunction with these extension plates also supports the Linergy HK busbar when used vertically.

A control terminal block **13** comprising a support plate bolted onto the single or double mounting plates and a 10-pole plug-in block, enables connection of the control circuit wires (c.s.a. 1.5 mm^2 max).

References:
pages B1/14 to B1/16
Characteristics:
pages B1/20 and B1/21
Dimensions:
pages B1/22 and B1/23

Product references

PB112406_R.eps



AK5JB1●●

Busbars

The busbars can be screw-mounted onto any type of support. However. if it is to be used in conjunction with component mounting plates incorporating a tap-off, it is essential that it is mounted on the AM1DL201 rail.
When mounting tap-offs, the rated operational current of the busbar should be taken into account: 160 A at 35 °C.

Number of conductors	Number of tap-offs at 18 mm intervals	Length	Suitable for mounting in enclosure width	Reference	Weight
		mm	mm		kg
4 (1)	12	344	600	**AK5JB143**	0.700
	18	452	800	**AK5JB144**	0.900
	24	560	800	**AK5JB145**	1.100
	30	668	800	**AK5JB146**	1.300
	48	992	1200	**AK5JB149**	1.900
	54	1100	1200	**AK5JB1410**	2.100

PB112411_R.eps



AK5PC12

PB112412_R.eps



AK5PC14

Removable power sockets

Use	Number of points used on the busbar system		Thermal current	Cable lengths	Min. order qty	Unit reference
		Width	A	mm		
Single-phase + Neutral	1	9 mm	16	200	6 (2)	**AK5PC12**
			32	1000	6 (2)	**AK5PC32L**
2-phase	1		16	200	6 (3)	**AK5PC12PH**
			32	1000	6 (3)	**AK5PC32LPH**
3-phase	2	18 mm	16	200	6	**AK5PC13**
			32	250	6	**AK5PC33**
				1000	6	**AK5PC33L**
3-phase + Neutral	2		16	200	6	**AK5PC14**
			32	250	6	**AK5PC34**
				1000	6	**AK5PC34L**
3-phase + common	2		16 10 (common)	200	6	**AK5PC131**
			32 10 (common)	250	6	**AK5PC331**

PB112405.eps



AK5GF1

Accessories

Description	Maximum no. of connections	C.s.a. mm²	Sold in lots of	Unit reference
Cable guide	4	2.5 or 4	20	**AK5GF1**

(1) 4-pole: 3-phase + Neutral or 3-phase + Common.
(2) Total of 6 sockets supplied: 2 sockets (N + L1), 2 sockets (N + L2). 2 sockets (N + L3).
(3) Total of 6 sockets supplied: 2 sockets (L1 + L2), 2 sockets (L1 + L3). 2 sockets (L2 + L3).
(4) Cut and drill to suit use.

Introduction: page B1/13
Characteristics: pages B1/20 and B1/21
Dimensions: pages B1/22 and B1/23

Product references

PB112407_R.eps



AK5PA231

PB112408_R.eps



AK5PA242

PB500804_R.eps



AM1DL201

Component mounting plates incorporating tap-off

Single plate (height 105 mm)

Use	No. of 18 mm points used on the busbar system	Phase	Thermal currentA	Number of ⊔ rails for com-ponent support	Min. order qty	Reference
Single-phase + neutral	3 (54 mm width)	Ph1+N	25	1	1	**AK5PA211N1**
		Ph2+N	25	1	1	**AK5PA211N2**
		Ph3+N	25	1	1	**AK5PA211N3**
2-phase	3	Ph1+Ph2	25	1	1	**AK5PA211PH12**
		Ph1+Ph3	25	1	1	**AK5PA211PH13**
		Ph2+Ph3	25	1	1	**AK5PA211PH23**
3-phase	3	–	25	1	1	**AK5PA231**
3-phase + common	3	–	25	1	1	**AK5PA2311**
3-phase + neutral	3	–	25	1	1	**AK5PA241**

Double plate (height 190 mm)

Prefabricated 25 A connectors are supplied for connecting the 2 protection and control devices.

Single-phase + neutral	3	Ph1+N	25	2	1	**AK5PA212N1**
		Ph2+N	25	2	1	**AK5PA212N2**
		Ph3+N	25	2	1	**AK5PA212N3**
2-phase	3	Ph1+Ph2	25	2	1	**AK5PA212PH12**
		Ph1+Ph3	25	2	1	**AK5PA212PH13**
		Ph2+Ph3	25	2	1	**AK5PA212PH23**
3-phase	3	–	25	2	1	**AK5PA232**
	6 (108 mm width)	–	25	2	1	**AK5PA232S**
			50	1	1	**AK5PA532**
3-phase + neutral	3	–	25	2	1	**AK5PA242**
3-phase + common	3	–	25 (10 common)	2	1	**AK5PA2312**
	6	–	25 (10 common)	2	1	**AK5PA2312S**
			50 (10 common)	1	1	**AK5PA5312**
3-phase + neutral	6	–	50	1	1	**AK5PA542**

Omega rail, width 75 mm

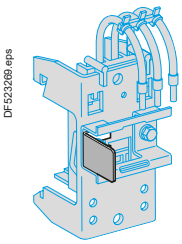
This rail is designed to accommodate the busbar system when it is used with Linergy HK mounting plates incorporating tap-offs. It supportsthe busbar system. The plates simply clip onto the rail.

Material and surface treatment	Depth	Length	Min. order qty	Reference	Weight
	mm	mm			kg
2 mm sheet steel	15	2000 (4)	6	**AM1DL201**	3.000

Product references



AK5BT01





AK5SB1



AB1R4

Extension plates

These plates bolt onto the equipment support plates, after having removed them from the rails, to be able to mount wider components.

Use		Number of tap-offs at 18 mm intervals	Reference
For mounting plates incorporating tap-off	Single	4	**AK5PE17**
	Double	4	**AK5PE27**

Side stop (AK5JB mounted vertically)

Use	Set of	Reference
For extension plate (for AK5PA●●●)	50	**AK5BT01**

Control terminal blocks

Description	Thermal current A	Set of	Reference
10-pole terminal blocks, for screwing onto plate AK5 PA●●●			
	10	10	**AK5SB1**

Accessories

Description	Marking	Set of	Reference
Strips of clip-in markers 10 identical numbers, signs or capital letters per strip	0…9	25	**AB1R●** (1)
	+	25	**AB1R12**
	–	25	**AB1R13**
	A…Z	25	**AB1G●** (1)

*(1) Replace the ● in the selected reference with the number or letter required. Example: **AB1R1** or **AB1GA.***

Note:
- *if the equipment is wider than the mounting plate, an extension plate can be used to increase the width of the support plate.*
- *for upstream protection, see page B1/20.*

Linergy BZ, HK

Technical Data for Designers

Contents

Linergy BZ:
> characteristics B1/18
> curves B1/19
Linergy HK:
> characteristics ..... B1/20 and B1/21
> dimensions ..... B1/22 and B1/23

Characteristics

PB112441.eps



LA9ZX01495

PB112440.eps



LA9ZX01485

PB112442.eps



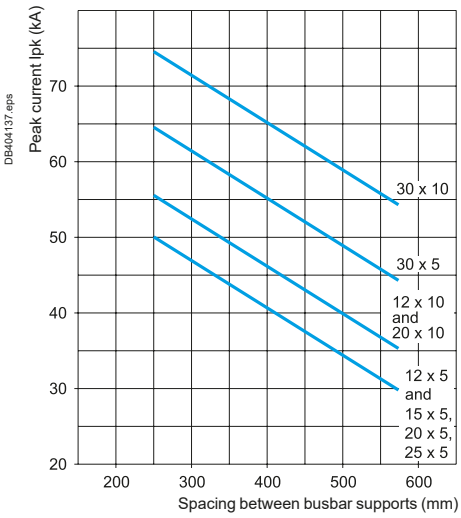
LA9ZX01508

General characteristics

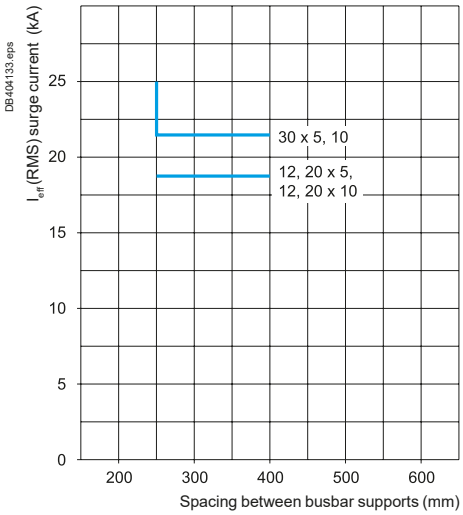
		LA9ZX01495 and LA9ZX01485 (IEC 6.439-1)							
Bar dimensions compatibility	mm	12 x 5	15 x 5	20 x 5	25 x 5	30 x 5	12 x 10	20 x 10	30 x 10
Max. rated operating current	A	200	250	320	400	450	360	520	630
Min. peak permissible rated current	kA	30	30	30	30	45	35	35	53
Distance max. between 2 busbars supports	mm	570	570	570	570	570	570	570	570
Degree of protection	IP	20 (with cover LA9ZX01244 or LA9ZX01245)							
Thermal resistance	°C	125							
Rated current frequency	Hz	50/60							
Rated insulation voltage	V	690							
Rated operating voltage	V	690							
		LA9ZX01508 (UL) 508 A							
Bar dimensions compatibility	mm	12 x 5	20 x 5	30 x 5	12 x 10	20 x 10	30 x 10		
Rated operating current	A	150	362	500	300	564	630		
I_{eff} (RMS) surge current	kA	18	18	22 - 25	18	18	22 - 25		
SCCR (protected by Compact NSX circuit breaker) 250 A 480 V AC	kA	65	-	-	65	-	-		
SCCR (protected by Compact NSX circuit breaker) 250 A 600 V AC	kA	25	-	-	25	-	-		
SCCR (protected by Compact NSX circuit breaker) 400 A 480 V AC	kA	-	65	65	-	65	65		
SCCR (protected by Compact NSX circuit breaker) 400 A 600 V AC	kA	-	35	35	-	35	35		
SCCR (protected by Compact NSX circuit breaker) 500 A 480 V AC	kA	-	-	65	-	-	65		
SCCR (protected by Compact NSX circuit breaker) 600 A 600 V AC	kA	-	-	35	-	-			
SCCR (protected by Compact NSX circuit breaker) 600 A 480 V AC	kA	-	-	50	-	-	50		
SCCR (protected by Compact NSX circuit breaker) 600 A 600 V AC	kA	-	-	25	-	-	25		
SCCR (protected by fuses Class J or T ...) 400 A 480 V AC	kA	100	100	100	100	100	100		
SCCR (protected by fuses Class J or T ...) 500 A 480 V AC	kA	-	-	100	-	-	100		
SCCR (protected by fuses Class J or T ...) 500 A 600 V AC	kA	-	-	100	-	-	100		
Distance max. between 2 busbars supports (busbar protected)	mm	400	800	800	400	800	800		
Degree of protection	IP	20 (with cover LA9ZX01244 or LA9ZX01245)							
Thermal resistance	°C	125							
Rated current frequency	Hz	50/60							
Rated operating voltage	V	600							

Curves

Determining the spacing between busbar supports (LA9ZX01495 and LA9ZX01485), according to IEC 61439-1 (1)



Short-circuit strength diagram according to UL845 (LA9ZX01508)



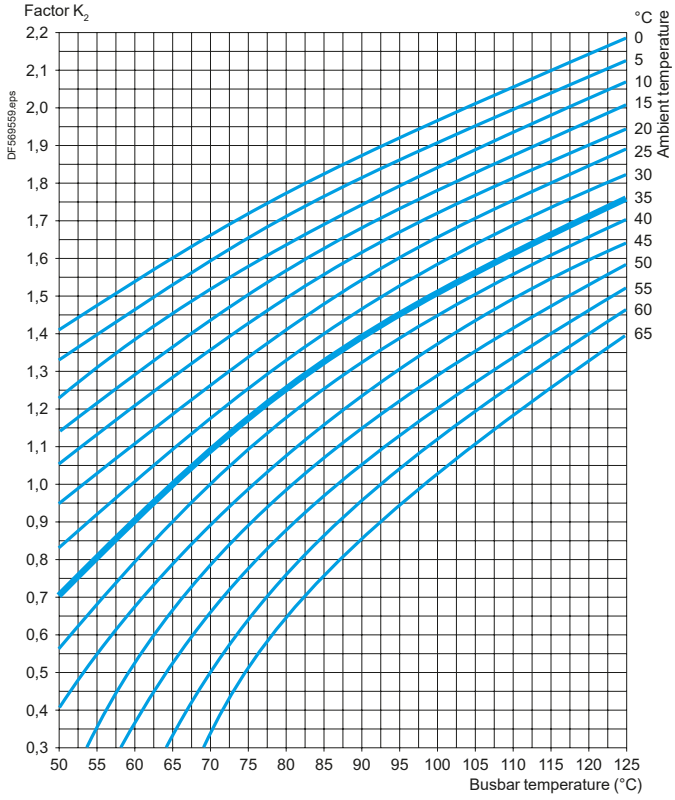
(1) Depending on the short-circuit current.

Load resistance of busbar assemblies in IEC applications

For an ambient temperature of 35 °C and a busbar temperature of 65 °C

Cross section	mm²	12 x 5	15 x 5	20 x 5	25 x 5	30 x 5	12 x 10	20 x 10	30 x 10
Permissible current	**A**	200	250	320	400	450	360	520	630

In the event of changes in climatic conditions, the following curve indicates the correction factor K_2 to be applied.



Example: In normal operating conditions, a tinned busbar of 30 x 10 can permanently withstand 630 A.

For a load of 800 A, the correction factor K_2 to be applied will be 1.3 ($\frac{800\ A}{630\ A}$). As a result, the temperature rise in the busbars will reach 82.5 °C.

Introduction: page B1/5
References: pages B1/6 to B1/9
Characteristics: page B1/18

Characteristics

Busbar system characteristics

Conforming to standards			IEC 60439					
Product certifications			UL, CSA, DNV, LROS					
Degree of protection	Against access to live parts		IP XXB conforming to IEC 60529					
Flame resistance	Conforming to IEC 60695	**°C**	850 (incandescent wire)					
	Conforming to standard UL 94		V0					
Number of conductors	AK5JB14●		4					
Supply current			~					
Rated operational frequency		**Hz**	50 or 60					
Rated operational current	Ambient temperature 35 °C	**A**	160					
	Coefficient K to be applied according to the ambient temperature	**°C**	35	40	45	50	55	60
		K	1	0.96	0.92	0.88	0.83	0.78
Rated insulation voltage	Conforming to IEC 60439-1	**V**	690					
	Conforming to UL and CSA	**V**	600					
Operational voltage			Off-load plugging-in and unplugging, with supply switched on					
	Conforming to IEC 60439-1	**V**	400					
	Conforming to UL, CSA	**V**	480					
			Plugging-in and unplugging, with supply switched off					
	Conforming to IEC 60439-1	**V**	690					
	Conforming to UL, CSA	**V**	600					
Maximum permissible peak current		**kA**	25					
Maximum let-through energy		**A^2s**	1×10^7					
Upstream short-circuit [1] and overload protection	Type of protection		Schneider Electric circuit-breaker			Fuses		
			NSX 160 N	NSX 160 H		aM	gF	
	Rating	**A**	160	160		160	160	
	Prospective short-circuit current	**kA**	36	70		100	100	
	Operational current	**A**	160	160		160	160	
Cabling			Maximum c.s.a.			Minimum c.s.a.		
	Flexible cable with cable end	**mm^2**	70			2.5		
	Solid cable	**mm^2**	70			2.5		
	Tightening torque	**Nm**	10					
Mounting position	Horizontal or vertical [2]		Fixing with screws provided					

(1) For conditions where conditional short-circuit current exceeds 25 kA.
(2) Using side stop **AK5BT01** *on mounting plates* **AK5PA**.

Introduction: page B1/13
References: pages B1/14 to B1/16
Dimensions: pages B1/22 and B1/23

Characteristics

Tap-off characteristics

Type		AK5 PC12	AK5 PC12PH	AK5 PC13	AK5 PC14	AK5 PC131	AK5 PC32L	AK5 PC32LPH	AK5 PC33 PC33L	AK5 PC34 PC34L	AK5 PC331
Conforming to standards		IEC 60439									
Product certifications		UL, LROS, CSA, DNV									
Degree of protection		Against access to live parts: IP XXB conforming to IEC 529									
Polarity		Phase + Neutral	Phase + Phase	3-phase	3-phase + Neutral	3-phase + Common	Phase + Neutral	Phase + Phase	3-phase	3-phase + Neutral	3-phase + Common
Conductor c.s.a. (UL cables)	**mm²**	2 x 2.5	2 x 2.5	3 x 2.5	4 x 2.5	3 x 2.5 1 x 1.5	2 x 4	2 x 4	3 x 4	4 x 4	3 x 4 1 x 1.5
Conductor colours		Black Blue (Neutral)	Black	Black	Black Blue (Neutral)	Black White	Black Blue (Neutral)	Black	Black	Black Blue (Neutral)	Black White (Common)
Permissible current	**A**	16	16	16	16	16 10 (Common)	32	32	32	32	32 10 (Common)
Rated insulation voltage	**V**	690 conforming to IEC 60439-1									
Rated peak current	**kA**	6									
Maximum let-through energy	**A²s**	100 000					200 000				
Type of conductor insulation		PVC 105 °C									

Tap-off characteristics

Type		AK5 PA211N1 PA211N2 PA211N3 PA212N1 PA212N2 PA212N3	AK5 PA211PH12 PA211PH13 PA211PH23 PA212PH12 PA212PH13 PA212PH23	AK5 PA231 PA232 PA232S	AK5 PA241 PA242	AK5 PA2311 PA2312 PA2312S	AK5 PA532	AK5 PA542	AK5 PA5312
Conforming to standards		IEC 60439							
Product certifications		UL, LROS, CSA, DNV							
Degree of protection		Against access to live parts: IP XXB conforming to IEC 60529							
Polarity		Phase + Neutral	Phase + Phase	3-phase	3-phase + Neutral	3-phase + Common	3-phase	3-phase + Neutral	3-phase + Common
Conductor c.s.a. (UL cables)	**mm²**	2 x 4	2 x 4	3 x 4	4 x 4	3 x 4 1 x 1.5	2 x (3 x 4)	2 x (4 x 4)	2 x (3 x 4) 1 x 1.5
Permissible current	**A**	25	25	25	25	25 10 (Common)	50	50	50 10 (Common)
Rated insulation voltage	**V**	690 conforming to IEC 60439-1							
Rated peak current	**kA**	6							
Maximum let-through energy	**A²s**	200 000							
Type of conductor insulation		PVC 105 °C							

Characteristics of mounting rails AM1DL201

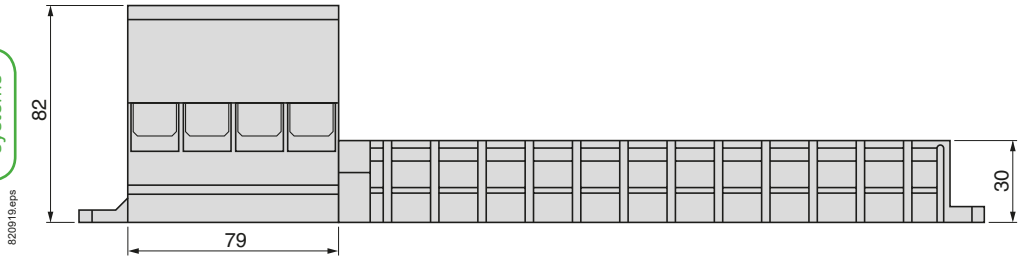
Type		Omega ⌓ (width 75 mm, depth 15 mm)
Material		2 mm sheet steel
Surface treatment		Galvanized

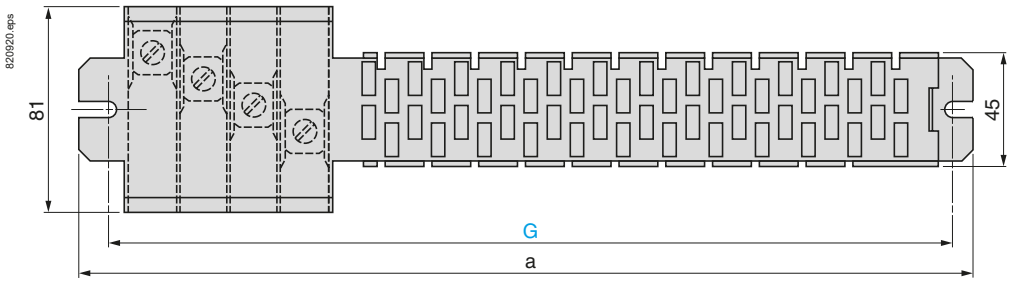
Introduction: page B1/13
References: pages B1/14 to B1/16
Dimensions: pages B1/22 and B1/23

Dimensions

Busbars

AK5JB●●●

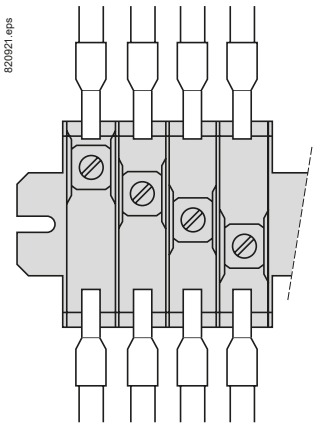




AK5	a	G	No. of 18 mm points
JB143	344	330	12
JB144	452	438	18
JB145	560	546	24
JB146	668	654	30
JB149	992	978	48
JB1410	1100	1086	54

Busbar feed units

AK5JB●●●



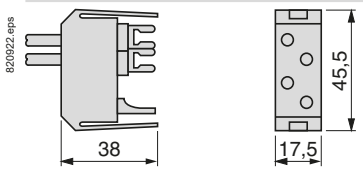
Installation of AK5JB●●● busbar systems

Connection			C.s.a. in mm² min	C.s.a. in mm² max
Flexible cable with or without cable end			1 x 2.5 2 x 2.5	1 x 70 (1) 2 x 35
Flexible bar			–	2 x (9 x 4)
Flexible bar + flexible cable with or without cable end			9 x 4 + 1 x 2.5	9 x 4 + 1 x 35

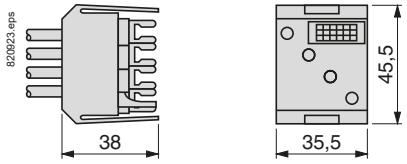
(1) Maximum c.s.a. or connection of conductor without cable end.

Removable power sockets 16 and 32 A

AK5PC12●. AK5PC32L●

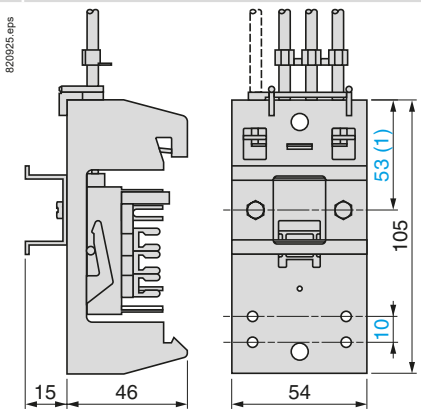


AK5PC●3. AK5PC33L
AK5PC●4. AK5PC34L
AK5PC●31



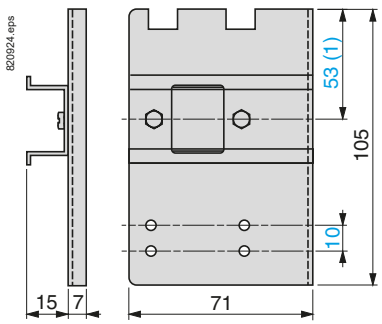
Mounting plates incorporating tap-offs, 25 A

AK5PA2●1. AK5PA2311. AK5PA211●●●●



Single width extension plates

AK5PE17



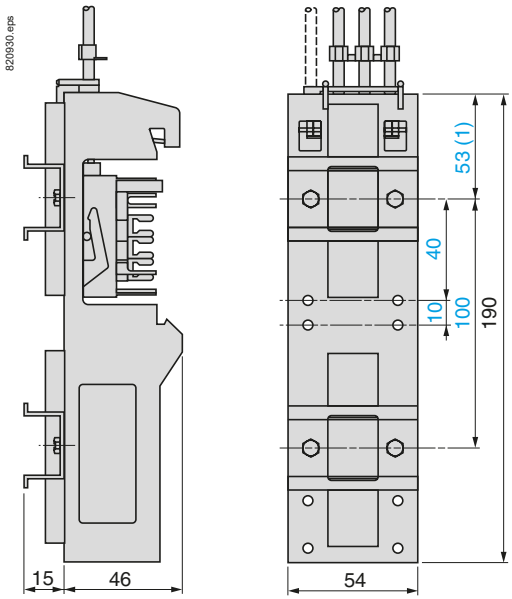
Note: *It is recommended that the power sockets or the removable plates are connected as close as possible to the busbar feed unit.*

(1) Can be fixed at 43 mm.

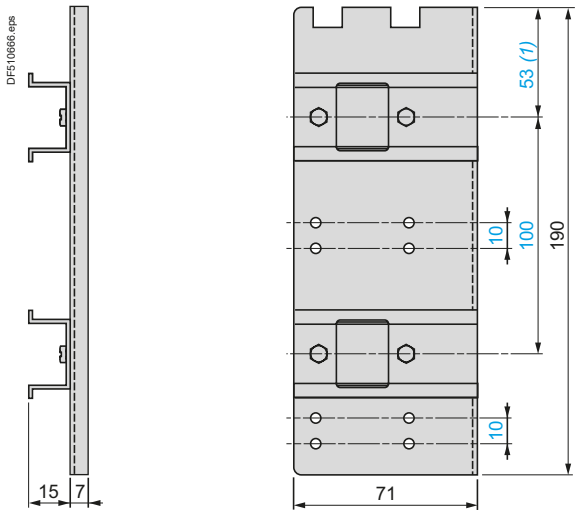
Introduction: page B1/13
References: pages B1/14 to B1/16
Characteristics: pages B1/20 and B1/21

Dimensions

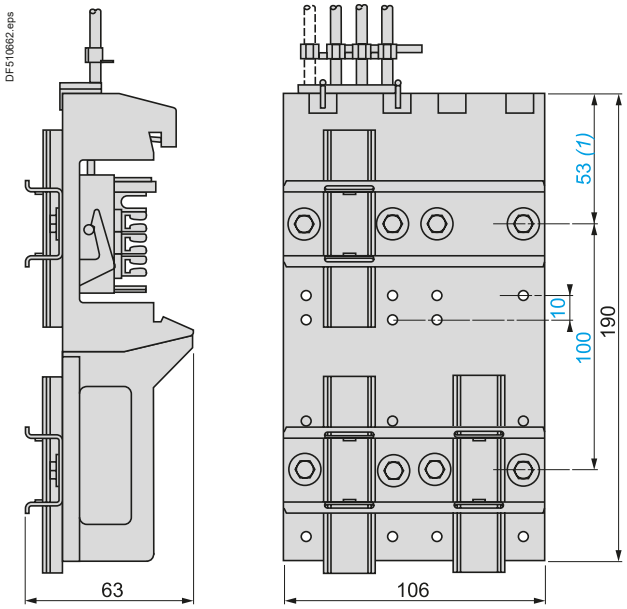
Component mounting plates incorporating tap-off
AK5PA232. AK5PA2312. AK5PA242



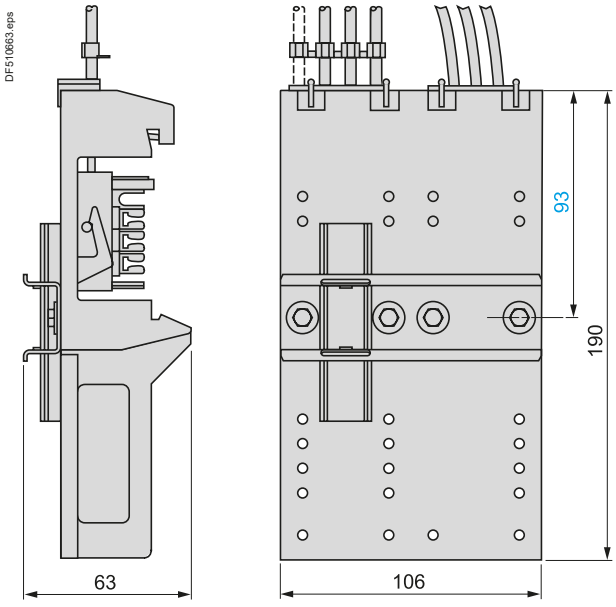
Double extension plate
AK5PE27



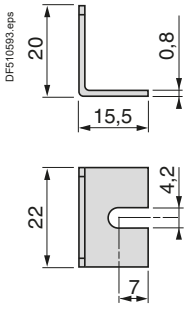
Component mounting plates incorporating tap-off
AK5PA232S. AK5PA2312S



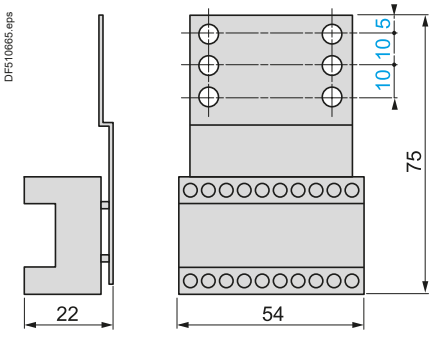
Component mounting plates incorporating tap-off
AK5PA532. AK5PA5312. AK5PA542



Side stop
AK5BT01



Control terminal block
AK5SB1

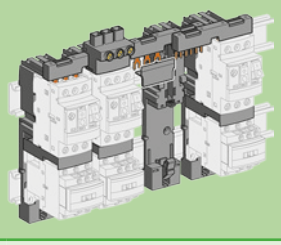
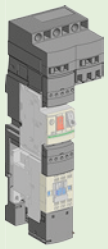
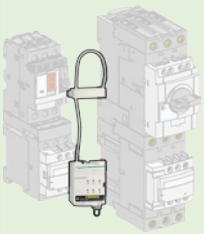
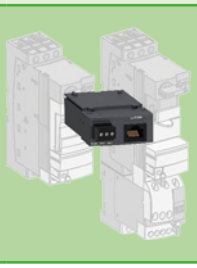


(1) Can be fixed at 43 mm.

Introduction: page B1/13
References: pages B1/14 to B1/16
Characteristics: pages B1/20 and B1/21

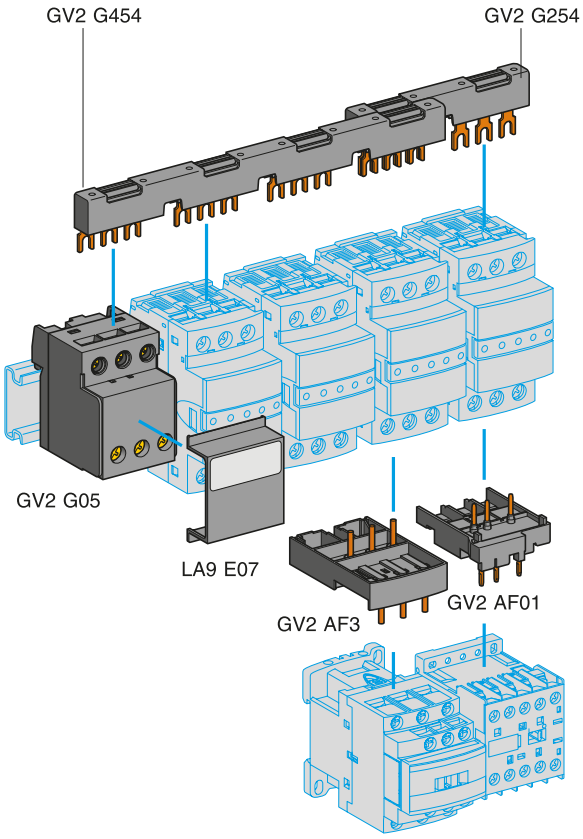
TeSys GV, LAD, U
Wiring systems for motor starters

Power wiring systems for motor starters

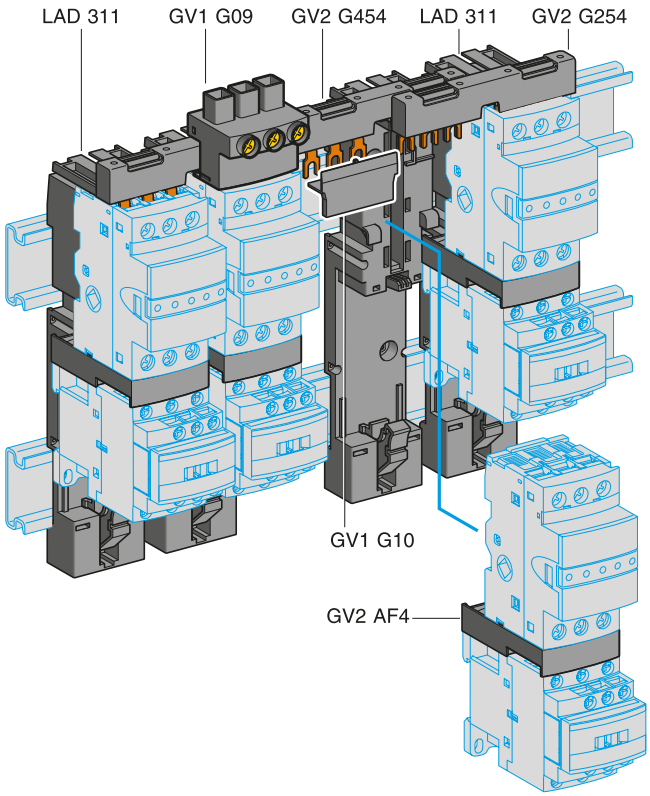
Type of product		Pages
Power wiring system for motor starter assemblies: screw clamp connection **TeSys** GV		B2/2
Power wiring system for motor starter assemblies: spring terminals connection **TeSys** LAD3		B2/4
RJ45 Control wiring systems for motor starters		
Motor starters-to-PLC Control wiring architectures Selection tables		B2/6
RJ45 connection modules for circuit breakers + contactors **Spring terminals** **TeSys** LAD9		B2/8
RJ45 connection module for **TeSys** U motor starter **Pluggable** **TeSys** LUFC00		B2/10

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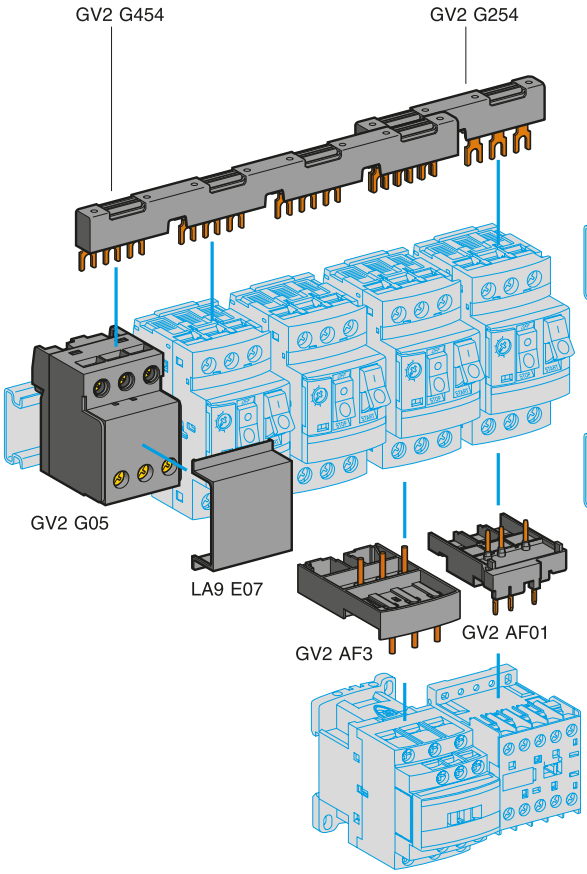
Group of fuse carriers directly mounted on DIN rail



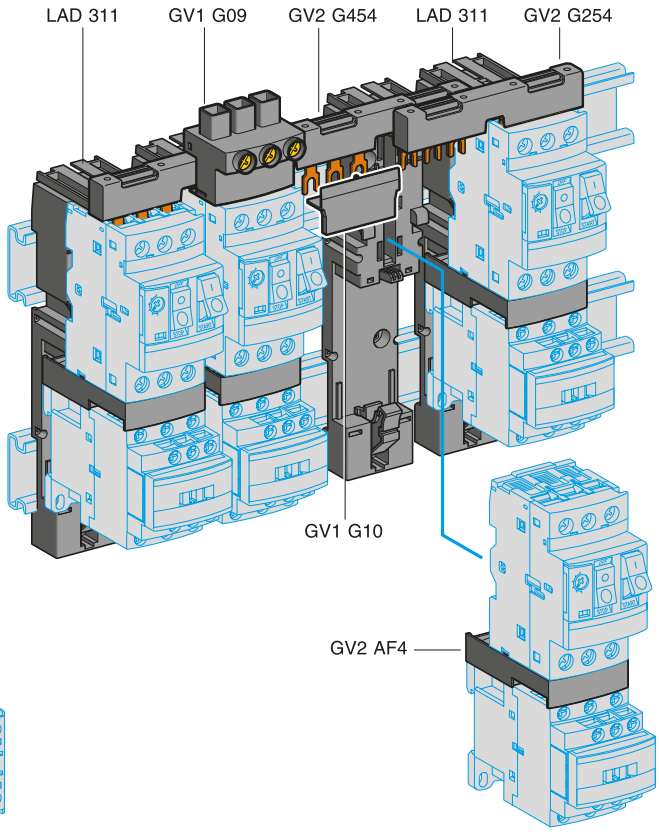
Group of fuse carriers + contactors mounted on adapter plates



Group of circuit breakers directly mounted on DIN rail



Group of circuit breakers + contactors mounted on adapter plates



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Product references

This system is convenient when time and space savings are required.
The motor starter can be composed of:
- LS1D323 fuse carrier + LC1D contactor
- GV2 circuit breaker + LC1D contactor.

Upstream busbars and terminals

Description	Application	Pitch (mm)	Unit reference
Sets of 3-pole 63 A busbars	2 tap-offs	45	**GV2G245**
		54	**GV2G254**
		72	**GV2G272**
	3 tap-offs	45	**GV2G345**
		54	**GV2G354**
	4 tap-offs	45	**GV2G445**
		54	**GV2G454**
		72	**GV2G472**
	5 tap-offs	54	**GV2G554**
Description	**Application**	**Sold in lots of**	**Unit reference**
Terminal block for supply to one or more GV2G busbar sets	Connection from the top	1	**GV1G09**
	Can be fitted with current limiter GV1L3 (GV2ME and GV2P)	1	**GV2G05**
Cover for terminal block	For mounting in modular panels	10	**LA9E07**
Protective end cover	For unused busbar outlets	5	**GV1G10**

Assembling components

Description	Application	Sold in lots of	Unit reference
Combination blocks	Between GV2 and contactor LC1K or LP1K (1)	10	**GV2AF01**
	Between GV2 and contactor LC1D09…D38 (1)	10	**GV2AF3**
	Between GV2 mounted on LAD311 and contactor LC1D09…D38	10	**GV2AF4**
Adapter plates	For mounting a GV2ME and contactor LC1D09…D38 with front faces aligned	1	**LAD311**
Height compensation plate	7.5 mm	10	**GV1F03**

(1) Ensures both the connection and a rigid support to the contactor. No extra fixing mean required.

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GV2AF02

Accessories

Description	Application	Sold in lots of	Unit reference
Adapter plates	For mounting a GV2 by screw fixing	10	**GV2AF02**
Motor starter adapter plate	For mounting a GV2 and a contactor LC1D09…D25. Item delivered with a GV1G02 flexible connection	1	**GK2AF01**
Flexible 3-pole connection for connecting a GV2 to a contactor LC1-D09…D25	Centre distance between mounting rails: 100…120 mm	10	**GV1G02**
Set of connections upstream/downstream	For connecting GV2ME to a printed circuit board	10	**GV2GA01**
Incoming line spacer for UL 508 Type E applications	For GV2P (except 32 A)	1	**GV2GH7**
Clip-in marker holders (supplied with each circuit breaker)	For GV2 P, GV2L, GV2LE and GV2RT (8 x 22 mm)	100	**LA9D92**

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GK2AF01

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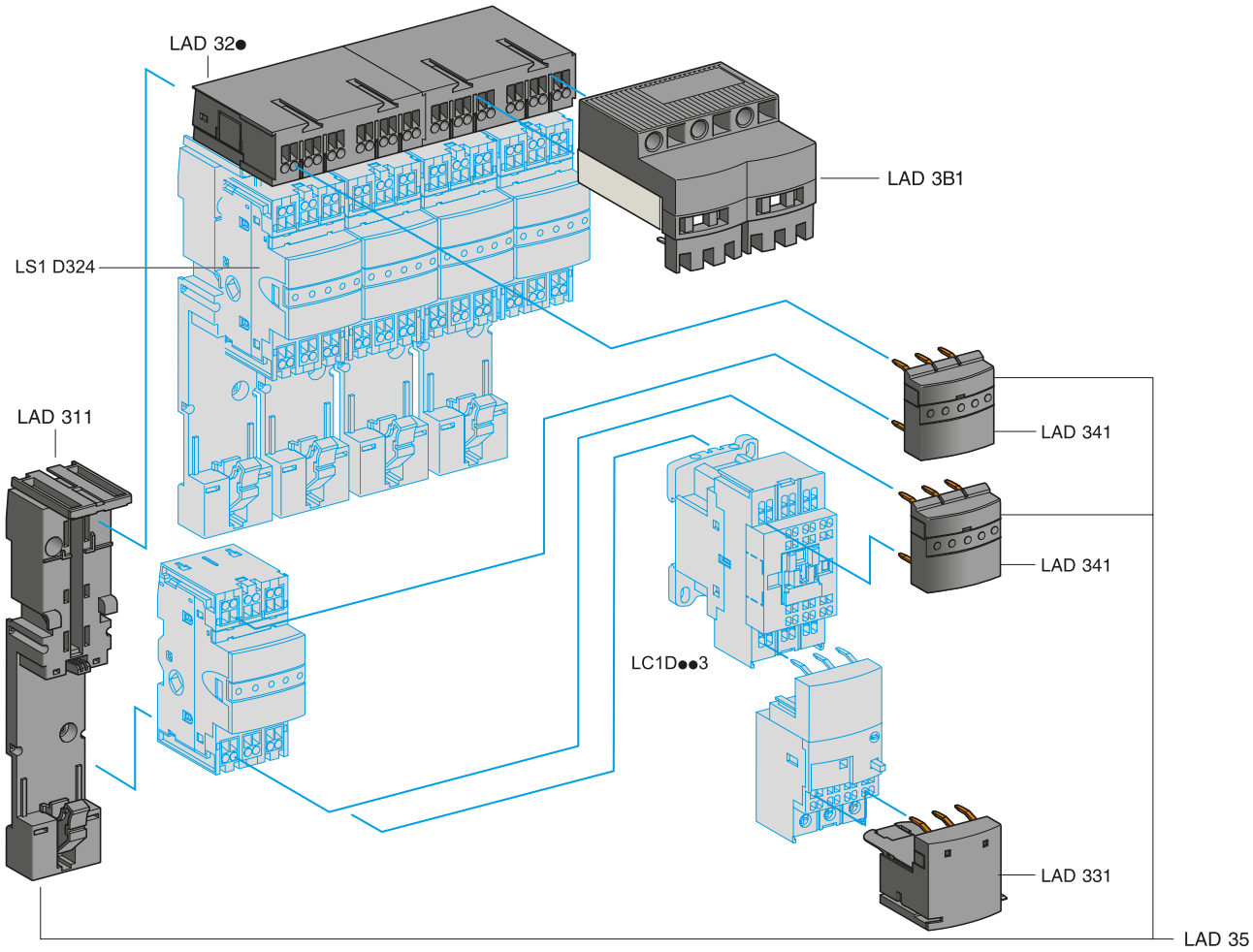


GV1G02 *GV2GA01*

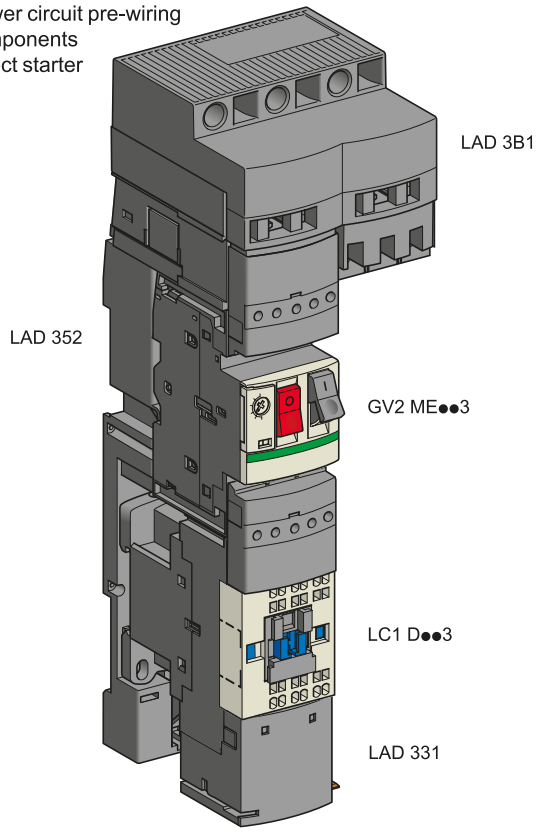
Dimensions:
page B2/15

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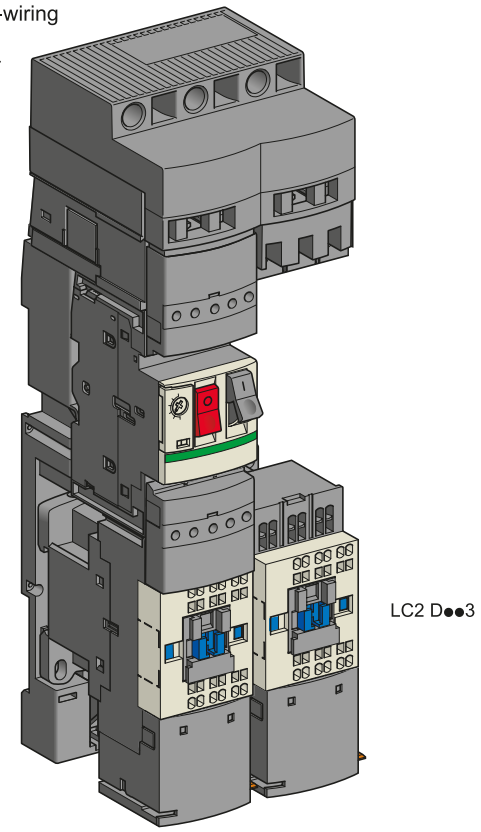
Group of fuse carriers + contactors mounted on adapter plates



Power circuit pre-wiring components
Direct starter



Power circuit pre-wiring components
Reversing starter



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Product references

This system is convenient when time and space savings are required.
The motor starter can be composed of:
- LS1D323 fuse carrier + LC1D contactor.
- GV2 circuit breaker + LC1D contactor



LAD3B1



LAD324

Upstream terminal and splitter blocks

Description	Maximum connection c.s.a.	Application	Sold in lots of	Reference
Upstream terminal block	16 mm² (1)	Power supply of 1 or 2 power splitter boxes	1	**LAD3B1**
Description	**Extension by**	**Number of starters**		**Reference**
Power splitter box, 60 A	LAD32●	2	1	**LAD322**
		4	1	**LAD324**



LAD311



LAD341

Assembling components

Description	Composition	Sold in lots of	Reference
Plate for mounting a GV2ME circuit breaker and a contactor	For 1 starter	10	**LAD311**
Power connection module	For 1 starter	10	**LAD341**
Power connection kit for direct starter (2)	1 plate LAD311 for GV2ME and 2 power connection modules LAD341		**LAD352**



LAD331

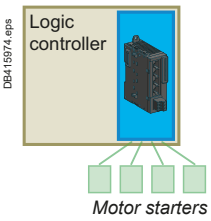
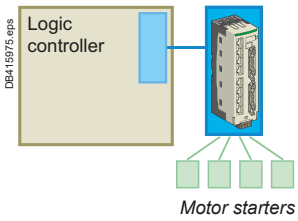
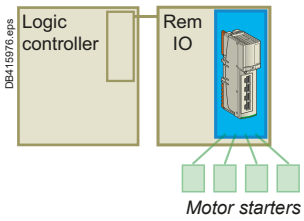
Downstream terminal and accessory

Description	Maximum connection c.s.a.	Application	Sold in lots of	Reference
Downstream terminal block	6 mm²	Connection of motor cables	10	**LAD331**
Cable end reducer	-	For connection of conductors from 1 to 1.5 mm²	20	**LAD99**

(1) Cables with one end pre-crimped are available to allow fast connection. References:
*1 set of 3 x 6 mm² cables (length 1 m: **LAD3B061**, length 2 m: **LAD3B062** and length 3 m: **LAD3B063**),*
*1 set of 3 x 10 mm² cables (length 1 m: **LAD3B101**, length 2 m: **LAD3B102** and length 3 m: **LAD3B103**),*
*1 set of 3 x 16 mm² cables (length 1 m: **LAD3B161**, length 2 m: **LAD3B162** and length 3 m: **LAD3B163**).*
*(2) To build a reversing starter, order 2 kits **LAD352**.*

Wiring systems

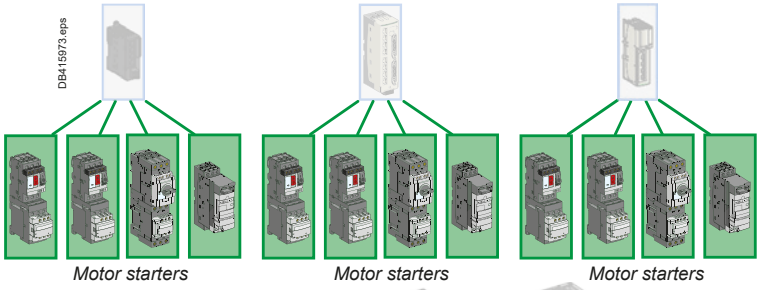
Dimensions:
page B2/14

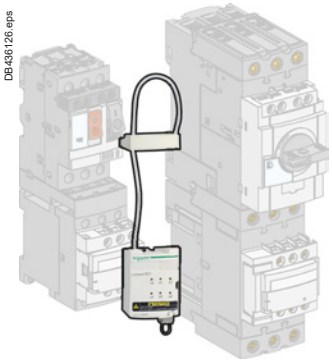
Product type	Connection interfaces for a group of motor starters		
IO system name	**Modicon TM3**	**Modicon Telefast**	**Modicon STB**
Architecture			
			
Application	Control of single or multiple motor-starters assemblies by mean of a logic controller. Machines or processes requiring easy, fast cabling and replacement of motor starters.		
Function	**IO module:** Ensures the direct connection of up to **4 motor starters** to logic controller (Modicon M221, M241, M251)	**Splitter box:** Ensures the connection of up to **8 motor starters** to a logic controller via Modicon Telefast multiwire cable	**IO module:** Ensures the connection of up to **4 motor starters** to a logic controller via an automation island (Modicon STB distributed IO architecture)
Upstream compatibility	With Modicon M221, M241, M251 logic controller, via logic controller internal bus	With any logic controller equipped with HE10 inputs/ outputs module	With Modicon STB automation island, via automation island internal bus
Upstream connectors	Backplane bus connector	HE10 connector	Backplane bus connector
Compatibility – **Motor circuit breaker - Type** / **Contactor - Type / Amp** / **Motor circuit breaker + Contactor - terminals**	All types of motor starters equiped with RJ45 connection system		
Motor control	Reversing / Non reversing		
Number of motor starters	**4**	**8**	**4**
Downstream connector type	RJ45		
Reference	**TM3XTYS4**	**LU9G02 / LU9G03**	**STBEPI2145K ***
Pages	Refer to Modicon M221/M241/ M251 catalogue	TeSys U - page B2/10 and A3/32	Refer to IP20 distributed IO Modicon STB catalogue

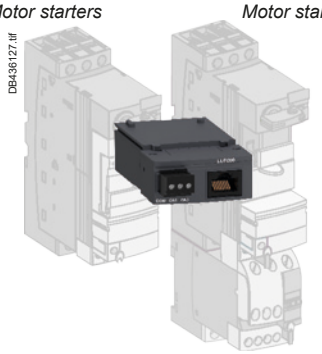
** STBEPI2145K: GV2 + contactor D09 to D32,* TeSys U *only.*

RJ45 connection components for motor starter

Common components for Modicon TM3, Modicon Telefast, Modicon STB systems



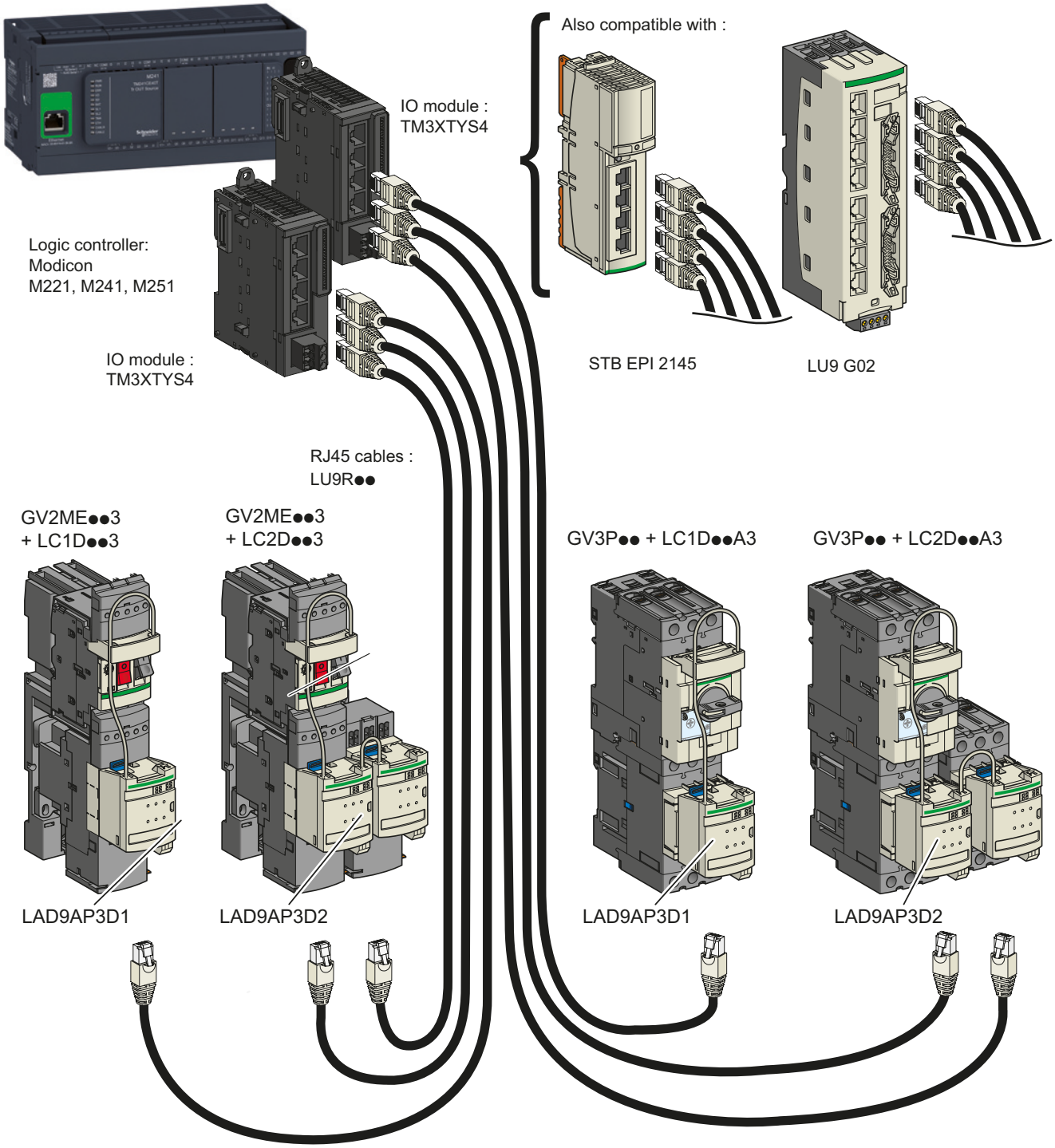




Connection module: ensures the compatibility of circuit breaker + contactor assemblies with spring terminals to the RJ45 connection system	**Connection module:** ensures the compatibility TeSys U motor starters to the RJ45 connection system
TM3XTYS4 / LU9G02 / LU9G03 / STBEPI2145K	
RJ45	
GV2ME / GV3P TeSys D: 9 to 32 A (GV2ME), 40 to 65 A (GV3P)	TeSys U 12 to 38 A
Spring	Screw-clamp
Non reversing / Reversing	Reversing or Non reversing
Plugin modules	Plugin module
LAD9AP3●●	**LUFC00**
B2/8	B2/10

Description

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PB114210.eps



LAD9AP3D1

PB114209.eps



LAD9AP3D2

PB108384.eps



LU9R●●

LAD9AP3●● Connection module for circuit breaker + contactors

"Plug and play", for single or reverse motor starters

The connection module ❶ + ❷ provides a simple and safe solution for wiring control and monitoring terminals of a motor starter assembly. The connections to the terminals are grouped on a single (direct starter) or double (reverse starter) RJ45 connector. Thus, liaison to an IO module or splitter box is ensured by a straight preconnectorized RJ45 cable (LU9R●●).

Remote control of contactor coil, of any voltage

■ The LAD9AP3● "Electromechanical" version is adapted for contactors with coil of any voltage, (12 to 230 V AC, or 5 to 130 V DC) thanks to an internal relay ensuring the voltage interfacing. An external control supply is needed.
■ The LAD9AP3D● "without relay" version is adapted for contactors with 24 V DC coil, the output voltage of the programmable logic controller IO or of the splitter box is directly applied to it.

Compatibility

■ TeSys GV2ME circuit breaker + TeSys D contactors ratings up to 18 A with spring type control terminals + LAD311 mounting plate + LAD341 power connection module.
■ TeSys GV3P circuit breaker + LC1D●●● contactors up to 65 A with spring type control terminals.

❶ Circuit breaker plug:
■ plugs directly into the auxiliary contacts terminals of a TeSys GV2ME or TeSys GV3P motor circuit breaker, in the location provided for the front-mounting block.

❷ and ❸ Contactor block:
The contactor block ensures the connection to the coil and auxiliary contacts of the contactor. 2 contactor blocks are linked for the reverse starter assembly. Each one is fitted with a RJ45 connector.
The mechanical locking onto the top and bottom of the contactor ensures a perfect connection, whatever the operating conditions (vibrations, knocks, etc.)

Control command pre-wiring components

Description	TeSys D coil voltage	Type of coil control relay	Type of starter	Reference
Control connection modules	∿ 12...250 V or ⎓ 5...130 V	Electromechanical	Direct	**LAD9AP31**
			Reversing	**LAD9AP32**
	⎓ 24 V	Without relay	Direct	**LAD9AP3D1**
			Reversing	**LAD9AP3D2**

Connection cable

Between the control connection module and the splitter box LU9G02 or STBEPI2145

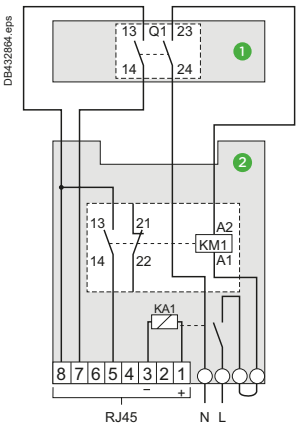
Connectors	Length (m)	Reference
2 x RJ45 connectors	0.3	**LU9R03**
	1	**LU9R10**
	3	**LU9R30**

Design / Installation

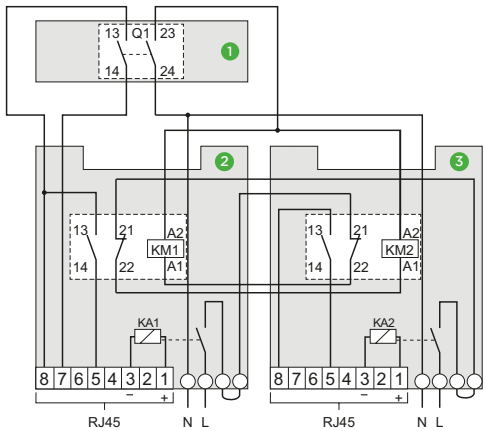
❶ Plug connected to circuit breaker auxiliary contacts
❷ ❸ Plug connected to contactor, to RJ45 and Aux. supply
1-3: 24 V DC control signal to the internal relay. It's contact sends the external source voltage to the contactor coil (KM1 or KM2).
7-8: circuit breaker status
5-8: contactor status
The external link (red) can be replaced by an Emergency Stop pushbutton.

Note: *GV2 circuit breaker + LC1D contactor assemblies must include the LAD311 back plate + LAD341 power connector.*

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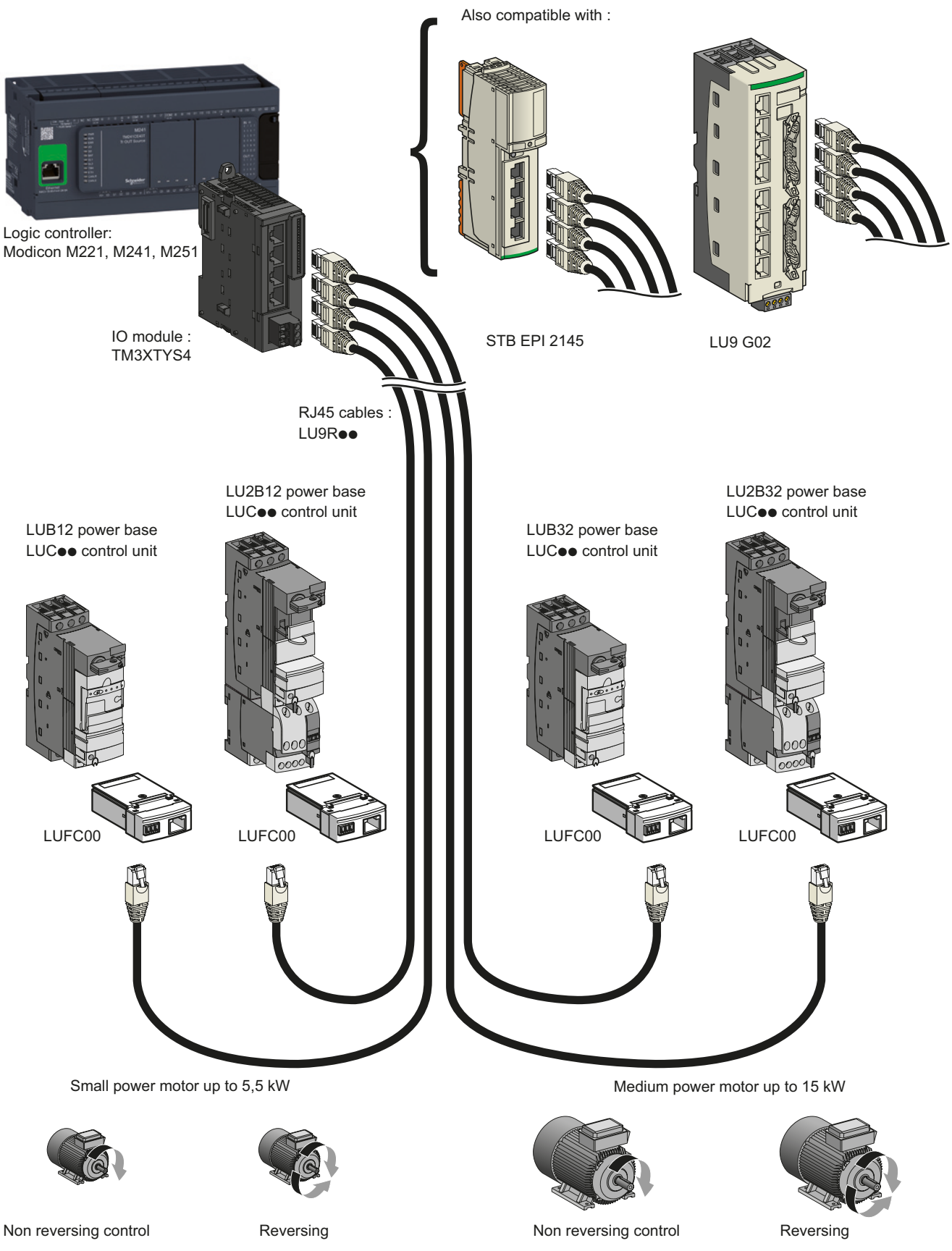
DB432865.eps



Introduction: page B2/16
Characteristics: page B2/17
Dimensions: pages B2/18 and B2/19

Description

DB417815.eps



"Plug and play", for single or reversing motor starters

The LUFC00 parallel connection module provides a simple and efficient solution for control and monitoring of a TeSys U direct or reverse motor starter.

Compact, fast cabling

The connection to the TeSys U power base is simply achieved by insertion of the module into it. The status and control signals are carried by a simple pre-connectorized RJ45 cable (LU9R●●) between an IO module or splitter box and TeSys U.

Features

■ On / OFF / Reverse control (functions non provided with LUB12, 32, 38 power bases).
■ Handle position, power contacts position monitoring (function provided with all power bases).

Compatibility

12, 32 or 38 A direct motor starters: LUB12, LUB32 or LUB38 power base + LUC●● control unit (coil code BL),
LUB120, LUB320 or LUB380 power base + LU9N11C connector + LUC●● control unit (coil code BL)

12, 32 or 38 A reversing motor starters: LU2B12, LU2B32 or LU2B38 power base + LU9MRC connector + LUC●● control unit (coil code BL).

PB121285.eps



LUFC00

PB121287.eps



LU9MRC

PB121286.eps



LU9BN11C

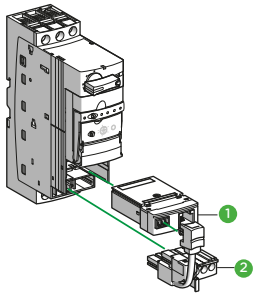
TeSys U **RJ45 connection module**	
Designation	**Commercial ref**
1 Parallel wiring module	**LUFC00**

TeSys U **coil connector**	
Designation	**Commercial ref**
2 Pre wired coil connector for LUB120, LUB320 or LUB380 power base	**LU9BN11C**
3 Pre wired coil connector for LU2B12, LU2B32 or LU2B38 power base	**LU9MRC**

Design / Installation

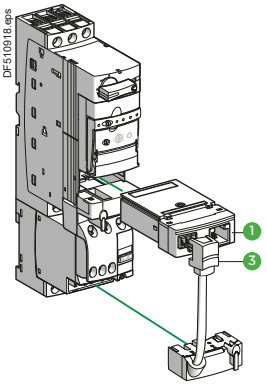
The LUFC00 parallel (RJ45) connection module acts as a connection interface for controlling the coil (except with LUB12, 32, 38) and the monitoring of the auxiliary contacts. As a necessary complement, a pre wired connector is needed for carrying the signal to the coil and collecting:
■ the status of the protection device (OK / Alarm) with LU9BN11C,
■ the electrical interlock contacts with LU9MRC.
As the "reversing" is higher than the "direct" power base, the LU9MRC link is longer than the LU9BN11C.

DF566964.eps



Direct motor starter (LUB120, 320, 380 power base).

DF510918.eps



Reversing motor starter (LU2B12, 32, 38 power base).

TeSys GV, LAD, U

Technical Data for Designers

Contents

Power wiring systems for motor starter assemblies:
> Dimensions (GV2 + LAD311 assembly)..... B2/14
> Dimensions (GV2G●●● busbars) B2/15

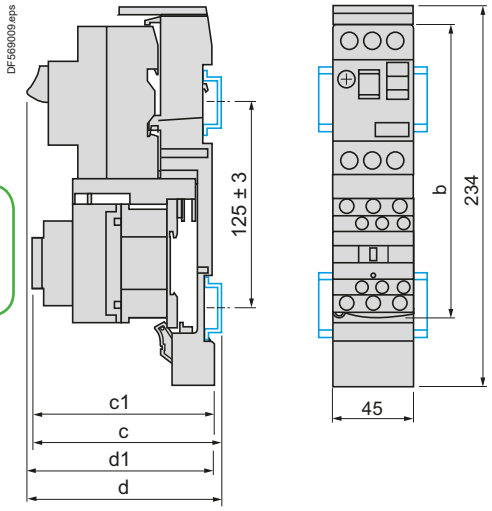
Power + Control wiring systems for motor starter assemblies:
> Introduction..... B2/16
> Characteristics..... B2/17
> Dimensions B2/18

IO module, splitter box, for motor starters control circuits
> Dimensions B2/19

Dimensions

GV2AF4 + LAD311

Combination GV2ME + TeSys D contactor



GV2ME +	LC1D09…D18	LC1D25 and D32
b	176.4	186.8
c1	103.1	136.4
c	135.6	141.9
d1	107	107
d	112.5	112.5

7.5 mm height compensation plate GV1F03



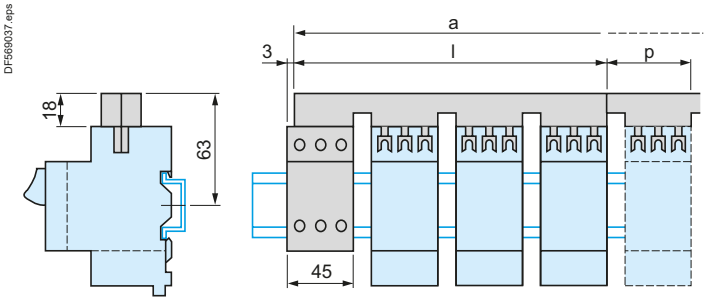
Wiring systems
Ref.

References:
page B2/5

Dimensions

GV2ME, GV2P, GV2L and GV2LE

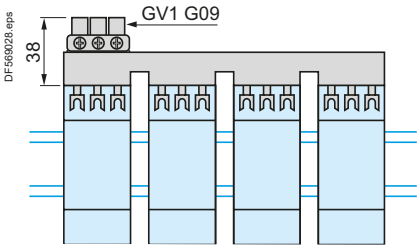
Sets of busbars GV2G445, GV2G454, GV2G472, with terminal block GV2G05



	l	p
GV2G445 (4 x 45 mm)	179	45
GV2G454 (4 x 54 mm)	206	54
GV2G472 (4 x 72 mm)	260	72

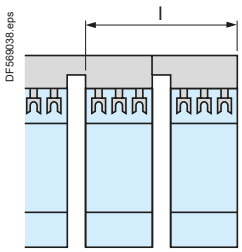
	a			
Number of tap-offs	**5**	**6**	**7**	**8**
GV2G445	224	269	314	359
GV2G454	260	314	368	422
GV2G472	332	404	476	548

Sets of busbars GV2G●●● with terminal block GV1G09

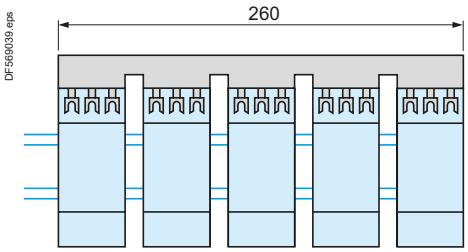


	l
GV2G245 (2 x 45 mm)	89
GV2G254 (2 x 54 mm)	98
GV2G272 (2 x 72 mm)	116

Sets of busbars GV2G245, GV2G254, GV2G272

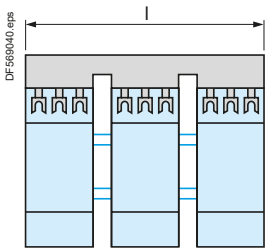


Sets of busbars GV2G554



	l
GV2G345 (3 x 45 mm)	134
GV2G354 (3 x 54 mm)	152

Sets of busbars GV2G345 and GV2G354

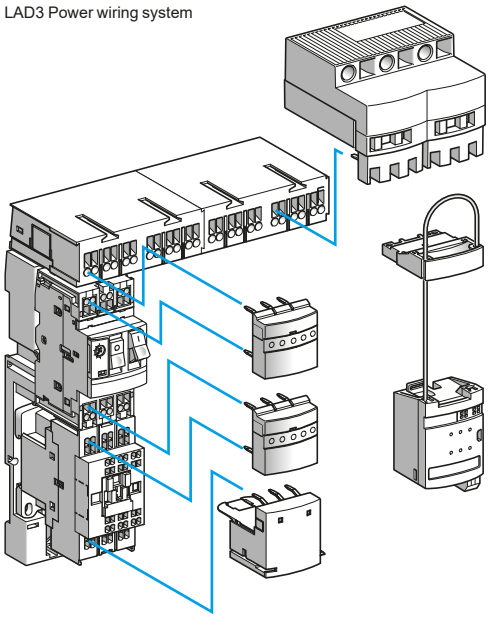


References:
page B2/3

Introduction

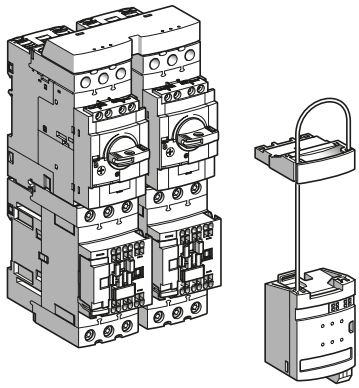
LAD3 Power wiring system

DF510533.eps



Motor starter with GV2ME circuit breakers

LAD9AP3D1 RJ45 control wiring module



DF503981.eps

Motor starter with GV3P circuit breakers

LAD9AP3D1 RJ45 control wiring module

It is a modular system which standardises and simplifies setting up of motor starters with its pre-wired control and power circuits.
Installation of a motor starter is therefore quick, simple, safe and flexible. In addition, this system:
- enables the motor starter to be customised at a later date,
- reduces maintenance time and
- optimises panel space by reducing the number of terminals and intermediate interfaces and the amount of ducting.

Wiring system for motor starters with spring terminals

Motor starters with TeSys GV2ME circuit breakers

- From 0 to 18 A max.,
- TeSys GV2ME circuit breakers combined with LC1D contactors from 9 to 25 A (spring terminal version),
- Pre-wired power and control connections.

Motor starters with TeSys GV3P circuit breakers

- From 9 to 65 A max.,
- TeSys GV3P circuit breakers combined with LC1D contactors from 40 to 65 A (spring terminal version),
- Pre-wired control connections only,
- For pre-wired power connections, use busbar sets from the TeSys D 40 to 65 A contactor range (see chapter B8).

This range comprises pre-wiring components for:
- the power circuits,
- the control circuits.

Power circuit pre-wiring components
(motor starters with TeSys GV2 circuit breakers only)

- **a power circuit connection kit** comprising, for each starter, a plate for mounting the contactor and the circuit breaker and two power connection modules,
- **a power splitter box** for 2 or 4 starters,
- **an upstream terminal block** for a power supply up to 60 A (16 mm^2),
- **an outgoing terminal block** for connection of the motor power supply cables and the earth cables (6 mm^2).

Note: *with GV3 circuit breakers, no accessories are required for pre-wiring of the power circuit. The GV3P●● outgoing terminal block can be removed.*
This circuit breaker is also sold with only one terminal block (reference: GV3P●●1).

Control circuit pre-wiring components
(motor starters with TeSys GV2 and GV3 circuit breakers)

- **a control circuit connection module** which plugs directly into the contactor and the circuit breaker on each starter. This module incorporates status and control data for this motor starter.
- **a parallel wiring module** which concentrates the data of each motor starter:
  - **HE10** connector, for centralised applications. Data is transmitted to the PLC via the Advantys Telefast pre-wired system.
  - **STB**, designed for decentralised automation architectures. This module is suitable for use in an Advantys STB configuration for connection to the PLC via a field bus.

References: page B2/9
Characteristics: page B2/17
Dimensions: pages B2/18 and B2/19

Characteristics

General environment

Type of control connection module				LAD9AP3●●
Standard				IEC 60439-1
Certifications				UL, CSA
Degree of protection		Conforming to IEC 60529		IP 40 (mounted assembly)
Resistance to incandescent wire		Conforming to IEC 60695-2-1	°C	960
Shock resistance		Conforming to IEC 60068-2-27		11 ms and 15 gn (half sine wave)
Vibration resistance		Conforming to IEC 60068-2-6 and BV/LR	gn	2…100 Hz: 4 and 3…100 Hz: 0.7
Resistance to electrostatic discharge		Conforming to IEC 61000-4-2		Level 3
Resistance to radiated fields		Conforming to IEC 61000-4-3	V/m	10 (26…1000 MHz)
Immunity to fast transient currents		Conforming to IEC 61000-4-4		Level 3
Surge withstand		Conforming to IEC 61000-4-5	kV	2 in common mode, 0.6 in differential mode Wave form: 1.2/50 µs - 8/20 µs
Immunity to radioelectric fields		Conforming to IEC 61000-4-6	V	10 (0.15...80 MHz)
Ambient air temperature		Operation in floor-standing enclosure	°C	-5…+60
		Operation in wall-mounted enclosure	°C	-5…+40
		Storage	°C	-40…+70
Space required around mounted assembly		For inserting cables and heat dissipation	mm	> 30
Degree of pollution				3
Assembly fixing (with TeSys GV2 circuit breakers only)				On 2 x 35 mm rails or with 2 x Ø5.5 mm screws on plate for GV2ME
Suitable wire c.s.a.	Voltage supply for power	Number of wires		3
		Flexible cable with cable end	mm²	16
		Flexible cable without cable end	mm²	25
		Solid cable	mm²	25
	Voltage supply for contactor coil control	Number of wires		2
		Flexible cable with cable end (max)	mm²	1.5
		Flexible cable without cable end (max)	mm²	2.5
		Solid cable (max)	mm²	2.5

3-phase power circuit characteristics

Maximum current	Per power supply	Conforming to IEC 60439-1	A	60 (single power supply to one or more sub-bases or splitter boxes)
	Per sub-base	Conforming to IEC 60439-1	A	60
GV2 operating limit				80 % of Imax at 60 °C ambient temperature (see table on opposite page)
Maximum current per starter			A	18 (with an empty slot between two starters)
Insulation voltage			V	750
Operational voltage			V	690
U imp			kV	6
Rated operational frequency			Hz	50-60
Rated short-circuit current conditional Isc at 415 V		Conforming to IEC 60439-1	kA	50
Permissible short-time rating Icw		Conforming to IEC 60439-1	kA	9.1 (for 70 ms)

Control circuit characteristics

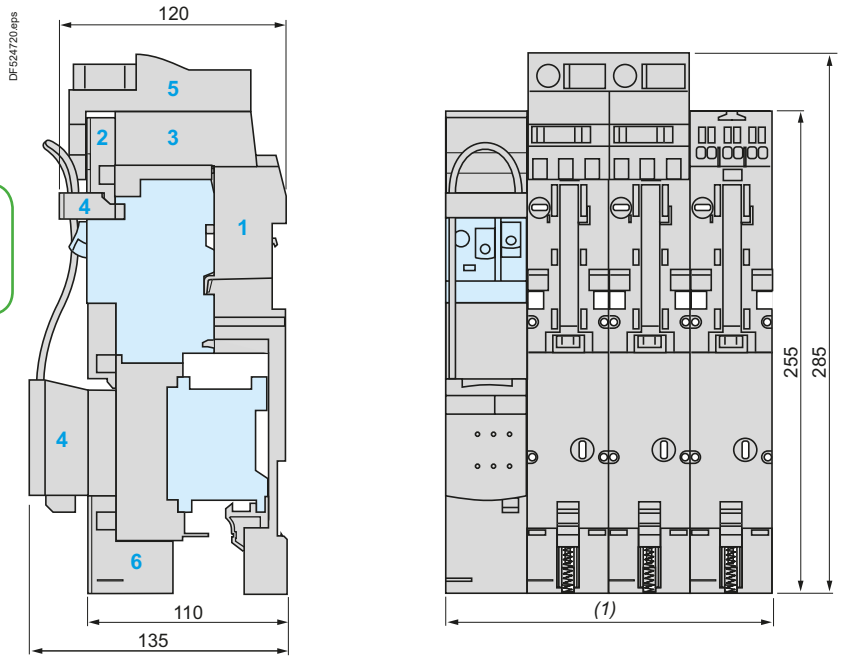
Contactor coil control voltage	V	∼ 12…250 (with interface relay)
	V	⎓ 5…24 (without interface relay)
	V	⎓ 5…130 (with interface relay)

References: page B2/9
Introduction: page B2/16
Dimensions: pages B2/18 and B2/19

Dimensions

TeSys LAD3 Power + LAD9 Control wiring systems for spring terminals

Mounted assembly, with TeSys GV2ME circuit breakers and TeSys D contactors



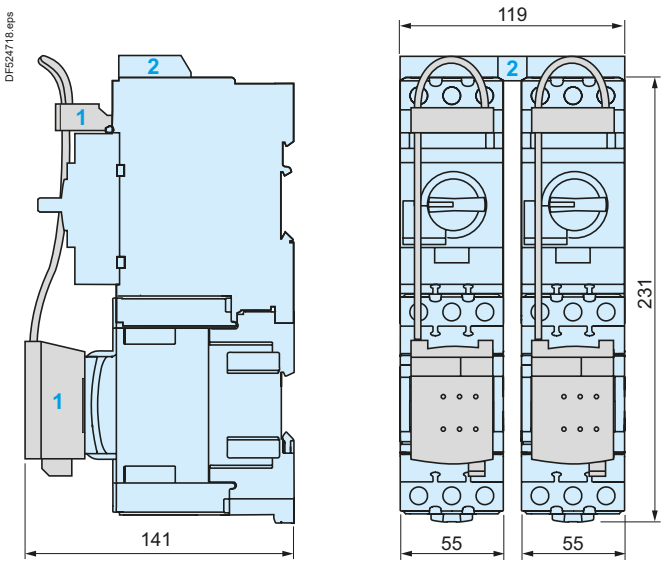
1 Circuit breaker and contactor support plate
2 Power connection module
3 Power splitter box
4 Control splitter box
5 Upstream terminal block
6 Outgoing terminal block

(1) 2 starters: 90 mm, 4 starters: 180 mm, 8 starters: 360 mm.

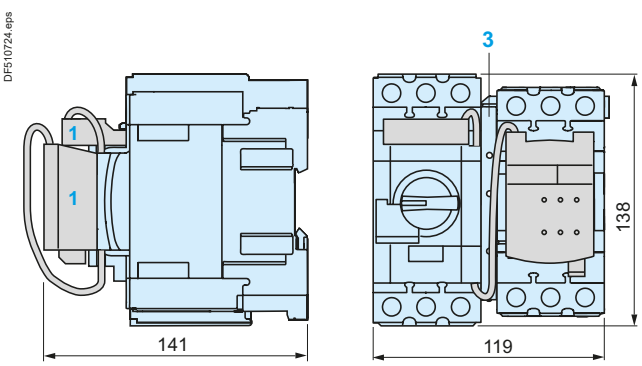
LAD9 Control wiring systems for spring terminals

Mounted assembly with TeSys GV3P circuit breakers and TeSys D contactors (LC1D40A3… LC1D65A3)

Vertical mounting



Side by side mounting



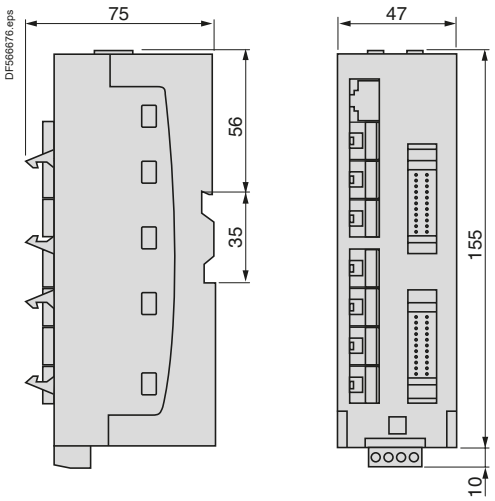
1 Control splitter box
2 Set of GV3 G264 busbars
3 Set of S-shape busbars GV3S

References: page B2/9
Introduction: page B2/16
Characteristics: page B2/17

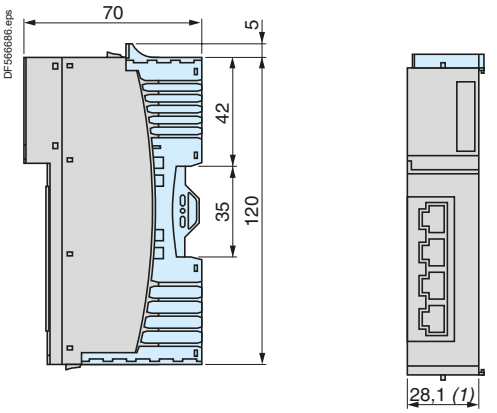
Dimensions

Parallel RJ45 wiring modules

Splitter box LU9G02



Parallel wiring module Advantys STBEPI2145



*(1) Dimension to be multiplied by the number of **STBEPI2145** modules present in the configuration.*

Wiring systems
Ref.

TeSys Vario
Switch-disconnectors

Door mounting isolation switch - Mini-Vario - Vario

Type of product	Range		Pages
Switch-disconnectors Mini-Vario	Up to 12 or 20 A		B3/2
Switch-disconnectors, high performance applications Vario	From 12 to 175 A		B3/6
Accessories Mini-Vario and Vario			B3/8

Technical Data for Designers B3/17

PB121292.eps



VCDN20

PB121293.eps



VCCDN20

PB119284.eps



VBDN20

TeSys Mini-Vario Switch-disconnectors for standard applications

- 3-pole rotary switch-disconnectors, 12 to 20 A
- Marking on operator O I.
- Padlockable operating handle (padlocks not supplied).
- Degree of protection IP 65.

Main and Emergency stop switch-disconnectors for door mounting

Operator			Ith	Reference
Handle	Front plate	Fixing		
	mm	mm	A	
Red, padlockable with up to 3 padlocks (Ø4 to Ø8)	Yellow 60 x 60	Ø22.5	12	**VCDN12**
			20	**VCDN20**

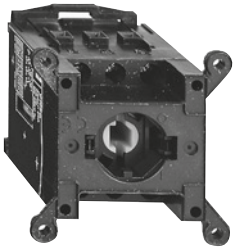
Main and Emergency stop switch-disconnectors for mounting at back of an enclosure (1)

Operator			Ith	Reference
Handle	Front plate	Fixing		
	mm	mm	A	
Red, padlockable with up to 3 padlocks (Ø4 to Ø8)	Yellow 60 x 60	Ø22.5	12	**VCCDN12**
			20	**VCCDN20**

Main switch-disconnectors for door mounting

Operator			Ith	Reference
Handle	Front plate	Fixing		
	mm	mm	A	
Black, padlockable with up to 3 padlocks (Ø4 to Ø8)	Black 60 x 60	Ø22.5	12	**VBDN12**
			20	**VBDN20**

(1) Switches supplied with a shaft extension **VZN17** *and a door interlock plate* **KZ32** *(see page B3/5).*

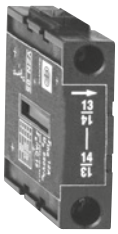
812801.tif

VN20

580586.tif

VZN11

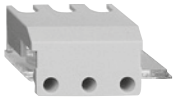
580587.tif

VZN14

580588.tif

VZN05

812805.tif

VZN26

812806.tif

VZN08

TeSys Mini-Vario Switch-disconnectors for standard applications

Switch bodies

Description	Rating A	Reference
3-pole switch-disconnectors	12	**VN12**
	20	**VN20**

Add-on modules

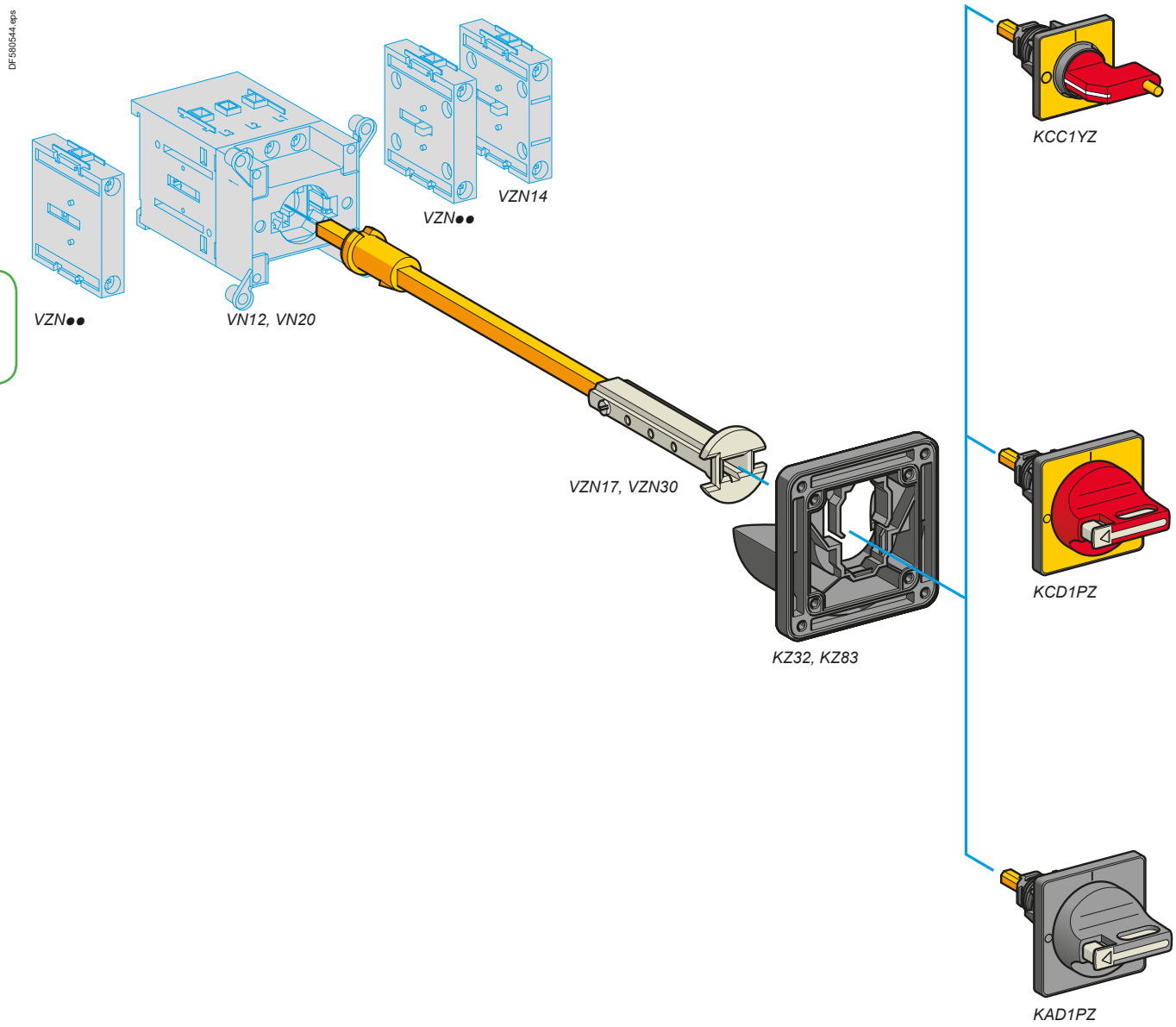
Description	Rating A	Reference
Main pole modules	12	**VZN12**
	20	**VZN20**
Neutral pole module with early make and late break contacts	12 and 20	**VZN11**
Earthing module	12 and 20	**VZN14**
Auxiliary contact block modules	1 N/O late make contact	**VZN05**
	1 N/C early break contact	**VZN06**
Input terminal protection shrouds	For add-on pole modules or auxiliary contact block modules (single-pole shroud)	**VZN26**
	For switch bodies (3-pole shroud)	**VZN08**

Maximum number of add-on modules that can be fitted on a switch body

VZN12 or VZN20	+	**VN12**	+	VZN12 or VZN20
				or
or		**or**		VZN11 + VZN14
		VN20		or
VZN05 or VZN06				VZN05 or VZN06

Switch-disconnectors

Characteristics: pages B3/18 to B3/21
Dimensions: pages B3/22 and B3/23
Schemes: page B3/23


DF580544.eps
VZN●●
VN12, VN20
VZN●●
VZN14
VZN17, VZN30
KZ32, KZ83
KCC1YZ
KCD1PZ
KAD1PZ

TeSys Mini-Vario Switch-disconnectors for standard applications

- Degree of protection IP 65.
- Marking on operator .
- Padlockable operating handle (padlocks not supplied).
- Operator fixing by 1 Ø22.5 hole; for other operators see pages B3/11 and B3/13.
- For other accessories and empty enclosures, see pages B3/14, B3/15 and chapter A1.

Operators for main and Emergency stop switch-disconnectors

Handle	Front plate mm	Reference
Red, padlockable with 1 padlock (Ø4 to Ø6)	Yellow 45 x 45	**KCC1YZ**
Red, padlockable with up to 3 padlocks (Ø4 to Ø8)	Yellow 60 x 60	**KCD1PZ**

Operators for main switch-disconnectors

Handle	Front plate mm	Reference
Black, padlockable with up to 3 padlocks (Ø4 to Ø8)	Black 60 x 60	**KAD1PZ**

Accessories for door interlocking

For rear fixing switch-disconnectors mounted at the back of an enclosure, in addition to a direct operator

Description	Front plate	Distance enclosure back/door	Sold in lots of	Unit reference
	mm	mm		
Shaft extensions	–	300…330	1	**VZN17**
		400…430	1	**VZN30**
Door interlock plate	45 x 45 or 60 x 60	–	5	**KZ32**
Plate for door mounting	45 x 45 or 60 x 60	–	5	**KZ83**

Switch-disconnectors

Characteristics: pages B3/18 to B3/21
Dimensions: pages B3/22 and B3/23
Schemes: page B3/23

PB121294.eps



VCF0

PB121295.eps



VCF5

PB121296.eps



VCCF0

TeSys Vario Switch-disconnectors for high performance applications

- 3-pole rotary switch-disconnectors, 12 to 175 A
- Marking on operator ○ |.
- Padlockable operating handle (padlocks not supplied).
- Degree of protection IP 65.

Main and Emergency stop switch-disconnectors for door mounting

Handle	Front plate mm	Fixing	Rating A	Reference	Weight kg
Red, padlockable with up to 3 padlocks (Ø4 to Ø8)	Yellow 60 x 60	Ø22.5	12	**VCD02**	0.215
			20	**VCD01**	0.215
			25	**VCD0**	0.215
			32	**VCD1**	0.215
			40	**VCD2**	0.215
		4 screws	12	**VCF02**	0.250
			20	**VCF01**	0.250
			25	**VCF0**	0.250
			32	**VCF1**	0.250
			40	**VCF2**	0.250
			63	**VCF3**	0.560
			80	**VCF4**	0.560
Red, long, padlockable with up to 3 padlocks (Ø4 to Ø8)	Yellow 90 x 90	4 screws	125	**VCF5**	1.200
			175	**VCF6**	1.200

Main and Emergency stop switch-disconnectors for mounting at back of an enclosure (1)

Handle	Front plate mm	Fixing	Rating A	Reference	Weight kg
Red, padlockable with up to 3 padlocks (Ø4 to Ø8)	Yellow 60 x 60	Ø22.5	12	**VCCD02**	0.392
			20	**VCCD01**	0.392
			25	**VCCD0**	0.392
			32	**VCCD1**	0.392
			40	**VCCD2**	0.392
		4 screws	12	**VCCF02**	0.527
			20	**VCCF01**	0.527
			25	**VCCF0**	0.527
			32	**VCCF1**	0.527
			40	**VCCF2**	0.527
			63	**VCCF3**	0.440
			80	**VCCF4**	0.680
Red, long, padlockable with up to 3 padlocks (Ø4 to Ø8)	Yellow 90 x 90	4 screws	125	**VCCF5**	1.320
			175	**VCCF6**	1.320

*(1) Unit supplied with a shaft extension **VZN17** or **VZ18** and a door interlock plate **KZ32** or **KZ74** (see page B3/14).*

Characteristics: pages B3/18 to B3/21
Dimensions: pages B3/24 and B3/25
Schemes: page B3/25

PB121515.eps



VBD01

PB119275.eps



VBF4

PB121298.eps



VVE1

TeSys Vario Switch-disconnectors for high performance applications

- 3-pole rotary switch-disconnectors, 12 to 175 A
- Marking on operator ○╵.
- Padlockable operating handle (padlocks not supplied).
- Degree of protection IP 65.

Main switch-disconnectors for door mounting

Handle	Front plate mm	Fixing	Rating A	Reference	Weight kg
Black, padlockable with up to 3 padlocks (Ø4 to Ø8)	Black 60 x 60	Ø22.5	12	**VBD02**	0.215
			20	**VBD01**	0.215
			25	**VBD0**	0.215
			32	**VBD1**	0.215
			40	**VBD2**	0.215
		4 screws	12	**VBF02**	0.250
			20	**VBF01**	0.250
			25	**VBF0**	0.250
			32	**VBF1**	0.250
			40	**VBF2**	0.250
			63	**VBF3**	0.560
			80	**VBF4**	0.560
Black, long, padlockable with up to 3 padlocks (Ø4 to Ø8)	Black 90 x 90	4 screws	125	**VBF5**	1.200
			175	**VBF6**	1.200

Main and Emergency stop switch-disconnectors

For mounting in an enclosure or for modular distribution boards

Handle	Front plate mm	Fixing	Rating A	Reference	Weight kg
Red, padlockable with 1 padlock (Ø4 to Ø6)	Yellow 45 x 45	4 screws	25	**VVE0**	0.250
			32	**VVE1**	0.250
			40	**VVE2**	0.250
			63	**VVE3**	0.530
			80	**VVE4**	0.530

Main switch-disconnectors

For mounting in an enclosure or for modular distribution boards

Handle	Front plate mm	Fixing	Rating A	Reference	Weight kg
Black, not padlockable	Black 45 x 45	4 screws	25	**VVD0**	0.250
			32	**VVD1**	0.250
			40	**VVD2**	0.250
			63	**VVD3**	0.560
			80	**VVD4**	0.560

Characteristics: pages B3/18 to B3/21
Dimensions: pages B3/24 and B3/25
Schemes: page B3/25

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V5

580537.tif



VZ0

580538.tif



VZ11

580539.tif



VZ15

580540.tif



VZ20

TeSys Vario Switch-disconnectors for high performance applications

Switch bodies

Description	Rating A	Reference
3-pole switch-disconnectors (1)	12	**V02**
	20	**V01**
	25	**V0**
	32	**V1**
	40	**V2**
	63	**V3**
	80	**V4**
	125	**V5**
	175	**V6**

Add-on modules

Description	Rating A	Reference
Main pole modules	12	**VZ02**
	20	**VZ01**
	25	**VZ0**
	32	**VZ1**
	40	**VZ2**
	63	**VZ3**
	80	**VZ4**
Neutral pole modules with early make and late break contacts (1)	12 to 40	**VZ11**
	63 to 80	**VZ12**
	125 and 175	**VZ13**
Earthing modules	12 to 40	**VZ14**
	63 and 80	**VZ15**
	125 and 175	**VZ16**

Auxiliary contact block modules

Description	Type	Reference
Auxiliary contact block modules with 2 auxiliary contacts	N/O + N/C (2)	**VZ7**
	N/O + N/O	**VZ20**

(1) Protection shrouds are available if required: see page B3/14.
(2) Late make N/O, early break N/C contacts

TeSys Vario Switch-disconnectors for high performance applications

Maximum number of add-on modules that can be fitted on a switch body

1 add-on module on each side of the switch body

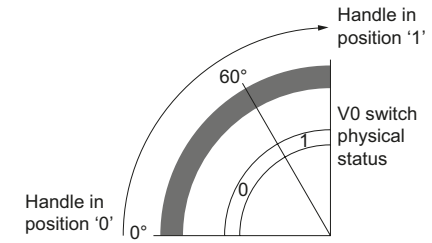
VZ7 or VZ20	+	**V0●**	+	VZ7 or VZ20	VZ7	+	**V5**	+ VZ7
or				or	or			or
VZ11 or VZ12	+	**V0**	+	VZ11 or VZ12	VZ20	+	**or**	+ VZ20
or		**to**		or	or			or
VZ14 or VZ15	+		+	VZ14 or VZ15	VZ13	+	**V6**	+ VZ13
or		**V4**		or	or			or
VZ0●/VZ0 to VZ4	+		+	VZ0●/VZ0 to VZ4	VZ16	+		+ VZ16

2 add-on modules on each side of the switch body

VZ0●	+	VZ0●	+	**V0●**	+	VZ0●	+	VZ7	or	VZ20	or	VZ11	or	VZ14
VZ0	+	VZ0	+	**V0**	+	VZ0	+	VZ7	or	VZ20	or	VZ11	or	VZ14
VZ1	+	VZ1	+	**V1**	+	VZ1	+	VZ7	or	VZ20	or	VZ11	or	VZ14
VZ2	+	VZ2	+	**V2**	+	VZ2	+	VZ7	or	VZ20	or	VZ11	or	VZ14
VZ3	+	VZ3	+	**V3**	+	VZ3	+	VZ7	or	VZ20	or	VZ12	or	VZ15
VZ4	+	VZ4	+	**V4**	+	VZ4	+	VZ7	or	VZ20	or	VZ12	or	VZ15

Note: *The add-on modules mounted next to the switch body are main pole modules. Maximum of 3 main pole modules per switch body.*

Auxiliary switch switching angles

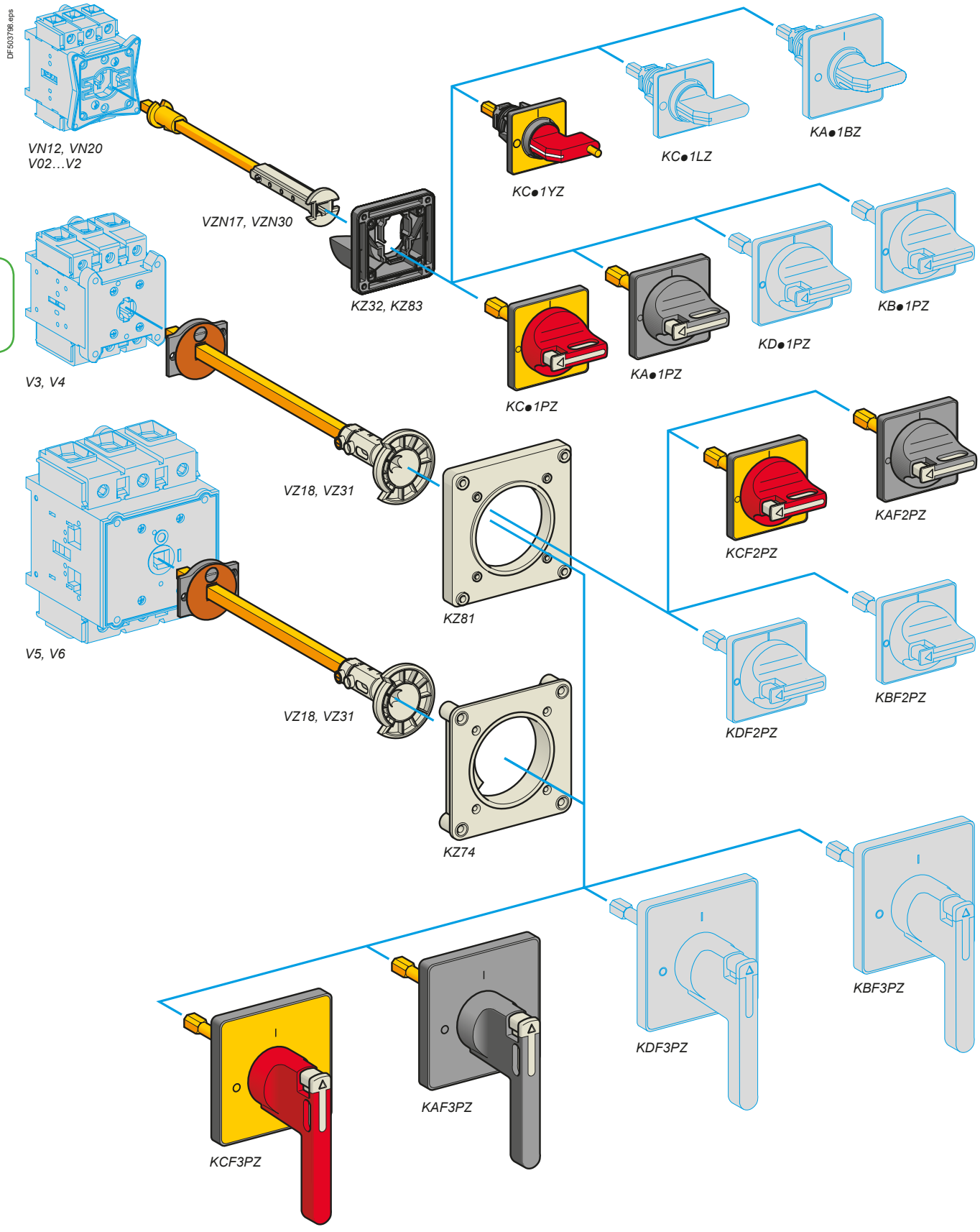


Switching angle representation - example with V0 switch

0: contact open 1: contact close

Handle travel 0 > 1		0°	30°	60°	90°
3-pole switch-disconnectors V02 / V01 / V0 / V1 / V2 / V3 / V4 / V5 / V6				60°	
			0		1
Main pole modules VZ02 / VZ01 / VZ0 / VZ1 / VZ2 / VZ3 / VZ4				60°	
			0		1
Neutral pole modules with early make and late break contacts VZ11 / VZ12 / VZ13				45°	
			0		1
Auxiliary contact block modules with 2 auxiliary contacts (N/0+N/C) VZ7					75°
Late make N0 and earlier break NC	N/0		0		1
(Early break N0 and late make NC for travel 1-0)	N/C	1		0	
			20°		
Auxiliary contact block modules with 2 auxiliary contacts (N/0+N/C) VZ20				60°	
			0		1
			0		1
				60°	

Characteristics: pages B3/18 to B3/21
Dimensions: pages B3/24 and B3/25
Schemes: page B3/25


DF503798.eps
VN12, VN20
V02…V2
VZN17, VZN30
KZ32, KZ83
KC●1YZ
KC●1LZ
KA●1BZ
V3, V4
KC●1PZ
KA●1PZ
KD●1PZ
KB●1PZ
VZ18, VZ31
KZ81
KCF2PZ
KAF2PZ
V5, V6
VZ18, VZ31
KDF2PZ
KBF2PZ
KZ74
KCF3PZ
KAF3PZ
KDF3PZ
KBF3PZ

- Marking on operator .
- Padlockable operating handle (padlocks not supplied).
- Degree of protection IP 65.

Handles and front plates for main and Emergency stop switch-disconnectors

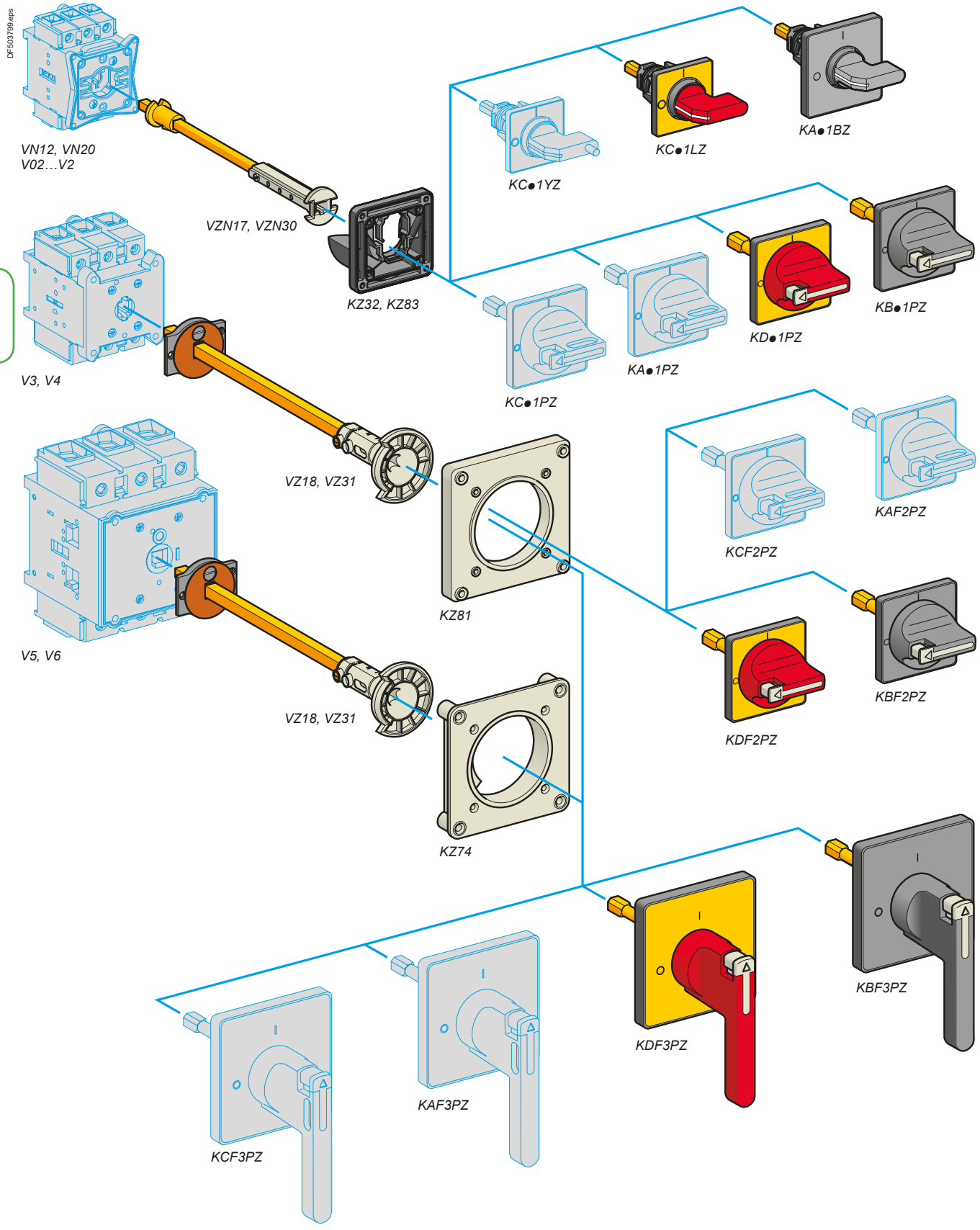
For switch body	Operator			Reference
	Handle	Front plate		
		Dimensions	Fixing	
		mm		
VN12, VN20 V02…V2	Red, padlockable with 1 padlock (Ø4 to Ø6)	Yellow 45 x 45	Ø22.5	**KCC1YZ**
			4 screws	**KCE1YZ**
	Red, padlockable with up to 3 padlocks (Ø4 to Ø8)	Yellow 60 x 60	Ø22.5	**KCD1PZ**
			4 screws	**KCF1PZ**
V3 and V4	Red, padlockable with up to 3 padlocks (Ø4 to Ø8)	Yellow 60 x 60	4 screws	**KCF2PZ**
V5 and V6	Red, long, padlockable with up to 3 padlocks (Ø4 to Ø8)	Yellow 90 x 90	4 screws	**KCF3PZ** (1)

Handles and front plates for main switch-disconnectors

For switch body	Operator			Reference
	Handle	Front plate		
		Dimensions	Fixing	
		mm		
VN12, VN20 V02…V2	Black, padlockable with up to 3 padlocks (Ø4 to Ø8)	Black 60 x 60	Ø22.5	**KAD1PZ**
			4 screws	**KAF1PZ**
V3 and V4	Black, padlockable with up to 3 padlocks (Ø4 to Ø8)	Black 60 x 60	4 screws	**KAF2PZ**
V5 and V6	Black, long, padlockable with up to 3 padlocks (Ø4 to Ø8)	Black 90 x 90	4 screws	**KAF3PZ** (1)

*(1) For door mounting of 63 and 80 A switch-disconnectors, adapter plate **KZ106** must be ordered separately (see page B3/14).*

Characteristics: pages B3/18 to B3/21
Dimensions: pages B3/24 and B3/25
Schemes: page B3/25



Life Is On Schneider Electric

- Marking on operator .
- Degree of protection IP 65.

Handles and front plates for Emergency stop switch-disconnectors

For switch body	Operator			Reference
	Handle	Front plate		
		Dimensions	Fixing	
		mm		
VN12, VN20 V02…V2	Red, not padlockable	Yellow 45 x 45	Ø22.5	**KCC1LZ**
			4 screws	**KCE1LZ**
		Yellow 60 x 60	Ø22.5	**KDD1PZ**
			4 screws	**KDF1PZ**
V3 and V4	Red, long, not padlockable	Yellow 60 x 60	4 screws	**KDF2PZ**
V5 and V6	Red, long, not padlockable	Yellow 90 x 90	4 screws	**KDF3PZ** (1)

Handles and front plates for switch-disconnectors

For switch body	Operator			Reference
	Handle	Front plate		
		Dimensions	Fixing	
		mm		
VN12, VN20 V02…V2	Black, not padlockable	Black 45 x 45	Ø22.5	**KAC1BZ**
			4 screws	**KAE1BZ**
		Black 60 x 60	Ø22.5	**KBD1PZ**
			4 screws	**KBF1PZ**
V3 and V4	Black, not padlockable	Black 60 x 60	4 screws	**KBF2PZ**
V5 and V6	Black, not padlockable	Black 90 x 90	4 screws	**KBF3PZ** (1)

*(1) For door mounting of 63 and 80 A switch-disconnectors, adapter plate **KZ106** must be ordered separately (see next page).*

Characteristics: pages B3/18 to B3/21
Dimensions: pages B3/24 and B3/25
Schemes: page B3/25

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VZ8

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VZ26

580584.tif



VZ29

Input terminal protection shrouds

Description	For use on	Reference
For switch bodies (3-pole shroud)	V02…V2	**VZ8**
	V3 and V4	**VZ9**
	V5 and V6	**VZ10**
For add-on pole modules (single-pole shroud)	VZ02…VZ2, VZ11, VZ14	**VZ26**
	VZ3, VZ4, VZ12, VZ15	**VZ27**
	VZ13, VZ16	**VZ28**
For contact blocks with 2 auxiliary contacts	–	**VZ29**

Components for door interlocking

For rear fixing switch-disconnectors mounted at the back of an enclosure, in addition to a direct operator

Description	For use on	Distance enc. back/door	Sold in lots of	Unit reference
		mm		
Shaft extensions	VN12, VN20 V02…V2	300…330	1	**VZN17** (1)
		400…430	1	**VZN30** (1)
	V02…V2	300…330	1	**VZ17**
		400…430	1	**VZ30**
	V3 and V4	300…320	1	**VZ18**
		400…420	1	**VZ31**
	V5 and V6	330…350	1	**VZ18**
		430…450	1	**VZ31**
Door interlock plates	VN12, VN20 V02…V2	–	5	**KZ32**
	V3…V6	–	5	**KZ74**

Description	For use on	Front plate dimensions	Sold in lots of	Unit reference
		mm		
Plates for door mounting of handles with 4 screw fixing	VN12, VN20 V02…V2	45 x 45 or 60 x 60	5	**KZ83**
	V3…V6	60 x 60 or 90 x 90	5	**KZ81**
Adapter plate for switch-disconnectors	V3 and V4	90 x 90	5	**KZ106**

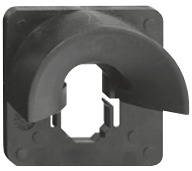
(1) Can be used with V02 to V2 switches.

PB121517.eps



VZ31

580585.tif



KZ32

PB121518.eps



KZ81

Characteristics: pages B3/18 to B3/21
Dimensions: pages B3/24 and B3/25
Schemes: page B3/25

Product references

PB121519.eps



KZ15

PB121520.eps



KZ67

PB121521.eps



Z01

Accessories for operators

Description	For use on	Front plate dimensions	Sold in lots of	Unit reference
		mm		
Legend holder with silver coloured blank legend plate	Front plate	45 x 45	5	**KZ13**
		60 x 60	5	**KZ15**
		90 x 90	5	**KZ103**
Legend holders without legend plate	Front plate	45 x 45	20	**KZ14**
		60 x 60	10	**KZ16**
		90 x 90	5	**KZ101**
Silver coloured blank legend plates for engraving by customer	KZ14	–	20	**KZ76**
	KZ16	–	10	**KZ77**
	KZ101	–	5	**KZ100**
Seals	VN12, VN20	45 x 45	5	**KZ65**
	V02…V2	60 x 60	5	**KZ66**
	V3 and V4	60 x 60	5	**KZ62**
	V3…V6	90 x 90	5	**KZ67**
Tightening tool	For operators with Ø22.5 fixing	–	5	**Z01**

Characteristics:
pages B3/18 to B3/21

Dimensions:
pages B3/24 and B3/25

Schemes:
page B3/25

Technical Data for Designers

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Mini-Vario:
> Dimensions ..... B3/22 to B3/23
> Schemes B3/23
Vario:
> Dimensions ..... B3/24 to B3/25
> Schemes B3/25

Characteristics

Environment

Switch type (bare type)		VN12 VZN12	V02 VZ02	VN20 VZN20	V01 VZ01	V0 VZ0	VVD0 VVE0	V1 VZ1	VVD1 VVE1
Conforming to standards		IEC/EN 60947-3 and UL/CSA 60947-4-1							
Product certifications		UL, CSA	UL, CSA, DNV-GL, CCC, IEC	UL, CSA	UL, CSA, DNV-GL, IEC, EAC, CCC (1)				
Degree of protection with protection shroud		IP 20 conforming to IEC 60529							
Ambient air temperature	°C	-20…+50							
Flame resistance	°C	960 conforming to IEC 60695-2-11							
Shock resistance 1/2 sine wave = 11ms conforming to IEC60068-2-27	gn	15	30	15	30				
Vibration resistance 10…150 Hz conforming to IEC 60068-2-6	gn	5	1						

Electrical characteristics, a.c. operation

Switch type (bare type)				VN12 VZN12	V02 VZ02	VN20 VZN20	V01 VZ01	V0 VZ0	VVD0 VVE0	V1 VZ1	VVD1 VVE1
Rated operational voltage (Ue)			V	690							
Rated impulse withstand voltage (Uimp)			kV	6	8	6	8				
Conventional thermal currents in free air (Ith) and rated uninterrupted (Iu)			A	12		20		25		32	
Conventional thermal current in enclosure (Ithe)			A	10		16		20		25	
Power dissipation per pole for the above operational currents	AC-23A		W	–				1.25		2	
	AC-21A		W	–				3.2		5	
Rated operational power and current	AC-21A/22A	230…690 V	A	12		20		25		32	
	AC-23A	230 V	A/kW	10.6/3		14/4		19.7/5.5			
		240 V	A/kW	10.6/3		14/4		19.9/5.5		18.9/5.5	
		400 V	A/kW	8.1/4		11/5.5		14.5/7.5		21.8/11	
		415 V	A/kW	8.1/4		11/5.5		14/7.5		21/11	
		500 V	A/kW	8.9/5.5		11.9/7.5		16.7/11			
		690 V	A/kW	8.6/7.5		12.3/11		17.5/15			
Rated operational power	AC -3	230/240 V	kW	1.5		3		4			
		400/415 V	kW	3		4		5.5		7.5	
		500 V	kW	4		5.5		7.5			
		690 V	kW	4	5.5		7.5	11			
Intermittent duty class				30							
Characteristics in normal operating conditions	Rated making capacity AC-21A/22A/23A (I rms)		A/ 400 V	120		200		250		320	
	Rated breaking capacity AC-21A/22A/23A (I rms)		A/ 400 V	120		200				250	
Short-circuit characteristics	Permissible rms short time rating (Icw)		A/ 400V/1s	140	300	140	300			384	
	Rated making capacity under short-circuit conditions (Icm) I peak		kA/ 400 V	0.5	1	0.5	1				
	Rated conditional short-circuit current (I rms) with aM/gG fuses		kA/ 400 V	6	10	6	10				
			A	12		20		25		35	

(1) CCC: except for VVD, VVE switches.

References: page B3/3
Dimensions: page B3/22
Schemes: page B3/23

V2 VZ2	VVD2 VVE2	V3 VZ3	VVD3 VVE3	V4 VZ4	VVD4 VVE4	V5	V6	VZ7 VZ20	VZN05 VZN06
IEC/EN 60947-3 and UL/CSA 60947-4-1								IEC/EN 60947-5-1, UL/CSA 60947-5-1	
UL, CSA, DNV-GL, IEC, EAC, CCC [1]									
IP 20 conforming to IEC 60529									
-20…+50									
960 conforming to IEC 60695-2-11									
30								–	
1								–	

V2 VZ2	VVD2 VVE2	V3 VZ3	VVD3 VVE3	V4 VZ4	VVD4 VVE4	V5	V6	VZ7 VZ20	VZN05 VZN06
690									
8									6
40		63		80		125	175	12	12
32		50		63		100	140	10	10
2.4		4.2		5.1		7.5	11	–	
5.4		6.4		12.5		15	25	–	
40		63		80		125	160	Ie/AC-15	
25.8/7.5		50.3/15		61.2/18.5		71.9/22	96.6/30	6 A	
24.8/7.5		48.2/15		58.5/18.5		68/22	92.7/30	6 A	
29/15		41.5/22		57/30		68.5/37	83/45	4 A	
28/15		40/22		55/30		66/37	80/45	4 A	
28.5/18.5		44/30		54/37		64.5/45	79/55	2 A	
17.5/15		25/22		33/30		42/37	49/45	1 A	
5.5		11		15		22	30	–	
11		18.5		22		30	37	–	
15		22		30		37	45	–	
11		18.5				30	37	–	
30								–	
400		630		800		1250	1750	–	
320		500		640		1000	1400	–	
480		756		960		1500	2100	–	
1		2.1				2.8		–	
10								1	
50		63		80		125	200	16	16

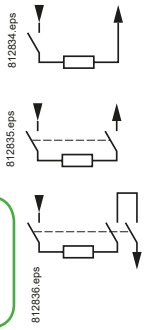
(1) CCC: except for VVD, VVE switches.

References: page B3/3
Dimensions: page B3/22
Schemes: page B3/23

Characteristics

Electrical characteristics, d.c. operation

Switch type (bare type)				VN12 VZN12	V02 VZ02	VN20 VZN20	V01 VZ01	V0 VZ0	VVD0 VVE0	V1 VZ1	VVD1 VVE1
Rated operational current DC-1 (L/R = 1ms)	24 V	1 contact	**A**	12		20		25		32	
		2 contacts	**A**	12		20		25		32	
		3 contacts	**A**	12		20		25		32	
	48 V	1 contact	**A**	12		20		25		32	
		2 contacts	**A**	12		20		25		32	
		3 contacts	**A**	12		20		25		32	
	60 V	1 contact	**A**	12		20		25		32	
		2 contacts	**A**	12		20		25		32	
		3 contacts	**A**	12		20		25		32	
	110 V	1 contact	**A**	1.5		2		9		10	
		2 contacts	**A**	8		10		12		16	
		3 contacts	**A**	12		20		25		32	
	220 V	1 contact	**A**	1.5		2		2.5		3	
		2 contacts	**A**	7		8		10		12	
		3 contacts	**A**	10		14		16		20	
	250 V	1 contact	**A**	0.6		0.7		0.8		1	
		2 contacts	**A**	3		4		6		8	
		3 contacts	**A**	8		10		12		16	
Rated operational current DC-2 to DC-5 (L/R = 1ms)	24 V	1 contact	**A**	12		20		25		32	
		2 contacts	**A**	12		20		25		32	
		3 contacts	**A**	12		20		25		32	
	48 V	1 contact	**A**	12		20		25		32	
		2 contacts	**A**	12		20		25		32	
		3 contacts	**A**	12		20		25		32	
	60 V	1 contact	**A**	10		14		16		20	
		2 contacts	**A**	12		20		25		32	
		3 contacts	**A**	12		20		25		32	
	110 V	1 contact	**A**	1.5		2		2.5		3	
		2 contacts	**A**	3		4		5		6	
		3 contacts	**A**	12		20		25		32	
	220 V	1 contact	**A**	0.4		0.5		0.5		0.8	
		2 contacts	**A**	1.4		1.5		1.5		2	
		3 contacts	**A**	1		2		3		4	
	250 V	1 contact	**A**	0.3		0.4		0.5		0.8	
		2 contacts	**A**	0.4		0.6		0.8		1	
		3 contacts	**A**	1.2		2.4		1.6		2	



Other characteristics

Switch type (bare type)			VN12 VZN12	V02 VZ02	VN20 VZN20	V01 VZ01	V0 VZ0	VVD0 VVE0	V1 VZ1	VVD1 VVE1
Mechanical durability (millions of operating cycles)			0.05	0.1	0.05	0.1				
Electrical durability in cat. AC-21 (millions of operating cycles)			0.05	0.1	0.05	0.1				
Electrical durability in cat. DC-1 to 5 (operating cycles)			30000							
Suitable for isolation			Yes							
Cabling	Flexible cable + cable end	**mm²**	4	6	4	6				
	Solid cable	**mm²**	4	10	4	10				
Tightening torque		**N.m**	0.7	2.1	0.7	2.1				

References: page B3/3
Dimensions: page B3/22
Schemes: page B3/23

V2 VZ2	VVD2 VVE2	V3 VZ3	VVD3 VVE3	V4 VZ4	VVD4 VVE4	V5	V6	VZ7 VZ20	VZN05 VZN06
40		63		80		125	175	8 (Ie/DC-1)	
40		63		80		125	175	–	
40		63		80		125	175	–	
40		63		80		125	175	8 (Ie/DC-1)	
40		63		80		125	175	–	
40		63		80		125	175	–	
35		40		50		60	70	4 (Ie/DC-1)	
40		63		80		125	175	–	
40		63		80		125	175	–	
12		20		25		30	37	2 (Ie/DC-1)	
20		63		80		125	175	–	
40		63		80		125	175	–	
4		6		8		12	15	1 (Ie/DC-1)	
14		25		30		40	50	–	
25		30		40		80	100	–	
2		4		5		3	10	0.8 (Ie/DC-1)	
12		20		25		30	40	–	
20		30		40		50	61	–	
40		63		80		125	175	–	
40		63		80		125	175	–	
40		63		80		125	175	–	
40		63		80		125	175	–	
40		63		80		125	175	–	
40		63		80		125	175	–	
25		40		50		60	70	–	
40		63		80		125	175	–	
40		63		80		125	175	–	
5		6		8		10	12	–	
8		10		20		22	24	–	
40		50		63		70	80	–	
1		1.5		2		2.2	2.4	–	
3		4		6		7	8	–	
7		10		15		16	13	–	
1		1.2		1.5		1.6	1.8	–	
2		3		6		7	8	–	
6		8		10		12	14	–	

V2 VZ2	VVD2 VVE2	V3 VZ3	VVD3 VVE3	V4 VZ4	VVD4 VVE4	V5	V6	VZ7 VZ20	VZN05 VZN06
0.1		0.03						0.1	0.05
0.1		0.03						0.1 (AC-15)	0.05
30000								30000 (DC-1)	
Yes								–	
6		16				70		2 x 0.75…1.5	
10		25				95		2 x 1…2.5	
2.1		4				22.6		0.7	

References:
page B3/3

Dimensions:
page B3/22

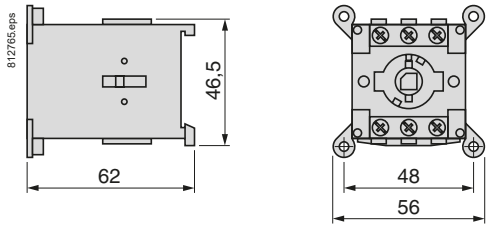
Schemes:
page B3/23

Dimensions, mounting

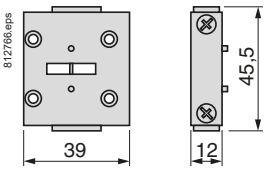
Dimensions

Switch-disconnectors

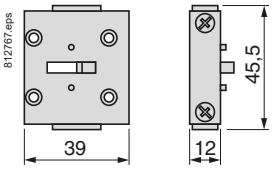
Switch bodies VN12, VN20



Add-on modules VZN12, VZN20



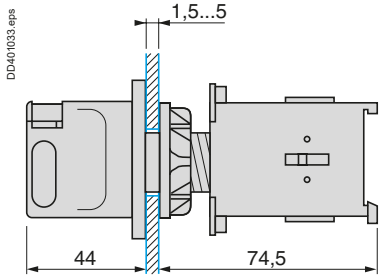
Add-on modules VZN11, VZN14 VZN05 and VZN06

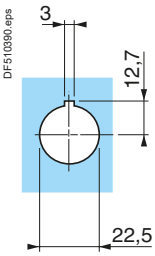


Mounting

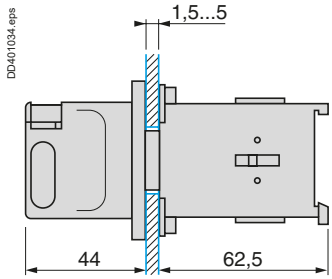
Switch-disconnector mounted on enclosure door

VCDN12, VCDN20, VBDN12, VBDN20
Single hole fixing

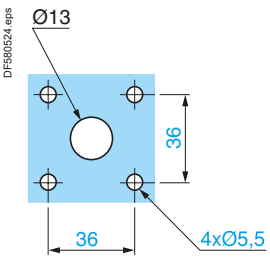




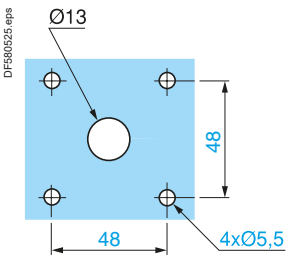
VN12, VN20
4 screw fixing



45 x 45 front plate



60 x 60 front plate



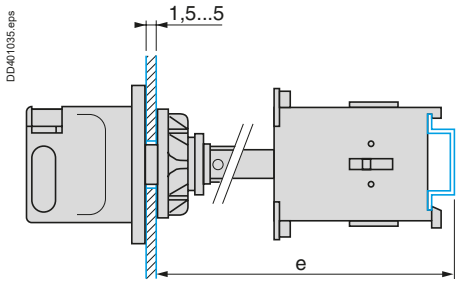
References:
pages B3/2 to B3/5
Characteristics:
pages B3/18 to B3/21
Schemes:
page B3/23

Mounting (continued)

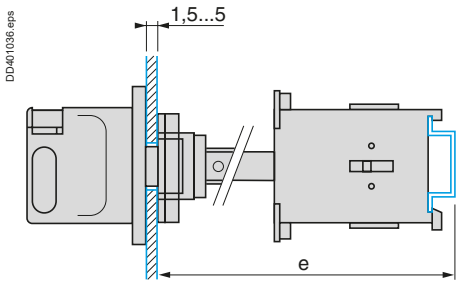
Switch-disconnector mounted at back of enclosure with shaft extension VZN17 or VZN30 (clip-on mounting on ⊔ rail)

VN12, VN20

Single hole fixing



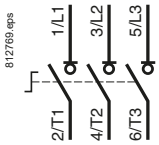
4 screw fixing



	Shaft extension	Distance (e) enclosure back/door
		mm
VN12, VN20	VZN17	300…330
	VZN30	400…430

Schemes

Switch body VN12, VN20



Main pole module VZN12, VZN20



Neutral pole module VZN11



Auxiliary contact blocks

VZN05



VZN06



Switch-disconnectors
Ref.

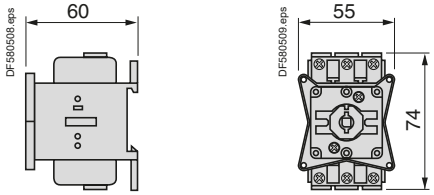
References:
pages B3/2 to B3/5

Characteristics:
pages B3/18 to B3/21

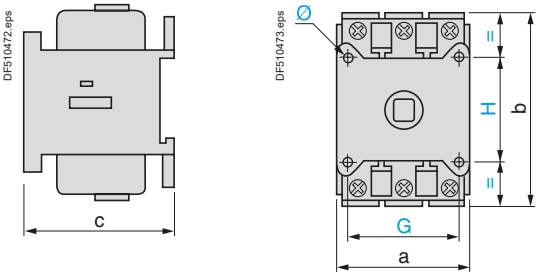
Dimensions

Switch-disconnectors

Switch bodies V0●, V0 to V2

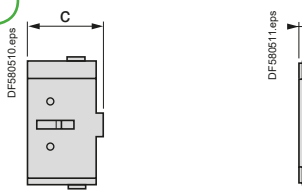


Switch bodies V3 to V6

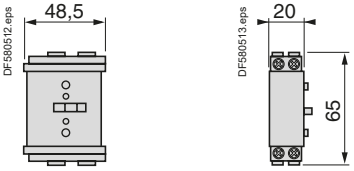


	a	b	c	G	H	Ø
V3, V4	60	83	65	48	48	5.5
V5, V6	90	125	90	68	68	5.5

Add-on modules VZ02 to VZ4 and VZ11 to VZ16



Add-on modules VZ7, VZ20

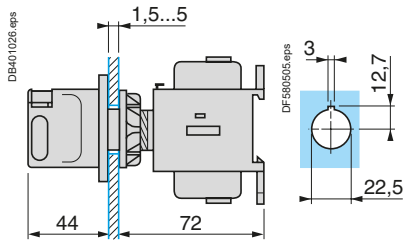


	a	b	c
VZ02 and VZ01, VZ0 to VZ2, VZ11, VZ14	16	74	35
VZ3, VZ4, VZ12, VZ15	20	83	46
VZ13, VZ16	30	125	63

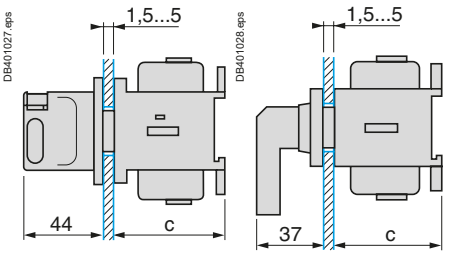
Mounting

Switch-disconnector mounted on enclosure door

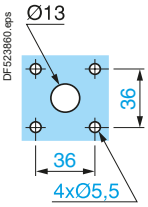
Single hole fixing V0●, V0 to V2



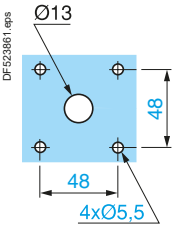
4 screw fixing V0●, V0 to V4



4 screw fixing 45 x 45 front plate V0●, V0 to V2

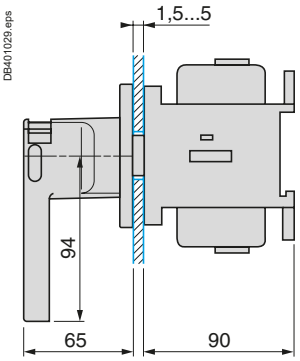


4 screw fixing 60 x 60 front plate V0●, V0 to V4

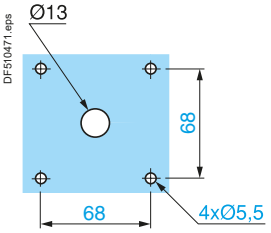


	c
V0●, V0 to V2	60
V3, V4	65

V5 and V6. 4 screw fixing



90 x 90 front plate

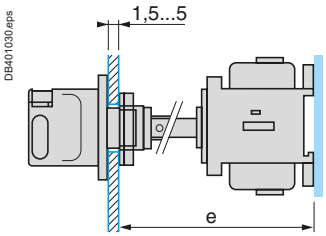


References:
pages B3/6 to B3/9
Characteristics:
pages B3/18 to B3/21
Schemes:
page B3/25

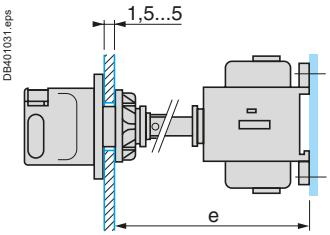
Mounting (continued)

Switch-disconnector mounted at back of enclosure

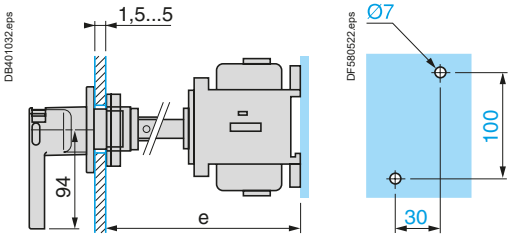
4 screw fixing
V0●, V0 to V2 with shaft extension VZ17 or VZ30 (clip-on mounting on ⊔ rail possible for V0● to V2)



Single hole fixing
V3 to V4 with shaft extension VZ18 or VZ31



V5 and V6 with shaft extension VZ18 or VZ31

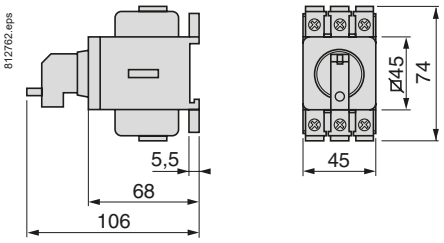


	Shaft extension	Distance (e) enc.back/door	Ø	G
		mm		
V02 and V01 V0 to V2	VZ17	300…330	2 x 4.2	15
	VZ30	400…430	2 x 4.2	15
V3 and V4	VZ18	300…320	2 x 5	20
	VZ31	400…420	2 x 5	20

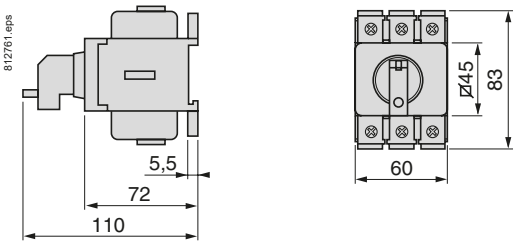
	Shaft extension	Distance (e) enc. back/door
		mm
V5 and V6	VZ18	300…350
	VZ31	430…450

Switch-disconnectors for modular distribution boards

VV●0 to VV●2



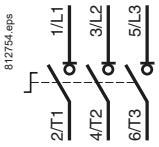
VV●3 to VV●4



Schemes

Switch body

V02 and V01
V0 to V6



Main pole module

VZ02 and VZ01
VZ0 to VZ4



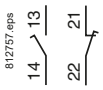
Neutral pole module

VZ11 to VZ13



Auxiliary contact blocks

VZ7



VZ20



References:
pages B3/6 to B3/9

Characteristics:
pages B3/18 to B3/21

TeSys DF, LS, GK
Fuse carriers

TeSys DF, LS, GK Fuse carriers

Type of product	Range		Pages
Introduction			B4/2
For protection of control circuits or transformer TeSys DF and accessories	Up to 25, 32, 50 or 125 A		B4/3
For protection of control circuits or transformer TeSys DF – For North American market	Up to 30 A		B4/5
For protection of motors or transformers TeSys LS, GK and accessories	Up to 25, 32, 50 A		B4/6
Technical Data for Designers			B4/9

Operation: safety

The fuse carrier performs two basic functions:
- it isolates the downstream circuit by means of a visible break and wide opening contacts,
- it holds the cartridge fuses designed to protect the installation against short-circuits.

The type of cartridge fuse needed to protect the circuit must be determined before selecting the fuse carrier.

Cartridge fuse selection (type, rating, size)

Type

Application	■ Motor protection. ■ Transformer protection.
Solution	■ **aM type** fuses. These fuses are designed to withstand high current peaks of a very short duration. They must be combined with a thermal overload relay coupled with a contactor.
Application	■ Lighting circuit protection. ■ Supply line protection. ■ Furnace protection.
Solution	■ **gG** type fuses, which are more widely used but whose limiting capacity is weaker than that of **aM** type fuses.

Rating

gG fuses
aM fuses

See standard NF C 15-100.
Table 53 A paragraph 532-2-1 and table 52 C paragraph 523-1.

Motors 3 x 220 V		Motors 3 x 400 V		Cartridge fuses type aM		Fuse carrier
P	in	P	in	Size	Rating	
kW	A	kW	A		A	
9	32	15	28.5	10 x 38	32	**LS1D32**
11	39	22	44	14 x 51	50	**GK1EK**
22	75	37	73	22 x 58	80	**GK1FK**

Size

Use the “fuse characteristics” table opposite to select the correct fuse size according to:
- the nominal current of the circuit to be protected,
- the operational voltage.

Fuse carrier selection

Application	**Isolation** of a circuit for safety reasons only.
Solution	The fuse carrier may be fitted with links. The maximum permissible current is indicated in the “pole characteristics” table opposite.
Application	**Isolation** of a circuit and its **protection** against short-circuits.
Solution	Select a fuse carrier according to: ■ the type of cartridge fuse required, ■ the maximum permissible current in the fuse carrier poles (see “pole characteristics” table opposite). If the operational current is greater than the maximum permissible current in the poles of the fuse carrier corresponding to the cartridge fuse size selected, select the fuse carrier the next size up. The **safety** provided by using a fuse carrier can be increased by adding a padlocking device with up to three padlocks.

Recommendations for use

The fuse carrier conforms to utilisation category AC-21A/22A of standard IEC 60947-3. It is therefore recommended that the fuse carrier early break auxiliary contacts always be inserted in the coil circuit of the contactor with which it is in series. If the fuse carrier is not associated with a contactor, it is essential to ensure that it will be operated off-load.

Fuse carriers
Ref.

Product references



DF101



DF103



DF141



DF143NC



DF221



DF223NC



DF101NV



DF103V



DF141NV



DF143VC



DF221NV



DF223VC

For protection of control circuits or transformers

Fuse carriers (1)

Conventional thermal current (Ith)	Size of cartridge fuse or link	Composition	Sold in lots of	Unit reference
A	mm			
25	8.5 x 32	1 P	12	**DF81**
		N	12	**DF10N**
		1 P + N (2)	6	**DF81N**
		2 P	6	**DF82**
		3 P	4	**DF83**
		3 P + N (2)	3	**DF83N**
32	10 x 38	1 P	12	**DF101**
		N	12	**DF10N**
		1 P + N (2)	6	**DF101N**
		2 P	6	**DF102**
		3 P	4	**DF103**
		3 P + N (2)	3	**DF103N**
50	14 x 51	1 P	6	**DF141**
		N	6	**DF14N**
		1 P + N (2)	3	**DF141N**
		2 P	3	**DF142**
		3 P	2	**DF143C** (3)
		3 P + N (2)	1	**DF143NC** (3)
125	22 x 58	1 P	6	**DF221**
		N	6	**DF22N**
		1 P + N (2)	3	**DF221N**
		2 P	3	**DF222**
		3 P	2	**DF223C** (3)
		3 P + N (2)	1	**DF223NC** (3)

Fuse carriers with "blown fuse" indicators (LED) (1) (4)

Conventional thermal current (Ith)	Size of cartridge fuse or link	Composition	Sold in lots of	Unit reference
A	mm			
25	8.5 x 32	1 P	12	**DF81V**
		1 P + N (2)	6	**DF81NV**
		2 P	6	**DF82V**
		3 P	4	**DF83V**
		3 P + N (2)	3	**DF83NV**
32	10 x 38	1 P	12	**DF101V**
		1 P + N (2)	6	**DF101NV**
		2 P	6	**DF102V**
		3 P	4	**DF103V**
		3 P + N (2)	3	**DF103NV**
50	14 x 51	1 P	6	**DF141V**
		1 P + N (2)	3	**DF141NV**
		2 P	3	**DF142V**
		3 P	2	**DF143VC** (3)
		3 P + N (2)	1	**DF143NVC** (3)
125	22 x 58	1 P	6	**DF221V**
		1 P + N (2)	3	**DF221NV**
		2 P	3	**DF222V**
		3 P	2	**DF223VC** (3)
		3 P + N (2)	1	**DF223NVC** (3)

(1) Each pole can be marked. A clip-in marker holder is provided for this purpose. Clip-in markers type AB1R● or AB1G● can also be used. DF8●●● and DF10●●● are pad lockable fuse carriers.
(2) N: neutral pole fitted with a locked tubular link as standard.
(3) A letter "C" in the reference indicates that the fuse carrier can be fitted with auxiliary early break, "blown fuse" signalling and "fuse present" signalling contacts.
(4) Operational voltage of the blown fuse indicator: 110 V...690 V.

Introduction: page B4/2
Characteristics: page B4/10
Dimensions: page B4/11
Schemes: page B4/11

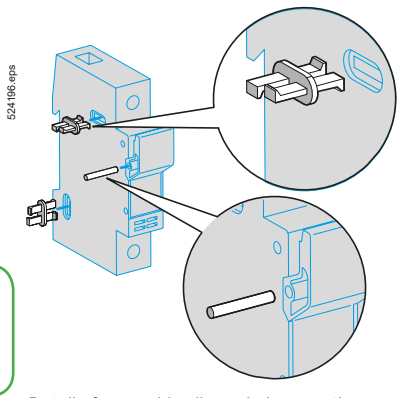
Product references



DF14AM●



DF14AP



Detail of assembly clip and pin mounting

Accessories

Auxiliary early break and "blown fuse" signalling contacts (1)

Fuse carriers to be equipped	Size of cartridge fuse or link	Number of contacts	Sold in lots of	Unit reference
DF14 (3 P or 3 P + N)	14 x 51	1	1	**DF14AM1**
		2	1	**DF14AM2**
DF22 (3 P or 3 P + N)	22 X 58	1	1	**DF22AM1**
		2	1	**DF22AM2**

Fuse carrier assembly kits (2)

Fuse carriers to be assembled	Size of cartridge fuse or link	Composition	Sold in lots of	Unit reference
DF8	8.5 x 32	1 pin, 2 clips	12	**DF10AP**
DF10	10 x 38			
DF14	14 x 51	1 pin, 3 clips	10	**DF14AP**
DF22	22 x 58	1 pin, 3 clips	10	**DF22AP**

Marking accessories

Description	Composition	Marking	Sold in lots of	Unit reference
Clip-in markers	Strip of 10 identical numbers or letters	0…9	25	**AB1R●** (3)
		A…Z	25	**AB1G●** (3)

Substitution

Fuse carriers

Old range			New range	
Reference	Size of cartridge fuse or link	Composition	Reference w/o indicator	Reference with indicator
DF6AB08	8.5 x 32	1 P	**DF81**	**DF81V**
DF6AB10	10 x 38	1 P	**DF101**	**DF101V**
DF6N10	8.5 x 32 or 10 x 38	1 N	**DF10N**	**–**
GK1CC	8.5 x 32	1 P + N	**DF81N**	**DF81NV**
GK1CD	8.5 x 32	2 P	**DF82**	**DF82V**
GK1CF	8.5 x 32	3 P	**DF83**	**DF83V**
GK1CH	8.5 x 32	3 P + N	**DF83N**	**DF83NV**
GK1DC	10 x 38	1 P + N	**DF101N**	**DF101NV**
GK1DD	10 x 38	2 P	**DF102**	**DF102V**
GK1DF	10 x 38	3 P	**DF103**	**DF103V**
GK1DH	10 x 38	3 P + N	**DF103N**	**DF103NV**
GK1EB	14 x 51	1 P	**DF141**	**DF141V**
GK1EN	14 x 51	1 N	**DF14N**	**–**
GK1EC	14 x 51	1 P + N	**DF141N**	**DF141NV**
GK1ED	14 x 51	2 P	**DF142**	**DF142V**
GK1EF	14 x 51	3 P	**DF143C**	**DF143VC**
GK1EH	14 x 51	3 P + N	**DF143NC**	**DF143NVC**
GK1FB	22 x 58	1 P	**DF221**	**DF221V**
GK1FN	22 x 58	1 N	**DF22N**	**–**
GK1FC	22 x 58	1 P + N	**DF221N**	**DF221NV**
GK1FD	22 x 58	2 P	**DF222**	**DF222V**
GK1FF	22 x 58	3 P	**DF223C**	**DF223VC**
GK1FH	22 x 58	3 P + N	**DF223NC**	**DF223NVC**

Fuse carrier assembly kits

Old range		New range
Reference	Size of cartridge fuse or link	Reference
GK1AP2	8.5 x 32 or 10 x 38	**DF10AP**
GK1AP3	8.5 x 32 or 10 x 38	**DF10AP**
	14 x 51	**DF14AP**
GK1AP4	8.5 x 32 or 10 x 38	**DF10AP**
	22 x 58	**DF22AP**
GK1AP5	14 x 51	**DF14AP**
GK1AP6	14 x 51	**DF14AP**
	22 x 58	**DF22AP**
GK1AP9	22 x 58	**DF22AP**

(1) These auxiliary contacts provide the following functions: early break, "blown fuse" signalling (if the fuse carrier is fitted with striker fuses) and "fuse present" signalling.
(2) 1 pin and 2 clips are required to assemble two DF8 or DF10 fuse carriers together. 1 pin and 3 clips are required to assemble two DF14 or DF22 fuse carriers together.
*(3) When ordering, replace the ● in the reference with the number or letter required. Example: **AB1-R1** or **AB1-GA**.*

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For protection of control circuits or transformers

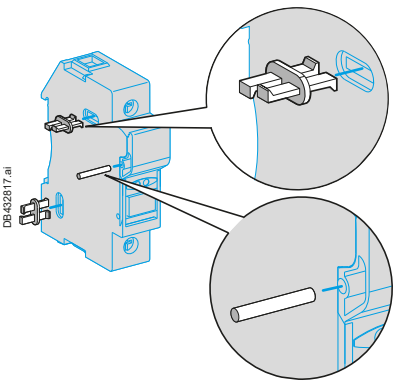
References



DFCC1



DFCC3V



Detail of assembly clip and pin mounting

Fuse carriers (1)

Conventional thermal current (Ith)	Size of cartridge fuse or link	Composition	Sold in lots of	Unit reference
A				
30	Class CC	1 P	12	**DFCC1**
		2 P	12	**DFCC2**
		3 P	6	**DFCC3**

Fuse carriers with "blown fuse" indicators (LED) (1) (2)

Conventional thermal current (Ith)	Size of cartridge fuse or link	Composition	Sold in lots of	Unit reference
A				
30	Class CC	1 P	12	**DFCC1V**
		2 P	6	**DFCC2V**
		3 P	6	**DFCC3V**

Fuse carrier assembly kits (3)

Fuse carriers to be assembled	Size of cartridge fuse or link	Composition	Sold in lots of	Unit reference
DFCC	Class CC	1 pin, 2 clips	12	**DF10AP**

Marking accessories

Description	Composition	Marking	Sold in lots of	Unit reference
Clip-in markers	Strip of 10 identical numbers or letter	0…9	25	**AB1R●** (4)
		A…Z	25	**AB1G●** (4)

(1) Each pole can be marked. A clip-in marker holder is provided for this purpose. Clip-in markers type AB1R● or AB1G● can also be used. DFCC fuse holders are pad lockable.
(2) Operational voltage of the blown fuse indicator: 230 V...690 V.
(3) 1 pin and 2 clips are required to assemble two DFCC fuse carriers together.
*(4) When ordering, replace the p in the reference with the number or letter required. Example: **AB1R1** or **AB1GA**.*


PB111831.eps

LS1D323


PB111830.eps

LS1D32


PB121302.eps

GK1EK


PB111830.eps

LS1D32


PB121303.eps

+ LA8D324

For protection of motors or transformers

3-pole basic blocks

Connection by spring terminals

Rating	Cartridge fuse size	Number of early break contacts (1)	Single-phase protection device (2)	Reference (3)	Weight kg
25 A	10 x 38	– (4)	Without	**LS1D323**	0.270

Connection by screw clamp terminals or connectors

32 A	10 x 38	– (4)	Without	**LS1D32**	0.300
50 A	14 x 51	1	Without	**GK1EK**	0.430
			With	**GK1EV**	0.470
		2	Without	**GK1ES**	0.470
			With	**GK1EW**	0.510

4-pole basic blocks

Connection by screw clamp terminals or connectors

32 A	10 x 38	– (4)	Without	**LS1D32 + LA8D324** (5)	0.300
50 A	14 x 51	1	Without	**GK1EM**	0.570
			With	**GK1EY**	0.600
		2	Without	**GK1ET**	0.610
			With	**GK1EX**	0.650

Fuse carriers for the North American market

25 and 30 A basic blocks: please consult your Regional Sales Office.

(1) With 1 or 2 early break contacts to be inserted in the contactor control circuit.
(2) Fuse carriers with single-phase protection device must be fitted with striker fuses.
(3) LS1D: clips directly onto a 35 mm ⊔ rail or screw fixing.
GK1: clips directly onto a 35 mm ⊔ rail or Telequick mounting plate.
(4) Addition of add-on contact block, see page B4/7.
(5) Can be mounted on left-hand or right-hand side of the basic block.

Fuse carriers

Product references

PG112152.eps



GK1AP05

Add-on contact blocks

Description	For use on	Mounting	Maximum number	Type of contacts	Sold in lots of	Unit reference
Instantaneous auxiliary contacts (early break contacts)	LS1D32	Front	1	N/O + N/C	10	**GVAE11**
				N/O + N/O	10	**GVAE20**
	LS1D323	Front	1	N/O + N/C	10	**GVAE113**
				N/O + N/O	10	**GVAE203**

Operators

For fuse carrier		For mounting on	Reference
Rating	Number of poles		
Side handles			
125 A	3 or 4	Right-hand side	**GK1AP07**
		Left-hand side	**GK1AP08**
Front handles (1)			
32 - 50 - 125 A			Fitted as standard
External handles			
32 A	3 or 4	Right-hand side (IP54)	**LS1D32005** (2)
		Left-hand side (IP54)	**LS1D32006**
50 A	3 or 4	Right-hand side	**GK1AP05**
		Left-hand side	**GK1AP06**

Padlocking devices (3)

For fuse carrier			Reference
Rating	Number of poles	Single-phase protection device	
32 A	3 or 4	Without	integral
50 A	3	Without	**GK1AV07**
		With	**GK1AV08**
	4	Without	**GK1AV08**
		With	**GK1AV09**

Links

Tubular links

For fuse carrier		Sold in lots of	Unit reference
Rating	Number of poles		
32 A	3 or 4	10	**DK1CB92** (4)
50 A	3 or 4	10	**DK1EB92** (5)
125 A	3 or 4	10	**DK1FA92** (5)

(1) Fitted as standard on 32, 50 and 125 A fuse carriers type GK1.
*(2) Reference **LS1D32005** replaces reference DK1FB005.*
*(3) For the 125 A rating, use side handles **GK1AP07** or **GK1AP08**.*
*(4) For use on a neutral circuit, the tubular link can be interlocked with special device **LA8D25906** (sold in lots of 10).*
(5) 50 A fuse carriers type GK1 are fitted with an interlocked neutral tubular link as standard.

Product references

Accessories for LS1D32 (screw clamp terminals)

Description	Application	Sold in lots of	Unit reference
Plate for mounting	LS1D32 and contactor LC1D09...D38 with front faces aligned	1	**LAD311**
Combination blocks	Between LS1D32 and contactor LC1K or LP1K	10	**GV2AF01**
	Between LS1D32 and contactor LC1D09...D38	10	**GV2AF3**
	Between LS1D32 mounted on LAD311 and contactor LC1D09...D38	10	**GV2AF4**

Description	Application	Pitch mm	Reference
Sets of 3-pole 63 A busbars	2 tap-offs	45	**GV2G245**
		54	**GV2G254**
		72	**GV2G272**
	3 tap-offs	45	**GV2G345**
		54	**GV2G354**
	4 tap-offs	45	**GV2G445**
		54	**GV2G454**
		72	**GV2G472**
	5 tap-offs	54	**GV2G554**

Description	Application	Sold in lots of	Unit reference
Protective end cover	For unused busbar outlets	5	**GV1G10**
Terminal block Connection from the top	For supply to one or more GV2G busbar sets	1	**GV1G09**
Cover for terminal block	For mounting in modular panels	10	**LA9E07**
Padlocking device	For use with up to 4 padlocks (not supplied) Ø6 mm shank max	1	**GV2V03**

Accessories for LS1D323 (spring terminals)

Description	Application	Reference
Plate for mounting	LS1D323 and contactor LC1D09...D38 with front faces aligned	**LAD311**

Description	Extension by	Number of starters	Reference
Power splitter box, 63 A	LAD32●	2	**LAD322**
		4	**LAD324**

Description	Kit contents	Reference
Assembly and power connection kit for LS1D323 and LC1D093...D323	1 LAD311 plate for mounting LS1D323 2 LAD341 power connection modules - between LS1D323 and power splitter box - between LS1D323 and contactor	**LAD352**

Description	Maximum capacity	Application	Sold in lots of	Unit reference
Upstream terminal block	16 mm²	Power supply to 1 or 2 power splitter boxes	1	**LAD3B1**
Downstream terminal block	16 mm²	Connection of motor cables	1	**LAD331**
Cable end reducer	–	For connection of conductors from 1 to 1.5 mm²	20	**LAD99**

Fuse carriers

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TeSys DF, LS, GK Fuse carriers

Technical Data for Designers

Contents

TeSys DF:
> Characteristics B4/10
> Dimensions and schemes B4/11
TeSys DF for the North American market:
> Characteristics B4/12
> Dimensions and schemes B4/13
TeSys LS and GK:
> Characteristics B4/14
> Dimensions..... B4/15
> Schemes B4/16

Characteristics

Environment characteristics

Fuse carrier type			DF8	DF10	DF14	DF22
Conforming to standards			IEC/EN 60947-3, IEC/HD 60269-2	IEC/EN 60947-3 (1), IEC/HD 60269-2, R22HL2, UL 4248-1 (2), CSA C22.2 No 4248-1 (2)	IEC/EN 60947-3, UL 4248-1, CSA C22.2 No 4248-1	
Product certification			IEC, EAC, DNV-GL, CCC	IEC, UL, CSA, EAC, DNV-GL, CCC	IEC, UL, CSA, EAC	
Degree of protection	Conforming to IEC 60529		IP 20			
Ambient air temperature	Storage	**°C**	-40…+80			
	For operation, with derating (1)	**°C**	-20…+60			
Operating positions			± 23° in relation to normal mounting plane			
Flame resistance	Conforming to IEC 60695-2-1	**°C**	960			

Pole characteristics

Fuse size		**mm**	8.5 x 32		10 x 38		14 x 51	22 x 58	
Rated insulation voltage (Ui) with tubular links, a.c. or D.C. supply		**V**	500		690		690	690	
Rated impulse withstand voltage (Uimp)		**kV**	6		6		8	8	
Conventional thermal current (Ith) for ambient air temperature ≤ 20 °C (3)									
	With tubular links	**A**	25		32		50	125	
	With aM cartridge fuses	**A**	25		32		50	125	
	With gG cartridge fuses	**A**	25		32		50	100	
Rated conditional short-circuit current Conforming to IEC 60947-3									
	400 V	**kA**	20		120		120	120	
	500 V	**kA**	–		120		120	120	
	690 V	**kA**	–		–		80	80	
Peak withstand current (dynamic stress) Conforming to IEC 60269-1									
	With tubular links	**kA**	11		15		15	19	
Cabling (number of conductors x c.s.a.)			**Min.**	**Max.**	**Min.**	**Max.**	**Min.**	**Max.**	**Min.**	**Max.**
	Solid cable	**mm²**	1 x 1.5	1 x 16 2 x 6	1 x 1.5	1 x 16 2 x 6	1 x 2.5	1 x 25 2 x 10	1 x 2.5	1 x 35 2 x 25
	Flexible cable without cable end	**mm²**	1 x 1.5	1 x 10 2 x 6	1 x 1.5	1 x 10 2 x 6	1 x 2.5	1 x 25 2 x 10	1 x 2.5	1 x 35 2 x 16
	Flexible cable with cable end	**mm²**	1 x 1.5	1 x 10 2 x 6	1 x 1.5	1 x 10 2 x 6	1 x 2.5	1 x 25 2 x 10	1 x 2.5	1 x 35 2 x 16
Tightening torque		**Nm**	2.2				3.5	4	

Characteristics of early break and signalling contacts DF14 AM and DF22 AM

Rated insulation voltage (Ui) a.c. supply		**V**	250			
Conventional thermal current (Ith) for ambient air temperature ≤ 20 °C (1)		**A**	5			
Rated operational current			**24 V**	**48 V**	**127 V**	**240 V**
	Category AC-15	**A**	4	4	3	2.5
	Category DC-13	**A**	3	1	0.2	0.1
Definition of rated characteristics	Conforming to IEC 60947-5-1		B300			
Low load operating characteristics	Minimum voltage	**V**	10			
	Minimum current	**mA**	30			
Cabling			Faston connectors			

(1) DF101PV excluded.

(2) DF101PV add UL/CSA 4248-19.

(3) For use in an installation with ambient temperature > 20 °C, apply a derating coefficient:

Maximum temperature	20 °C	30 °C	40 °C	50 °C	60 °C
Max. relative humidity	95 %	90 %	80 %	50 %	50 %
Current derating coefficient	1	0.95	0.9	0.8	0.7

Number of poles (each side)	1 to 3	4 to 6	≥7
Current derating coefficient	1	0.95	0.9

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Life Is On Schneider Electric

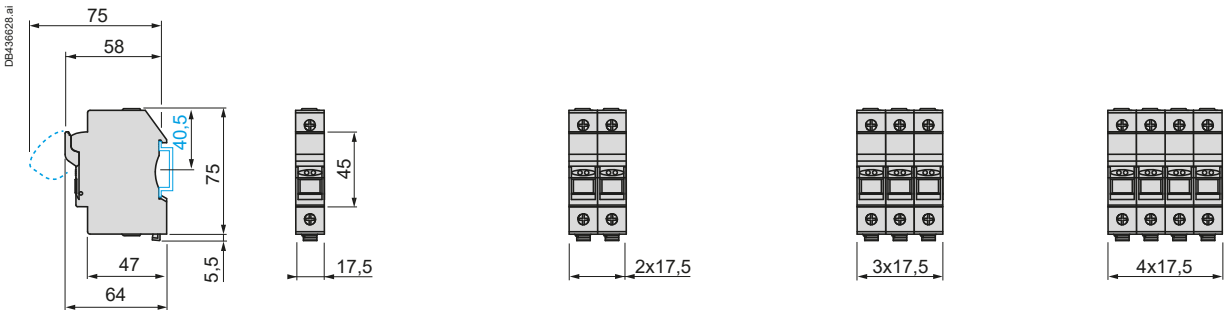
Dimensions, schemes

Dimensions

Modular fuse carriers 25 A and 32 A

Mounting on 35 mm ⊔ rail

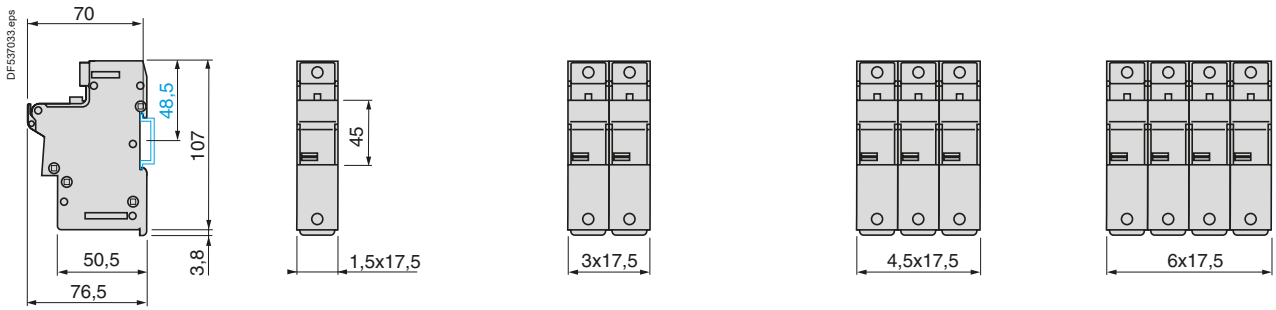
DF81 and DF81V DF101 and DF101V DF10N	DF81N and DF81NV DF82 and DF82V DF101N and DF101NV DF102 and DF102V	DF83 and DF83V DF103 and DF103V	DF83N and DF83NV DF103N and DF103NV



Modular fuse carriers 50 A

Mounting on 35 mm ⊔ rail

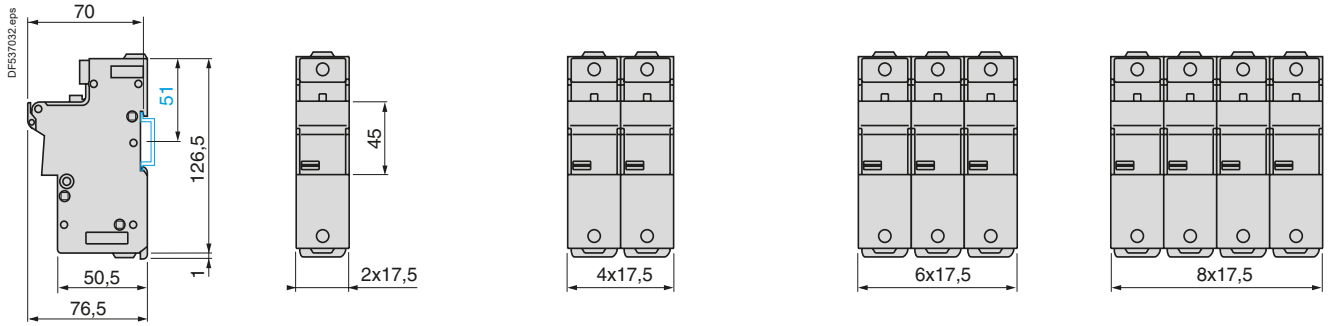
DF141 and DF141V DF14N	DF141N and DF141NV DF142 and DF142V	DF143C and DF143VC	DF143NC and DF143NVC



Modular fuse carriers 125 A

Mounting on 35 mm ⊔ rail

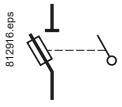
DF221 and DF221V DF22N	DF221N and DF221NV DF222 and DF222V	DF223C and DF223VC	DF223NC and DF223NVC



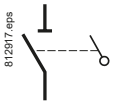
Schemes

Modular fuse carriers

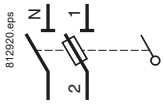
DF•1P



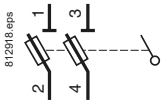
DF•N



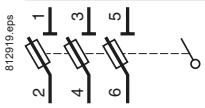
DF•1P + N



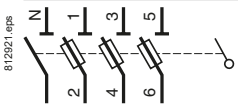
DF•2P



DF•3P



DF•3P + N



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References: pages B4/3 and B4/4
Characteristics: page B4/10

Characteristics

Environment characteristics

Fuse carrier type			DFCC
Conforming to standards			UL 4248-1 & 4, CSA 22-2 No 4248-1 & 4
Product certification			UL, CSA, CCC
Degree of protection	Conforming to IEC 60529		IP 20
Ambient air temperature	Storage	**°C**	-40…+80
	For operation, with derating (1)	**°C**	-20…+60
Operating positions	Without derating		±23° in relation to normal vertical mounting plane
Flame resistance	Conforming to IEC 60695-2-1	**°C**	960

Pole characteristics

Fuse carrier type			DFCC	
Fuse size			Class CC	
Rated insulation voltage (Ui) with tubular links, a.c. supply		**V**	600	
Rated impulse withstand voltage (Uimp)		**kV**	6	
Conventional thermal current (Ith) for ambient air temperature ≤ 40 °C (1)				
	With tubular links	**A**	30	
	With aM cartridge fuses	**A**	30	
	With gG cartridge fuses	**A**	30	
Short-circuit current withstand With UL 248-4 Class CC fuses				
	Conforming to UL 512 at 600 V	**kA**	200	
Cabling (number of conductors x c.s.a.)			**Min.**	**Max.**
	Solid cable	**mm²**	1 x 1.5	1 x 16 2 x 6
	Flexible cable without cable end	**mm²**	1 x 1.5	1 x 10 2 x 6
	Flexible cable with cable end	**mm²**	1 x 1.5	1 x 10 2 x 6
Tightening torque		**Nm**	2.2	

(1) For use in an installation with ambient temperature > 20 °C, apply a derating coefficient:

Maximum temperature	20 °C	30 °C	40 °C	50 °C	60 °C
Max. relative humidity	95 %	90 %	80 %	50 %	50 %
Current derating coefficient	1	0.95	0.9	0.8	0.7

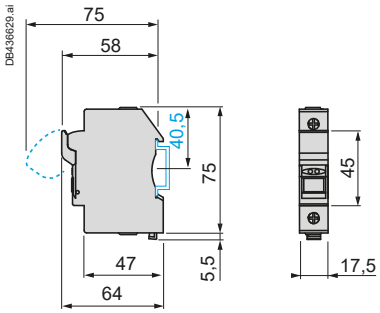
Dimensions, schemes

Dimensions

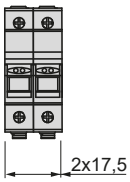
Modular fuse carriers 30 A

Mounting on 35 mm ⊔ rail

DFCC1 and DFCC1V



DFCC2 and DFCC2V



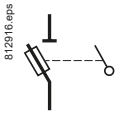
DFCC3 and DFCC3V



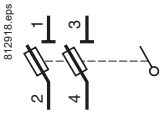
Schemes

Modular fuse carriers

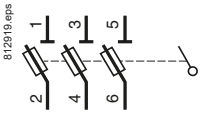
DFCC1P



DFCC2P



DFCC3P



Fuse carriers
Ref.

Characteristics

Environment

Fuse carrier type			LS1D32	LS1D323	GK1E●
Conforming to standards	NF EN 60947-3		●		●
	IEC 60947-3		●		●
Product certifications			BV, UR		–
Ambient air temperature for operation with links without derating		**°C**	-50…+70		-50…+70
Maximum tilt in relation to normal vertical mounting plane			±23°		±23°

Pole characteristics

Fuse size			10 x 38	10 x 38	14 x 51
Rated operational voltage with links. a.c. supply		**V**	690	690	690
Maximum continuous current at ambient temperature ≤ 40 °C [1] (Min. cable Ø/Ie)					
	With tubular links	**mm²/A**	6/32 or 4/25 or 2.5/16	4/25 or 2.5/16	10/50 or 6/40
	With **aM** fuses	**mm²/A**	6/32 or 4/22 or 2.5/20	4/25 or 2.5/20	10/50 or 6/35
	With **gG** fuses	**mm²/A**	4/25 or 2.5/20 or 1.5/16	2.5/20 or 1.5/16	10/40 or 6/32

Early break contact characteristics

Rated operational voltage		**V**	∼ 250. ⎓ 60	∼ 250. ⎓ 60	∼ 500	⎓ 48
Conventional thermal current		**A**	2.5	2.5	6	3

Blow fuse contact characteristics 95/96-98

Rated operational voltage		**V**	–	–	∼ 250	⎓ 24
Conventional thermal current		**A**	–	–	6	3

Cartridge fuse characteristics

Fuse size			10 x 38	10 x 38	14 x 51
Type **aM**	∼ 400 V	**A**	32 [2]	25	50
	∼ 500 V	**A**	20	20	40
	∼ 660 V	**A**	–	–	25
Type **gG**	∼ 400 V	**A**	25 [2]	25	40
	∼ 500 V	**A**	25	25	40
	∼ 660 V	**A**	–	–	25
Maximum power dissipated by fuse		**W**	3	3	8.5

Cabling

Connection by screw clamp terminals or connectors

Number and c.s.a. of conductors			Min.	Max.	Min.	Max.	Min.	Max.
	Solid cable	**mm²**	2 x 1	2 x 6	–	–	1 x 2.5	1 x 25
	Flexible cable without cable end	**mm²**	2 x 1.5	2 x 6	–	–	1 x 2.5	1 x 25
	Flexible cable with cable end	**mm²**	2 x 1	2 x 4	–	–	1 x 2.5	1 x 16
Connection			Screw clamp terminals		–	–	Connector	
Tightening torque		**Nm**	1.7		–	–	2	

Connection by spring terminals

Number and c.s.a. of conductors			Min.	Max.	Min.	Max.	Min.	Max.
	Solid cable	**mm²**	–	–	2 x 1 [3]	2 x 4	–	–
	Flexible cable without cable end	**mm²**	–	–	2 x 1.5 [1]	2 x 4	–	–

(1) For use in an installation with ambient temperature > 55 °C, apply a derating coefficient equivalent to $\sqrt{\frac{120 - \text{ambient temperature}}{80}}$

*(2) These values are for fuse carriers mounted side by side with a gap of 10 mm between them or mounted with sets of busbars **GV2●54**. If mounted side by side without a gap, use the following fuse sizes: **aM** fuse: 25 A and **gG** fuse: 20 A.*

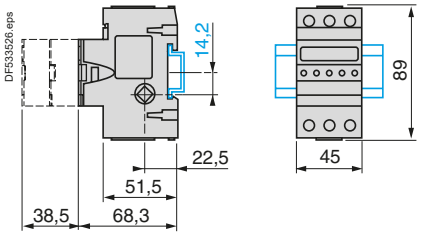
*(3) For cross-sections 1 to 1.5 mm², the use of an **LA9D99** cable end reducer is recommended.*

Introduction: page B4/2
References: pages B4/6 to B4/8
Dimensions: page B4/15
Schemes: page B4/16

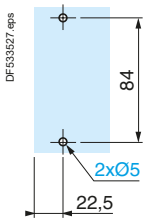
Dimensions, mounting

LS1D32

Mounting on rail NSYDPR200BD

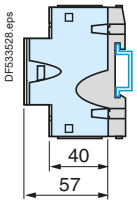


Panel mounting



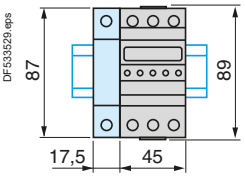
LS1D32 + LA8D324

Mounting on rail NSYDPR200BD

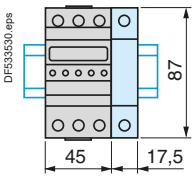


Mounting of 4th pole

On left-hand side

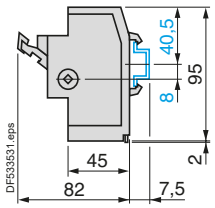


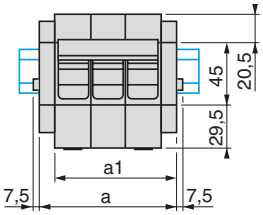
On right-hand side



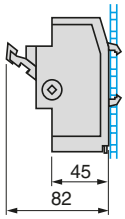
GK1EK, EM, ES, ET, EV, EW, EX, EY

Mounting on rail NSYDPR200BD





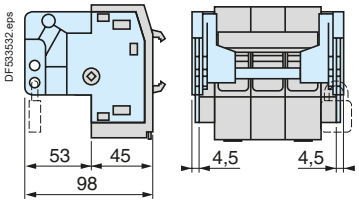
Mounting on pre-slotted plate AM1P



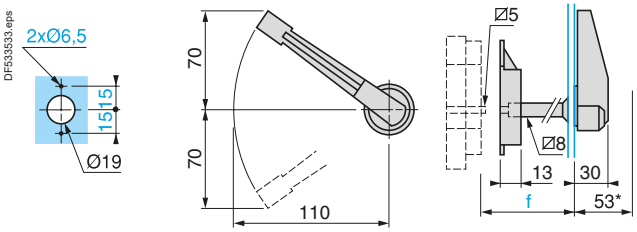
a: with single-phase protection device.
a1: without single-phase protection device.

GK1	a		a1	
	3 P	4 P	3 P	4 P
EK	–	–	88	–
EM	–	–	–	114
ES	–	–	97	–
ET	–	–	–	123
EV	106	–	–	–
EW	115	–	–	–
EX	–	141	–	–
EY	–	132	–	–

GK1E + GK1AV (padlocking device)



External operator GK1AP05 right-hand, GK1AP06 left-hand



External operator, RH or LH side	f
GK1EK, EM, ES, ET	29…114
GK1EV, EW, EX, EY	29…114

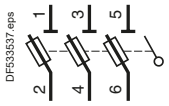
Fuse carriers
Ref.

Schemes

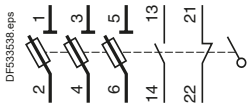
Fuse carriers without single-phase protection device

3-pole

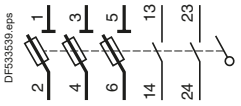
LS1D32, D323



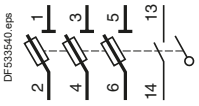
LS1D32, D323 + GVAE11●



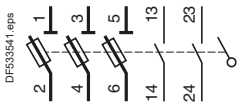
LS1D32, D323 + GVAE20●



GK1EK

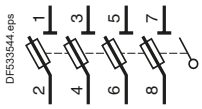


GK1ES



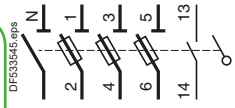
4-pole

LS1D32 + LA8D324

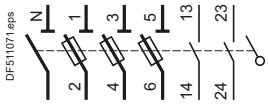


3-pole + Neutral

GK1EM



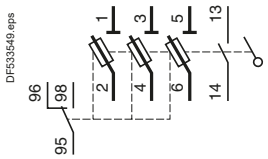
GK1ET



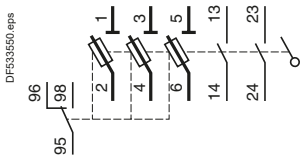
Fuse carriers with single-phase protection device

3-pole

GK1EV

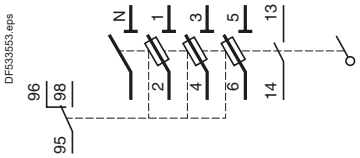


GK1EW

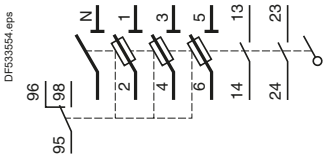


3-pole + Neutral

GK1EY



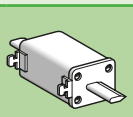
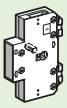
GK1EX



TeSys GS
Switch-disconnector fuses

Introduction B5/2

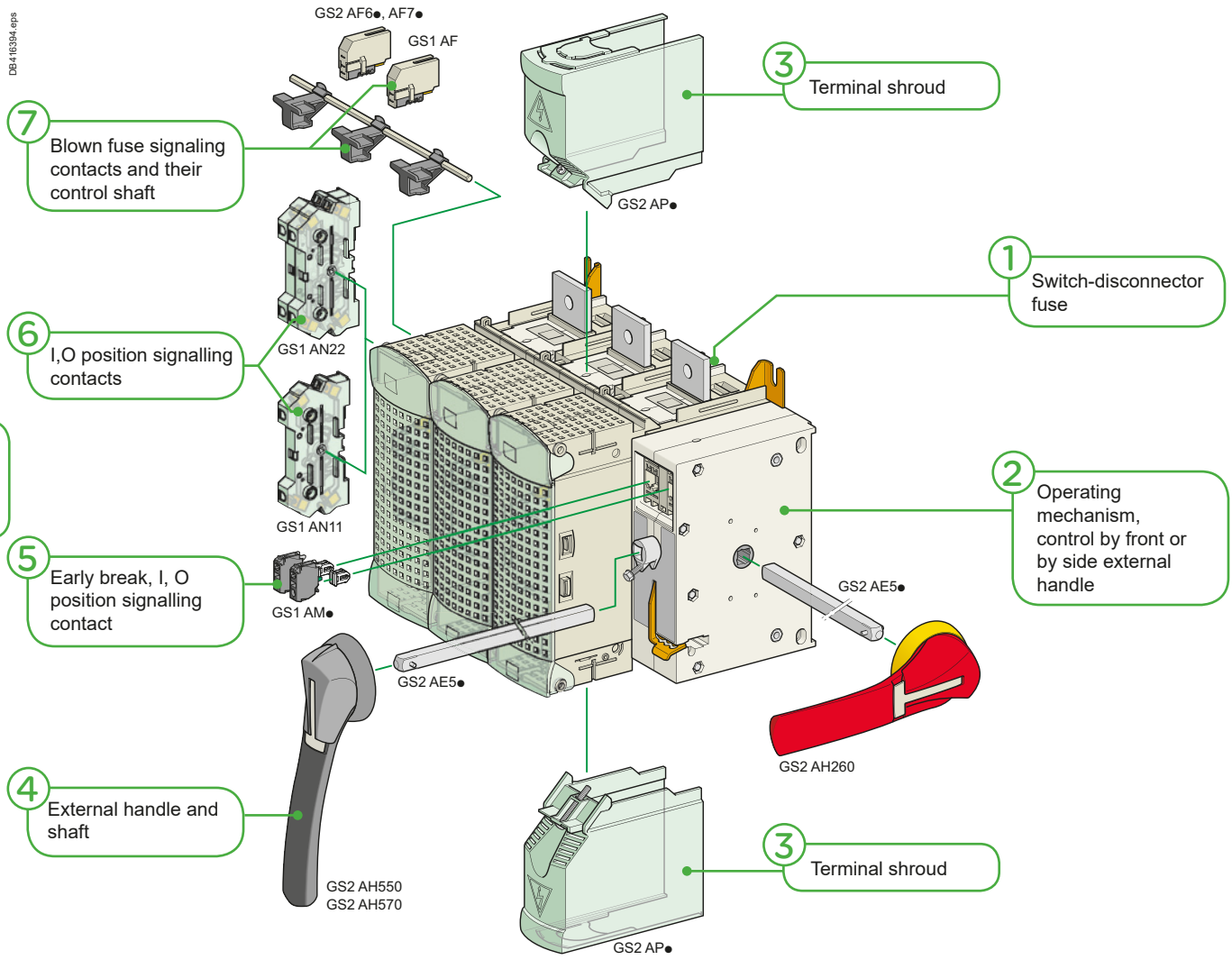
TeSys GS Switch-disconnector fuses

Type of product	Range		Pages
IEC - Switch-disconnector fuses For NFC / DIN fuses	From 32 to 1250 A		B5/4
IEC - Switch-disconnector fuses For BS fuses	From 32 to 1250 A		B5/6
UL - Switch-disconnector fuses For CC / J fuses	From 30 to 800 A		B5/8
NFC - Cartridge fuses Type aM, gG	From 0.16 to 125 A		B5/10
DIN - Cartridge fuses Type aM, gG	From 10 to 1250 A		B5/11
Auxiliary contacts for IEC and UL switch-disconnector fuses	From 32 to 1250 A		B5/12
Handles	From 32 to 1250 A		B5/13
Other accessories	From 32 to 1250 A		B5/14

Technical Data for Designers B5/15

A customizable functional block

Whatever its rating, the switch-disconnector fuse fits the need: particular position of the handle, triggering of an automatic control before full opening, enhanced protection of terminals...



Customizable

GS2630 A switch-disconnector fuse

1 Switch-disconnector fuse
- NFC/DIN or BS fuse compatible
- Enhanced isolation between poles
- On-load making/breaking with double break isolation of the power circuit

2 Operating mechanism
- For one front or side external handle, right or left side
- Cavity for early-break contacts

3 Terminal shrouds
- For use when the switch-disconnector fuse is installed outside an enclosure or when the operating voltage is over 500 V AC

4 Operating handle
- Padlockable in open position

5 GS1AN●● Position signalling contacts
- Synchronized with the poles operation

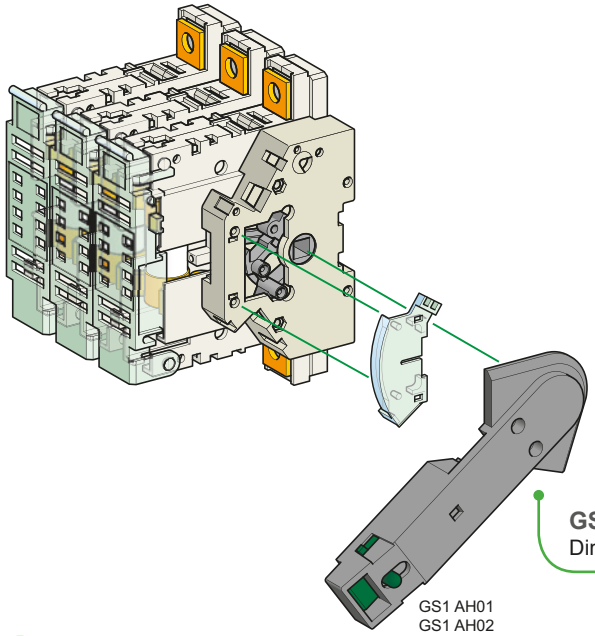
6 GS1AM●●● Early-break signalling contacts
- Activated before the poles are opened

7 GS1AF●● Blown fuse signalling contacts
- A missing fuse is also indicated

Simplicity of the direct operating

The mounting of an operating handle directly on the side of the switch-disconnector fuse is a simple operation.
This handle will be for use by qualified personnel only.
As the mechanical design is simplified, the manoeuvre will be immediately understood by the operator.
Each handle can be padlocked in open position. Locking device for 3 padlocks.

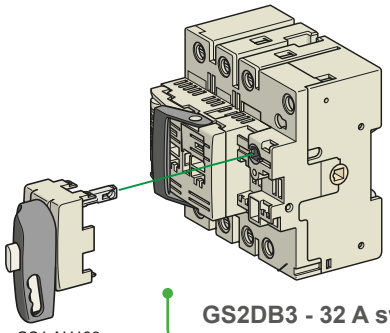
DB416395.eps



GS1 AH01
GS1 AH02

GS1JD3 - 100 A switch-disconnector fuse
Direct lateral operating

DB416396.eps



GS1 AH103

GS2DB3 - 32 A switch-disconnector fuse
Direct front operating

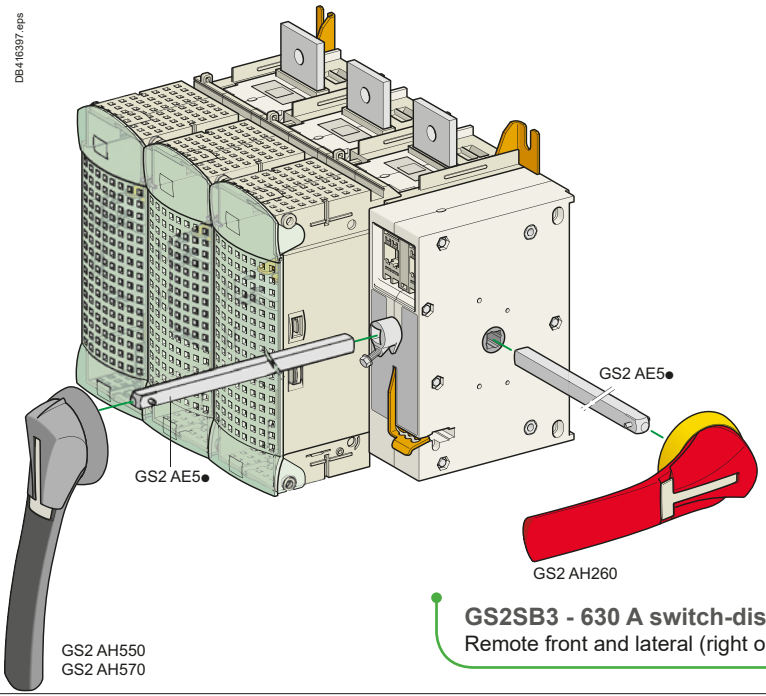
Position of the handle, a free choice

Performance remote operating

Located on the front or side panel of an enclosure, the operating handle provide complementary features:
- simple (IP55) or reinforced (IP65) protection against dust
- intermediate "Test" position
- door interlock when the handle is in "Close" position, opening by mean of a special tool is needed for opening.
- optional key-operated handle lock

The handles are available in different lengths. They are chosen according the operating effort which depends on the rating of the switch-disconnector fuse.
The drive shaft can be cut to the ideal length.
The choice of a red and yellow handle (CNOMO standard) will identify an "Emergency Stop handle" among others handles, generally black and gray.

DB416397.eps



GS2 AH260

GS2 AH550
GS2 AH570

GS2SB3 - 630 A switch-disconnector fuse
Remote front and lateral (right only) operating

IEC - For NFC / DIN fuses - From 32 to 1250 A


GS1DD3


GS1FD3


GS1KD4

Rating A			32		50		63		100		125	
Number of poles			3	3+N	3	4	3	4	3	4	3	4
Fuse size			10 x 38		14 x 51		Size 000		22 x 58		22 x 58	
For direct operators												
Switch-disconnector fuses reference			**GS1DD3**	**GS1DD4**	**GS1FD3**	**GS1FD4**	**GS1GD3**	**GS1GD4**	**GS1JD3**	**GS1JD4**	**GS1KD3**	**GS1KD4**
Handle	Black		**GS1AH103**		**GS1AH01**				**GS1AH02**			
Auxiliary contacts	O/I + Test	1NO + 1NC	-		**GS1AN11**							
		2NO + 2NC	-		**GS1AN22**							
	O/I + early break		**GS1AM111** (1 OF)		**GS1AM1** (1 OF)							
			GS1AM211 (2 OF)		**GS1AM2** (2 OF)							
	Blown fuse		-		**GS1AF1**		-		**GS1AF23**	**GS1AF24**	**GS1AF23**	**GS1AF24**
For external left hand side-mounted operators												
Switch-disconnector fuses reference			**GS1DD3**	**GS1DD4**	**GS2FG3**	**GS2FG4**	**GS2GG3**	**GS2GG4**	**GS2JG3**	**GS2JG4**	**GS2KG3**	**GS2KG4**
Handle	Black/Grey	IP65	**GS2AH310**						**GS2AH330**			
	Red/Yellow	IP65	**GS2AH320**						**GS2AH340**			
Auxiliary contacts	O/I + Test	1NO + 1NC	-		**GS1AN11G**							
		2NO + 2NC	-		**GS1AN22G**							
	O/I + early break	1NO	**GS1AM110**									
		2NO	**GS1AM101**									
	Blown fuse		-		**GS1AF1**		-		**GS1AF23**	**GS1AF24**	**GS1AF23**	**GS1AF24**
For external front-mounted and right-hand side-mounted operators												
Switch-disconnector fuses reference			**GS1DD3**	**GS1DD4**	**GS2F3**	**GS2F4**	**GS2G3**	**GS2G4**	**GS2J3**	**GS2J4**	**GS2K3**	**GS2K4**
Front-mounted handle	Black/Grey	IP55	**GS2AH515**						**GS2AH535**			
	Black/Grey	IP65	**GS2AH510**						**GS2AH530**			
	Red/Yellow	IP65	**GS2AH520**						**GS2AH540**			
Front-mounted handle + Test position	Black/Grey	IP65	**GS2AHT510**						**GS2AHT530**			
	Red/Yellow	IP65	**GS2AHT520**						**GS2AHT540**			
RH side-mounted handle	Black/Grey	IP55	**GS2AH215**						**GS2AH235**			
	Black/Grey	IP65	**GS2AH210**						**GS2AH230**			
	Red/Yellow	IP65	**GS2AH220**						**GS2AH240**			
Auxiliary contacts	O/I + Test	1NO + 1NC	-		**GS1AN11**							
		2NO + 2NC	-		**GS1AN22**							
		1NO + 1NC + test	-		**GS1ANT11**							
		2NO + 2NC + test	-		**GS1ANT22**							
	O/I + Test + early break	1NO	-		**GS1AM110**							
		1NC	-		**GS1AM101**							
	Blown fuse		-		**GS1AF1**		-		**GS1AF23**	**GS1AF24**	**GS1AF23**	**GS1AF24**
Accessories												
Shaft for external handle (mm)		200	**GS2AE82**		**GS2AE22**							
		320	**GS2AE8**		**GS2AE2**							
		400	**GS2AE81**		**GS2AE21**							
Terminal shroud			Integrated						**GS1AP33** (3P), **GS1AP34** (4P)			
Dimensions												
	Direct front-mounted version		page B5/23		page B5/24							
	External front-mounted version		page B5/23		page B5/25							

Handles


PF568668.tif
GS1AH01


PF568669.tif
GS1AH02


PF538656.tif
GS2AH●10
GS2AH●20


PF538655.tif
GS2AH●30
GS2AH●40


PF538654.tif
GS2AH●50
GS2AH●60

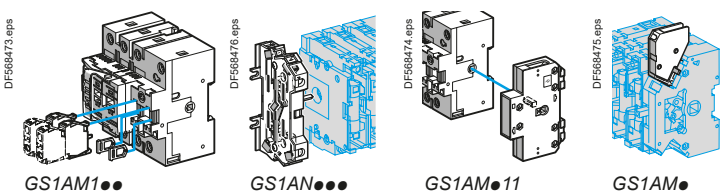

PF538653.tif
GS2AH●70
GS2AH●80

See details on handles page B5/13.

Characteristics: pages B5/16 and B5/17
Dimensions: pages B5/23 to B5/27
Schemes: page B5/31

	 *GS1KKD3*		 *GS1LLD4*				 *GS1ND3*									
	125		**160**				**250**		**400**		**630**		**1250**			
	3	4	3	4	3	4	3	4	3	4	3	4	3	4		
	Size 00		Size 00		Size 0		Size 1		Size 2		Size 3		Size 4			
	GS1KKD3	**GS1KKD4**	**GS1LLD3**	**GS1LLD4**	**GS1LD3**	**GS1LD4**	**GS1ND3**	**GS1ND4**	**GS1QQD3**	**GS1QQD4**	**GS2S3**	**GS2S4**	**GS2V3**	**GS2V4**		
	GS1AH02										**GS2AH104**		**GS2AH105**			
	GS1AN11															
	GS1AN22															
	GS1AM1 (1 OF)										**GS1AM110** (1 NO)					
	GS1AM2 (2 OF)										**GS1AM101** (1 NC)					
	-				**GS1AF33**	**GS1AF34**	**GS1AF43**	**GS1AF44**	**GS1AF43**	**GS1AF44**	**GS2AF63**	**GS2AF64**	**GS2AF73**	**GS2AF74**		
	GS2KKG3	**GS2KKG4**	**GS2LLG3**	**GS2LLG4**	**GS2LG3**	**GS2LG4**	**GS2NG3**	**GS2NG4**	**GS2QQG3**	**GS2QQG4**	**GS2SG3**	**GS2SG4**	**GS2VG3**	**GS2VG4**		
	GS2AH330										**GS2AH350**					
	GS2AH340										**GS2AH360**					
	GS1AN11G															
	GS1AN22G															
	GS1AM110															
	GS1AM101															
	-				**GS1AF33**	**GS1AF34**	**GS1AF43**	**GS1AF44**	**GS1AF43**	**GS1AF44**	**GS2AF63**	**GS2AF64**	**GS2AF73**	**GS2AF74**		
	GS2KK3	**GS2KK4**	**GS2LL3**	**GS2LL4**	**GS2L3**	**GS2L4**	**GS2N3**	**GS2N4**	**GS2QQ3**	**GS2QQ4**	**GS2S3**	**GS2S4**	**GS2V3**	**GS2V4**		
	GS2AH535										-					
	GS2AH530										**GS2AH550**		**GS2AH570**			
	GS2AH540										**GS2AH560**		**GS2AH580**			
	GS2AHT530										-					
	GS2AHT540										-					
	GS2AH235										-					
	GS2AH230										**GS2AH250**					
	GS2AH240										**GS2AH260**					
	GS1AN11															
	GS1AN22															
	GS1ANT11										-					
	GS1ANT22										-					
	GS1AM110										-					
	GS1AM101										-					
	-				**GS1AF33**	**GS1AF34**	**GS1AF43**	**GS1AF44**	**GS1AF43**	**GS1AF44**	**GS2AF63**	**GS2AF64**	**GS2AF73**	**GS2AF74**		
	GS2AE22										**GS2AE52**					
	GS2AE2										**GS2AE5**					
	GS2AE21										**GS2AE51**					
	GS1AP33 (3P), **GS1AP34** (4P)						**GS1AP43** (3P), **GS1AP44** (4P)				**GS2AP73**	**GS2AP64**	**GS2AP83**	**GS2AP84**		
	page B5/24										page B5/26					
	page B5/25										page B5/27					

Auxiliary contacts



GS1AM1●● *GS1AN●●●* *GS1AM●11* *GS1AM●*

See details on auxiliary contacts, page B5/12.

Maximal number of auxiliary contacts

Switch rating (A)	Standard configuration	With additional bracket	Reference of additional bracket
30...32	4	4	**GS1AD10** (1)
32...400	4	4	**GS2AD20** (2)
200...400	8	8	**GS2AD20** (2)
630...1250	8	-	-

(1) Only compatible with switch disconnector fuses starting by GS1D●●
(2) Only compatible with switch disconnector fuses starting by GS2●●●

Characteristics: pages B5/16 and B5/17
Dimensions: pages B5/23 to B5/27
Schemes: page B5/31

IEC - For BS fuses - From 32 to 1250 A


GS1DDB3


GS2JB3

Rating A			32				63		100		160			
Number of poles			3	3+N	3	4	3	4	3	4	3	4	3	4
Fuse size			A1		A1		A2-A3		A4		A4		B1-B2	
For direct operators														
Switch-disconnector fuses reference			**GS1DDB3**	**GS1DDB4**	-									
Handle	Black		**GS1AH103**		-									
Auxiliary contacts	O/I + Test	1NO + 1NC	-		-									
		2NO + 2NC	-		-									
	O/I + early break		**GS1AM111** (1 OF)		-									
			GS1AM211 (2 OF)		-									
For external front-mounted and right-hand side-mounted operators														
Switch-disconnector fuses reference			**GS1DDB3**	**GS1DDB4**	**GS2DB3**	**GS2DB4**	**GS2GB3**	**GS2GB4**	**GS2JB3**	**GS2JB4**	**GS2LLB3**	**GS2LLB4**	**GS2LB3**	**GS2LB4**
Front-mounted handle	Black/Grey	IP55	**GS2AH515**						**GS2AH535**					
	Black/Grey	IP65	**GS2AH510**						**GS2AH530**					
	Red/Yellow	IP65	**GS2AH520**						**GS2AH540**					
Front-mounted handle + Test position	Black/Grey	IP65	**GS2AHT510**						**GS2AHT530**					
	Red/Yellow	IP65	**GS2AHT520**						**GS2AHT540**					
RH side-mounted handle	Black/Grey	IP55	**GS2AH215**						**GS2AH235**					
	Black/Grey	IP65	**GS2AH210**						**GS2AH230**					
	Red/Yellow	IP65	**GS2AH220**						**GS2AH240**					
Auxiliary contacts	O/I + Test	1NO + 1NC	-		**GS1AN11**									
		2NO + 2NC	-		**GS1AN22**									
		1NO + 1NC + test	-		**GS1ANT11**									
		2NO + 2NC + test	-		**GS1ANT22**									
	O/I + Test + early break	1NO	**GS1AM110** - max 4 contacts											
		1NC	**GS1AM101** - max 4 contacts											
Accessories														
Shaft for external handle (mm)		200	**GS2AE82**		**GS2AE22**									
		320	**GS2AE8**		**GS2AE2**									
		400	**GS2AE81**		**GS2AE21**									
Terminal shroud			Integrated						**GS1AP33** (3P), **GS1AP34** (4P)					
Dimensions														
	Direct front-mounted version		page B5/23				page B5/24							
	External front-mounted version		page B5/23				page B5/25							

Switch-disconnectors fuses



GS2MMB3



GS2SB3

	200		250		315		400		630		800		1250	
	3	4	3	4	3	4	3	4	3	4	3	4	3	4
	B1-B2		B1...B3		B1...B3		B1...B4		C1-C2		C1...C3		D1	
	-								-				-	
	-								-				-	
	-								-					
	-								-					
	-								-					
	-								-					
	GS2MMB3	**GS2MMB4**	**GS2NB3**	**GS2NB4**	**GS2PPB3**	**GS2PPB4**	**GS2QQB3**	**GS2QQB4**	**GS2SB3**	**GS2SB4**	**GS2TB3**	**GS2TB4**	**GS2VB3**	**GS2VB4**
	GS2AH535								-					
	GS2AH530								**GS2AH550**				**GS2AH570**	
	GS2AH540								**GS2AH560**				**GS2AH580**	
	GS2AHT530								-					
	GS2AHT540								-					
	GS2AH235								-					
	GS2AH230								**GS2AH250**					
	GS2AH240								**GS2AH260**					
	GS1AN11													
	GS1AN22													
	GS1ANT11								-					
	GS1ANT22								-					
	GS1AM110 - max 8 contacts													
	GS1AM101 - max 8 contacts													
	GS2AE22								**GS2AE52**					
	GS2AE2								**GS2AE5**					
	GS2AE21								**GS2AE51**					
	GS1AP43 (3P), **GS1AP44** (4P)								**GS2AP73** (3P), **GS2AP64** (4P)				**GS2AP83**	**GS2AP84**
	page B5/24								page B5/26					
	page B5/25								page B5/27					

UL - For CC and J fuses - From 32 to 800 A


GS1DU3


GS2GU3N

Rating			30 Compact		30		60	100	
Number of poles			3		3		3	3	
Fuse size			CC	J	CC	J	J	J	
For direct operators									
Switch-disconnector fuses reference			**GS1DDU3**	**GS1DU3**	**-**				
Handle	Black		**GS1AH106**	-	-				
Auxiliary contacts	O/I + Test	1NO + 1NC	-						
		2NO + 2NC	-						
	O/I + early break	1NO	**GS1AM110 + GS1AD10**		-				
		1NC	**GS1AM101 + GS1AD10**		-				
For external front-mounted operators									
Switch-disconnector fuses reference			**GS1DDU3**	**GS1DU3**	**GS2EEU3**	**GS2EU3N**	**GS2GU3N**	**GS2JU3N**	
Front-mounted handle	Black/Grey	1,3R, 12	**GS2AH110**		**GS2AH130**				
		4, 4X	**GS2AH410**		**GS2AH430**				
	Red/Yellow	1,3R, 12	**GS2AH120**		**GS2AH140**				
		4, 4X	**GS2AH420**		**GS2AH440**				
Front-mounted handle + Test position	Black/Grey	1,3R, 12	**GS2AHT110**		**GS2AHT130**				
		4, 4X	**GS2AHT410**		**GS2AHT430**				
	Red/Yellow	1,3R, 12	**GS2AHT120**		**GS2AHT140**				
		4, 4X	**GS2AHT420**		**GS2AHT440**				
Auxiliary contacts	O/I + Test	1NO + 1NC	-		**GS1AN11**				
		2NO + 2NC	-		**GS1AN22**				
		1NO + 1NC + test	-		**GS1ANT11**				
		2NO + 2NC + test	-		**GS1ANT22**				
	O/I + Test + early break	1NO	**GS1AM110** - max 4 contacts (1)		**GS1AM110** - max 4 contacts (1)				
		1NC	**GS1AM101** - max 4 contacts (1)		**GS1AM101** - max 4 contacts (1)				
Accessories									
Shaft for external handle (mm)		320	**GS2AE8**		**GS2AE2**				
		400	**GS2AE81**		**GS2AE21**				
Terminal shroud			Integrated						
Dimensions									
	Direct front-mounted version		page B5/23				page B5/24		
	External front-mounted version		page B5/23				page B5/25		

(1) 4 more contacts allowed with GS1AD10 additional bracket.

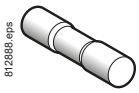
Switch-disconnectors fuses

	 *GS2QU3N*			 *GS2TU3*
	200	400	600	800
	3	3	3	3
	J	J	J	J
	-		-	-
	-		-	
	-		-	
	-		-	
	-		-	
	-		-	
	GS2MU3N	**GS2QU3N**	**GS2SU3**	**GS2TU3**
	GS2AH130		-	
	GS2AH430		**GS2AH150**	
	GS2AH140		-	
	GS2AH440		**GS2AH160**	
	GS2AHT130		-	
	GS2AHT430		-	
	GS2AHT140		-	
	GS2AHT440		-	
	GS1AN11			
	GS1AN22			
	GS1ANT11		-	
	GS1ANT22		-	
	GS1AM110 - max 8 contacts [1]		**GS1AM110** - max 8 contacts only	
	GS1AM101 - max 8 contacts [1]		**GS1AM101** - max 8 contacts only	
	GS2AE2		**GS2AE5**	
	GS2AE21		**GS2AE51**	
	GS2AP43	**GS2AP53**	**GS2AP73**	
	page B5/24		page B5/26	
	page B5/25		page B5/27	

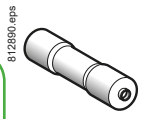
Product references



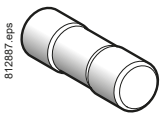
DF2CA●●●
DF2CN●●



DF2EA●●●
DF2EN●●



DF3EA●●
DF3EN●●



DF2FA●●
DF2FN●●



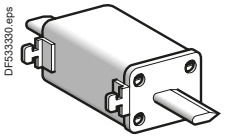
DF3FA●●
DF3FN●●

NFC Cartridge fuses - Type aM / gG - From 0.16 to 125 A

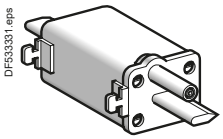
Fuse type	Maximum rated voltage	Rating	Sold in lots of	Fuses without striker		Fuses with striker	
				Unit reference		Unit reference	
	V ∼	A		aM	gG	aM	gG
Cylindrical 8.5 x 31.5	400	1	10	DF2BA0100	DF2BN0100	–	–
		2	10	DF2BA0200	DF2BN0200	–	–
		4	10	DF2BA0400	DF2BN0400	–	–
		6	10	DF2BA0600	DF2BN0600	–	–
		8	10	DF2BA0800	DF2BN0800	–	–
		10	10	DF2BA1000	DF2BN1000	–	–
		12	10	–	DF2BN1200	–	–
		16	10	–	DF2BN1600	–	–
		20	10	–	DF2BN2000	–	–
Cylindrical 10 x 38	500	0.16	10	DF2CA001	–	–	–
		0.25	10	DF2CA002	–	–	–
		0.50	10	DF2CA005	–	–	–
		1	10	DF2CA01	–	–	–
		2	10	DF2CA02	DF2CN02	–	–
		4	10	DF2CA04	DF2CN04	–	–
		6	10	DF2CA06	DF2CN06	–	–
		8	10	DF2CA08	DF2CN08	–	–
		10	10	DF2CA10	DF2CN10	–	–
		12	10	DF2CA12	DF2CN12	–	–
		16	10	DF2CA16	DF2CN16	–	–
		20	10	–	DF2CN20	–	–
	400	20	10	DF2CA20	–	–	–
		25	10	DF2CA25	DF2CN25	–	–
		32	10	DF2CA32	DF2CN32	–	–
Cylindrical 14 x 51	690	0.25	10	DF2EA002	–	–	–
		0.50	10	DF2EA005	–	–	–
	500	1	10	DF2EA01	–	–	–
		2	10	DF2EA02	–	DF3EA02	–
		4	10	DF2EA04	DF2EN04	DF3EA04	DF3EN04
		6	10	DF2EA06	DF2EN06	DF3EA06	DF3EN06
		8	10	DF2EA08	–	DF3EA08	–
		10	10	DF2EA10	DF2EN10	DF3EA10	DF3EN10
		12	10	DF2EA12	–	DF3EA12	–
		16	10	DF2EA16	DF2EN16	DF3EA16	DF3EN16
		20	10	DF2EA20	DF2EN20	DF3EA20	DF3EN20
		25	10	DF2EA25	DF2EN25	DF3EA25	DF3EN25
		32	10	DF2EA32	DF2EN32	DF3EA32	DF3EN32
		40	10	DF2EA40	DF2EN40	DF3EA40	DF3EN40
	400	50	10	DF2EA50	DF2EN50	DF3EA50	–
Cylindrical 22 x 58	690	4	10	DF2FA04	–	DF3FA04	–
		6	10	DF2FA06	–	DF3FA06	–
		8	10	DF2FA08	–	DF3FA08	–
		10	10	DF2FA10	DF2FN10	DF3FA10	DF3FN10
		16	10	DF2FA16	–	DF3FA16	–
		20	10	DF2FA20	DF2FN20	DF3FA20	DF3FN20
		25	10	DF2FA25	DF2FN25	DF3FA25	DF3FN25
		32	10	DF2FA32	DF2FN32	DF3FA32	DF3FN32
		40	10	DF2FA40	DF2FN40	DF3FA40	DF3FN40
		50	10	DF2FA50	DF2FN50	DF3FA50	DF3FN50
	500	63	10	DF2FA63	DF2FN63	DF3FA63	DF3FN63
		80	10	DF2FA80	DF2FN80	DF3FA80	DF3FN80
		100	10	DF2FA100	DF2FN100	DF3FA100	DF3FN100
	400	125	10	DF2FA125	–	DF3FA125	–

For protection of equipment with current peaks
For protection of circuits without significant current peaks

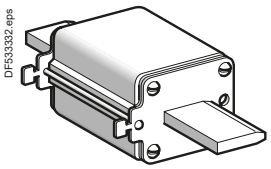
Product references



DF2GA●●●●
DF2GN●●●●



DF4GA●●●●
DF4GN●●●●

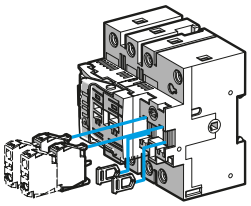


DF2JA●●●●
DF2JN●●●●

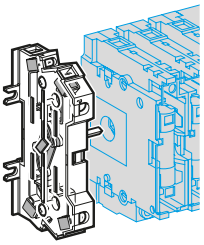
DIN Cartridge fuses - Type aM /gG - From 10 to 1250 A

Fuse type	Maximum rated voltage	Rating	Sold in lots of		Fuses without striker – Unit reference		Fuses with striker – Unit reference	
	V ∼	A	aM	gG	aM	gG	aM	gG
Blade size 000	690	10	-	10	–	DF2FGN10	–	–
		16	3	10	DF2FGA16	DF2FGN16	–	–
		20	3	10	DF2FGA20	DF2FGN20	–	–
		25	3	10	DF2FGA25	DF2FGN25	–	–
		32	3	10	DF2FGA32	DF2FGN32	–	–
		40	3	10	DF2FGA40	DF2FGN40	–	–
		50	3	10	DF2FGA50	DF2FGN50	–	–
		63	3	10	DF2FGA63	DF2FGN63	–	–
		80	-	10	–	DF2FGN80	–	–
Blade size 00	690	80	3	-	DF2FGA80	–	–	–
		100	3	10	DF2FGA100	DF2FGN100	–	–
		125	3	10	DF2FGA125	DF2FGN125	–	–
	500	160	-	10	–	DF2FGN160	–	–
Blade size 0	690	50	3	3	DF2GA1051	DF2GN1051	–	–
		63	3	3	DF2GA1061	DF2GN1061	–	–
		80	3	3	DF2GA1081	DF2GN1081	–	–
		100	3	3	DF2GA1101	DF2GN1101	–	–
		125	3	3	DF2GA1121	DF2GN1121	DF4GA1121	–
		160	3	3	DF2GA1161	DF2GN1161	DF4GA1161	–
	500	125	-	3	–	–	–	DF4GN1121
		160	-	3	–	–	–	DF4GN1161
		200	3	-	DF2GA1201	–	DF4GA1201	–
Blade size 1	690	160	3	3	DF2HA1161	DF2HN1161	–	–
		200	3	3	DF2HA1201	DF2HN1201	DF4HA1201	DF4HN1201
		250	3	-	DF2HA1251	–	DF4HA1251	–
	500	250	-	3	–	DF2HN1251	–	DF4HN1251
		315	3	-	DF2HA1311	–	DF4HA1311	–
Blade size 2	690	250	3	3	DF2JA1251	DF2JN1251	–	–
		315	3	3	DF2JA1311	DF2JN1311	DF4JA1311	DF4JN1311
		400	3	-	DF2JA1401	–	DF4JA1401	–
	500	400	-	3	–	DF2JN1401	–	DF4JN1401
		500	3	-	DF2JA1501	–	DF4JA1501	–
Blade size 3	690	400	3	-	DF2KA1401	–	–	–
		500	3	3	DF2KA1501	–	DF4KA1501	DF4KN1501
	500	500	-	3	–	DF2KN1501	–	–
		630	3	3	DF2KA1631	DF2KN1631	DF4KA1631	DF4KN1631
Blade size 4	690	800	1	3	DF2LA1801	–	DF4LA1801	DF4LN1801
		1000	1	-	DF2LA1101	–	DF4LA1101	–
	500	800	-	1	–	DF2LN1801	–	–
		1000	-	1	–	DF2LN1101	–	DF4LN1101
		1250	1	1	DF2LA1251	DF2LN1251	DF4LA1251	DF4LN1251

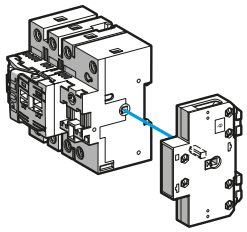
For protection of equipment with current peaks
For protection of circuits without significant current peaks



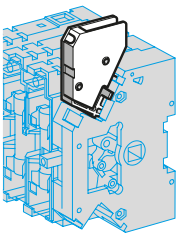
GS1AM1●●



GS1AN●●●



GS1AM●11



GS1AM●

Auxiliary contacts for IEC and UL switch-disconnector-fuses

Auxiliary early break and/or O, I and Test position signalling contacts (1) (2) (3)

Switch rating		Contact type	Type of operator	Rated operating current Ie (A)		Reference
A (CEI)	**A** (UL)			< 24 V DC	< 240 V AC	
32…1250	30 Compact 30...800	1 N/O	External, front or side-mounted (4)	2.8	3	**GS1AM110**
		1 N/C	External, front or side-mounted (4)	2.8	3	**GS1AM101**

Auxiliary O, I and Test position signalling contacts (3) (5)

Switch rating		Contact type	Type of operator	Rated operating current Ie (A)		Reference
A (CEI)	**A** (UL)			< 24 V DC	< 240 V AC	
Auxiliary O and I position signalling contacts						
50…1250	30...800	1 N/C + 1 N/O	External, front or RH side-mounted Direct	–	10	**GS1AN11**
			External, LH side	–	10	**GS1AN11G***
		2 N/C + 2 N/O	External, front or RH side-mounted Direct	–	10	**GS1AN22**
			External, LH side	–	10	**GS1AN22G***
Auxiliary O, I and Test position signalling contacts (3)						
50…400	30...400	1 N/C + 1 N/O	External, front side-mounted	–	10	**GS1ANT11**
		2 N/C + 2 N/O	External, front side-mounted	–	10	**GS1ANT22**

Auxiliary early break O and I position signalling contacts

Switch rating	Contact type	Type of operator	Rated operating current Ie (A)		Reference
A (CEI)			< 24 V DC	< 240 V AC	
32	1 C/O	–	12	4	**GS1AM111***
	2 C/O	–	12	4	**GS1AM211***
50…400	1 C/O	Direct, RH side	12	4	**GS1AM1***
	2 C/O	Direct, RH side	12	4	**GS1AM2***

Auxiliary "blown fuse" signalling contacts for use with NF C and DIN fuses (6)

Contact type	Switch rating	Fuse size	Number of poles	Rated operating current Ie (A)		Reference
	A (CEI)			< 24 V DC	< 240 V AC	
1st C/O	50	14 x 51	3 or 4	12	4	**GS1AF1***
	100 and 125	22 x 58	3	12	4	**GS1AF23***
			4	12	4	**GS1AF24***
	160	Size 0	3	12	4	**GS1AF33***
			4	12	4	**GS1AF34***
	250 and 400	Size 1 and Size 2	3	12	4	**GS1AF43***
			4	12	4	**GS1AF44***
	630	Size 3	3	12	4	**GS2AF63***
			4	12	4	**GS2AF64***
	1250	Size 4	3	12	4	**GS2AF73***
			4	12	4	**GS2AF74***
2nd C/O	50…1250	–	3 or 4	12	4	**GS1AF***

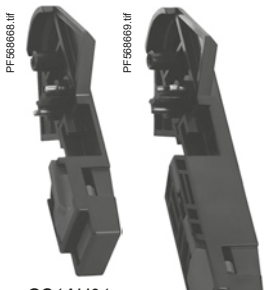
(*) Not for UL switch-disconnector.
(1) ***For 32 A (CEI), 30 (UL) switch-disconnector-fuses, these auxiliary contacts allow:***
- early break and O and I position signalling,
- O, I and Test position signalling,
- O and I position signalling,
- Test position signalling.
For 50 to 400 A (CEI), 30-400 A (UL) switch-disconnector-fuses, they allow:
- early break,
- O, I and Test position signalling,
- O and I position signalling,
- Test position signalling.
For 630 and 1250 A (CEI), 630 and 800 A (UL) switch-disconnector-fuses, they allow:
- early break and O and I position signalling,

(2) Maximum number of auxiliary contacts:

Switch rating			Standard	With additional bracket	Reference of additional bracket
A (CEI)	**A** (UL)				
32 (7)	30 Compact	CC	4	4 + 4	**GS1AD10**
		J	2	2 + 4	**GS1AD10**
32 (8)…160	30...100		4	4 + 4	**GS2AD20**
200…400	200 and 400		8	8 + 4	**GS2AD20**
630…1250	600 and 800		8	8	**–**

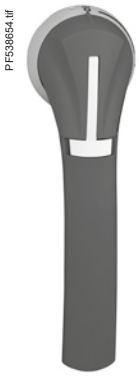
(3) The Test position allows testing of the control circuits off-load. Auxiliary contacts ***GS1AM110****,* ***GS1AM101*** *and* ***GS1ANT●●*** *only allow the text function with external handles* ***GS2AHT●●●****.*
(4) These auxiliary contacts can also be used with 630, 800 and 1250 A switch-disconnector-fuses fitted with a direct front-mounted operator.
(5) Reversible add-on attachments for converting an N/C contact to an N/O contact and vice versa.
(6) For striker fuses (BS fuses are not available with striker).
(7) For ***GS1DDB3*** *fuse switch disconnector only.*
(8) For 32 A: for fuse switch disconnector ***GS2DB3*** *only.*

Characteristics: page B5/22
Dimensions: page B5/31
Schemes: page B5/31


PF568668.tif
PF568669.tif
GS1AH01
GS1AH02


PF538656.tif
GS2AH●10
GS2AH●20


PF538655.tif
GS2AH●30
GS2AH●40


PF538654.tif
GS2AH●50
GS2AH●60


PF538653.tif
GS2AH●70
GS2AH●80

Handles for IEC and UL switch-disconnector-fuses

Handles for direct operators

Switch rating A (CEI)	Switch rating A (UL)	Type of operator	Handle colour	Reference
Handles for direct operators, padlockable				
-	30 Compact	Front-mounted	Black	**GS2AH106**
32	-	Front	Black	**GS1AH103**
50 and 63	-	RH side	Black	**GS1AH01**
100…400	-	RH side	Black	**GS1AH02**
-	600 and 800	Front-mounted	Black	**GS2AH107**
630 and 800	-	Front	Black	**GS2AH104**
1250	-	Front	Black	**GS2AH105**

Handles for external operator

Switch rating A (CEI)	Switch rating A (UL)	Handle colour	Degree of protection	Protection index Nema	Reference
Handles for front-mounted external operators, padlockable and lockable in position O (1) Door interlock in I position (2)					
32…63	-	Black/Grey	IP 65	–	**GS2AH510**
			IP55	–	**GS2AH515**
		Red/Yellow	IP 65	–	**GS2AH520**
100…400	-	Black/Grey	IP 65	–	**GS2AH530**
			IP55	–	**GS2AH535**
		Red/Yellow	IP 65	–	**GS2AH540**
630 and 800	-	Black/Grey	IP65	–	**GS2AH550**
		Red/Yellow	IP65	–	**GS2AH560**
1250	-	Black/Grey	IP65	–	**GS2AH570**
		Red/Yellow	IP65	–	**GS2AH580**
-	30 Compact	Black/Grey	–	1, 3R, 12	**GS2AH110**
		Red/Yellow	–	1, 3R, 12	**GS2AH120**
		Black/Grey	–	1, 3R, 4, 4X, 12	**GS2AH410**
		Red/Yellow	–	1, 3R, 4, 4X, 12	**GS2AH420**
-	30…400	Black/Grey	–	1, 3R, 12	**GS2AH130**
		Red/Yellow	–	1, 3R, 12	**GS2AH140**
		Black/Grey	–	1, 3R, 4, 4X, 12	**GS2AH430**
		Red/Yellow	–	1, 3R, 4, 4X, 12	**GS2AH440**
-	600 and 800	Black/Grey	–	1, 3R, 12	**GS2AH150**
		Red/Yellow	–	1, 3R, 12	**GS2AH160**
Handles for front-mounted external operators with test facility (3), padlockable and lockable in "O" position (1). Door interlock in "I" position (2)					
32…63	-	Black/Grey	IP 65	–	**GS2AHT510**
		Red/Yellow	IP65	–	**GS2AHT520**
100…400	-	Black/Grey	IP65	–	**GS2AHT530**
		Red/Yellow	IP65	–	**GS2AHT540**
-	30 Compact	Black/Grey	–	1, 3R, 12	**GS2AHT110**
		Red/Yellow	–	1, 3R, 12	**GS2AHT120**
		Black/Grey	–	1, 3R, 4, 4X, 12	**GS2AHT410**
		Red/Yellow	–	1, 3R, 4, 4X, 12	**GS2AHT420**
-	30…400	Black/Grey	–	1, 3R, 12	**GS2AHT130**
		Red/Yellow	–	1, 3R, 12	**GS2AHT140**
		Black/Grey	–	1, 3R, 4, 4X, 12	**GS2AHT430**
		Red/Yellow	–	1, 3R, 4, 4X, 12	**GS2AHT440**
Handles for external right-hand side-mounted operators, padockable and lockable in "O" position (1)					
32…63	-	Black/Grey	IP 65	–	**GS2AH210**
			IP55	–	**GS2AH215**
		Red/Yellow	IP65	–	**GS2AH220**
100…400	-	Black/Grey	IP65	–	**GS2AH230**
			IP55	–	**GS2AH235**
		Red/Yellow	IP65	–	**GS2AH240**
630…1250	-	Black/Grey	IP65	–	**GS2AH250**
		Red/Yellow	IP65	–	**GS2AH260**
Handles for external left-hand side-mounted operators, padockable and lockable in "O" position (1)					
32…63	-	Black/Grey	IP 65	–	**GS2AH310**
		Red/Yellow	IP65	–	**GS2AH320**
100…400	-	Black/Grey	IP65	–	**GS2AH330**
		Red/Yellow	IP65	–	**GS2AH340**
630…1250	-	Black/Grey	IP65	–	**GS2AH350**
		Red/Yellow	IP65	–	**GS2AH360**

*(1) Lockable with device **GS2AX1,** to be ordered separately.*
(2) Door interlock override by means of a tool.
*(3) The Test facility allows testing of the control circuits off-load, by using auxiliary contacts **GS1AM110**, **GS1AM101** or **GS1ANT●●**. In the "Test" position, the enclosure door can be opened.*

Dimensions:
pages B5/23 to B5/30

PB121455.eps



GS2AE5

PB121456.eps



GS2AE2 - GS2AE21

PB121457.tif



GS2AE8 - GS2AE81

Accessories for IEC and UL switch-disconnector fuses

Shafts for external operators

Switch rating A (CEI)	Switch rating A (UL)	Shaft length mm	Shaft cross section mm	Reference
32	30 Compact	200	5 x 5	**GS2AE82**
		320	5 x 5	**GS2AE8**
		400	5 x 5	**GS2AE81**
50…400	30...400	200	10 x 10	**GS2AE22**
		320	10 x 10	**GS2AE2**
		400	10 x 10	**GS2AE21**
630…1250	600 and 800	200	12 x 12	**GS2AE52**
		320	12 x 12	**GS2AE5**
		40	12 x 12	**GS2AE51**

Terminal protection shrouds for upstream or downstream connector plates

Switch rating A (CEI)	Switch rating A (UL)	Number of poles	Reference
50 and 63	30 Compact, 30...60 (3P)	3 or 4	(1)
100…160	100	3	**GS1AP33**
	–	4	**GS1AP34**
200…400	200	3	**GS1AP43**
	–	4	**GS1AP44**
–	400	3	**GS1APU53**
630…800	600 and 800	3	**GS2AP73**
	–	4	**GS2AP64**
1250	–	3	**GS2AP83**
		4	**GS2AP84**

Devices for locking fuse covers in "I" position (2)

Switch rating A	Fuse size	Number of poles	Reference
50	14 x 51	3 or 4	(3)
63	Size 00C	3 or 4	**GS1AV1**
100…160	22 x 58, Size 00	3 or 4	**GS1AV2**
160	Size 0	3	**GS1AV33**
		4	**GS1AV34**
250	Size 1	3	**GS1AV53**
		4	**GS1AV54**
400	Size 2	3	**GS1AV73**
		4	**GS1AV74**

Cage terminals for connection of bare cables (without lug)

Switch rating A	Number of poles	Reference
50 and 63	3 or 4	(4)
100…160	3	**GS1AW33**
	4	**GS1AW34**
200…250	3	**GS1AW43**
	4	**GS1AW44**

External handle locking device

Switch rating A	Description	Reference
32…1250	Device for RONIS EL11AP keylock (lock to be ordered separately).	**GS2AX1**

Height compensation plate for external handles

Switch rating A (CEI)	Switch rating A (UL)	Description	Degree of protection	Reference
32…1250	30 Compact, 30...400	Allows a new GS2●● handle to be fitted on existing cut-outs	IP 65	**GS2AH001**

Flat mounting kit

Switch rating A	Description	Reference
50…400	The kit, for use with a front-mounted external handle, includes: ■ a 200 mm shaft, cross section 10 x 10 mm, ■ an adapter plate	**GS2ADL2**

(1) For these ratings, the switch-disconnector-fuses are fitted with terminal covers as standard.
(2) For NF C and DIN switch-disconnector-fuses fitted with right-hand mounted direct operator.
(3) For this rating, switch-disconnector-fuses are fitted with a cover locking device as standard.
(4) For these ratings, switch-disconnector-fuses are fitted with cage terminals as standard.

TeSys GS

Technical Data for Designers

Contents

Characteristics:
> switch-disconnector fuses.... B5/16 to B5/21
> auxiliary contacts B5/22
Dimensions ..... B5/23 to B5/31
Schemes.....B5/31

IEC - For NFC / DIN fuses - From 32 to 1250 A

Switch-disconnector-fuse characteristics

Type				GS1DD	GS●F	GS●G	GS●J
Environment							
Conforming to standards	Switch-disconnector-fuses			IEC 60947-3			
	Fuses			IEC 60269-1 and 2			
Product certifications				ASEFA/LOVAG, LROS (pending)			
Degree of protection conforming to IEC 60529	On front panel with terminal covers			IP 20			
Ambient air temperature around the device	Storage		°C	-40…+80			
	Operation		°C	-20…+70			
Flame resistance conforming to IEC 60695-2-1	Body		°C	960	960		
	Fuse cover		°C	–	850		
Pole characteristics							
Conventional thermal current (Ith) for ambient temperature ≤ 40 °C			A	32	50	63	100
Fuse size				10 x 38	14 x 51	T00C	22 x 58
Rated insulation voltage (Ui)			V	800	750	750	750
Rated impulse withstand voltage (Uimp)			kV	8	8	8	8
Rated operational current (Ie)	Cat. AC-23A/B (1)	∼ 400 V	A	32	50	63	100
		∼ 500 V	A	32	50	63	100
		∼ 690 V	A	32	50	63	100 (3)
	Cat. DC-23A/B (1)	⎓ 440 V (2)	A	20	40	40	100
Rated operational power	Cat. AC-23A/B (1)	∼ 400 V	kW	15	25	30	51
		∼ 500 V	kW	18.5	33	40	63
		∼ 690 V	kW	25	45	55	90
Rated conditional short-circuit current	I rms at ∼ 400 V with protection by gG (gl) fuses		kA	100	100	100	100
	Rating of associated fuses		A	32	50	63	100
Peak value of permissible current (dynamic short-circuit withstand)	Conforming to IEC 60269-1	∼ 400 V	kA	5.5	7.6	10.6	20
Rated making capacity	I rms at 400 V Cat. AC-23B		A	320	500	630	1000
Rated breaking capacity	I rms at 400 V Cat. AC-23B		A	256	400	500	800
Mechanical durability	Number of operating cycles			20000	10000	10000	10000
Electrical durability	Number of operating cycles cat. AC/DC-23A/B (1)			1500/300	1500/300	1500/300	1500/300
Cabling	Cable (c.s.a. min/max)		mm²	2.5/16	6/25	10/25	25/95
	Bars (max width)		mm	–	–	–	20
Tightening torque			N.m	3	3.2	3.2	12

(1) Category "A": frequent operating cycles, category "B": infrequent operating cycles.
(2) 2 poles in series per phase.
(3) With terminal covers.
(4) Poles not juxtaposed.

References:
pages B5/4 and B5/5
Dimensions:
pages B5/23 to B5/27
Schemes:
page B5/31

	GS●K	GS●KK	GS●LL	GS●L	GS●N	GS●QQ	GS2S	GS2V
	IEC 60947-3							
	IEC 60269-1 and 2							
	ASEFA/LOVAG, LROS (pending)							
	IP 20							
	-40…+80							
	-20…+70							
	960							
	850							
	125	125	160	160	250	400	630	1250
	22 x 58	T00	T00	T0	T1	T2	T3	T4
	750	750	750	750	750	800	1000	1000
	8	8	8	8	8	8	12	12
	125	125	160	160	250	400	630	1000
	125	125	160	160	250	315	500	800
	100 (3)	100 (3)	125 (3)	125 (3)	250 (3)	250/315	315/400	630
	100	100	125	125	200	200/315 (4)	400/630 (4)	1000
	63	63	80	80	132	220	355	560
	90	90	110	110	160	220	355	560
	80	80	110	110	220	220/295	295/400	400/475
	100	100	100 (50)	100	100	50	100	100
	125	125	125 (160)	160	250	400	630	1250
	20	20	22.7	20	32.5	40	70	90
	1250	1250	1600	1600	2500	4000	6300	10 000
	1000	1000	1280	1280	2000	3200	5040	8000
	10000	10000	10000	10000	10000	10000	8000	5000
	1000/200	1000/200	1000/200	1000/200	1000/200	1000/200	1000/200	500/100
	35/95	35/95	50/95	50/95	95/240	185/240	2 x 150 / 2 x 300	- / 4 x 185
	20	20	20	20	32	45	63	80
	12	12	12	12	25	25	44	44

References:
pages B5/4 and B5/5

Dimensions:
pages B5/23 to B5/27

Schemes:
page B5/31

IEC - For BS fuses - From 32 to 1250 A

Switch-disconnector-fuse characteristics

Type				GS1DDB	GS2DB	GS2GB	GS2JB
Environment							
Conforming to standards	Switch-disconnector-fuses			IEC 60947-3			
	Fuses			IEC 60269-1 and 2			
Product certifications				ASEFA/LOVAG, LROS (pending)			
Degree of protection conforming to IEC 60529	On Front panel, with terminal covers			IP 20			
Ambient air temperature around the device	Storage		°C	-40…+80			
	Operation		°C	-20…+70			
Flame resistance conforming to IEC 60695-2-1	Body		°C	960			
	Fuse cover		°C	–		850	
Pole characteristics							
Conventional thermal current (Ith) for ambient temperature ⩽ 40 °C			A	32	32	63	100
Fuse size				A1	A1	A2-A3	A4 Ø ⩽ 31 mm
Rated insulation voltage (Ui)			V	800	750	750	750
Rated impulse withstand voltage (Uimp)			kV	8	8	8	8
Rated operational current (Ie)	Cat. AC-23A/B [1]	∼ 400 V	A	32	32	63	100
		∼ 500 V	A	32	32	63	100
		∼ 690 V	A	32	32	63	100 [4]
	Cat. DC-23A/B [1]	⎓ 440 V [2]	A	20	20	40	100
Rated operational power	Cat. AC-23A/B [1]	∼ 400 V	kW	15	15	30	51
		∼ 500 V	kW	18.5	18.5	40	63
		∼ 690 V	kW	25	25	55	90
Rated conditional short-circuit current	I rms at ∼ 400 V with protection by gG (gl) fuses		kA	80	80	80	80
	Rating of associated fuses		A	32	32	63	100
Peak value of permissible current (dynamic short-circuit withstand)	Conforming to IEC 60269-1	∼ 400 V	kA	5.5	9	10.6	20
Rated making capacity	I rms at 400 V Cat. AC-23B		A	320	320	630	1000
Rated breaking capacity	I rms at 400 V Cat. AC-23B		A	256	256	500	800
Mechanical durability	Number of operating cycles			20000	10000	10000	10000
Electrical durability	Number of operating cycles cat. AC/DC-23A/B [1]			1500/300	1500/300	1500/300	1500/300
Cabling	Cable (c.s.a. min/max)		mm^2	2.5/16	6/25	10/25	25/95
	Bars (max width)		mm	–	–	–	20
Tightening torque			N.m	3	3.2	3.2	12

(1) Category "A": frequent operating cycles, category "B": infrequent operating cycles.
(2) 2 poles in series per phase.
*(3) Fit switch-disconnector-fuses **GS2LB** with B1 or B2 fuses and **GS2LLB** with A4 fuses.*
(4) With terminal covers.
(5) Poles not juxtaposed.

References: pages B5/6 and B5/7
Dimensions: pages B5/23 to B5/27
Schemes: page B5/31

	GS2LB or LLB [3]	GS2MMB	GS2NB	GS2PPB	GS2QQB	GS2SB	GS2TB	GS2VB
	IEC 60947-3							
	IEC 60269-1 and 2							
	ASEFA/LOVAG, LROS (pending)							
	IP 20							
	-40…+80							
	-20…+70							
	960							
	850							
	160	200	250	315	400	630	800	1250
	A4. B1-B2 [3]	B1-B2	B1…B3	B1…B3	B1…B4	C1-C2	C1…C3	D1
	750	750	750	800	800	1000	1000	1000
	8	8	8	8	8	12	12	12
	160	200	250	315	400	630	800	1000
	160	200	250	315	315	500	630	800
	125 [4]	200/160 [4]	250 [4]	250/315 [4]	250/315	315/400	630	630
	125	200	200	200	200/315 [5]	400/630 [5]	800	1000
	80	100	132	150	220	355	450	560
	110	140	160	220	220	355	450	560
	110	150/185	220	220/295	220/295	295/400	400	400/475
	80	80	80	80	80	80	80	80
	160	200	250	315	400	630	800	1250
	22.7	32.5	32.5	40	40	70	80	90
	1600	2000	2500	3150	4000	6300	8000	10 000
	1280	1600	2000	2520	3200	5040	6400	8000
	10000	10000	10000	10000	10000	8000	8000	5000
	1000/200	1000/200	1000/200	1000/200	1000/200	1000/200	500/100	500/100
	50/95	95/240	95/240	185/240	185/240	2 x 150 / 2 x 300	2 x 185 / 2 x 300	- / 4 x 185
	20	32	32	45	45	63	63	80
	12	25	25	25	25	44	44	44

References:
pages B5/6 and B5/7

Dimensions:
pages B5/23 to B5/27

Schemes:
page B5/31

UL, CSA, IEC - For CC and J fuses - From 32 to 800 A

Switch-disconnector-fuse characteristics

Type				GS1DDU3	GS1DU3	GS2EEU3	GS2EU3N
Environment							
Conforming to standards	Switch-disconnector-fuses			UL 489, CSA 22.2 n°5, IEC 60947-3		UL 98, UL 248, CSA 22.2 n°4, IEC 60947-3	
	Fuses			UL 248			
Degree of protection conforming to IEC 60529	With terminal covers			IP 20			
Ambient air temperature around the device	Storage		°C	-40…+80			
	Operation		°C	-20…+70			
Flame resistance conforming to IEC 60695-2-1	Body		°C	960	960	960	
	Fuse cover		°C	–	–	850	
Pole characteristics							
Conventional thermal current (Ith) for ambient temperature ≤ 40 °C			A	30	30	30	30
Fuse size				CC	J	CC	J
Rated insulation voltage (Ui)			V	800	800	750	750
Rated impulse withstand voltage (Uimp)			kV	8	8	8	8
Rated operational current (Ie)	Cat. AC-23A/B (1)	∼ 400 V	A	32	32	32	32
		∼ 500 V	A	32	32	32	32
		∼ 690 V	A	32	32	32	32
Rated operational power	Cat. AC-23A/B (1)	∼ 400 V	kW	15	15	15	15
		∼ 500 V	kW	18.5	18.5	18.5	18.5
		∼ 690 V	kW	25	25	25	25
Prospective short-circuit current withstand	Conforming to UL 98 / UL 489	∼ 600 V	kA	100	100	200	200
Peak value of permissible current (dynamic short-circuit withstand)	Conforming to IEC 60269-1	∼ 400 V	kA	5.5	5.5	7.6	17.6
Rated making capacity	I rms at 400 V Cat. AC-23B		A	300	300	300	300
Rated breaking capacity	I rms at 400 V Cat. AC-23B		A	240	240	240	240
Mechanical durability	Number of operating cycles			10000	10000	10000	10000
Electrical durability	Number of operating cycles Cat. AC/DC-23A/B (1)			1500/300	1500/300	1500/300	1500/300
Cabling	Cable (c.s.a. min/max)		mm^2	2.5/6	2.5/6	2.5/6	2.5/16
			AWG	#14/#10	#14/#10	#14/#10	#14/#6
	Bars (max width)		mm	-	-	-	-
Tightening torque			N.m	3 (for wire)	4 (for wire)	5.5 (for wire)	3.5 (for wire)
			lb-in	27	27	48	31

(1) Category "A": frequent operating cycles, category "B": infrequent operating cycles.

References: pages B5/8 and B5/9
Dimensions: pages B5/28 to B5/30
Schemes: page B5/31

	GS2GU3N	GS2JU3N	GS2MU3N	GS2QU3N	GS2SU3	GS2TU3
	UL 98, CSA 22.2 n°4, IEC 60947-3					
	UL 248					
	IP 20					
	-40…+80					
	-20…+70					
	960					
	850					
	60	100	200	400	600	800
	J	J	J	J	J	L
	750	750	750	800	1000	1000
	8	8	8	8	12	12
	63	100	200	400	630	800
	63	100	200	315	630	630
	63	100	200	250	630	630
	30	51	100	220	355	450
	40	63	140	220	450	560
	55	90	185	220	600	600
	100	200	200	200	200	200
	17.6	22	32	36	80	80
	600	1000	2000	4000	6000	8000
	480	800	1600	3200	4800	6400
	10000	10000	8000	6000	5000	5000
	1500/300	1500/300	1000/200	1000/200	1000/200	500/100
	2.5/16	4/50	16/150	25/300	2 x 150	–
	#14/#6	#12/#1	#6/300 Kcmil	#4/600 Kcmil	#2/600 Kcmil	–
	-	20	32	45	100	100
	3.5 (for wire)	4 (for wire)	18 (for lug)	35 (for lug)	35 (for lug)	35 (for lug)
	31	35.4	160	310	310	310

References:
pages B5/8 and B5/9
Dimensions:
pages B5/28 to B5/30
Schemes:
page B5/31

Auxiliary contacts

GS1AM●11, GS1AM1 and GS1AM2 early break and signalling contact characteristics

Conventional thermal current (Ith) for ambient temperature ≤ 40 °C		**A**	16
Rated operational current (Ie)	Cat. AC-15	**A**	127 V: 5 - 230 V: 4 - 400 /415 V: 3 - 440 V: 2
	Cat. DC-13	**A**	24 V: 12 - 48 V: 2 - 110 V: 0.6 - 220 V: 0.4
Durability	Number of operating cycles		Mechanical: 1000000 Electrical: cat. AC-15: 30000
Fuse protection	gG	**A**	6 max
Cabling		**mm**	Faston connectors: 1 x 6.35 or 2 x 2.8

GS1AN and GS1ANT signalling contact characteristics

Conventional thermal current (Ith) for ambient temperature ≤ 40 °C		**A**	20
Rated operational current (Ie)	Cat. AC-15	**A**	127 V: 12 - 230 V: 10 - 400/415 V: 8 - 440 V: 6
	Cat. DC-13	**A**	48 V: 4 - 110 V: 1.2 - 220 V: 1
Durability	Number of operating cycles		Mechanical: 30000 Electrical: cat. AC-15: 30000
Fuse protection	gG	**A**	16 max
Cabling	Cable (c.s.a. min/max)	**mm²**	Min: 1.5 - max: 10

GS1AM110 and GS1AM101 early break and signalling contact characteristics

Conventional thermal current (Ith) for ambient temperature ≤ 40 °C		**A**	10
Rated operational current (Ie)	Cat. AC-15	**A**	120 V: 6 - 240 V: 3 - 400 V: 1.8 - 480 V: 1.5
	Cat. DC-13	**A**	24 V: 2.8 - 48 V: 1.4 - 125 V: 0.55 - 250 V: 0.27 - 400 V: 0.15
Durability	Number of operating cycles		Mechanical: 5000000 Electrical: cat. AC-15: 1000000
Cabling	Cable (c.s.a. min/max)	**mm²**	Min: 1 x 0.22 - max: 2 x 2.5

GS●AF "blown fuse" signalling contact characteristics

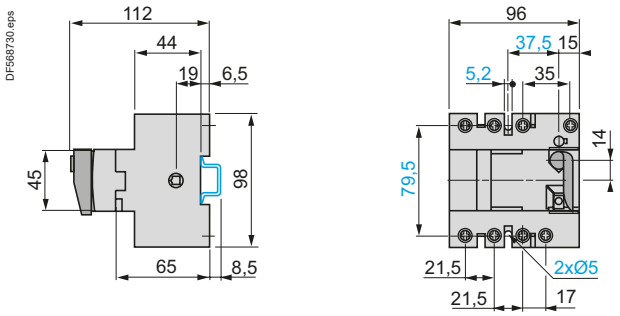
Conventional thermal current (Ith) for ambient temperature ≤ 40 °C		**A**	16
Rated operational current (Ie)	Cat. AC-15	**A**	230 V: 4 - 400 V: 3
	Cat. DC-13	**A**	24 V: 12 - 48 V: 2 - 110 V: 0.6 - 220 V: 0.4
Durability	Number of operating cycles		Mechanical: 30000 Electrical: cat. AC-15: 30000
Cabling		**mm**	Faston connectors: 1 x 6.35

Dimensions

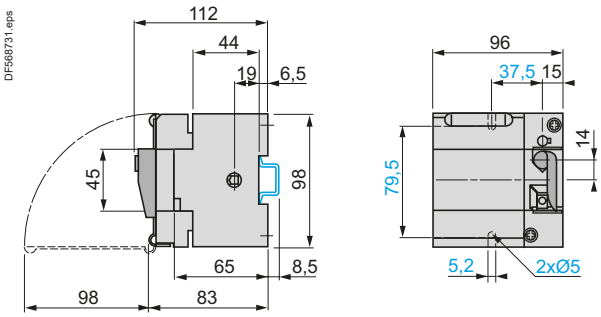
IEC - GS1●● (32 A) Switch-disconnector-fuse

Direct front-mounted operator

GS1DD

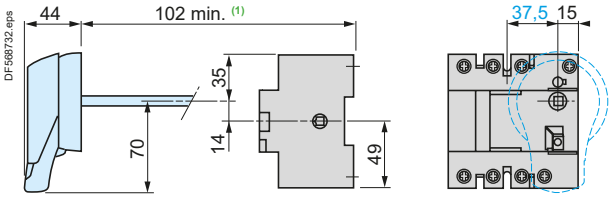


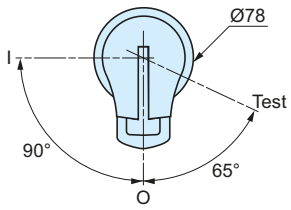
GS1DDB



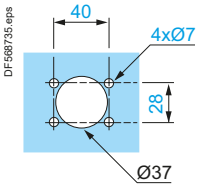
External front-mounted operator

GS1DD

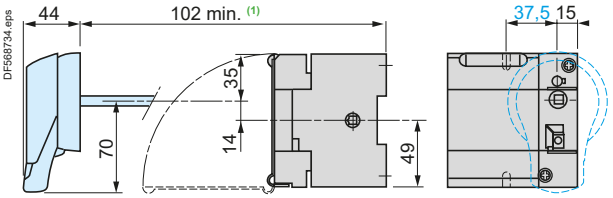


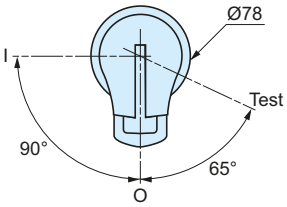


Door cut-out

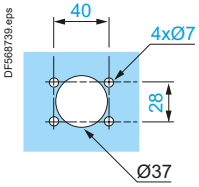


GS1DDB





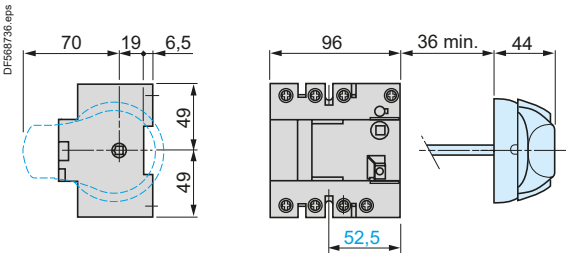
Door cut-out

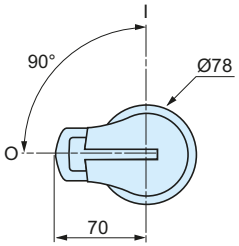


(1) With 1 or 2 auxiliary contacts GS1AM1●●: 130 mm.
(2) With 3 or 4 auxiliary contacts GS1AM1●●: 155 mm.

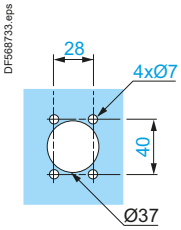
External right-hand side-mounted operator

GS1DD

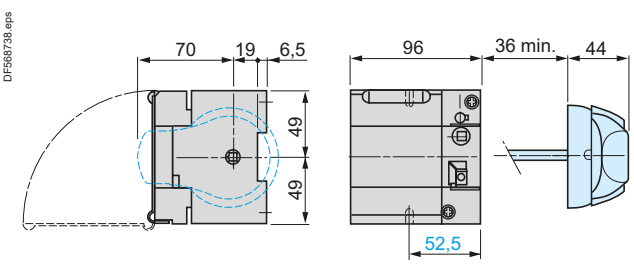


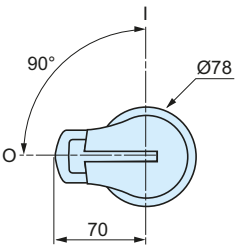


Door cut-out

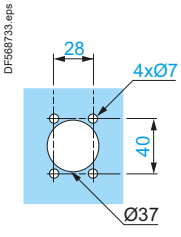


GS1DDB





Door cut-out



References:
pages B5/4 and B5/5

Characteristics:
pages B5/16 and B5/17

Schemes:
page B5/31

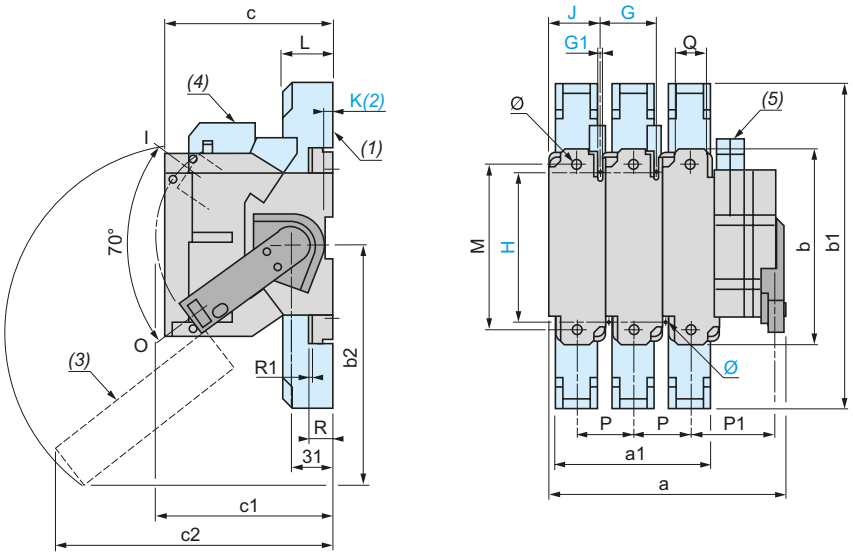
Dimensions

IEC - GS1●● (50...400 A) Switch-disconnector-fuse

Direct right-hand side-mounted operator

GS1FD (50 A), GD (63 A), JD (100 A), KD, KKD (125 A), LD, LLD (160 A), ND (250 A) and QQD (400 A)

DF538732.eps



GS1		a	a1	b	b1	b2	c	c1	c2	G	G1	H	J	K	Ø	L	M	P	P1	Q	R	R1	Ø
FD	**3P**	118	–	118	–	–	87	134	–	27	5.4	106	31	6.5	5	–	–	27	33.5	–	–	–	–
	4P	145	–	118	–	–	87	134	–	27	5.4	106	31	6.5	5	–	–	27	33.5	–	–	–	–
GD	**3P**	133	–	118	–	159	116.5	134	145	32	5.4	106	36	6.5	5	–	–	32	36	–	–	–	–
	4P	165	–	118	–	159	116.5	134	145	32	5.4	106	36	6.5	5	–	–	32	36	–	–	–	–
JD, KD	**3P**	150	108	162	268	–	116	173	–	36	5.4	127	40	–	5	44	141	36	38	20	19.5	2.5	8.5
	4P	186	144	162	268	–	116	173	–	36	5.4	127	40	–	5	44	141	36	38	20	19.5	2.5	8.5
KKD, LLD	**3P**	150	108	162	268	141	126.5	173	193	36	5.4	127	40	–	5	44	141	36	38	20	19.5	2.5	8.5
	4P	186	144	162	268	141	126.5	173	193	36	5.4	127	40	–	5	44	141	36	38	20	19.5	2.5	8.5
LD	**3P**	192	136	162	268	174	136.5	173	229	50	5.4	140	54	–	5	44	141	50	45	20	19.5	2.5	8.5
	4P	242	172	162	268	174	136.5	173	229	50	5.4	140	54	–	5	44	141	50	45	20	19.5	2.5	8.5
ND	**3P**	253	180	195	345	185	146	173	251	60	6.4	162	64	–	6	65	166	60	81	32	19.5	2.5	11
	4P	313	240	195	345	185	146	173	251	60	6.4	162	64	–	6	65	166	60	81	32	19.5	2.5	11
QQD	**3P**	271	192	205	355	200	149	173	260	66	6.4	172	70	–	6	65	175	66	86	50	20	3	11
	4P	337	258	205	355	200	149	173	260	66	6.4	172	70	–	6	65	175	66	86	50	20	3	11

(1) Terminal cover.
(2) Mounting on ⊔ rail only for GS1FD and GS1GD (50 and 63 A).
(3) Protective screen, lockable in I position.
(4) 1 or 2 auxiliary contacts GS1AF●●.
(5) 1 or 2 auxiliary contacts GS1AM●.

Ref.
Switch-disconnectors fuses

References:
pages B5/4 and B5/5
Characteristics:
pages B5/16 and B5/17
Schemes:
page B5/31

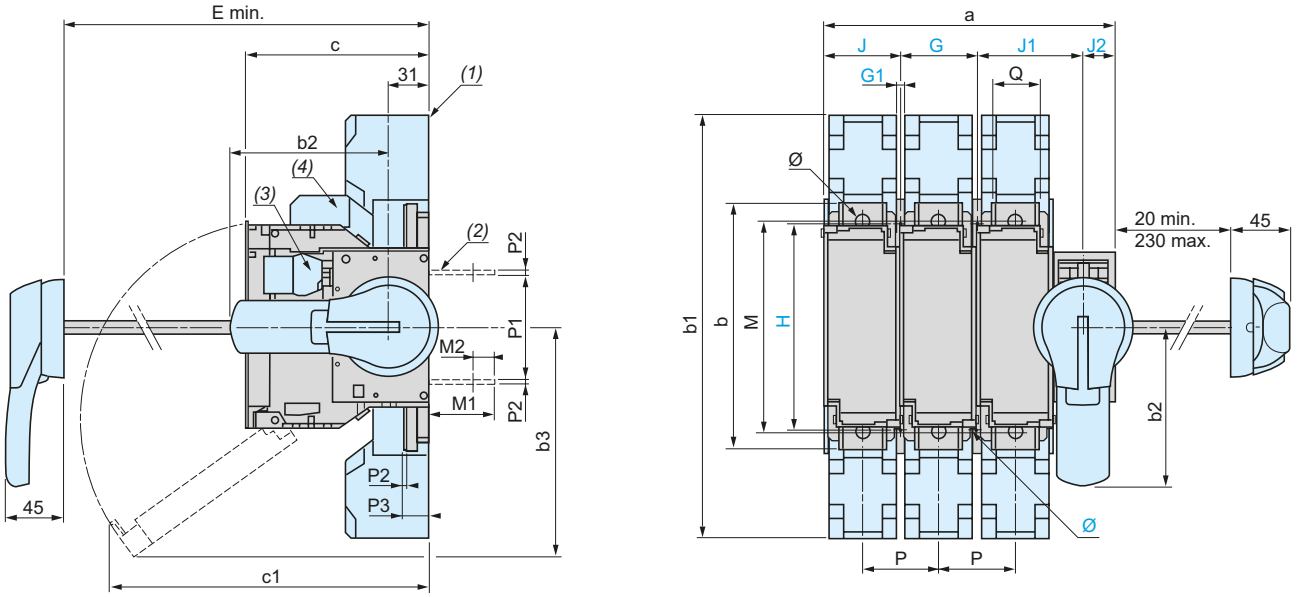
Dimensions

IEC - GS2●● (32...400 A) Switch-disconnector-fuse

External front and right-hand side-mounted operator

GS2DB (32 A), F (50 A), G, GB, JB (63 A), J (100 A), K, KK (125 A), L, LL, LB, LLB (160 A), MMB (200 A), N, NB (250 A), PPB (315 A), QQ and QQB (400 A)

DF538733.eps



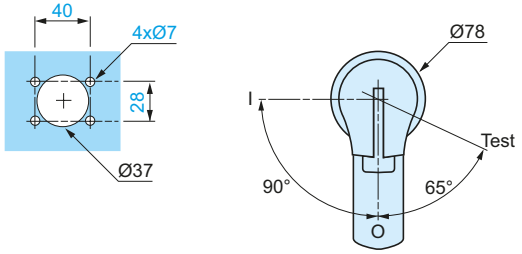
GS2		a	b	b1	b2	b3	c	c1	E min.	G	G1	H	J	J1	J2	Ø	M	M1	M2	P	P1	P2	P3	Q	Ø
F, DB	3P	121	118	–	70	85	87 (5)	153	100 (5)	27	5.4	106	31	45	18	5	–	15	6	27	59	2	–	12	–
	4P	148	118	–	70	85	87 (5)	153	100 (5)	27	5.4	106	31	45	18	5	–	15	6	27	59	2	–	12	–
G, GB	3P	136	118	–	70	159	116.5 (6)	145	125	32	5.4	106	36	50	18	5	–	15	6	32	59	2	–	12	–
	4P	168	118	–	70	159	116.5 (6)	145	125	32	5.4	106	36	50	18	5	–	15	6	32	59	2	–	12	–
J, JB, K	3P	148	162	268	125	141	116 (6)	187	135	36	5.4	127	40	54	18	5	141	41	8	36	62	2.5	19.5	20	8.5
	4P	184	162	268	125	141	116 (6)	187	135	36	5.4	127	40	54	18	5	141	41	8	36	62	2.5	19.5	20	8.5
KK, LL	3P	148	162	268	125	141	126.5 (6)	193	135	36	5.4	127	40	54	18	5	141	41	8	36	62	2.5	19.5	20	8.5
	4P	184	162	268	125	141	126.5 (6)	193	135	36	5.4	127	40	54	18	5	141	41	8	36	62	2.5	19.5	20	8.5
L, LB, LLB	3P	190	162	268	125	174	136.5	229	145	50	5.4	140	54	64	18	5	141	41	8	50	62	2.5	19.5	20	8.5
	4P	240	162	268	125	174	136.5	229	145	50	5.4	140	54	64	18	5	141	41	8	50	62	2.5	19.5	20	8.5
MMB, NB, N	3P	234	195	345	125	185	146	251	154	60	6.4	162	64	86	25	6	166	52	17	60	84	2.5	19.5	32	11
	4P	294	195	345	125	185	146	251	154	60	6.4	162	64	86	25	6	166	52	17	60	84	2.5	19.5	32	11
PPB, QQB, QQ	3P	252	205	355	125	200	149	260	157	66	6.4	172	70	91	25	6	175	54	14.5	66	84	3	20	50	11
	4P	318	205	355	125	200	149	260	157	66	6.4	172	70	91	25	6	175	54	14.5	66	84	3	20	50	11

(1) Terminal cover.
(2) Rear access connector plates (option).
(3) 1 to 8 auxiliary contacts GS1AM1●●.
(4) 1 or 2 auxiliary contacts GS1AF●●.
(5) 1 auxiliary contact GS1AM1●●: + 23.5 mm, 2 auxiliary contacts GS1AM1●●: + 47 mm.
(6) 132 mm with 2 auxiliary contacts GS1AM1●●.

Door cut-out

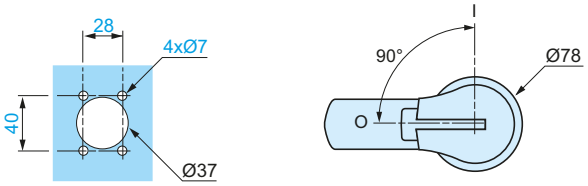
For external front-mounted operator

DF568742.eps



For external right-hand side-mounted operator

DF568743.eps



References:
pages B5/6 and B5/7

Characteristics:
pages B5/18 and B5/19

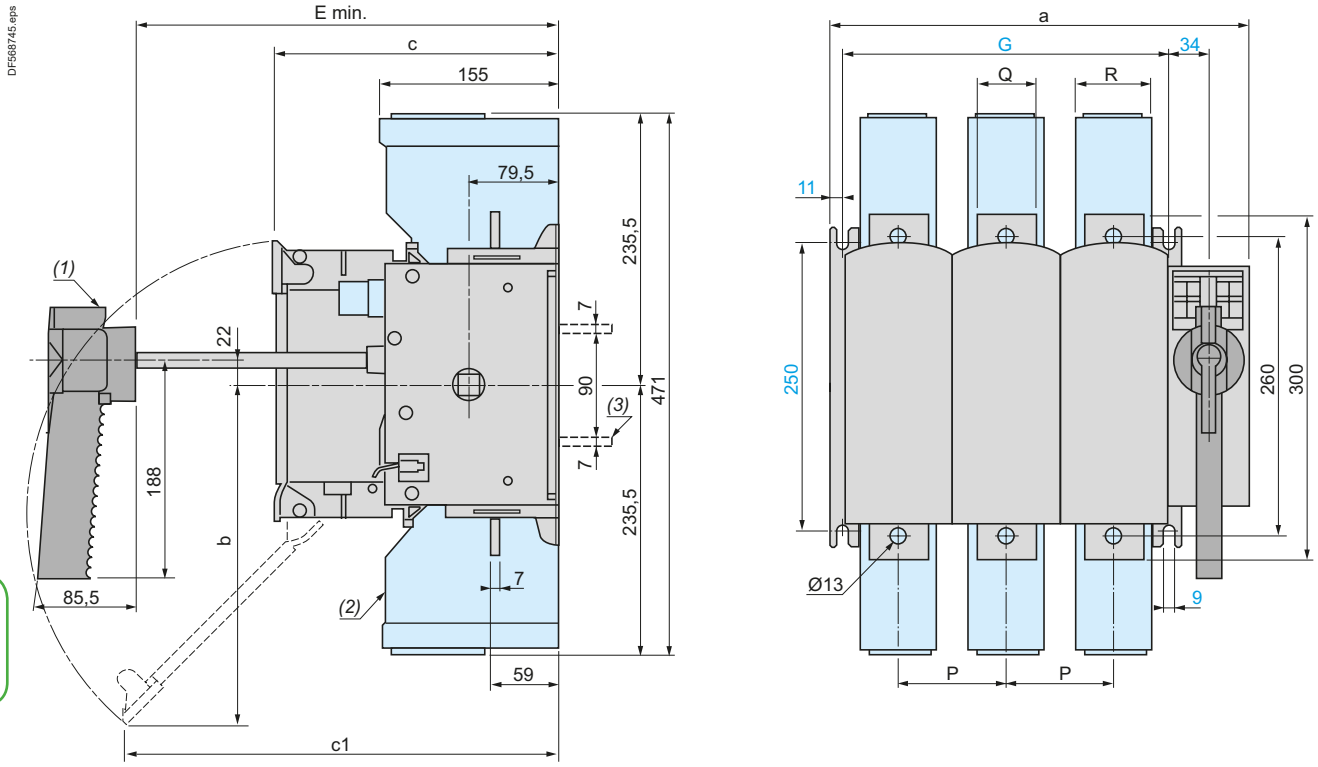
Schemes:
page B5/31

Dimensions

IEC - GS2●● (630...1250 A) Switch-disconnector-fuse

Direct front-mounted operator

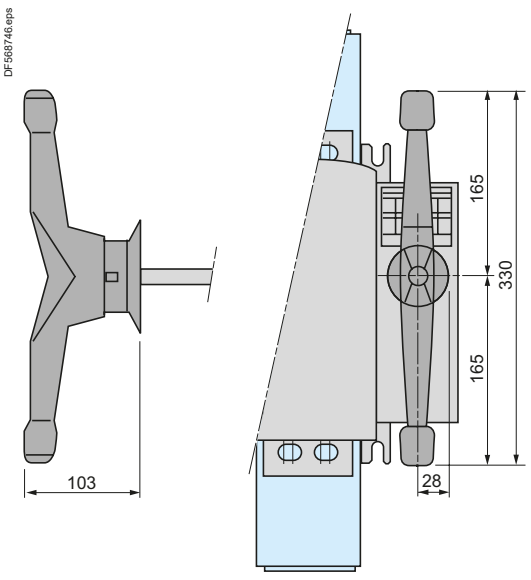
GS2S, SB (630 A), TB (800 A), V and VB (1250 A)



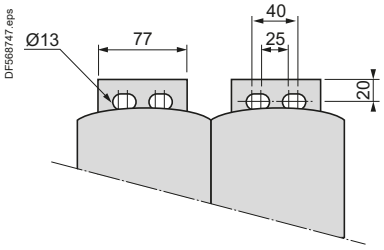
GS2		a	b	c	c1	E min.	G	P	Q	R
S, SB, TB	3P	364	300	250	380	265	284	94	51	65
	4P	458	300	250	380	265	378	94	51	65
V, VB	3P	442	355	289	295	304	362	120	77	88
	4P	562	355	289	295	304	482	120	77	88

(1) Handle GS2AH104 for GS2S, GS2SB and GS2TB.
(2) Terminal cover.
(3) Rear access connector plates (GS2V and GS2VB).

Handle GS2AH105 for GS2V and GS2VB (direct front-mounted operator)



Connector plates for GS2V and GS2VB



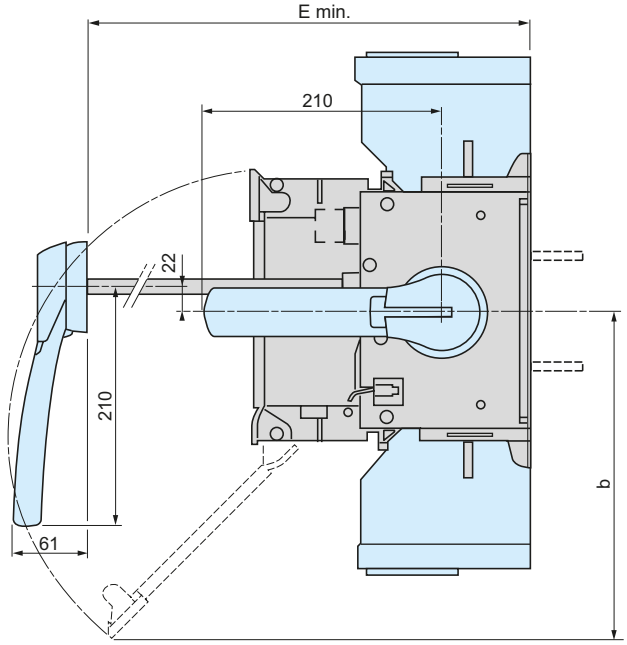
References: page B5/5
Characteristics: pages B5/17 to B5/19
Schemes: page B5/31

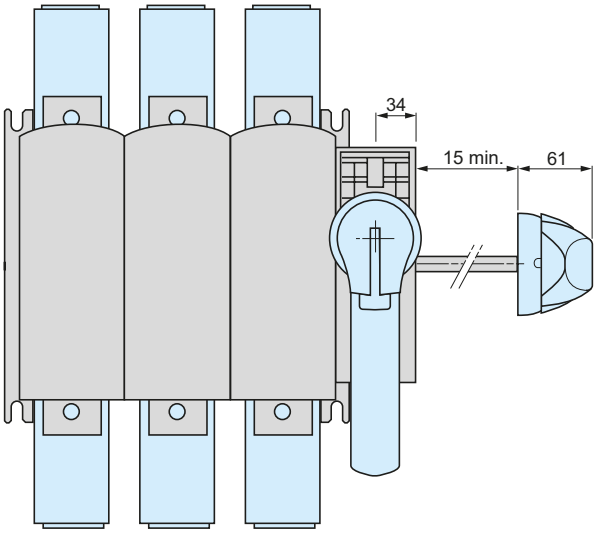
IEC - GS2●● (630...1250 A) Switch-disconnector-fuse

External front and right-hand side-mounted operator

GS2S, SB (630 A), TB (800 A), V and VB (1250 A)

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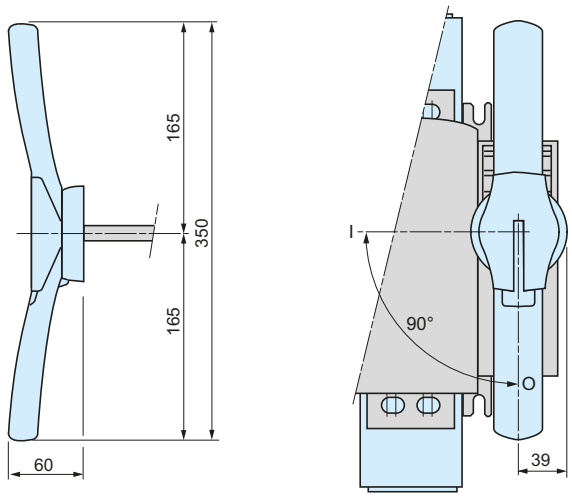




GS2		b	E min.
S, SB, TB	3P	297	265
	4P	297	265
V, VB	3P	350	304
	4P	350	304

Handle GS2AH570 or GS2AH580 for GS2V and GS2VB (external front-mounted operator)

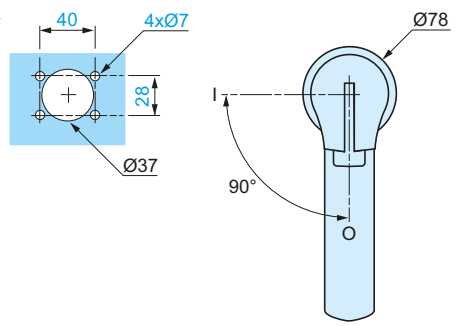
DF568749.eps



Door cut-out

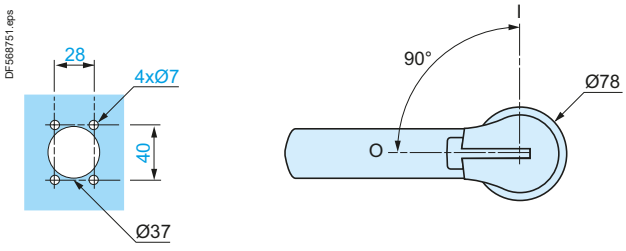
For external front-mounted operator

DF568750.eps



For external right-hand side-mounted operator

DF568751.eps



References:
page B5/5

Characteristics:
pages B5/17 to B5/19

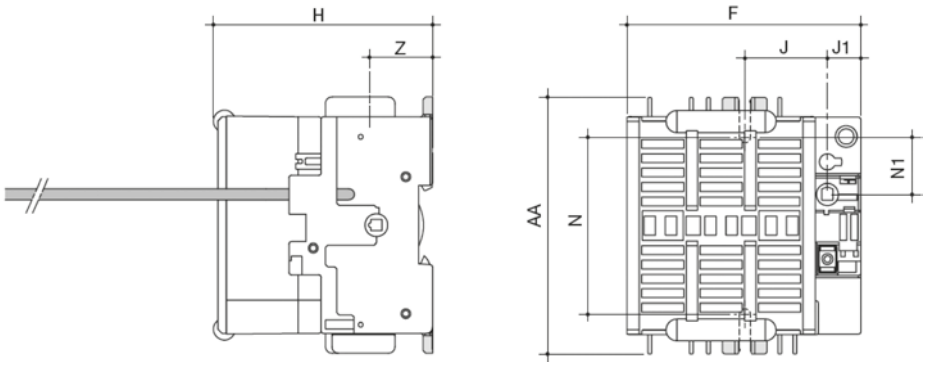
Schemes:
page B5/31

Dimensions

UL, CSA, IEC - GS1●● GS2●● Switch-disconnector-fuses (30 and 60 A)

GS1DU3 (30 A) class CC fuses, GS1DDU3 (30 A) class J fuses

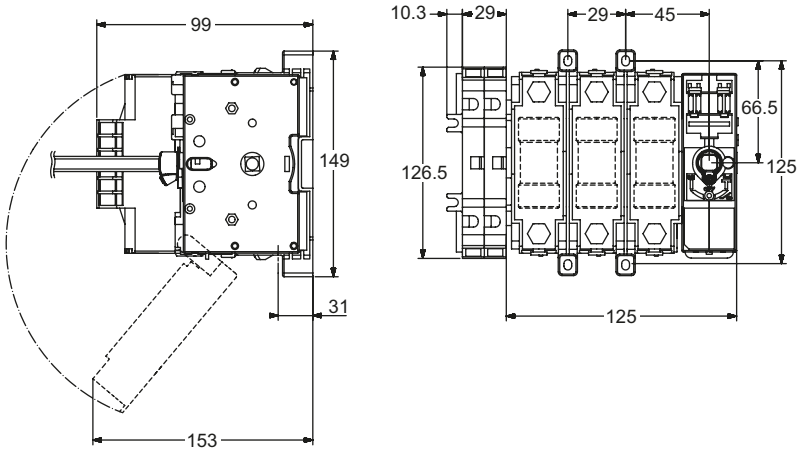
DB417416.eps



Rating	F	H	J	J1	N	N1	AA	Z
30 / CC	96	83.5	37.5	15	79.5	25.5	116	28.5
30 / J	105	99	37.5	15	79.5	25.5	116	28.5

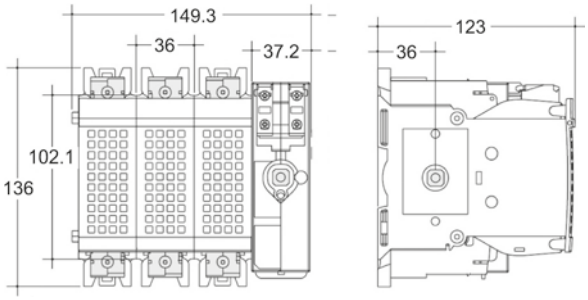
GS2EEU3 (30 A) class CC fuses

DB417417.eps



GS2EU3N, GS2GU3N (60 A) class J fuses

DB417418.eps

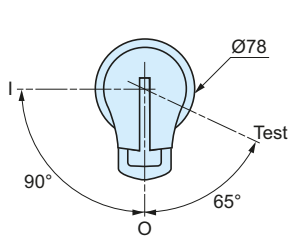


Accessories

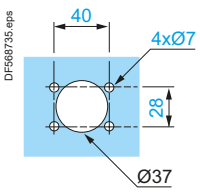
Handle for 30 and 60 A switch-disconnector-fuses

External front handle | **Door cut-out** | **External side handle** | **Door cut-out**

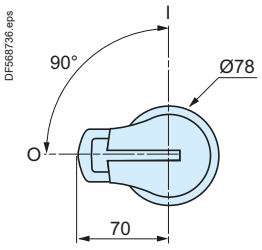
DF568732.eps



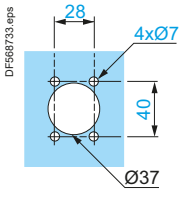
DF568735.eps



DF568736.eps



DF568733.eps



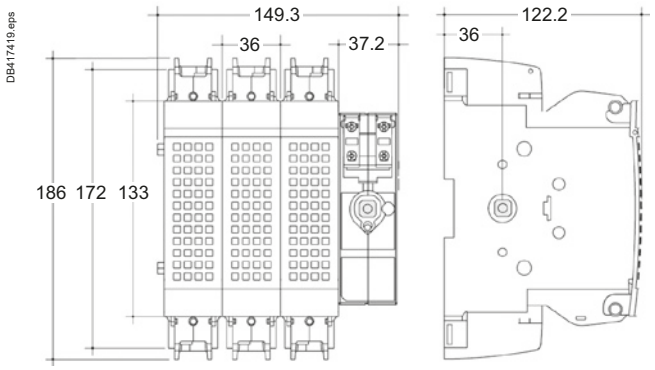
References:
pages B5/8 and B5/9

Characteristics:
pages B5/20 and B5/21

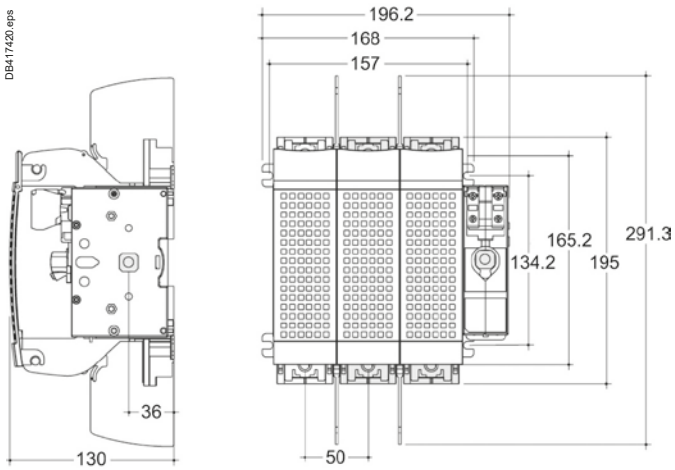
Schemes:
page B5/31

UL, CSA, IEC - GS2●● Switch-disconnector-fuses (100 and 400 A)

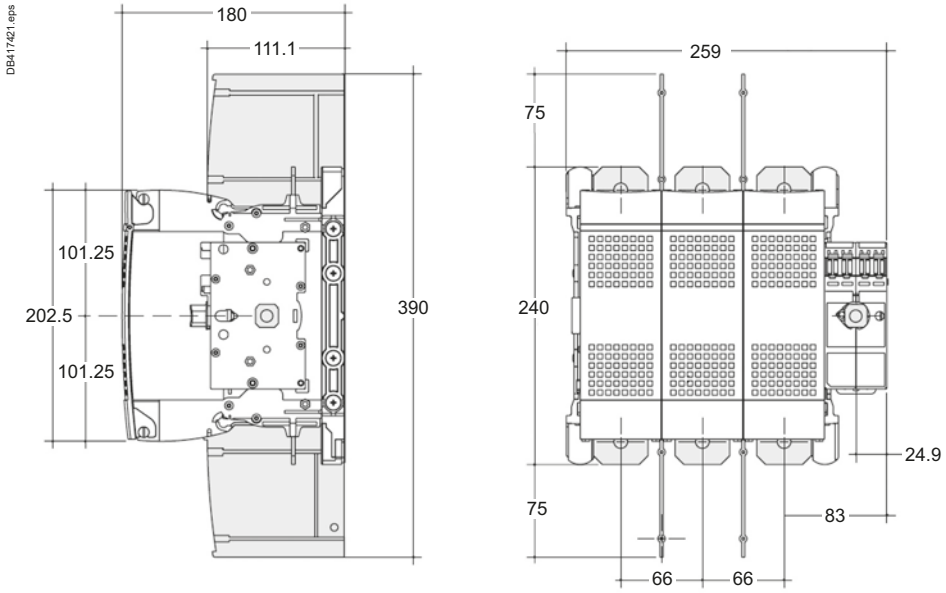
GS2JU3N (100 A) class J fuses



GS2MU3N (200 A) class J fuses



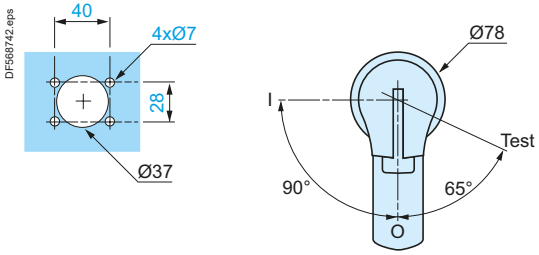
GS2QU3N (400 A) class CC fuses



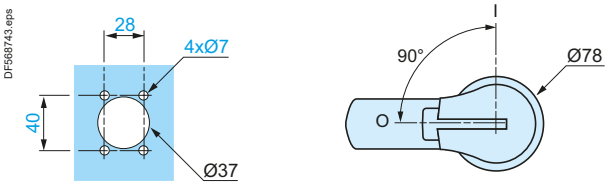
Accessories

Handle for 100, 200 and 400 A switch-disconnector-fuses

For external front-mounted operator



For external right-hand side-mounted operator



References:
pages B5/8 and B5/9

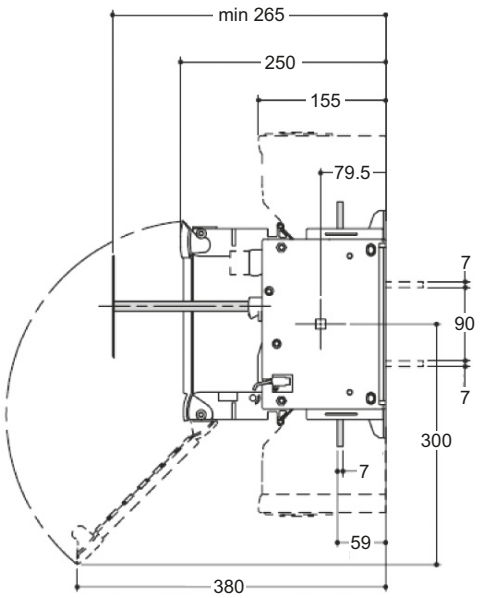
Characteristics:
pages B5/20 and B5/21

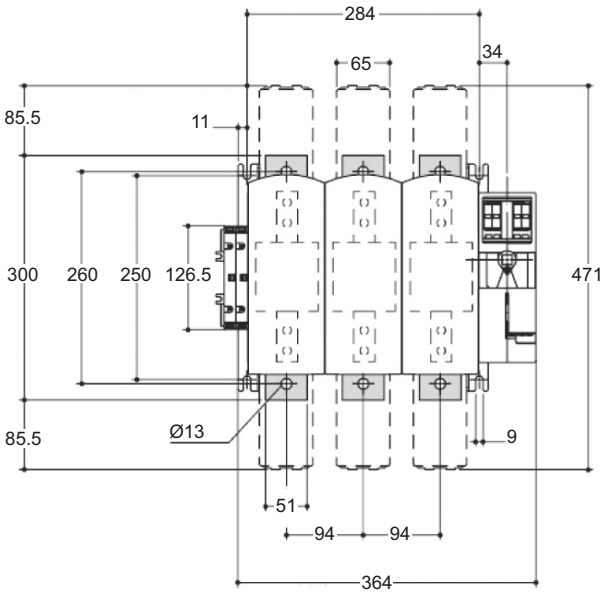
Schemes:
page B5/31

UL, CSA, IEC - GS2●● Switch-disconnector-fuses (600 and 800 A)

GS2SU3 (600 A), GS2TU3 (800 A) class J fuses

DB417422.eps





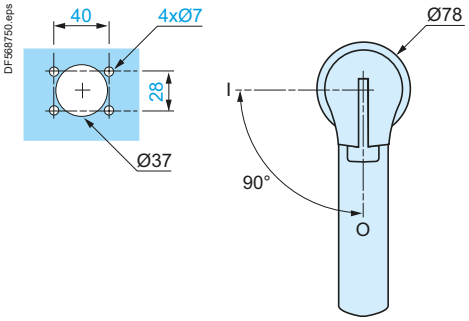
Ref.
Switch-disconnectors fuses

Accessories

Handle for 600 and 800 A switch-disconnector-fuses

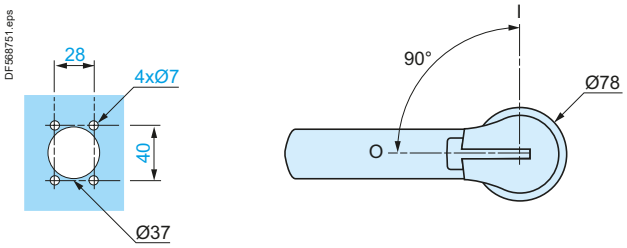
For external front-mounted operator

DF568750.eps



For external right-hand side-mounted operator

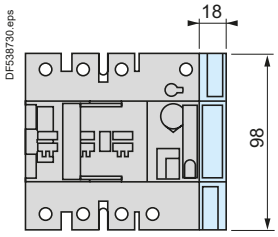
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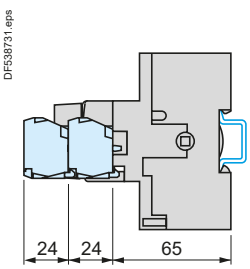
Dimensions, schemes

Auxiliary contacts

GS1AM111, GS1AM211



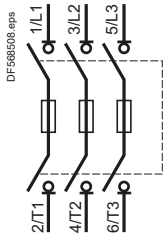
GS1AM110, GS1AM101



Schemes

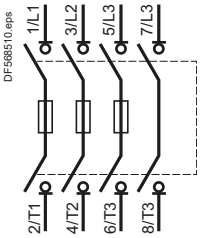
3-pole GS

32 to 1250 A

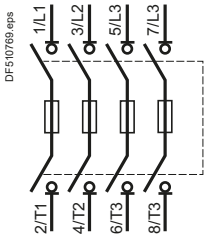


4-pole GS

32 A



50 to 1250 A



Auxiliary contacts

GS1AM110

1 N/O



GS1AM101

1 N/C



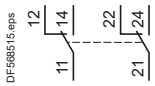
GS1AM111 and GS1AM1

1 C/O



GS1AM211 and GS1AM2

2 C/O

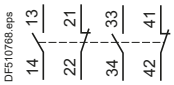


GS1AN••

1 N/C + 1 N/O



2 N/C + 2 N/O

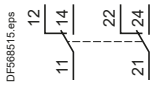


GS1AF•

1 C/O



2 C/O



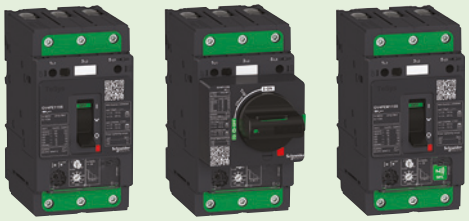
Ref.
Switch-disconnectors fuses

References:
page B5/12

Characteristics:
page B5/22

TeSys GV, GB
Circuit breakers

TeSys GV2, GV3, GV4, GV5 and GV6 Motor circuit breakers

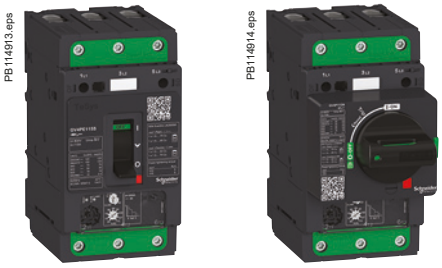
Type of product	Range (400/415 V AC)		Pages
Introduction TeSys GV			B6/3
Magnetic and thermal magnetic circuit breakers TeSys GV2L, GV2LE, GV2P, GV2ME	0.06 or 15 kW		B6/11
Thermal magnetic circuit breakers - delayed tripping - For high current peak motors or 3-phase transformers TeSys GV2RT Add-on blocks, accessories for GV2	0.09 or 11 kW		B6/18
Magnetic and Thermal magnetic circuit breakers TeSys GV3L, GV3P Add-on blocks, accessories	5.5 to 45 kW		B6/25
Magnetic and Thermal magnetic circuit breakers TeSys GV4L, GV4LE, GV4P, GV4PE, GV4PEM, GV4PB Add-on blocks, accessories	0.25 to 55 kW 1/2 to 60 HP		B6/31
Thermal magnetic circuit breakers TeSys GV5P, GV6P Add-on blocks, accessories	55 to 250 kW		B6/49
TeSys GB Circuit breakers for auxiliary circuits			
Thermal magnetic circuit breakers TeSys GB	0.5 to 20 A		B6/57



GV2LE GV2P GV2ME



GV3L GV3P80



GV4●E●●● GV4●●●●



GV5P150F GV6P500F

Circuit breakers for motor protection and control

TeSys GV motor circuit breakers provide compact, reliable and efficient solutions for:

- isolation,
- protection against short circuits and overloads,
- On-Off manual control of motors from 0.06 to 250 kW.

They are conforming to, depending of the versions, IEC/EN 60947-1, IEC/EN 60947-2, IEC/EN 60947-4-1 and UL 60497-4-1, CSA 22.2 n° 60497-4-1.

TeSys GV protection technologies

TeSys GV are carried with 3 variants:

- Magnetic detection: GV2LE, GV2L, GV3L, GV4L, GV4LE for protection against short-circuit.
- Thermal-magnetic: GV2ME (1), GV2P, GV3P, GV4P, GV4PE, GV5, GV6 for protection against short-circuits, overload, phase loss and phase unbalance.
- Advanced: GV4PEM combines GV4P protections and motor jam, long start, ground-fault protections.

With a magnetic circuit breaker, a thermal relay is frequently associated in order to have a short circuit protection and an overload protection.

GV2: 45 mm width, for motors up to 15 kW

The most commonly used circuit breaker. with a choice of about 100 auxiliaries and accessories. GV2 and TeSys D or K contactors can be easily assembled as a single block with one accessory.
The high GV2 electrical endurance (up to 100 000 operating cycles) makes it very suitable for direct manual motor control, especially GV2ME (1) (thermal-magnetic c.b., Ith up to 32 A).

Enclosure mounting is well adapted to GV2L and GV2P, with their possible extended rotary handle and visible trip indication.

GV3: 55 mm width, for motors up to 45 kW

High performance breakers, high breaking capacity (Ics 100 kA /400 V for ratings up to 32 A, 50 kA up to 80 A).
Wide choice of auxiliaries / accessories, possible extended rotary handle. Visible tri indication.
Patended Everlink connectors provide everlasting connection (no re-tightening required).

Direct monoblock starter assembly with TeSys D contactors. No accessory required.

GV4: 81 mm width, for motors up to 55 kW

State-of-the-art technology, GV4 is compact and robust. Electronic core of GV4P gives a great detection accuracy, with alarming and advanced protections for GV4PEM, GV4PB.
Magnetic, electronic thermal-magnetic, or electronic thermal magnetic with advanced protections versions.
Ratings up to 115 A with breaking capacity Ics of 25 kA/400 V (B series), 50 kA/400 V (N series) or 100 kA/400 V (S series).

GV5: 105 mm width, for motors up to 110 kW / GV6: 140 mm width, for motors up to 250 kW

GV5 and GV6 with advanced thermal-magnetic trip unit provide more effective protection to high power motors in the most demanding appliances.
They provide protection to motors against overloads with selection of a trip class (5, 10 or 20), short-circuits, phase unbalance or phase loss.
Adjustable over-load and short circuit current settings provide flexibility.
Wide choice of auxiliaries/accessories are available for indication, control and operation.

*(1) **GV2ME●●AP** are specific **GV2ME** references for CEE zone.*



GV2L



GV2LE



GV2P



GV2ME



GV2RT



GV3L



GV3P



GV4L



GV4P



GV4PEM



GV5P150F



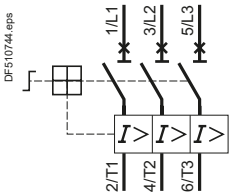
GV6P500F

GV range overview

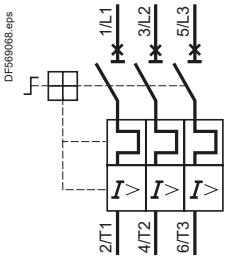
Molded case circuit breakers for motor protection and control

	Protection against			Range (kW / 415 V AC)	Control	Terminals	Dimensions (W x H x D)
	Short-circuits	Overload	Jam, ground-fault, long start... (Multifunction - see page B6/6)				
GV2							
GV2L	●			0.09 to 15	Rotary handle	Screw clamp	44.5 x 89 x 97 (with rotary handle)
GV2LE	●			0.06 to 15	Toggle	Screw clamp	44.5 x 89 x 78.5 (with toggle)
GV2P	●	●		0.06 to 15	Rotary handle	Screw clamp	44.5 x 89 x 97 (with rotary handle)
GV2ME (1)	●	●		0.06 to 11	Push button	Screw clamp, lug or spring	44.5 x 89 x 78.2 (with push button) (2)
GV2RT	●	●		0.09 to 11	Toggle	Screw clamp	44.5 x 89 x 78.5 (with toggle)
GV3							
GV3L	●			11 to 45	Rotary handle	Lug, EverLink (BTR screw)	55 x 132 x 136 (with rotary handle)
GV3P	●	●		5.5 to 45			
GV4							
GV4L	●			0.25 to 55 kW	Rotary handle	Lug, EverLink (BTR screw)	81 x 156 x 116 (with toggle) 81 X 156 x 165 (with rotary handle)
GV4LE	●				Toggle		
GV4P	●	●			Rotary handle		
GV4PE	●	●			Toggle		
GV4PEM	●	●	●		Toggle		
GV4PB	●	●	●	½ to 60 HP	Toggle		
GV5							
GV5P150●	●	●		55 to 110	Direct rotary handle	Lug, screw clamp	105 x 161 x 155 (3) (with direct rotary handle)
GV5P220●	●	●					
GV6							
GV6P320●	●	●		132 to 250	Direct rotary handle	Lug, screw clamp	140 x 255x 179 (3) (with direct rotary handle)
GV6P500●	●	●					

*(1) **GV2ME●●AP** are specific **GV2ME** references for CEE zone.*
*(2) 44.5 x 101 x 78.2 mm for **GV2ME●●3**.*
(3) Depth without keylock.



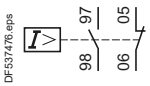
Thermal protection circuit breaker (with rotary control)



Thermal magnetic protection circuit breaker (with rotary control)



Voltage trip



Fault signalling

Basic functions

Short circuit protection (magnetic/thermal magnetic circuit breakers)
It provides a protection of the installation against short-circuit by an instantaneous trip of the circuit breaker. The tripping is obtained by means of a magnetic element incorporated in the motor circuit breaker or by an electronic detection (GV4P, GV5 and GV6).
The magnetic tripping threshold is not adjustable, except on GV4L, and is a fixed ratio of the maximum setting current In.

Overload protection (thermal magnetic circuit breakers)
It provides a protection of the motor against overload. When current drawn by the motor is above its rated current, this continuous overcurrent lead to increase of motor internal temperature and reduce motor life time. Use of suitable protective device shall avoid this damage to the motor. This is obtained by means of a thermal element incorporated in the motor circuit breaker, or by sensors for electronic products (GV4P, GV5 and GV6).
An automatic compensation for ambient temperature variations is also provided.
The rated operational current of the motor is displayed by turning a graduated knob.

Motor ON/OFF control
The circuit breaker provides a local manual control of the motor when used on its own (without contactor). The operation is possible by push buttons, toggle, or a single rotary handle.

Contacts position indication
Because they are suitable for isolation, the circuit breakers, in the open position, provide an adequate isolation distance and indicate the accurate position of the moving contacts by the position of the operators.

Additional functions

They are provided by additional modules.

Under voltage protection
Trips the circuit breaker in case of under voltage. The user is therefore protected against sudden starting of the machine when normal voltage is restored. Circuit breaker reset and/or start button “I” has to be pressed to restart the motor.

Remote off-power
Circuit breaker can be remotely tripped with the addition of a shunt trip.

Off-power locking
The operators on both open-mounted and enclosed motor circuit breakers can be locked in the off position “O” by up to 3 padlocks.



Motor circuit breakers versus fuse protection ?

Circuit breakers are a common solution for Powering motor against short circuits and overloads.
As a comparison, a fuse based solution can only provide a partial protection depending on the choice of the fuse type and rating. The thermal magnetic circuit breaker is adjustable and can be fine-tuned to the practical motor load.
The fuse based solution offers a very fast protection.

PB114917.eps

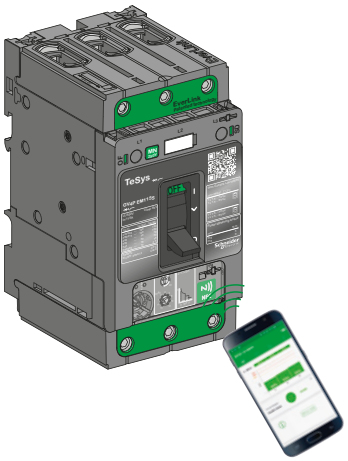


Advanced protections embedded on GV4PEM, GV4PB (multifunction)

In addition to basic protections, GV4PEM, GV4PB embed protections against:
- Long start (high inertia, resistive torque machines)
- Jam (overtorque, machine failure)
- Ground-fault (reduced isolation)
- Unbalanced (phase currents are not equal)
- Phase loss (1 or 2 phases missing).

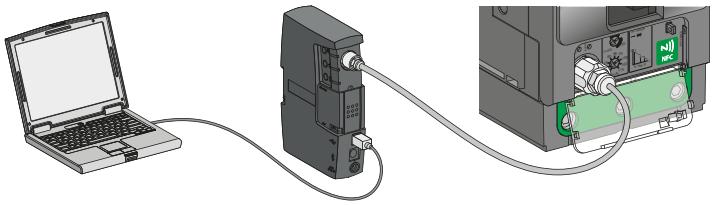
Fully configurable-advanced protections:
- wireless with 'EcoStruxure Power Device App' application for Android smartphone through NFC (near field communication).

DB424773.eps



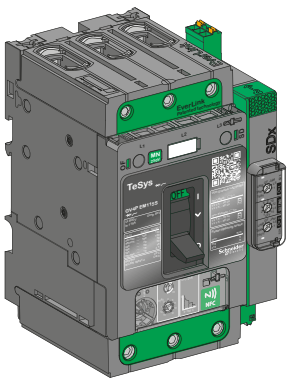
- with EcoStruxure Power Commission software on a computer connected to the test socket through a configuration and maintenance module.

DB424766.eps



Remote indications:
GV4PEM, GV4PB circuit breaker may be equipped with an SDx alarming / fault differentiation module to prevent to trip or to identify the type of fault after a trip (see page B6/44).

DB424931.eps



EverLink technology for TeSys GV3 and GV4

TeSys GV3 and GV4 features a cable connection method with patented creep-compensating technology built directly into the terminal — EverLink:
- With EverLink connectors, save space and time during panel assembly.
- Bare cable connections are as safe as compression lug ones.

DF526139.eps



PB114914_24.eps



DF526139.eps



EverLink terminals, with BTR screws

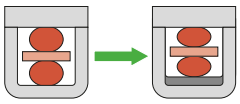
No overheating connections - EverLink creep-compensated terminals for GV3 and GV4

The EverLink patented technology for terminals dramatically reduces the risk of loose bare cables due to copper creeping. Vibration withstand is improved and periodic re-tightening is no longer needed.

EverLink® Long lasting connection quality

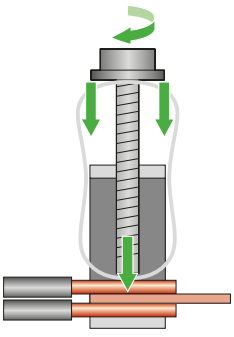
The clamp connectors which don't need re-tightening.

Creeping phenomena

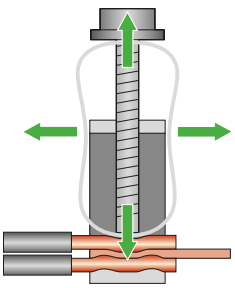


Copper conductors are subject to creep with the time, reducing the contact pressure in conventional clamps

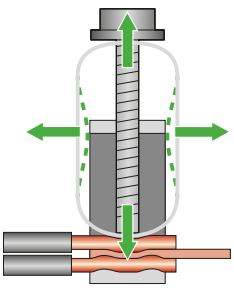
During the tightening a force is applied on the conductors and on a spring.



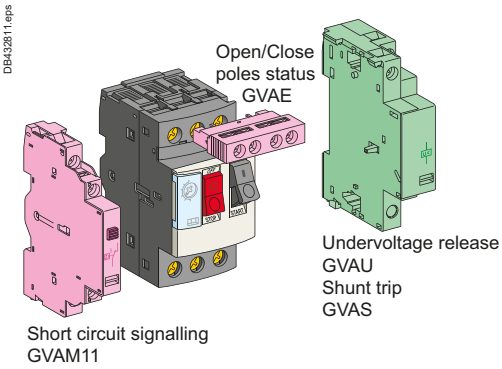
Maintaining of cables assured by pressure of spring and crimping of conductor on the contact plate.



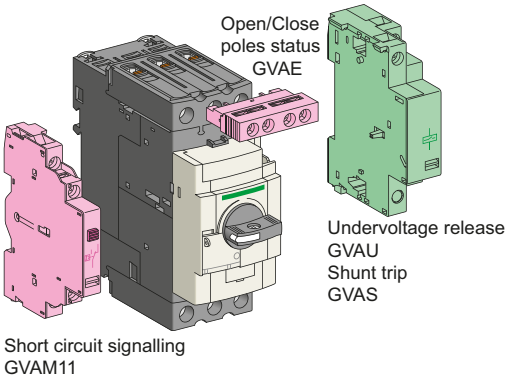
The spring compensates for cable conductor creep. Tightening force is assured.



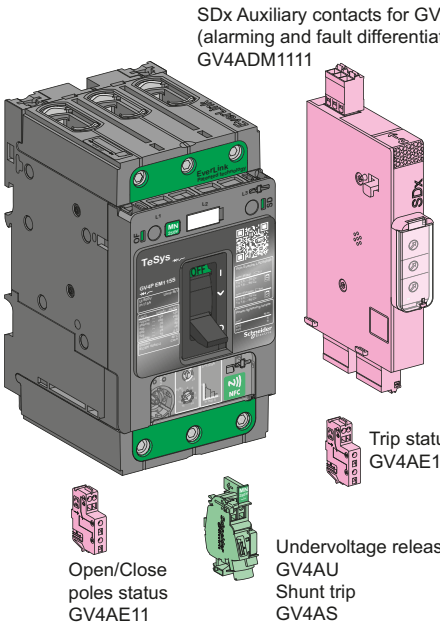
Auxiliary functions provided by add-on blocks



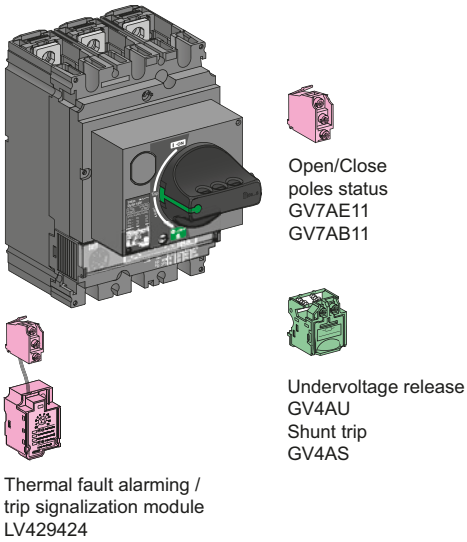
GV2



GV3



GV4



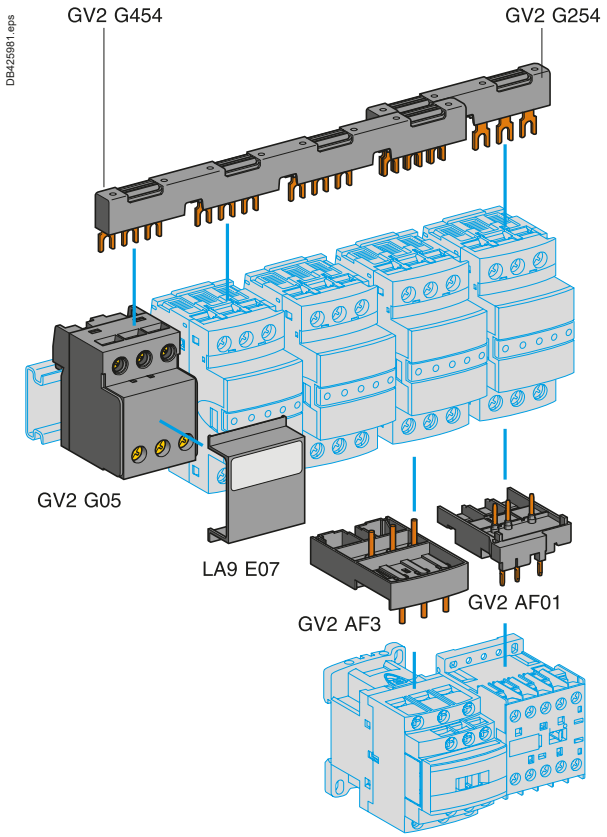
GV5/GV6

Auxiliary contacts add-on blocks
For control, alarms, automatic actions:
- **Instantaneous** indication of the position of the circuit breaker contacts
- **Trip indication**,
- **Alarming.**

Trip units
For remote tripping of circuit breaker:
- **Shunt trip / MX**, trips the circuit breaker when powered
- **Undervoltage release / MN**, trips the circuit breaker when voltage is loss.

Compact power circuits wiring with of GV2 + TeSys D contactors (1)

Busbars and combination blocks
Power busbars and combinations blocks provide a compact solution for assembling a group of motor starters.
Theysave wiring time and provide a clear finish aspect.
These solutions are available for GV2 circuit breakers + TeSys D contactors.



(1) Details on these solution in chapter B2 of TeSys catalogue.

TeSys GV2

0.06 to 15 kW



Product references

PB121308.eps



GV2L16

Motor circuit breakers from 0.09 to 15 kW

GV2L: Control by rotary knob, connection by screw clamp terminals

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Magnetic protection rating	Tripping current Id ± 20 %	Use in association with thermal overload relay (class 10 A)	Reference
400/415 V			500 V			690 V						
P	Icu	Ics (1)	P	Icu	Ics (1)	P	Icu	Ics (1)				
kW	kA		kW	kA		kW	kA		A	A		
0.09	★	★	**–**	–	–	**–**	–	–	0.4	5	LRD03	**GV2L03**
0.12	★	★	**–**	–	–	**0.37**	★	★	0.63	8	LRD04	**GV2L04**
0.18	★	★	**–**	–	–	**–**	–	–	0.63	8	LRD04	**GV2L04**
–	–	–	**–**	–	–	**0.55**	★	★	1	13	LRD05	**GV2L05**
0.25	★	★	**–**	–	–	**–**	–	–	1	13	LRD05	**GV2L05**
–	–	–	**–**	–	–	**0.75**	★	★	1	13	LRD06	**GV2L05**
0.37	★	★	**0.37**	★	★	**–**	–	–	1	13	LRD05	**GV2L05**
0.55	★	★	**0.55**	★	★	**1.1**	★	★	1.6	22.5	LRD06	**GV2L06**
–	–	–	**0.75**	★	★	**–**	–	–	1.6	22.5	LRD06	**GV2L06**
0.75	★	★	**1.1**	★	★	**1.5**	4	100	2.5	33.5	LRD07	**GV2L07**
1.1	–	–	**–**	–	–	**–**	–	–			LRD08	**GV2L08**
1.5	★	★	**1.5**	★	★	**3**	4	100	4	51	LRD08	**GV2L08**
–	–	–	**–**	–	–	**–**	–	–			LRD08	**GV2L08**
2.2	★	★	**3**	★	★	**4**	4	100	6.3	78	LRD10	**GV2L10**
3	★	★	**4**	10	100	**5.5**	4	100	10	138	LRD12	**GV2L14**
4	–	–	**–**	–	–	**–**	–	–			LRD14	**GV2L14**
–	–	–	**–**	–	–	**7.5**	4	100	10	138	LRD14	**GV2L14**
–	–	–	**–**	–	–	**9**	4	100	14	170	LRD16	**GV2L16**
5.5	50	50	**7.5**	10	75	**11**	4	100	14	170	LRD16	**GV2L16**
7.5	50	50	**9**	10	75	**15**	4	100	18	223	LRD21	**GV2L20**
9	50	50	**11**	10	75	**18.5**	4	100	25	327	LRD22	**GV2L22**
11	50	50	**15**	10	75	**–**	–	–	25	327	LRD22	**GV2L22**
15	50	50	**18.5**	10	75	**22**	4	100	32	416	LRD32	**GV2L32**

(1) As % of Icu. Associated current limiter or fuses, where required.
★ > 100 kA.

Characteristics: pages B6/64 to B6/66
Curves: pages B6/69 to B6/74
Dimensions, schemes: pages B6/82 to B6/84, B6/91

Product references

PB111879.eps



GV2L

Magnetic motor circuit breakers from 0.06 to 15 kW

GV2LE: control by rocker lever, connection by screw clamp terminals

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3										Magnetic protection rating	Tripping current Id ± 20 %	Use in association with thermal overload relay	Reference
400/415 V			500 V			690 V							
P	Icu	Ics (1)	P	Icu	Ics (1)	P	Icu	Ics (1)					
kW	kA		kW	kA		kW	kA			A	A		
0.06	★	★	–	–	–	–	–	–		0.4	5	LR2K0302	**GV2LE03**
0.09	★	★	–	–	–	–	–	–		0.4	5	LR2K0304	**GV2LE03**
0.12	★	★	–	–	–	**0.37**	★	★		0.63	8	LR2K0304	**GV2LE04**
0.18	★	★	–	–	–	–	–	–		0.63	8	LR2K0305	**GV2LE04**
–	–	–	–	–	–	**0.55**	★	★		1	13	LR2K0305	**GV2LE05**
0.25	★	★	–	–	–	–	–	–		1	13	LR2K0306	**GV2LE05**
–	–	–	–	–	–	**0.75**	★	★		1	13	LR2K0306	**GV2LE05**
0.37	★	★	**0.37**	★	★	–	–	–		1	13	LR2K0306	**GV2LE05**
0.55	★	★	**0.55**	★	★	**1.1**	★	★		1.6	22.5	LR2K0307	**GV2LE06**
–	–	–	**0.75**	★	★	–	–	–		1.6	22.5	LR2K0307	**GV2LE06**
0.75	★	★	**1.1**	★	★	**1.5**	3	75		2.5	33.5	LR2K0308	**GV2LE07**
1.1	★	★	–	–	–	–	–	–		2.5	33.5	LR2K0308	**GV2LE07**
1.5	★	★	**1.5**	★	★	**3**	3	75		4	51	LR2K0310	**GV2LE08**
–	–	–	**2.2**	★	★	–	–	–		4	51	LR2K0312	**GV2LE08**
2.2	★	★	**3**	50	100	**4**	3	75		6.3	78	LR2K0312	**GV2LE10**
3	★	★	**4**	10	100	**5.5**	3	75		10	138	LR2K0314	**GV2LE14**
4	★	★	**5.5**	10	100	–	–	–		10	138	LR2K0316	**GV2LE14**
–	–	–	–	–	–	**7.5**	3	75		10	138	LRD14	**GV2LE14**
–	–	–	–	–	–	**9**	3	75		14	170	LRD16	**GV2LE16**
5.5	15	50	**7.5**	6	75	**11**	3	75		14	170	LR2K0321	**GV2LE16**
7.5	15	50	**9**	6	75	**15**	3	75		18	223	LRD21	**GV2LE20**
9	15	40	**11**	4	75	**18.5**	3	75		25	327	LRD22	**GV2LE22**
11	15	40	**15**	4	75	–	–	–		25	327	LRD22	**GV2LE22**
15	10	50	**18.5**	4	75	**22**	3	75		32	416	LRD32	**GV2LE32**

(1) As % of Icu.
★ > 100 kA.

Circuit breakers

Characteristics: pages B6/64 to B6/66
Curves: pages B6/69 to B6/74
Dimensions, schemes: pages B6/82 to B6/84, B6/91

PB121311.eps



GV2ME

Motor circuit breakers from 0.06 to 15 kW / 400 V, with screw clamp terminals

GV2ME with pushbutton control

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Setting range of thermal trips (2)	Magnetic tripping current Id ± 20 %	Reference
400/415 V			500 V			690 V					
P	Icu	Ics (1)	P	Icu	Ics (1)	P	Icu	Ics (1)			
kW	kA	%	kW	kA	%	kW	kA	%	A	A	
–	–	–	–	–	–	–	–	–	0.1…0.16	1.5	**GV2ME01**
0.06	★	★	–	–	–	–	–	–	0.16…0.25	2.4	**GV2ME02**
0.09	★	★	–	–	–	–	–	–	0.25…0.40	5	**GV2ME03**
0.12	★	★	–	–	–	**0.37**	★	★	0.40…0.63	8	**GV2ME04**
0.18	★	★	–	–	–	–	–	–			
0.25	★	★	–	–	–	**0.55**	★	★	0.63…1	13	**GV2ME05**
0.37	★	★	**0.37**	★	★	–	–	–	1…1.6	22.5	**GV2ME06**
0.55	★	★	**0.55**	★	★	**0.75**	★	★			
–	–	–	**0.75**	★	★	**1.1**	★	★			
0.75	★	★	**1.1**	★	★	**1.5**	3	75	1.6…2.5	33.5	**GV2ME07**
1.1	★	★	**1.5**	★	★	**2.2**	3	75	2.5…4	51	**GV2ME08**
1.5	★	★	**2.2**	★	★	**3**	3	75			
2.2	★	★	**3**	50	100	**4**	3	75	4…6.3	78	**GV2ME10**
3	★	★	**4**	10	100	**5.5**	3	75	6…10	138	**GV2ME14**
4	★	★	**5.5**	10	100	**7.5**	3	75			
5.5	15	50	**7.5**	6	75	**9**	3	75	9…14	170	**GV2ME16**
–	–	–	–	–	–	**11**	3	75			
7.5	15	50	**9**	6	75	**15**	3	75	13…18	223	**GV2ME20**
9	15	40	**11**	4	75	**18.5**	3	75	17…23	327	**GV2ME21**
11	15	40	**15**	4	75	–	–	–	20…25	327	**GV2ME22** (3)
15	10	50	**18.5**	4	75	**22**	3	75	24…32	416	**GV2ME32**

Motor circuit breakers from 0.06 to 15 kW / 400 V, with lugs

To order thermal magnetic circuit breakers with connection by lugs, add the digit **6** to the end of reference selected above.
Example: **GV2ME08** becomes **GV2ME086**.

Thermal magnetic circuit breakers GV2ME with built-in auxiliary contact block

With instantaneous auxiliary contact block (composition, see page B6/21):

■ GVAE1, add suffix **AE1TQ** to the motor circuit breaker reference selected above.
Example: **GV2ME01AE1TQ**.
■ GVAE11, add suffix **AE11TQ** to the motor circuit breaker reference selected above.
Example: **GV2ME01AE11TQ**.
■ GVAN11, add suffix **AN11TQ** to the motor circuit breaker reference selected above.
Example: **GV2ME01AN11TQ**.

These circuit breakers with built-in contact block are sold in lots of 20 units in a single pack.

(1) As % of Icu.
(2) The thermal trip setting must be within the range marked on the graduated knob.
*(3) Maximum rating which can be mounted in enclosures **GV2MC** or **MP**, please consult your Regional Sales Office.*
★ *> 100 kA.*

Characteristics: pages B6/64 to B6/68
Curves: pages B6/75 to B6/77
Dimensions, schemes: pages B6/85 to B6/89, B6/91

Product references - UL applications

PB121311.eps



GV2ME

Motor circuit breakers from 3/4 to 20 HP / 460 V, with screw clamp terminals

GV2ME with pushbutton control

Thermal setting (A)	Maximum Horsepower ratings								Group Motor applications	Reference
	Single-Phase			Three-Phase						
	115 V	200 V	230 V	115 V	200 V	230 V	460 V	575 V	Max. Fuse or Circuit breaker (A)	
0.1…0.16	–	–	–	–	–	–	–	–	450	**GV2ME01**
0.16…0.25	–	–	–	–	–	–	–	–	450	**GV2ME02**
0.25…0.40	–	–	–	–	–	–	–	–	450	**GV2ME03**
0.40…0.63	–	–	–	–	–	–	–	–	450	**GV2ME04**
0.63…1	–	–	–	–	–	–	–	1/2	450	**GV2ME05**
1…1.6	–	–	1/10	–	–	–	3/4	3/4	450	**GV2ME06**
1.6…2.5	–	1/6	1/6	–	1/2	1/2	1	1.5	450	**GV2ME07**
2.5…4	1/8	1/4	1/3	–	3/4	3/4	2	3	450	**GV2ME08**
4…6.3	1/4	1/2	1/2	3/4	1	1.5	3	5	450	**GV2ME10**
6…10	1/2	1	1.5	1	2	3	5	7.5	450	**GV2ME14**
9…14	3/4	2	2	2	3	3	10	10	450	**GV2ME16**
13…18	1	2	3	2	5	5	10	15	450	**GV2ME20**
17…23	1.5	3	3	3	5	7.5	15	20	450	**GV2ME21**
20…25	2	–	–	–	7.5	7.5	15	20	450	**GV2ME22**
24…32	2	5	5	5	7.5	10	20	25	450	**GV2ME32**

Characteristics:
pages B6/64 to B6/68

Curves:
pages B6/75 to B6/77

Dimensions, schemes:
pages B6/85 to B6/89, B6/91

Product references

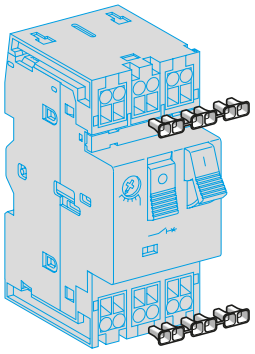


GV2ME●●3

Motor circuit breakers from 0.06 to 11 kW, with spring terminal connections

GV2ME (1) with pushbutton control

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3						Setting range of thermal trips (3)	Magnetic tripping current Id ± 20 %	Reference
400/415 V			500 V					
P	Icu	Ics (2)	P	Icu	Ics (2)			
kW	kA	%	kW	kA	%	A	A	
–	–	–	–	–	–	0.1…0.16	1.5	**GV2ME013**
0.06	★	★	–	–	–	0.16…0.25	2.4	**GV2ME023**
0.09	★	★	–	–	–	0.25…0.40	5	**GV2ME033**
0.12 **0.18**	★ ★	★ ★	–	–	–	0.40…0.63	8	**GV2ME043**
0.25 **0.37**	★ ★	★ ★	**0.37**	★	★	0.63…1	13	**GV2ME053**
0.37 **0.55**	★ ★	★ ★	**0.37** **0.55** **0.75**	★ ★ ★	★ ★ ★	1…1.6	22.5	**GV2ME063**
0.75	★	★	**1.1**	★	★	1.6…2.5	33.5	**GV2ME073**
1.1 **1.5**	★ ★	★ ★	**1.5** **2.2**	★ ★	★ ★	2.5…4	51	**GV2ME083**
2.2	★	★	**3**	50	100	4…6.3	78	**GV2ME103**
3 **4**	★ ★	★ ★	**4** **5.5**	10 10	100 100	6…10	138	**GV2ME143**
5.5	15	50	**7.5**	6	75	9…14	170	**GV2ME163**
7.5	15	50	**9**	6	75	13…18	223	**GV2ME203**
9 **11**	15 15	40 40	**11**	4	75	17…23	327	**GV2ME213**
11	15	40	**15**	4	75	20…25	327	**GV2ME223**



LA9D99

Contact blocks

Description	Mounting	Maximum number	Type of contacts	Sold in lots of	Unit reference
Instantaneous auxiliary contacts	Front	1	N/O + N/C	10	**GVAE113**
			N/O + N/O	10	**GVAE203**
	LH side	2	N/O + N/C	1	**GVAN113**
			N/O + N/O	1	**GVAN203**

Accessory

Description	Application	Sold in lots of	Unit reference
Cable end reducer	For connection of conductors from 1 to 1.5 mm²	20	**LA9D99**

*(1) For connection of conductors from 1 to 1.5 mm², the use of an **LA9D99** cable end reducer is recommended.*
*(2) Maximum rating which can be mounted in enclosures **GV2MC** or **MP**, please consult your Regional Sales Office*
(3) The thermal trip setting must be within the range marked on the graduated knob.
★ > 100 kA.

Circuit breakers

Characteristics: pages B6/64 to B6/68
Curves: pages B6/75 to B6/77
Dimensions, schemes: pages B6/85 to B6/89, B6/91

Product references



GV2P

Motor circuit breakers from 0.06 to 30 kW / 400 V

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Setting range of thermal trips (2)	Magnetic tripping current Id ± 20 %	Reference
400/415 V			500 V			690 V					
P	Icu	Ics (1)	P	Icu	Ics (1)	P	Icu	Ics (1)			
kW	kA	%	kW	kA	%	kW	kA	%	A	A	
GV2P: control by rotary knob											
Screw clamp terminals											
–	–	–	–	–	–	–	–	–	0.1…0.16	1.5	**GV2P01**
0.06	★	★	–	–	–	–	–	–	0.16…0.25	2.4	**GV2P02**
0.09	★	★	–	–	–	–	–	–	0.25…0.40	5	**GV2P03**
0.12	★	★	–	–	–	**0.37**	★	★	0.40…0.63	8	**GV2P04**
0.18	★	★	–	–	–	**–**	–	–			
0.25	★	★	–	–	–	**0.55**	★	★	0.63…1	13	**GV2P05**
0.37	★	★	**0.37**	★	★	**–**	–	–	1…1.6	22.5	**GV2P06**
0.55	★	★	**0.55**	★	★	**0.75**	★	★			
0.75	★	★	**1.1**	★	★	**1.5**	8	100	1.6…2.5	33.5	**GV2P07**
1.1	★	★	**1.5**	★	★	**2.2**	8	100	2.5…4	51	**GV2P08**
2.2	★	★	**3**	★	★	**4**	6	100	4…6.3	78	**GV2P10**
3	★	★	**5**	50	100	**5.5**	6	100	6…10	138	**GV2P14**
5.5	★	★	**7.5**	42	75	**9**	6	100	9…14	170	**GV2P16**
–	–	–	**–**	–	–	**11**	6	100			
7.5	50	50	**9**	10	75	**15**	4	100	13…18	223	**GV2P20**
9	50	50	**11**	10	75	**18.5**	4	100	17…23	327	**GV2P21**
11	50	50	**15**	10	75	**–**	–	–	20…25	327	**GV2P22**
15	50	50	**18.5**	10	75	**22**	4	100	24…32	416	**GV2P32**

How to use the table : select your load operating voltage, then select its standard power value (below, in the same column). The appropriate circuit breaker is in the extreme right column, in the corresponding row.
Exemple: GV2P04 can protect 0.12 and 0.18 kW under 400/415 V, and 0.18 kW under 440 V, and 0,37 kW under 690 V. No 500 V standard power value can fit GV2P04.

Motor circuit breakers up to 50 HP / 600 V, UL 60947-4-1 type E

GV2 (3)

To obtain a GV2P motor circuit breaker, UL 60947-4-1 type E, use the following with the circuit breaker:
■ a “Large Spacing” adapter **GV2GH7.**

Motor circuit breakers from 3/4 to 20 HP / 460 V, with screw clamp terminals

GV2P with rotary handle

Thermal setting (A)	Maximum Horsepower ratings (4)								Group Motor applications	Reference
	Single-Phase			Three-Phase						
	115 V	200 V	230 V	115 V	200 V	230 V	460 V	575 V	Max. Fuse or Circuit breaker (A)	
0.1…0.16	–	–	–	–	–	–	–	–	450	**GV2P01**
0.16…0.25	–	–	–	–	–	–	–	–	450	**GV2P02**
0.25…0.40	–	–	–	–	–	–	–	–	450	**GV2P03**
0.40…0.63	–	–	–	–	–	–	–	–	450	**GV2P04**
0.63…1	–	–	–	–	–	–	–	1/2	450	**GV2P05**
1…1.6	–	–	1/10	–	–	–	3/4	3/4	450	**GV2P06**
1.6…2.5	–	1/6	1/6	–	1/2	1/2	1	1.5	450	**GV2P07**
2.5…4	1/8	1/4	1/3	–	3/4	3/4	2	3	450	**GV2P08**
4…6.3	1/4	1/2	1/2	3/4	1	1.5	3	5	450	**GV2P10**
6…10	1/2	1	1.5	1	2	3	5	7.5	450	**GV2P14**
9…14	3/4	2	2	2	3	3	10	10	450	**GV2P16**
13…18	1	2	3	2	5	5	10	15	450	**GV2P20**
17…23	1.5	3	3	3	5	7.5	15	20	450	**GV2P21**
20…25	2	–	–	–	7.5	7.5	15	20	450	**GV2P22**
24…32	2	5	5	5	7.5	10	20	25	450	**GV2P32**

(1) As % of Icu.
(2) The thermal trip setting must be within the range marked on the graduated knob.
(3) Accessory: see page B6/23.
(4) 3P FLA corresponding values: see page A6/58.
★ > 100 kA.

Characteristics: pages B6/64 to B6/68
Curves: pages B6/75 to B6/78
Dimensions, schemes: pages B6/85 to B6/89, B6/91

Product references

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GV2RT

For motors with high current peak on starting

Control by rocker lever

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3					Setting range of thermal trips [1]	Magnetic tripping current Id ± 20 %	Reference
220/ 230 V	400/ 415 V	440 V	500 V	690 V			
kW	kW	kW	kW	kW	A	A	
0.06	0.09	0.09 0.12	–	–	0.25…0.40	8	**GV2RT03**
–	0.12 0.18	0.18	–	0.37	0.40…0.63	13	**GV2RT04**
0.09 0.12	0.25 0.37	0.25 0.37	0.37	0.55	0.63…1	22	**GV2RT05**
0.18 0.25	0.37 0.55	0.37 0.55	0.37 0.55 0.75	0.75 1.1	1…1.6	33	**GV2RT06**
0.37	0.75	0.75 1.1	1.1	1.5	1.6…2.5	51	**GV2RT07**
0.55 0.75	1.1 1.5	1.5	1.5 2.2	2.2 3	2.5…4	78	**GV2RT08**
1.1	2.2	2.2 3	3	4	4…6.3	138	**GV2RT10**
1.5 2.2	3 4	4	4 5.5	5.5 7.5	6…10	200	**GV2RT14**
2.2 3	5.5	5.5 7.5	7.5	9 11	9…14	280	**GV2RT16**
4	7.5	7.5 9	9	15	13…18	400	**GV2RT20**
5.5	9 11	11	11	18.5	17…23	400	**GV2RT21**

(1) The thermal trip setting must be within the range marked on the graduated knob.

For primaries of 3-phase transformers

Control by rocker lever

Standard power ratings					Setting range of thermal trips [2]	Magnetic tripping current Id ± 20 %	Reference
230/240 V	400/415 V	440 V	500 V	690 V			
kVA	kVA	kVA	kVA	kVA	A	A	
–	–	–	–	–	0.25…0.40	8	**GV2RT03**
–	–	–	–	–	0.40…0.63	13	**GV2RT04**
–	–	0.63	0.63	1	0.63…1	22	**GV2RT05**
0.4	0.63	1	1	–	1…1.6	33	**GV2RT06**
0.63	1	–	1.6	1.6 2	1.6…2.5	51	**GV2RT07**
1	1.6 2	1.6 2	2 2.5	2.5	2.5…4	78	**GV2RT08**
1.6 2	2.5	2.5 4	4	4 5 6.3	4…6.3	138	**GV2RT10**
2.5	4 5	5	5 6.3	–	6…10	200	**GV2RT14**
4	6.3	6.3	–	10 12.5	9…14	280	**GV2RT16**
5 6.3	10	10	10 12.5	10	13…18	400	**GV2RT20**

Accessory [3]

Description	Reference
Padlockable external operator (IP 54) black handle, blue legend plate	**GV2AP03**

(2) The thermal trip setting must be within the range marked on the graduated knob.

*(3) Other accessories such as mounting, cabling and marking accessories are identical to those used for **GV2ME** motor circuit breakers, see page B6/23.*

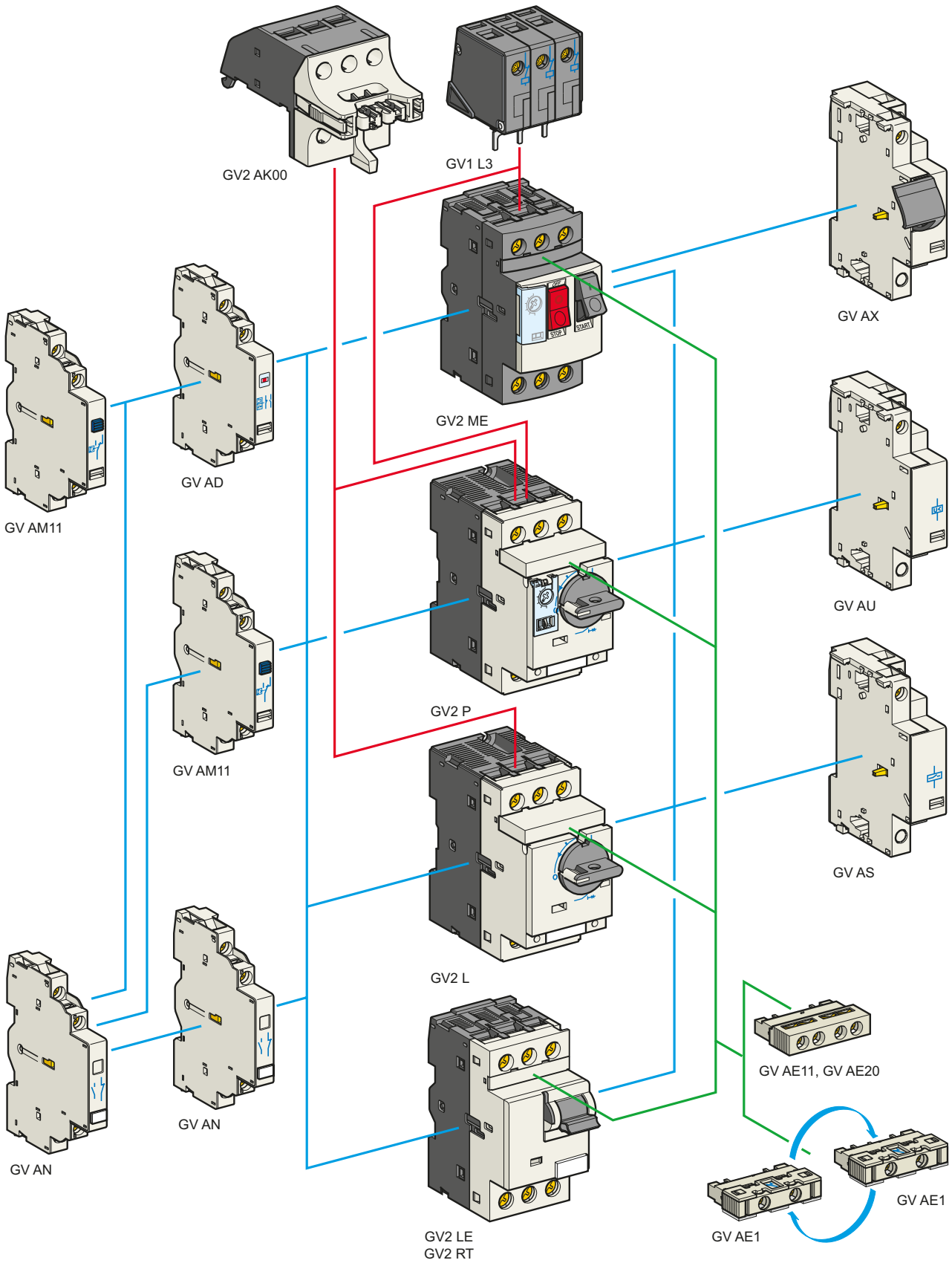
Characteristics:
pages B6/64 to B6/68

Curves:
pages B6/75 to B6/77

Dimensions, schemes:
pages B6/90 to B6/91

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Contact blocks

Description	Mounting	Maximum number	Type of contacts		Sold in lots of	Unit reference
Instantaneous auxiliary contacts	Front (1)	1	N/O or N/C (2)		10	**GVAE1**
			N/O + N/C		10	**GVAE11**
			N/O + N/O		10	**GVAE20**
	Side (LH)	2	N/O + N/C		1	**GVAN11**
			N/O + N/O		1	**GVAN20**
Fault signalling contact + instantaneous auxiliary contact	Side (3) (LH)	1	N/O (fault)	+ N/O	1	**GVAD1010**
				+ N/C	1	**GVAD1001**
			N/C (fault)	+ N/O	1	**GVAD0110**
				+ N/C	1	**GVAD0101**
Short-circuit signalling contact	Side (LH)	1	C/O common point		1	**GVAM11**

Electric trips

Mounting	Voltage		Reference
Undervoltage or shunt trips (4)			
Side (1 block on RH side of circuit breaker)	24 V	50 Hz	**GVA●025**
		60 Hz	**GVA●026**
	48 V	50 Hz	**GVA●055**
		60 Hz	**GVA●056**
	100 V	50 Hz	**GVA●107**
	100…110 V	60 Hz	**GVA●107**
	110…115 V	50 Hz	**GVA●115**
		60 Hz	**GVA●116**
	120…127 V	50 Hz	**GVA●125**
	127 V	60 Hz	**GVA●115**
	200 V	50 Hz	**GVA●207**
	200…220 V	60 Hz	**GVA●207**
	220…240 V	50 Hz	**GVA●225**
		60 Hz	**GVA●226**
	380…400 V	50 Hz	**GVA●385**
		60 Hz	**GVA●386**
	415…440 V	50 Hz	**GVA●415**
	415 V	60 Hz	**GVA●416**
	440 V	60 Hz	**GVA●385**
	480 V	60 Hz	**GVA●415**
	500 V	50 Hz	**GVA●505**
	600 V	60 Hz	**GVA●505**
Undervoltage trip, INRS (can only be mounted on GV2ME) Safety device for dangerous machines conforming to INRS and VDE 0113			
Side (1 block on RH side of circuit breaker GV2ME)	110…115 V	50 Hz	**GVAX115**
		60 Hz	**GVAX116**
	127 V	60 Hz	**GVAX115**
	220…240 V	50 Hz	**GVAX225**
		60 Hz	**GVAX226**
	380…400 V	50 Hz	**GVAX385**
		60 Hz	**GVAX386**
	415…440 V	50 Hz	**GVAX415**
	440 V	60 Hz	**GVAX385**

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GV1L3

Limiter blocks

Description	Mounting	Maximum number	Reference
Visible isolation block (5)	Front (1)	1	**GV2AK00** (6)
Limiters	At top (GV2ME and GV2P) for circuit breakers with screw clamp connections	1	**GV1L3**
	Independent	1	**LA9LB920**

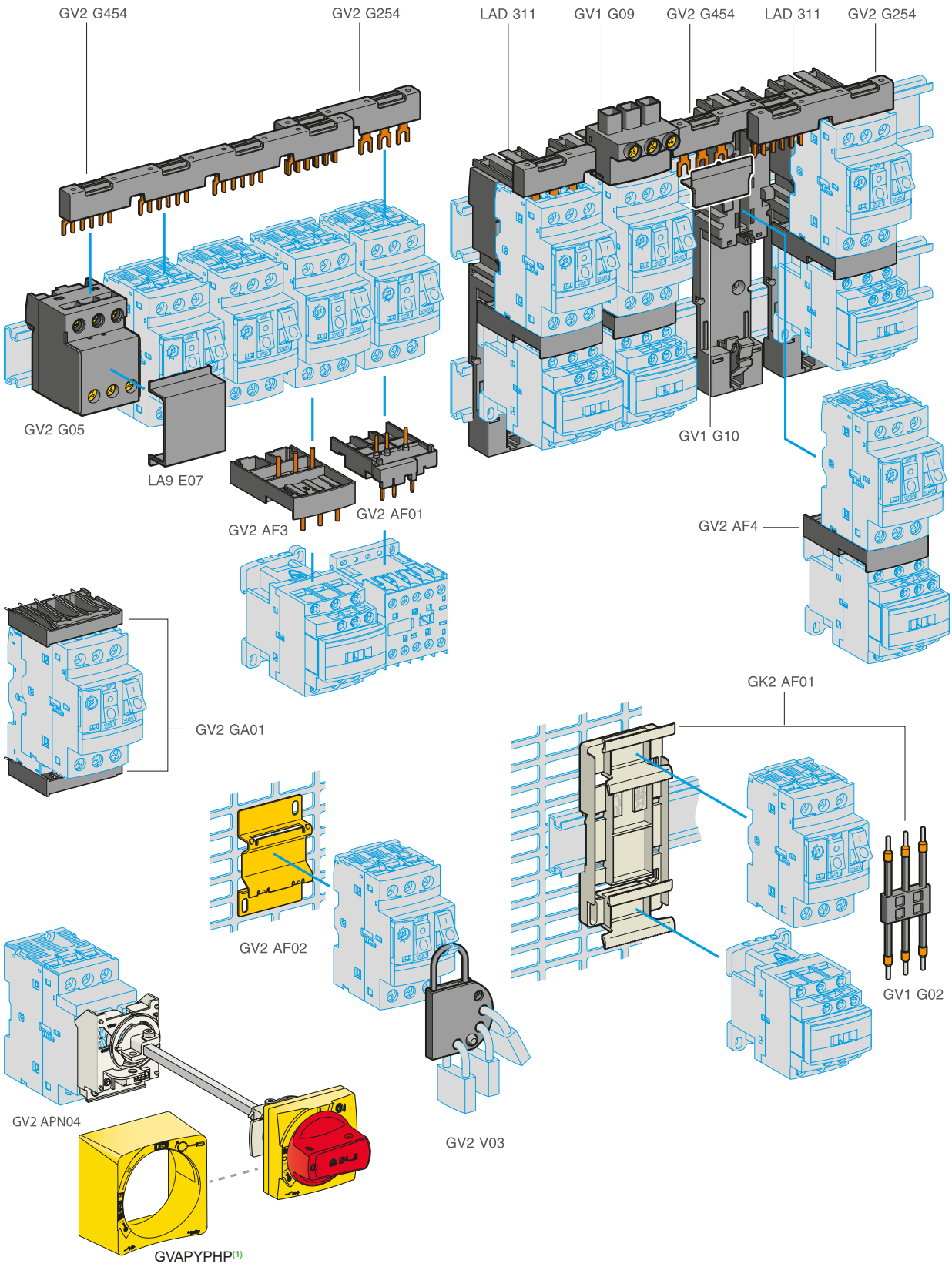
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LA9LB920

*(1) Mounting of a **GVAE** contact block or a **GV2AK00** visible isolation block on **GV2P** and **GV2L**.*
(2) Choice of N/C or N/O contact operation, depending on which way round the reversible block is mounted.
*(3) The **GVAD** is always mounted next to the circuit breaker.*
*(4) To order an undervoltage trip: replace the dot (●) in the reference with a **U**, example: **GVAU025**.*
*To order a shunt trip: replace the dot (●) in the reference with an **S**, example: **GVAS025**.*
*(5) Visible isolation of the 3 poles upstream of circuit breaker **GV2P** and **GV2L**.*
(6) Ie Max = 32 A.

Characteristics: pages B6/79 to B6/81
Dimensions, schemes: pages B6/82 to B6/91



(1) Standard front plate must be removed from the assembly and replaced by Protective front plate (GVAPYPHP).

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Product references

Accessories for circuit breakers with screw clamp connections

Description	Application	Sold in lots of	Unit reference
Adapter plates	For mounting a GV2 by screw fixing	10	**GV2AF02**
	For mounting a GV2ME and contactor LC1D09…D38 with front faces aligned	1	**LAD311**
Height compensation plate	7.5 mm to align GV2ME-GV2LE and GV2P-GV2L and allow the use of a common GV2G●●● busbar	10	**GV1F03**
Combination blocks	Between GV2 and contactor LC1K or LP1K	10	**GV2AF01**
	Between GV2 and contactor LC1D09…D38	10	**GV2AF3**
	Between GV2 mounted on LAD311 and contactor LC1D09…D38	10	**GV2AF4**
Motor starter adapter plate	With 3-pole connection for mounting a GV2 and a contactor LC1D09…D25	1	**GK2AF01**

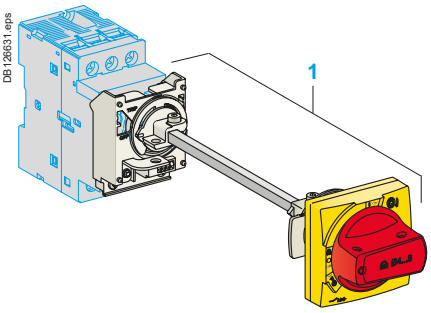
Description	Application	Pitch	Reference
		mm	
Sets of 3-pole Ie = 63 A busbars	2 tap-offs	45	**GV2G245**
		54	**GV2G254**
		72	**GV2G272**
	3 tap-offs	45	**GV2G345**
		54	**GV2G354**
	4 tap-offs	45	**GV2G445**
		54	**GV2G454**
		72	**GV2G472**
	5 tap-offs	54	**GV2G554**

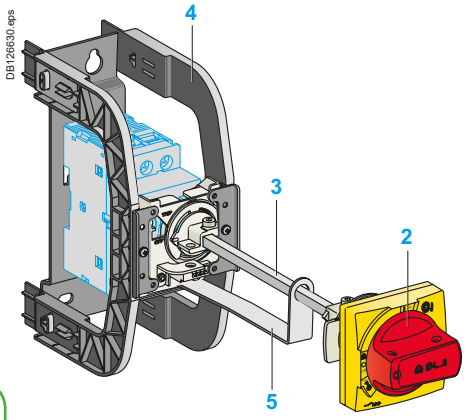
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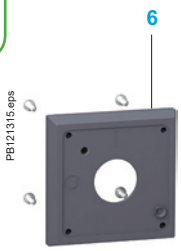


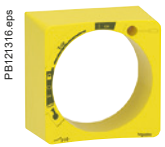
GV1G09

Description	Ie	Application	Sold in lots of	Unit reference
	A			
Protective end cover	-	For unused busbar outlets	5	**GV1G10**
Terminal block for supply to one or more GV2G busbar sets	63	Connection from the top	1	**GV1G09**
	63	Can be fitted with current limiter GV1L3 (GV2ME and GV2P)	1	**GV2G05**
Cover for terminal block	-	For mounting in modular panels	10	**LA9E07**
Flexible 3-pole connection for connecting a GV2 to a contactor LC1D09…D25	25	Centre distance between mounting rails: 100…120 mm	10	**GV1G02**
Set of connections upstream/downstream	16	For connecting GV2ME to a printed circuit board	10	**GV2GA01**
"Large Spacing" adapter UL 60947-4-1 type E	-	For GV2P●● (except 32 A)	1	**GV2GH7**
Clip-in marker holders (supplied with each circuit breaker)	-	For GV2P, GV2L, GV2LE and GV2RT (8 x 22 mm)	100	**LA9D92**









GVAPYPHP



Extended Rotary Handle

Allows a circuit breaker or a starter-controller installed in back of an enclosure to be operated from the front of the enclosure.
A rotary handle can be black or red/yellow, IP54 or IP65. It includes a function for locking the circuit breaker or the starter in the O (Off) for red/yellow handle, in the O (Off) or I (On) for black handle, by means of up to 3 padlocks with a shank diameter of 4 to 8 mm. The extended shaft must be adjusted to use in different size enclosures. The IP54 rotary handle is fixed with a nut (Ø22) to make easier the assembling. The new Laser Square tool brings the accuracy to align the circuit breaker and the rotary handle.

Padlockable external operators for GV2P and GV2L

Description

1 Kit handle + mounting system
2 Universal handle
3 Shaft
4 Bracket
5 Shaft support plate for deep enclosure
6 Retrofit accessory
7 Laser Square accessory

Kit handle + mounting system

Description		Item	Reference
For GV2P/L	Black handle, front plate, with trip status, IP 54	1	**GV2APN01**
	Red handle, front plate, with trip status, IP 54	1	**GV2APN02**
	Black handle, front plate, without trip status, IP 65	1	**GV2APN03**
	Red handle, front plate, without trip status, IP 65	1	**GV2APN04**
For GV2LE	Padlocking in “On” and “Off” position Black handle, blue front plate, IP 54	-	**GV2AP03**

Universal handle

For GV2P/L	Black handle, with trip status, IP54	2	**GVAPB54**
	Red handle, with trip status, IP54	2	**GVAPR54**
	Red handle, without trip status, IP65	2	**GVAPR65**
	Black handle, without trip status, IP 65	2	**GVAPB65**

External handle protection frame

For GV2P/L	Yellow frame	1	**GVAPYPHP**
	Black frame	1	**GVAPBPHP**

Shaft

For GV2P/L	L = 315 mm	3	**GVAPA1**

Bracket

For GV2P/L		4	**GVAPH02**

Shaft support plate for deep enclosure

For GV2P/L	Depth ≥ 250 mm	5	**GVAPK11**

Retrofit accessory

For GV2P/L		6	**GVAPP1**

Laser Square accessory

For GV2P/L		7	**GVAPL01**

Sticker		Sold in lots of		
Warning label	For French	10	-	**GVAPSFR**
	For English	10	-	**GVAPSEN**
	For German	10	-	**GVAPSDE**
	For Spanish	10	-	**GVAPSES**
	For Chinese	10	-	**GVAPSCN**
	For Portuguese	10	-	**GVAPSPT**
	For Russian	10	-	**GVAPSRU**
	For Italian	10	-	**GVAPSIT**

Padlocking device

Description		Reference
For all GV2 device	For use with up to 4 padlocks, Ø6 mm shank max. (padlocks not included)	**GV2V03**

Dimensions, schemes:
page B6/83

TeSys GV3

11 to 45 kW



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GV3L25

PB121320.eps



GV3L401

PB121321.eps



GV3L326

Motor circuit breakers from 11 to 45 kW

GV3L: control by rotary knob, connection by EverLink® BTR screw connectors

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Magnetic protection rating	Tripping current Id ± 20 %	Use in association with thermal overload relay (class 10 A)	Reference
400/415 V			500 V			690 V						
P	Icu	Ics (1)	P	Icu	Ics (1)	P	Icu	Ics (1)				
kW	kA		kW	kA		kW	kA		A	A		
11	100	100	**15**	12	50	**18.5**	6	50	25	350	LRD325	**GV3L25**
15	100	100	**18.5**	12	50	**22**	6	50	32	448	LRD332	**GV3L32**
18.5	50	100	**22**	12	50	**37**	6	50	40	560	LRD340	**GV3L40**
22	50	100	**30**	12	50	**45**	6	50	50	700	LRD350	**GV3L50**
30	50	100	**37**	12	50	**55**	6	50	65	910	LRD365	**GV3L65**
37	50	60	**45**	12	50	**55**	6	50	73	1120	LRD380	**GV3L73**
45	50	60	**45**	12	50	**55**	6	50	80	1120	LRD380	**GV3L80**(2)

Connection by EverLink® BTR screw connectors, for assembly with a contactor

To assemble a **GV3L25** to **L73** circuit breaker with an **LC1D40A** to **D80A** contactor, it is possible to use the circuit breaker supplied without downstream EverLink® power terminal block. To order this product, add the digit **1** to the end of the references selected above. Example: **GV3L73** becomes **GV3L731**. Do not use direct mounting between **GV3L80** and **LC1D80A** because of potential overheating, use cable link.

Connection by lugs

To order these circuit breakers with connection by lugs, add the digit **6** to the end of reference selected above. Example: **GV3L32** becomes **GV3L326**.

(1) As % of Icu. Associated current limiter or fuses, where required.
(2) 750 A Lock Rotor Current max.
★ > 100 kA.

PB116862.eps



GV3P80

PB121322.eps



GV3P731

PB121323.eps



GV3P736

Motor circuit breakers up to 45 kW / 400 V

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Setting range of thermal trips (2)	Magnetic tripping current Id ± 20 %	Reference
400/415 V			500 V			690 V					
P	Icu	Ics (1)	P	Icu	Ics (1)	P	Icu	Ics (1)			
kW	kA	%	kW	kA	%	kW	kA	%	A	A	
GV3P: control by rotary knob											
Connection by EverLink® BTR screw connectors (3)											
5.5	100	100	**7.5**	12	50	**11**	6	50	9…13	182	**GV3P13**
7.5	100	100	**9**	12	50	**15**	6	50	12…18	252	**GV3P18**
11	100	100	**15**	12	50	**18.5**	6	50	17…25	350	**GV3P25**
15	100	100	**18.5**	12	50	**22**	6	50	23…32	448	**GV3P32**
18.5	50	100	**22**	12	50	**37**	6	50	30…40	560	**GV3P40**
22	50	100	**30**	12	50	**45**	6	50	37…50	700	**GV3P50**
30	50	100	**45**	12	50	**55**	6	50	48…65	910	**GV3P65**
37	50	60	**45**	12	50	**55**	6	50	62...73	1120	**GV3P73**
45	50	60	**45**	12	50	**55**	6	50	70...80	1120	**GV3P80 (4)**

Connection by EverLink® BTR screw connectors, for assembly with a contactor

To assemble a **GV3P13** to **P73** circuit breaker with an **LC1D40A** to **D73A** contactor, it is possible to use the circuit breaker supplied without downstream EverLink® power terminal block. To order this product, add the digit **1** to the end of the references selected above. Example: **GV3P73** becomes **GV3P731**. Do not use direct mounting between **GV3P80** and **LC1D80A** because of potential overheating, use cable link.

Connection by lugs

To order thermal magnetic circuit breakers with connection by lugs, add the digit **6** to the end of reference selected above. Example: **GV3P18** becomes **GV3P186**.

Motor circuit breakers up to 40 HP / 460 V, UL 60947-4-1 type E

GV3P13 (5) to GV3P65 (5)

To obtain a motor-circuit breaker **GV3P**, UL 60947-4-1 type E, use the following with the circuit breaker:
- a "Large Spacing" cover **GV3G66**,
- a short-circuit signalling contact **GVAM11**.

Motor circuit breakers from 7.5 to 50 HP / 460 V, with screw clamp terminals

GV3P with rotary handle

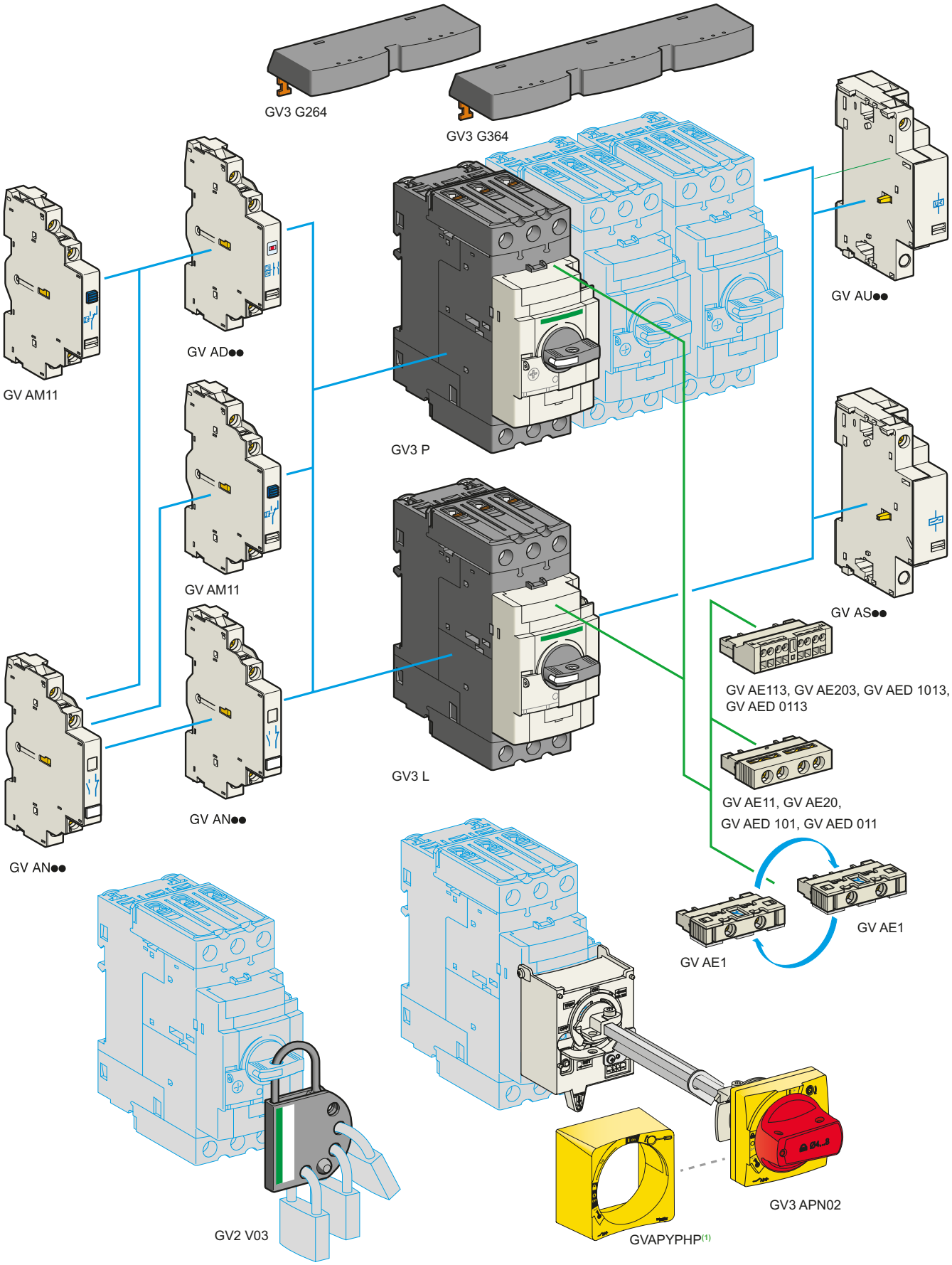
Thermal setting (A)	Maximum Horsepower ratings (6)						Reference
	Single-Phase		Three-Phase				
	115 V	230 V	200 V	230 V	460 V	575 V	
9…13	1/2	1.5	3	3	7.5	10	**GV3P13**
12…18	3/4	2	3	5	7.5	10	**GV3P18**
17…25	1.5	3	5	7.5	15	20	**GV3P25**
23…32	2	3	7.5	7.5	20	25	**GV3P32**
30…40	3	5	10	10	25	30	**GV3P40**
37…50	3	7.5	10	10	30	40	**GV3P50**
48…65	3	10	15	15	40	50	**GV3P65**
62…73	5	15	20	25	50	60	**GV3P73**

GV3P13 to GV3P65 - with connection by lugs (5)

To obtain a motor-circuit breaker **GV3P**, UL 60947-4-1 type E, with connection by lugs, add the digit **6** to the end of reference selected above and use the following with the circuit breaker:
- two IP 20 covers **LAD96570**,
- a short-circuit signalling contact **GVAM11**.

(1) As % of Icu.
(2) The thermal trip setting must be within the range marked on the graduated knob.
(3) BTR screws: hexagon socket head. Require use of an insulated Allen key, in compliance with local wiring regulations.
(4) 750 A Lock Rotor Current max.
(5) Accessories: see page B6/30.
(6) 3P FLA corresponding values : see page A6/58.

DB126635.eps



(1) Standard front plate must be removed from the assembly and replaced by Protective front plate (GVAPYPHP).

Life Is On Schneider Electric

Product references

Contact blocks

Description	Mounting	Maximum number	Type of contacts		Sold in lots of	Unit reference
Instantaneous auxiliary contacts	Front	1	N/O or N/C (1)		10	**GVAE1**
			N/O + N/C		10	**GVAE11** (2)
			N/O + N/O		10	**GVAE20** (2)
	Side (LH)	2	N/O + N/C		1	**GVAN11** (2)
			N/O + N/O		1	**GVAN20** (2)
Fault signalling contact + instantaneous auxiliary contact	Front	1	N/O (fault)	+ N/O	1	**GVAED101** (2)
			N/O (fault)	+ N/C	1	**GVAED011** (2)
	Side (3) (LH)	1	N/O (fault)	+ N/O	1	**GVAD1010**
				+ N/C	1	**GVAD1001**
			N/C (fault)	+ N/O	1	**GVAD0110**
				+ N/C	1	**GVAD0101**
Short-circuit signalling contact	Side (LH)	1	C/O common point		1	**GVAM11**

Electric trips - undervoltage or shunt (4)

Mounting	Voltage		Reference
Side (1 block on RH side of circuit breaker)	24 V	50 Hz	**GVA●025**
		60 Hz	**GVA●026**
	48 V	50 Hz	**GVA●055**
		60 Hz	**GVA●056**
	100	50 Hz	**GVA●107**
	100…110 V	60 Hz	**GVA●107**
	110…115 V	50 Hz	**GVA●115**
		60 Hz	**GVA●116**
	120…127 V	50 Hz	**GVA●125**
	127 V	60 Hz	**GVA●115**
	200 V	50 Hz	**GVA●207**
	200…220 V	60 Hz	**GVA●207**
	220…240 V	50 Hz	**GVA●225**
		60 Hz	**GVA●226**
	380…400 V	50 Hz	**GVA●385**
		60 Hz	**GVA●386**
	415…440 V	50 Hz	**GVA●415**
	415 V	60 Hz	**GVA●416**
	440 V	60 Hz	**GVA●385**
	480 V	60 Hz	**GVA●415**
	500 V	50 Hz	**GVA●505**
	600 V	60 Hz	**GVA●505**

Accessories

Description			Reference
Set of 3-pole busbars **Ie = 115 A** Pitch: 64 mm	2 tap-off	GV3P●● and GV3L●●	**GV3G264**
	3 tap-off	GV3P●● and GV3L●●	**GV3G364**
Cover "Large Spacing" UL 60947-4-1 type E (Only one cover required on supply side)		GV3P●●	**GV3G66**

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GV3G66

(1) Choice of N/C or N/O contact operation, depending on which way round the reversible block is mounted.
*(2) Contact blocks available in version with spring terminal connections. Add a figure **3** at the end of the references selected above. Example: **GVAED101** becomes **GVAED1013**.*
*(3) The **GVAD●●** is always mounted next to the circuit breaker.*
*(4) To order an undervoltage trip: replace the dot (●) in the reference with a **U**, example: **GVAU025**. To order a shunt trip: replace the dot (●) in the reference with an **S**, example: **GVAS025**.*

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LV426992



LV426990

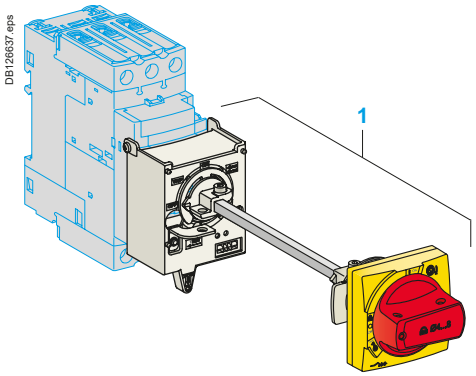
Limited torque throwaway bits

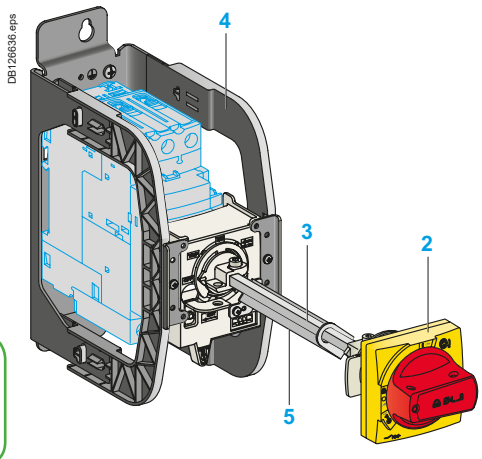
Torque limiting breakaway bits

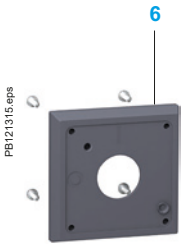
Description	Sold in lots of	Reference
5 N.m Yellow	6	**LV426992**
9 N.m Green	6	**LV426990**

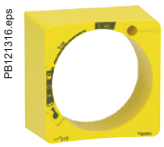
Characteristics: pages B6/104 to B6/106
Schemes: page B6/109

Product references









GVAPYPHP



Extended Rotary Handle

Allows a circuit breaker or a starter-controller installed in back of an enclosure to be operated from the front of the enclosure.
A rotary handle can be black or red/yellow, IP54 or IP65. It includes a function for locking the circuit breaker or the starter in the O (Off) or I (On) position (depending of the type of rotary handle) by means of up to 3 padlocks with a shank diameter of 4 to 8 mm. The extended shaft must be adjusted to use in different size enclosures. The IP54 rotary handle is fixed with a nut (Ø22) to make easier the assembling. The new Laser Square tool brings the accurency to align the circuit breaker and the rotary handle.

Padlockable external operators for GV3 and GV3L

Description

1 Kit handle + mounting system
2 Universal handle
3 Shaft
4 Bracket
5 Shaft support plate for deep enclosure
6 Retrofit accessory
7 Laser Square accessory

Kit handle + mounting system

Description		Item	Reference
For GV3P/L	Black handle, front plate, with trip status, IP 54	1	**GV3APN01**
	Red handle, front plate, with trip status, IP 54	1	**GV3APN02**
	Black handle, front plate, without trip status, IP65	1	**GV3APN03**
	Red handle, front plate, without trip status, IP 65	1	**GV3APN04**

Universal handle

For GV3P/L	Black handle, with trip status, IP54	2	**GVAPB54**
	Red handle, with trip status, IP54	2	**GVAPR54**
	Black handle, without trip status, IP65	2	**GVAPB65**
	Red handle, without trip status IP65	2	**GVAPR65**

External handle protection frame

For GV2P/L	Yellow frame	1	**GVAPYPHP**
	Black frame	1	**GVAPBPHP**

Shaft

For GV3P/L	L = 315 mm	3	**GVAPA1**

Bracket

For GV3P/L		4	**GVAPH03**

Shaft support plate for deep enclosure

For GV3P/L	Depth ≥ 300 mm	5	**GVAPK12**

Retrofit accessory

For GV3P/L		6	**GVAPP1**

Laser Square accessory

For GV3P/L		7	**GVAPL01**

Sticker		Sold in lots of		
Warning label	For French	10	-	**GVAPSFR**
	For English	10	-	**GVAPSEN**
	For German	10	-	**GVAPSDE**
	For Spanish	10	-	**GVAPSES**
	For Chinese	10	-	**GVAPSCN**
	For Portuguese	10	-	**GVAPSPT**
	For Russian	10	-	**GVAPSRU**
	For Italian	10	-	**GVAPSIT**

Dimensions, schemes:
pages B6/108

TeSys GV4

0.25 to 55 kW - 1/2 to 60 HP



Protection

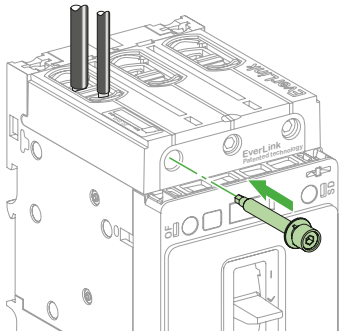
TeSys GV4 motor circuit breaker covers motor protection from 0.25 to 55 kW at 415 V AC (from 0.8 to 115 A) in one frame and is available in 3 breaking capacities: 25, 50 and 100 kA at 415 V AC IEC (15, 35, 65 kA at 480 V UL).

Tesys GV4 is available with 3 types of protection:
- Magnetic GV4L: to be used with an overload relay or a drive
- Thermal magnetic GV4P: electronic protection with wide range setting, dual class (10 & 20)
- Multifunction motor protection GV4PEM: GV4P with adjustable advanced protections and possibility to have a side module SDx for alarming and motor functional fault differentiation.

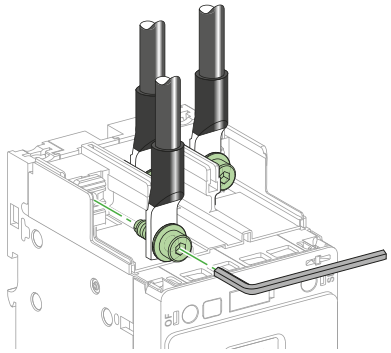
Power connection

TeSys GV4 comes in standard with 2-holes EverLink™ power connectors with creep (1) compensation for bare copper cables. This Schneider Electric patended technique makes it possible to achieve accurate and durable tightening torque in order to avoid cable creep.
Products may be delivered with connectors for bars or cables with compression lugs (except GV4PB).
Whatever, the connectors are field interchangeables and can be removed for the installation of one of both.
And to tight at the right torque power connections particularly in the field, torque limiting breakaway bits may be used.

DB425664.eps



DB425926.eps



Mounting

TeSys GV4 can be mounted on a backplate or on a DIN rail (35 or 75 mm).

Handle

TeSys GV4 can be ordered with a toggle or a direct rotary handle (except for GV4P Multifunction).
It is also possible to equip a toggle one with a direct rotaty handle, or a front extended one, or a side one.

Auxiliaries

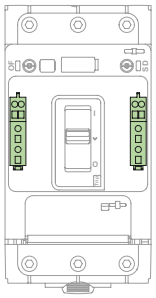
TeSys GV4 circuit breakers can be equiped with an open/close (OF) contact and a trip indication (SD) contact.
These contacts are common point changeover type, with a normaly open (NO) and a normaly closed (NC) contact.
TeSys GV4 may be equiped too with an MN (undervoltage release) or MX (shunt trip) coil.

GV4P Multifunction circuit breakers can be equiped with 1 or 2 SDx module(s) in order to have alarming and motor functional fault differentiation (SDx - See page B6/44)

Auxiliaries have spring connections for cables up to 1.5 mm².

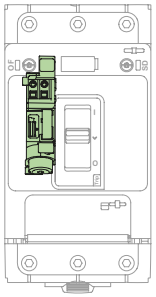
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OF **SD**



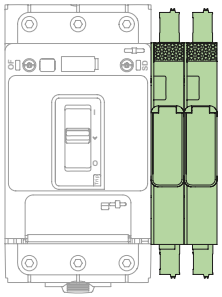
DB424979.eps

MN/MX



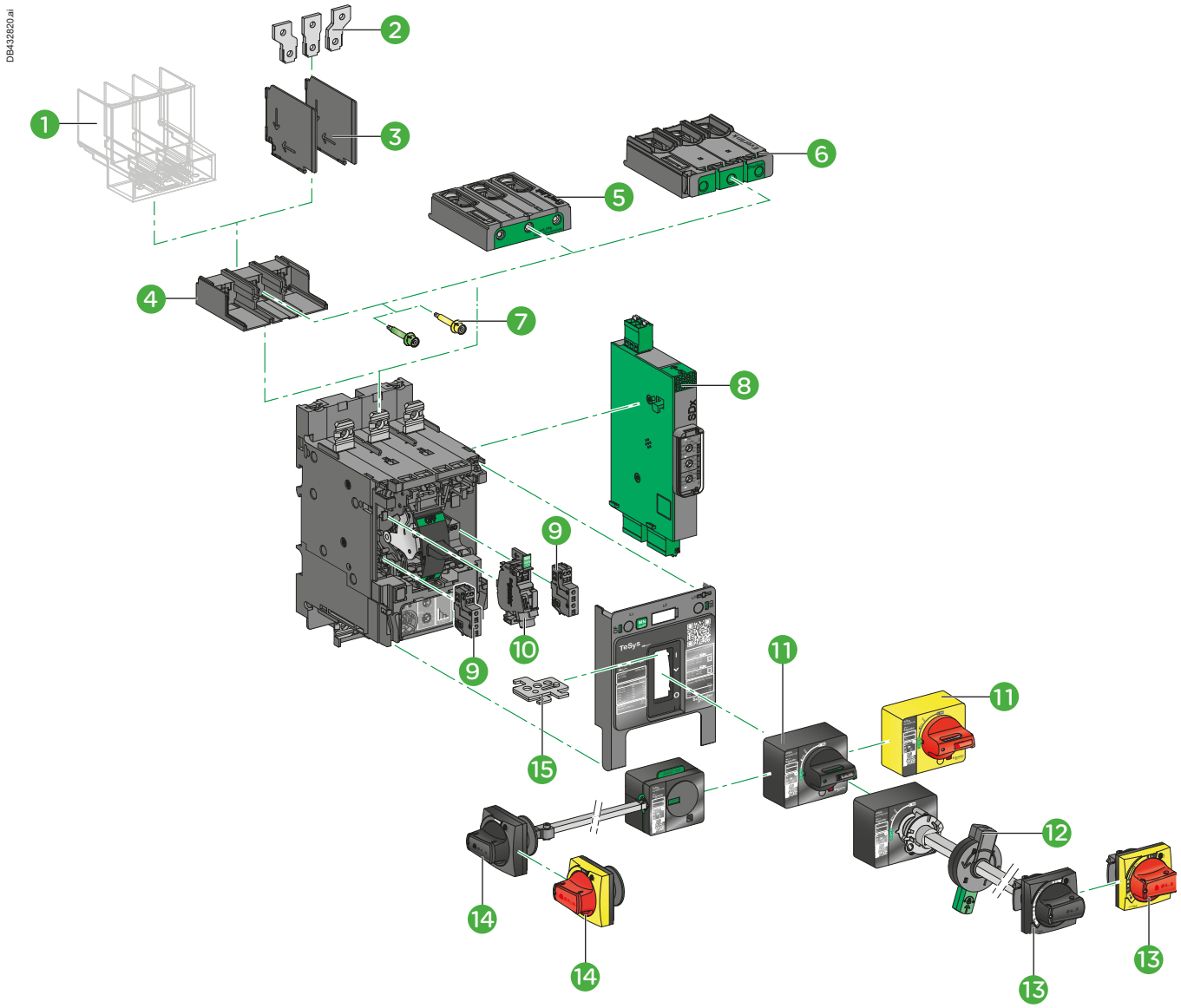
DB425752.eps

SDx



(1) Creep: normal crushing phenomenon of condustors, that is accentuated over time.

Introduction



1 Long terminal shield **LAD96590**
2 Terminal spreaders **LV426940**
3 Interphases barriers **LV426920**
4 Crimp lug connector **GV4LUG**
5 EverLink® connector **LAD96595**
6 Everlink® terminals and large spacing cover **GV4G66 + LAD96595**
7 Torque limiting breakaway bits **LV42699●**
8 SDx alarming/fault differentiation module **GV4ADM1111** (only with GV4PEM)
9 Auxiliary contact block for OF or SD function **GV4AE11**
10 - MN undervoltage release **GV4AU●●**
- MX shunt trip **GV4AS●●**
11 Direct mounting black or red on yellow bezel rotary handle **GV4ADN01/ GV4ADN02**
12 Open door shaft operator (for front extended rotary handle) **LV426937**
13 Front extended rotary handle kit with red handle on yellow bezel or black handle **GV4APN01/ GV4APN02 /GV4APN04**
14 Side rotary handle kit with red handle on yellow bezel or black handle **LV426935/LV426936**.
15 Toggle locking device **29370**

Introduction

PB114910.eps



GV4L

PB114909.eps



GV4LE

Protection

Setting is made using dial.

Trip class (class)
GV4L can be used with class 5, 10 or 20 relay.

Short circuit protection (Ii)
Protection with an adjustable pick-up **Ii = 6 to 14 In**. Settings are made in amperes.

Standards and certifications
IEC/EN 60947-1, IEC/EN 60947-2, CCC, EAC.

Ref.
Circuit breakers

Product references

Magnetic motor circuit breakers from 0.25 to 55 kW

Standard power ratings of 3-phase motors - 50 / 60 Hz									In	Magnetic setting range (Ii)	Use in association with overload relay Class 10 or 20	Reference with EverLink terminals	
400/415 V			500 V			690 V							
P	Icu	Ics (1)	P	Icu	Ics (1)	P	Icu	Ics (1)				with toggle	with rotary handle
kW	kA	%	kW	kA	%	kW	kA	%	A	A			
0.25... 0.75	25	100	**0.37... 1.1**	10	100	**0.55... 1.5**	-	-	2	12... 28	LRD05 (0.63... 1A) LRD06 (1... 1.6A) LRD07 (1.6... 2.5A)	-	-
	50	100		25	100		8	25				**GV4LE02N**	**GV4L02N**
	100	100		30	100		10	25				**GV4LE02S**	-
0.55... 1.5	25	100	**0.75... 1.5**	10	100	**1.1... 2.2**	-	-	3,5	21... 49	LRD07 (1.6... 2.5A) LRD08 (2.5... 4A)	-	-
	50	100		25	100		8	25				**GV4LE03N**	**GV4L03N**
	100	100		30	100		10	25				**GV4LE03S**	-
1.5... 3	25	100	**2.2... 4**	10	100	**3... 7.5**	-	-	7	42... 98	LRD08 (2.5... 4A) LRD10 (4...6A)	-	-
	50	100		25	100		8	25				**GV4LE07N**	**GV4L07N**
	100	100		30	100		10	25				**GV4LE07S**	-
3... 5.5	25	100	**3... 7.5**	10	100	**5.5... 11**	-	-	12,5	75... 175	LRD12 (5.5... 8A) LRD14 (7... 10A) LRD313 (9...13A)	-	-
	50	100		25	100		8	25				**GV4LE12N**	**GV4L12N**
	100	100		30	100		10	25				**GV4LE12S**	-
5.5... 11	25	100	**7.5... 15**	10	100	**7.5... 18.5**	-	-	25	150... 350	LRD318 (12... 18A) LRD325 (17... 25A)	**GV4LE25B**	**GV4L25B**
	50	100		25	100		8	25				**GV4LE25N**	**GV4L25N**
	100	100		30	100		10	25				**GV4LE25S**	-
11... 22	25	100	**15... 30**	10	100	**18.5... 45**	-	-	50	300... 700	LRD332 (23... 32A) LRD340 (30... 40A) LRD350 (37... 50A)	**GV4LE50B**	**GV4L50B**
	50	100		25	100		8	25				**GV4LE50N**	**GV4L50N**
	100	100		30	100		10	25				**GV4LE50S**	-
18.5... 37	25	100	**22... 55**	10	100	**30... 55**	-	-	80	480... 1120	LRD365 (48... 65A) LRD3363 (63... 80A)	**GV4LE80B**	**GV4L80B**
	50	100		25	100		8	25				**GV4LE80N**	**GV4L80N**
	100	100		30	100		10	25				**GV4LE80S**	**GV4L80S**
30... 55	25	100	**30... 75**	10	100	**45... 90**	-	-	115	690... 1610	LR9D5567 (60... 100A) LR9F5367 (60... 100A) LR9D5369 (90... 150A) LR9F5369 (90...150A)	**GV4LE115B**	**GV4L115B**
	50	100		25	100		8	25				**GV4LE115N**	**GV4L115N**
	100	100		30	100		10	25				**GV4LE115S**	**GV4L115S**

Connection by lugs

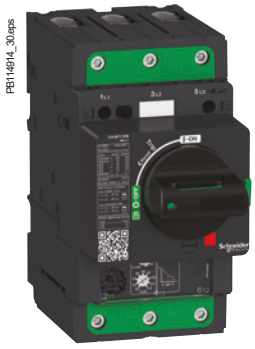
To order circuit breakers with connection by lugs, add the digit **6** to the end of reference selected above. Example: **GV4LE02N** becomes **GV4LE02N6**.

(1) As % of Icu.

Circuit breakers

Characteristics: pages B6/112 to B6/114
Curves: pages B6/116 to B6/120
Dimensions, schemes: pages B6/126, B6/127, B6/129

Introduction



GV4P



GV4PE

Protection

Settings are made using dials.

Overload or thermal protection (Ir)
Inverse-time thermal protection against overloads with adjustable pick-up Ir.
Wide range setting made in amperes.
The tripping curve for the thermal protection, which indicates the time delay tr before tripping, is defined by the selected trip class.

Trip class (class)
The class is selected as a function of the normal motor starting time.
- Class 10: starting time less than 10 s.
- Class 20: starting time less than 20 s.

For a given class, it is necessary to check that all motor-feeder components are sized to carry the 7.2 Ir starting current without excessive temperature rise during the time corresponding to the class.

Short time delay protection (Isd)
Short time delay protection (around 100 ms) to let through motor starting currents, but to protect cables and motor starter devices and allow not to oversize them (particularly usefull for wide range settings circuit breakers).
Fixed pick-up **Isd = 13 Ir.**

Short-circuit protection (Ii)
Instantaneous protection with non-adjustable pick-up **Ii=17 In**.

Phase unbalance or phase loss (Iunbal, tunbal)
This function opens the circuit breaker if a phase unbalance occurs:
- that is greater than the 30 % of Irms (fixed pick-up): **Iunbal**
- following the non-adjustable time delay (**tunbal**) equal to:
  - 0.7 s during starting
  - 4 s during normal operation.

Phase loss is an extreme case of phase unbalance and leads to tripping under the same conditions.

Ground-fault protection (Ig, tg)
Residual type ground-fault protection:
- fixed pick-up **Ig = In**
- fixed time delay **tg = 0.1 s.**

Indications

Front indications
- Green “Ready” LED: flashes slowly when the circuit breaker is ready to trip in the event of an abnormal deviation in engine operating conditions.
- Red alarm LED: goes ON when the thermal image of the motor is greater than 95 % of the permissible temperature rise.

Standards and certifications

IEC/EN 60947-1, IEC/EN 60947-2, IEC/EN 60947-4-1, UL 60497-4-1, CSA 22.2 n° 60497-4-1, CCC, EAC, CSA (cCSAus).

Ref.
Circuit breakers

Product references

Thermal magnetic motor circuit breakers from 0.25 to 55 kW

Standard power ratings of 3-phase motors - 50 / 60 Hz in category AC-3									Thermal setting range (Ir)	Reference with EverLink terminals	
400/415 V			500 V			690 V					
P	Icu	Ics (1)	P	Icu	Ics (1)	P	Icu	Ics (1)		with toggle	with rotary handle
kW	kA	%	kW	kA	%	kW	kA	%	A		
0.25... 0.75	25	100	**0.37... 1.1**	10	100	**0.55... 1.5**	-	-	0.8... 2	-	-
	50	100		25	100		8	25		**GV4PE02N**	**GV4P02N**
	100	100		30	100		10	25		**GV4PE02S**	-
0.55... 1.5	25	100	**0.75... 1.5**	10	100	**1.1... 2.2**	-	-	1.4... 3.5	-	-
	50	100		25	100		8	25		**GV4PE03N**	**GV4P03N**
	100	100		30	100		10	25		**GV4PE03S**	-
1.5... 3	25	100	**2.2... 4**	10	100	**3... 7.5**	-	-	2.9... 7	-	-
	50	100		25	100		8	25		**GV4PE07N**	**GV4P07N**
	100	100		30	100		10	25		**GV4PE07S**	-
3... 5.5	25	100	**3... 7.5**	10	100	**5.5... 11**	-	-	5... 12.5	-	-
	50	100		25	100		8	25		**GV4PE12N**	**GV4P12N**
	100	100		30	100		10	25		**GV4PE12S**	-
5.5... 11	25	100	**7.5... 15**	10	100	**7.5... 18.5**	-	-	10... 25	**GV4PE25B**	**GV4P25B**
	50	100		25	100		8	25		**GV4PE25N**	**GV4P25N**
	100	100		30	100		10	25		**GV4PE25S**	-
11... 22	25	100	**15... 30**	10	100	**18.5... 45**	-	-	20... 50	**GV4PE50B**	**GV4P50B**
	50	100		25	100		8	25		**GV4PE50N**	**GV4P50N**
	100	100		30	100		10	25		**GV4PE50S**	-
22... 37	25	100	**30... 55**	10	100	**37... 55**	-	-	40... 80	**GV4PE80B**	**GV4P80B**
	50	100		25	100		8	25		**GV4PE80N**	**GV4P80N**
	100	100		30	100		10	25		**GV4PE80S**	**GV4P80S**
37... 55	25	100	**45... 75**	10	100	**75... 90**	-	-	65... 115	**GV4PE115B**	**GV4P115B**
	50	100		25	100		8	25		**GV4PE115N**	**GV4P115N**
	100	100		30	100		10	25		**GV4PE115S**	**GV4P115S**

Thermal magnetic motor circuit breakers from 3/4 to 75 HP / 480 V

Single-Phase				3-Phase								Rating	Reference with EverLink terminals	
120 V		240 V		208 V		240 V		480 V		600 V				
Power	FLA	Power	FLA	Power	FLA	Power	FLA	Power	FLA	Power	FLA		with toggle	with rotary handle
HP	A	Hp	A	Hp	A	Hp	A	Hp	A	Hp	A	A		
-	-	**1/10**	1.5	-	-	-	-	**3/4**	1.6	**1**	1.7	2	-	-
													GV4PE02N	**GV4P02N**
													GV4PE02S	-
1/10	3	**1/4**	2.9	**1/2**	2.4	**3/4**	3.2	**2**	3.4	**2**	2.7	3.5	-	-
													GV4PE03N	**GV4P03N**
													GV4PE03S	-
1/4	5.8	**3/4**	6.9	**1-1/2**	6.6	**2**	6.8	**3**	4.8	**5**	6.1	7	-	-
													GV4PE07N	**GV4P07N**
													GV4PE07S	-
1/2	9.8	**1-1/2**	10	**3**	10.6	**3**	9.6	**7-1/2**	11	10	11	12.5	-	-
													GV4PE12N	**GV4P12N**
													GV4PE12S	-
1-1/2	20	**3**	17	**5**	16.7	**7-1/2**	22	**15**	21	**20**	22	25	**GV4PE25B**	**GV4P25B**
													GV4PE25N	**GV4P25N**
													GV4PE25S	-
3	34	**7-1/2**	40	**10**	30.8	**15**	42	**30**	40	**40**	41	50	**GV4PE50B**	**GV4P50B**
													GV4PE50N	**GV4P50N**
													GV4PE50S	-
7-1/2	80	**15**	68	**25**	74.8	**30**	80	**60**	77	**75**	77	80	**GV4PE80B**	**GV4P80B**
													GV4PE80N	**GV4P80N**
													GV4PE80S	**GV4P80S**
10	100	**20**	88	**30**	88	**40**	104	**75**	96	**100**	99	115	**GV4PE115B**	**GV4P115B**
													GV4PE115N	**GV4P115N**
													GV4PE115S	**GV4P115S**

Connection by lugs

To order circuit breakers with connection by lugs, add the digit **6** to the end of reference selected above. Example: **GV4PE02N** becomes **GV4PE02N6**.

(1) As % of Icu.

Characteristics: pages B6/112 to B6/115
Curves: pages B6/121 to B6/123
Dimensions, schemes: pages B6/126, B6/127, B6/129

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GV4PEM

Basic protection

Settings are made using dials.

Overloads or thermal protection (Ir)
Inverse-time thermal protection against overloads with adjustable pick-up Ir.
Wide range setting made in amperes.
The tripping curve for the thermal protection, which indicates the time delay tr before tripping, is defined by the selected trip class.

Trip class (class)
The class is selected as a function of the normal motor starting time.
■ Class 10: starting time less than 10 s.
■ Class 20: starting time less than 20 s.
For a given class, it is necessary to check that all motor-feeder components are sized to carry the 7.2 Ir starting current without excessive temperature rise during the time corresponding to the class.

Short-circuit protection (Ii)
Instantaneous protection with non-adjustable pick-up **Ii = 17 In**.

Advanced protection

Settings are made with an Android smartphone with dedicated application and using wireless NFC (Near Field Communication), or a computer with EcoStruxure Power Commission software and the configuration/maintenance tool kit (“Maintenance case” TRV00910).
The LV434206 pocket battery allows the GV4PEM controller to be powered for adjustments and tests when no internal source is available.

Short time delay protection (Isd)
Short time delay protection (around 100 ms) to let through motor starting currents, but to protect cables and motor starter devices and allow not to oversize them (particularly usefull for wide range settings circuit breakers).
Adjustable pick-up **Isd = 5...13 Ir** (13 by default).

Phase unbalance or phase loss (Iunbal, tunbal)
This function opens the circuit breaker if a phase unbalance occurs:
■ that is greater than the 10…40 % of Irms (30% by default): **Iunbal**
■ following a time delay (**tunbal**) equal to:
□ 0.7 s during starting (non adjustable)
□ 1…10 s during normal operation (4 s by default).
Phase loss is an extreme case of phase unbalance and leads to tripping under the same conditions.

Ground-fault protection (Ig, tg)
Residual type ground-fault protection, with OFF position:
■ adjustable pick-up **Ig**:
□ 0.7…1 In for products with nominal current from 2 to 50 A
□ 0.4…1 In for products with nominal current from 80 to 115 A
■ adjustable time delay **tg** 0.1...0.4 s.

Jam (Ijam, tjam)
This function detects locking of the motor shaft caused by the load, with OFF position (OFF by default). During motor starting the function is disabled.
During normal operation, it causes tripping:
■ above the **Ijam** pick-up that can be fine-adjusted from 1.5 to 8 Ir
■ in conjunction with the **tjam** time delay that can be adjusted from 1 to 30 s.

Long start (Ilong, tlong)
This protection supplements thermal protection (class). It is used to optimize the protection according to the starting parameters, with OFF position (OFF by default).
It detects abnormal motor starting i.e. when the starting current remains too high or too low with respect to a pick-up value and a time delay.
It causes tripping:
■ in relation with a **Ilong** pick-up that can be fine-adjusted from 1.5 to 8 Ir
■ in conjunction with the **tlong** time delay that can be adjusted from 1 to 200 s.

Indications

Front indications
■ Green "Ready" LED: flashes slowly when the circuit breaker is ready to trip in the event of an abnormal deviation in engine operating conditions.
■ Red alarm LED: goes ON when the thermal image of the motor is greater than 95 % of the permissible temperature rise.

Remote indications via SDx module
See description on page B6/44.

Standards and certifications
IEC/EN 60947-1, IEC/EN 60947-2, IEC/EN 60947-4-1, UL 60497-4-1, CSA 22.2 n° 60497-4-1, CCC, EAC, CSA (cCSAus).

Product references

Thermal magnetic motor circuit breakers from 0.25 to 55 kW

Standard power ratings of 3-phase motors - 50 / 60 Hz in category AC-3									Thermal setting range (Ir)	"Reference with EverLink terminals"
400/415 V			500 V			690 V				
P	Icu	Ics [1]	P	Icu	Ics [1]	P	Icu	Ics [1]		with toggle
kW	kA	%	kW	kA	%	kW	kA	%	A	
0.25... 0.75	25	100	**0.37... 1.1**	10	100	**0.55... 1.5**	-	-	0.8... 2	**-**
	50	100		25	100		8	25		**GV4PEM02N**
	100	100		30	100		10	25		**GV4PEM02S**
0.55... 1.5	25	100	**0.75... 1.5**	10	100	**1.1... 2.2**	-	-	1.4... 3.5	**-**
	50	100		25	100		8	25		**GV4PEM03N**
	100	100		30	100		10	25		**GV4PEM03S**
1.5... 3	25	100	**2.2... 4**	10	100	**3... 7.5**	-	-	2.9... 7	**-**
	50	100		25	100		8	25		**GV4PEM07N**
	100	100		30	100		10	25		**GV4PEM07S**
3... 5.5	25	100	**3... 7.5**	10	100	**5.5... 11**	-	-	5... 12.5	**-**
	50	100		25	100		8	25		**GV4PEM12N**
	100	100		30	100		10	25		**GV4PEM12S**
5.5... 11	25	100	**7.5... 15**	10	100	**7.5... 18.5**	-	-	10... 25	**GV4PEM25B**
	50	100		25	100		8	25		**GV4PEM25N**
	100	100		30	100		10	25		**GV4PEM25S**
11... 22	25	100	**15... 30**	10	100	**18.5... 45**	-	-	20... 50	**GV4PEM50B**
	50	100		25	100		8	25		**GV4PEM50N**
	100	100		30	100		10	25		**GV4PEM50S**
22... 37	25	100	**30... 55**	10	100	**37... 55**	-	-	40... 80	**GV4PEM80B**
	50	100		25	100		8	25		**GV4PEM80N**
	100	100		30	100		10	25		**GV4PEM80S**
37... 55	25	100	**45... 75**	10	100	**75... 90**	-	-	65... 115	**GV4PEM115B**
	50	100		25	100		8	25		**GV4PEM115N**
	100	100		30	100		10	25		**GV4PEM115S**

Connection by lugs

To order circuit breakers with connection by lugs, add the digit **6** to the end of reference selected above. Example: **GV4PE02N** becomes **GV4PE02N6**.

(1) As % of Icu.

Circuit breakers

Characteristics: pages B6/112 to B6/115
Curves: pages B6/121 to B6/123
Dimensions, schemes: pages B6/126, B6/127, B6/129

Introduction

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GV4PB

GV4PB is based on GV4PEM with specific tripping curve to follow UL489 SH supplement. It is designed with a large space connector in order to increase creepage and clearance distance.

Basic protection

Settings are made using dials.

Overloads or thermal protection (Ir)
Inverse-time thermal protection against overloads with adjustable pick-up Ir. Wide range setting made in amperes.
The tripping curve for the thermal protection, which indicates the time delay tr before tripping, is defined by the selected trip class.

Trip class (class)
The class is selected as a function of the normal motor starting time. It corresponds to the value of the tripping time delay for a current of 600 % of the rated tripping current according to UL489, SH supplement.
The rated tripping current is selected as 125 % of the dial value.
- Class 10: starting time less than 10 s.
- Class 20: starting time less than 20 s.

For a given class, it is necessary to check that all motor-feeder components are sized to withstand the 7.5 Ir starting current without excessive temperature rise during the time corresponding to the class.

Short-circuit protection (Ii)
Instantaneous protection with non-adjustable pick-up **Ii=17 In**.

Advanced protection (same as GV4PEM)

Settings are made with:
- Android smartphone using wireless NFC (Near Field Communication), or EcoStruxure Power Device App. computer + EcoStruxure Power Commission software and configuration/maintenance tool kit TRV00910
- LV434206 pocket battery, allows the GV4PB controller to be powered for adjustment and test. LV434206 pocket battery needs to be connected to the GV4PB controller to set the advanced protection.

Short time delay protection (Isd)
Short time delay protection (around 100 ms) to let through motor starting currents, but to protect cables and motor starter devices and allow not to oversize them (particularly usefull for wide range settings circuit breakers).
Adjustable pick-up **Isd = 5...13 Ir** (13 by default).

Phase unbalance or phase loss (Iunbal, tunbal)
This function opens the circuit breaker if a phase unbalance occurs:
- that is greater than the 10…40 % of Irms (30 % by default): **Iunbal**
- following a time delay **(tunbal)** equal to:
  - 0.7 s during starting (non adjustable)
  - 1…10 s during normal operation (4 s by default).

Phase loss is an extreme case of phase unbalance and leads to tripping under the same conditions.

Ground-fault protection (Ig, tg)
Residual type ground-fault protection, with OFF position:
- adjustable pick-up **Ig**:
  - 0.7…1 In for products with nominal current from 2 to 50 A
  - 0.4…1 In for products with nominal current from 80 to 115 A
- adjustable time delay **tg** 0.1...0.4 s.

Jam (Ijam, tjam)
This function detects locking of the motor shaft caused by the load, with OFF position (OFF by default). During motor starting the function is disabled.
During normal operation, it causes tripping:
- above the **Ijam** pick-up that can be fine-adjusted from 1.5 to 8 Ir
- in conjunction with the **tjam** time delay that can be adjusted from 1 to 30 s.

Long start (Ilong, tlong)
This protection supplements thermal protection (class). It is used to optimize the protection according to the starting parameters, with OFF position (OFF by default).
It detects abnormal motor starting i.e. when the starting current remains too high or too low with respect to a pick-up value and a time delay.
It causes tripping:
- in relation with a **Ilong** pick-up that can be fine-adjusted from 1.5 to 8 Ir
- in conjunction with the **tlong** time delay that can be adjusted from 1 to 200 s.

Indications

Front indications
- Green "Ready" LED: flashes slowly when the circuit breaker is ready to trip in the event of an abnormal deviation in engine operating conditions.
- Red alarm LED: goes ON when the thermal image of the motor is greater than 95 % of the permissible temperature rise

Remote indications via SDx module
See description on page B6/44.

Conforming to standards:
IEC/EN 60947-2, IEC/EN 60947-4-1

Product certifications:
UL 489, CSA C22.2 n°5.

Product references - UL applications

GV4PB - selection according to Short Circuit Current Rating (SCCR)

240 V AC SCCR kA	480Y/277 V AC SCCR kA	600Y/347 V AC SCCR kA	Reference
35	18	14	**GV4PB●●●B** (1)
65	35	18	**GV4PB●●●N**
100	65	25	**GV4PB●●●S**

*(1) Example: **GV4PB07S**, **GV4PB115S**.*

GV4PB thermal magnetic motor circuit breakers - selection according to FLA

3P 200 V FLA A	3P 230 V FLA A	3P 460 V FLA A	Rated %	Dial range A	Reference		
-	-	1.6	100	0.8 to 2		**GV4PB02N**	**GV4PB02S**
2.5	2.2	3	100	1.4 to 3.5		**GV4PB03N**	**GV4PB03S**
4.8	4.2	4.8	100	2.9 to 7		**GV4PB07N**	**GV4PB07S**
7.8	9.6	7.6	100	5 to 12.5		**GV4PB12N**	**GV4PB12S**
17.5	22	21	100	10 to 25	**GV4PB25B**	**GV4PB25N**	**GV4PB25S**
48	42	40	100	20 to 50	**GV4PB50B**	**GV4PB50N**	**GV4PB50S**
62	54	52	80	40 to 80	**GV4PB80B**	**GV4PB80N**	**GV4PB80S**
92	80	77	80	65 to 115	**GV4PB115B**	**GV4PB115N**	**GV4PB115S**

Connection by lugs

Please order GV4LUG accessory and LV426920 interphase barriers or L1D96590 terminal shield.

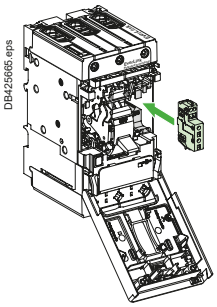
Characteristics:
pages B6/112 to B6/115

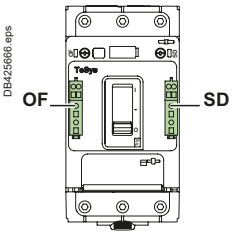
Curves:
pages B6/121 to B6/123

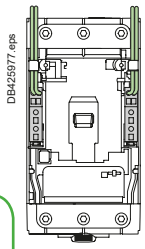
Dimensions, schemes:
pages B6/126, B6/127, B6/129

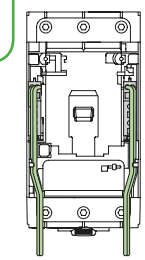


GV4AE11 auxiliary contact block

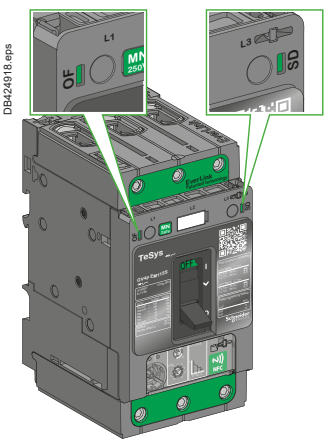








Pluggable auxiliary contact - OF or SD is dependent on cavity. Multiple internal wiring possibilities, even with long terminal shields



Visible presence of auxiliary contact block in OF or SD cavity

Auxiliary contact blocks

Auxiliary contacts give an indication of the circuit breaker status.
They can be used for remote visual signaling, alarming, electrical locking, relay activation, etc...
An auxiliary contact block provides one changeover contact with common point for OF or SD function, depending on the breaker cavity where it is inserted.

Auxiliary contact - Open/Close OF function

Indicates Open/Closed position of the circuit breaker contacts.

Auxiliary contact - Trip alarm SD function

- ■ Indicates that the circuit breaker has tripped due to:
  - □ Electrical fault (overload, short circuit, ...)
  - □ shunt trip
  - □ undervoltage release
  - □ "push-to-trip" button.
- ■ Resets when circuit breaker is reset.

Electrical characteristic

Characteristics						
Rated thermal current (A)		5				
Minimum load		2 mA at 17 V DC				
Utilization cat. (IEC 60947-5-1)		**AC12**	**AC15**	**DC12**	**DC13**	**DC14**
Operational current (A)	24 V AC/DC	5	5	5	2.5	1
	48 V AC/DC	5	5	2.5	1.2	0.2
	110...127 V AC / 110 V DC	5	4	0.6	0.35	0.05
	220/240 V AC	5	3	-	-	-
	250 V DC	-	-	0.3	0.05	0.03
	380/440 V AC	5	2.5	-	-	-
	660/690 V AC	5	0.11	-	-	-

Pilot duty B600 according UL508 and CSA 22.2 n°14.

Installation and connection

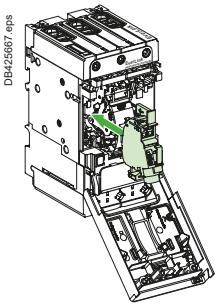
- ■ Auxiliary contact blocks snap into left (for OF function) and right (for SD function) cavities behind the front accessory cover of the circuit breaker and their presence is visible on the front face through green flags.
- ■ One model serves for all indication functions depending on where it is fitted in the circuit breaker.
- ■ Each NO and NC spring terminal may be connected by one 0.5...1.5 mm² flexible copper wire and by two for the common point.
- ■ Wires can be exited out of any of the four corners of the breaker under the accessory cover.

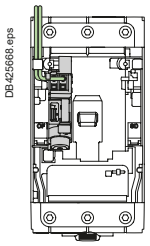
Description	Maximum number	Mounting	Type of contacts	Sold in lots of	Reference
Auxiliary contact block for OF or SD indication	2 (1 OF + 1 SD)	Internal plug-in	NO + NC	1	**GV4AE11**

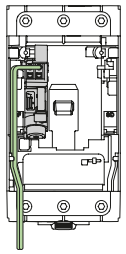
Characteristics: page B6/125
Schemes: page B6/129



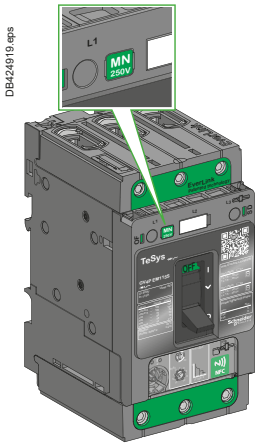
GV4AS137 shunt trip







MN or MX plugged into cavity. Multiple internal wiring possibilities, even with long terminal shields



Visible presence of MN undervoltage release in circuit breaker cavity, visible rated voltage through the window.

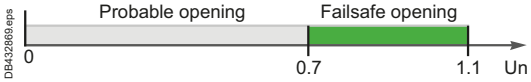
MX shunt trip, MN undervoltage release

MX and MN trip the circuit breaker on a control signal. They are mainly used for remote and emergency-off commands.

It is advised to test the system every six months.

MX shunt trip

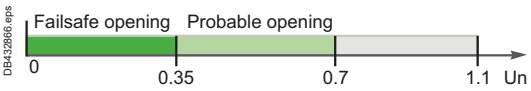
- Trips the circuit breaker when the control voltage rises above 70 % of its rated voltage (Un).
- Impulse type ⩾ 20 ms or maintained control signals.
- Shunt trip 110...130 V AC is suitable for ground-fault protection when combined with a Class I ground-fault sensing element.
- Continuous duty rated coil (1).



Opening conditions of the MX release.

MN undervoltage release

- Trips the circuit breaker when the control voltage drops below 35 % of its rated voltage.
- Between 35 % and 70 % of the rated voltage opening is only probable.
- Above 70 % of the rated voltage, opening does not take place.
- Continuous duty rated coil.
- Circuit breaker closing is possible only if the voltage exceeds 85 % of the rated voltage. If an undervoltage condition exists, operation of the closing mechanism of the circuit breaker will not permit the main contacts to touch, even momentarily. This is commonly called "Kiss Free".



Opening conditions of the MN release.



Closing conditions of the MN release.

Installation, connection

Accessories snap into cavities under the circuit breaker front accessory cover. Spring-type terminals in order to insure a fast and reliable connection to 0.5...1.5 mm² flexible copper wire (one per terminal).

Operation

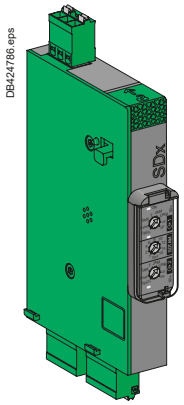
Circuit breaker must be locally reset after trip by shunt trip (MX) or undervoltage release (MN).Tripping by MX or MN has priority over manual closing; in the presence of a standing trip order such an action does not result in main contacts closing, even temporarily.

Description	Maximum number	Mounting	Voltage	Reference
MX Shunt trip	1	Internal, plug-in	24 V∿ 50/60 Hz, 24 V⎓	**GV4AS027**
			48 V∿ 50/60 Hz, 48 V⎓	**GV4AS057**
			110-130 V∿ 50/60 Hz 125 V⎓	**GV4AS137**
			220-240 V∿ 50 Hz, 208-240 V∿ 60 Hz, 277 V 60 Hz	**GV4AS287**
			380-415 V∿ 50 Hz, 440-480 V∿ 60 Hz	**GV4AS487**
MN undervoltage release	1	Internal, plug-in	24 V∿ 50/60 Hz, 24 V⎓	**GV4AU027**
			48 V∿ 50/60 Hz, 48 V⎓	**GV4AU057**
			110-130 V∿ 50/60 Hz 125 V⎓	**GV4AU137**
			220-240 V∿ 50 Hz, 208-240 V∿ 60 Hz	**GV4AU247**
			277 V∿ 60 hZ	**GV4AU286**
			380-415 V∿ 50 Hz	**GV4AU415**
			440-480 V∿ 60 Hz	**GV4AU486**

(1) Except for MX 24 V AC/DC (in case of continuous activation, may generate some minor perturbation in sensitive environment).

Characteristics:
page B6/124

Schemes:
page B6/129



GV4ADM1111 SDx contact module

SDx contact module for GV4PEM, GV4PB (Multifunction)

The SDx provides alarming and functional fault differentiation for GV4PEM, GV4PB (Multifunction) circuit breaker. This module has 2 NO/NC outputs dry contacts which can be assigned with one of the 8 following SD status:

- SD**T95%** overload alarm: thermal image of the motor is greater than 95 % of the permissible temperature rise.
- SD**Txxs** overload alarm: circuit breaker will trip in xx seconds with the same load. xx is adjustable between 10 to 40 seconds (default 20 seconds) on the circuit breaker itself through NFC or a computer with EcoStruxure Power Commission software and an interface module (TRV00911).
- SD**TAM** overload alarm just before tripping: in the event of a phase unbalance, overload, or on a jam fault, this output is activated to open the contactor and avoid circuit breaker tripping. In that case, contact can be manually or automatically reseted after an adjustable cooling time from 1 to 15 minutes. If after a 400 ms delay the motor is not stopped, the circuit breaker will trip.
- SD**T** overload trip indication: circuit breaker has tripped due to an overload fault
- SD**JAM** jam trip indication: circuit breaker has tripped due to a jam fault
- SD**UNB** phase unbalance trip indication: circuit breaker has tripped due to an unbalance fault
- SD**LS** long start trip indication: circuit breaker has tripped due to a long start fault
- SD**GF** ground-fault trip indication: circuit breaker has tripped due to a ground-fault.

Outputs are automatically resetted either when alarm disappears or when the circuit breaker is restarted.

Output characteristics

- 2 NO/NC dry contacts
- 24...250 V AC/DC
- Minimum load: 2 mA under 24 V DC
- Max load: 5 A
- AC15 (230 V max - 400 VA)
- DC13 (24 V - 50 W)

Power characteristics

- 24...240 V AC/DC

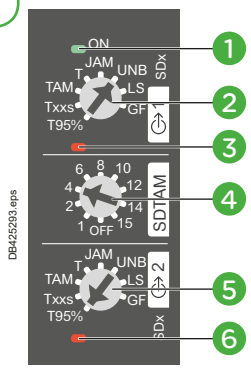
Contact rating (per UL/CSA B300 & R300)

Standard	Rated Voltage Ue	Operational Current Ie	Make	Break	Ithe
		A	VA	VA	A
B300	120 V AC	3	3600	360	5
	240 V AC	1.5			
R300	125 V DC	0.22	28	28	1
	250 V DC	0.1			

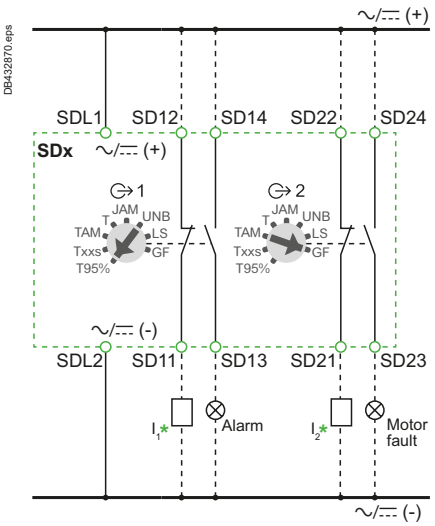
The rated operational current Ie (A), the rated operational voltage Ue (V) and the break apparent power B (V.A) are correlated by the formula B = Ue · Ie; with Ie ≤ Ith.

Installation, connection, settings and indication

The SDx module is clipped on the right side of the circuit breaker. Each removable spring terminal can be connected by one 0.5... 1.5 mm² copper wire. Settings and indications are available on the front face.

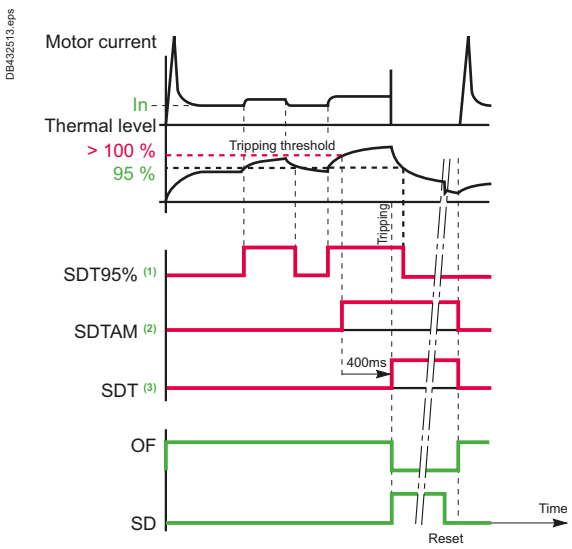


1. Green led lighted when the module is powered.
2. Output 1: SD status assignment.
3. Red led lighted when output 1 is activated.
4. Cooling time setting before automatic restart (OFF – 1…15 min).
5. Output 2: SD status assignment.
6. Red led lighted when output 2 is activated.



* I1, I2: PLC digital inputs - used as alarm inputs, as an example.

SDx wiring diagram



GV4PEM curves
SDx modules curves
Aux. contacts curves

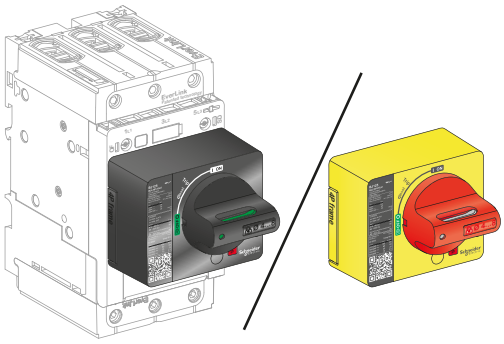
(1) SDT95% (= 95% overload)
(2) SDTAM (overload tripping pre alarm) here not connected to any contactor coil
(3) SDT (= tripping on thermal fault)

Description	Mounting	Maximum number	Type of contacts	Unit reference
SDx: alarming / fault differentiation module	Side	2	N/O / N/C	**GV4ADM1111**

Dimensions:
pages B6/128 and B6/129

Schemes:
page B6/129

DB424920.eps



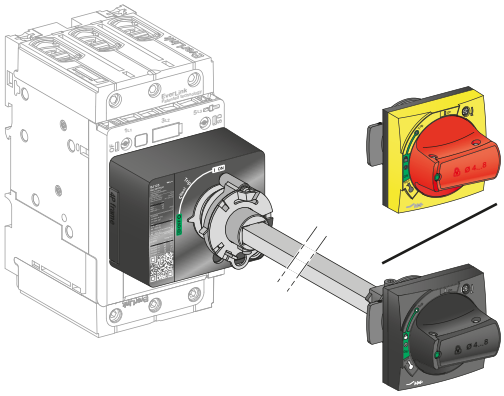
Direct mounting rotary handle

PB121325.eps



GV4ADN02 direct mounting rotary handle

DB424921.eps



Front extended rotary handle (door-mounting)

PB121326.eps



GV4APN01 front extended rotary handle kit

PB106297.eps



GVAPL01 laser tool

Direct mounting rotary handles

Installation
The direct mounting rotary handle has to be mounted by 3 screws on the front accessory cover.

Operation
The direct mounting rotary handle maintains:
- suitability for isolation
- indication of the three positions OFF (**O**), ON (**I**) and tripped (**Trip**)
- access to the "push-to-trip" button
- visibility and access to the trip unit.

Device padlocking
The circuit breaker may be locked in the OFF position by using one to three padlocks (not supplied) or in ON position after customer modification of the rotary handle before installation, padlock shackle Ø4-8 mm. Locking in the ON position does not prevent the circuit breaker from tripping if a circuit or motor malfunction occurs. In this case, the handle remains in the ON position after the circuit breaker trips. Unlocking is required for the handle to go to the tripped then the OFF position.

Variations: door locking
Door locking built-in functionality can be activated by the customer to prevent opening the door when the circuit breaker is ON or in trip position. For exceptional situations, door locking can be temporarily disabled with a tool by qualified personel to open the door when the circuit breaker is closed.

Description	Type	Degree of protection	Reference
Direct mounting rotary handle	Black handle	IP40	**GV4ADN01**
	Red handle on yellow bezel (VDE standard, for machine control)	IP40	**GV4ADN02**

Front extended rotary handles

Installation
The door-mounted (extended) rotary handle is made up of:
- a unit that has to be screwed on the front accessory cover of the circuit breaker
- an assembly (handle mechanism and front plate) on the door that is always secured in the same position, whether the circuit breaker is installed vertically or horizontally
- an adjustable extension shaft.

The handle mechanism is fixed with a nut (Ø22 mm) to make assembly easier. The Laser Square tool (GVAPL01) can be used to accurately align the hole on the door with the circuit breaker.

Operation when door is closed
The door mounted handle makes it possible to operate a circuit breaker installed in an enclosure from the front. The door mounted operating handle maintains:
- suitability for isolation
- indication of the three positions OFF (**O**), ON (**I**) and tripped (**Trip**)
- visibility and access to trip unit when the door is open
- degree of protection of the handle on the door: IP54 or IP65 as per IEC 60529.

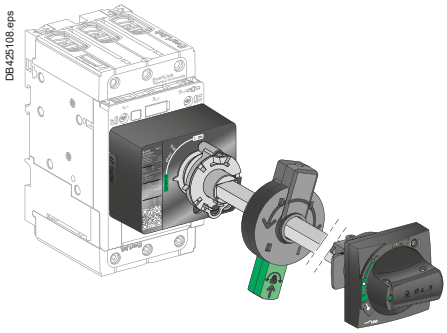
Mechanical door locking when device closed
A standard feature of the extended rotary handle is a locking function, built into the shaft, that disables door opening when the circuit breaker is in the ON or tripped positions.
Door locking can be temporarily disabled with a tool by qualified personnel to open the door without opening the circuit breaker. This operation is not possible if the handle is locked by a padlock.

Device and door padlocking
Padlocking locks the circuit breaker handle and disables door opening:
- standard situation, in the OFF position, using 1 to 3 padlocks, shackle Ø4-8 mm, padlocks are not supplied
- for the black handle, with a voluntary modification of the door handle (to be done by the customer during installation), in the ON and OFF positions. Locking in the ON position does not prevent the circuit breaker from tripping if a circuit or motor malfunction occurs. In this case, the handle remains in the ON position after the circuit breaker trips. Unlocking is required for the handle to go to the tripped then the OFF position.

Shaft length
The shaft length is the distance between the back of the circuit breaker and the door:
- minimum shaft length is 214 mm
- maximum shaft length is 627 mm
- shaft length must be adjusted.

Dimensions:
pages B6/126 to B6/128

Product references



Open door shaft operator mounted on front extended rotary handle assembly



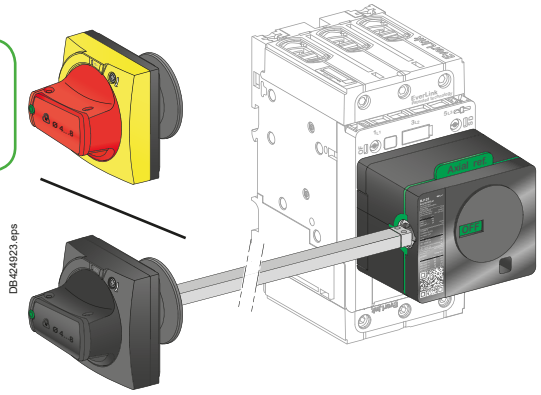
GV4APN01
Front extended rotary handle kit



LV426937
Open door shaft operator



GVAPL01 - Laser tool



Side extended rotary handle (cover mounting)



LV426936 - Side rotary handle kit



LV426998, LV426997 - Universal handles

Front extended rotary handles (cont.)

Operation when door is opened

An open door shaft operator can be used to operate the circuit breaker when door is opened. This accessory complies with UL508 A.
The indication of the three positions OFF (**O**), ON (**I**) and tripped (**Trip**) is visible on the circuit breaker.
The circuit breaker itself may be locked in OFF position when the door is opened by 1 padlock / lockout hasp, shackle Ø4-8 mm.

Description	Type	Degree of protection	Reference
Front extended rotary handle kit	Black handle	IP54	**GV4APN01**
	Red handle on yellow bezel	IP54	**GV4APN02**
		IP65	**GV4APN04**
Open door shaft operator			**LV426937**
Laser tool			**GVAPL01**
Spare part: GV4 universal handle (for replacement of front. ext. or side rotary handle)	Black handle	IP54	**LV426997**
	Red handle on yellow bezel	IP54	**LV426998**
		IP65	**LV426999**

Side rotary handles (left or right)

Installation

The side-mounted rotary handle is made up of:
- a unit that has to be screwed on the front accessory cover of the circuit breaker
- an assembly (handle and front plate) on the side (left or right) of the enclosure
- an adjustable extension shaft

The handle mechanism is fixed with a nut (Ø22 mm) to make assembly easier.

Operation

The side mounted rotary handle makes it possible to operate circuit breakers installed in enclosure from the side. The side mounted rotary handle maintains:
- suitability for isolation
- indication of the three positions OFF (**O**), ON (**I**) and tripped (**Trip**). Moreover, the position is visible on the circuit breaker itself
- visibility and access to trip unit when the door is open
- degree of protection of the handle on the side: IP54 or IP65 as per IEC 529.

Device padlocking

The circuit breaker may be locked in the OFF position, or, for the black rotary handle only, in ON position after voluntary modification of the side handle (to be done by the customer during installation), by using one to three padlocks, padlock shackle Ø4-8 mm ; padlocks are not supplied.
Locking in the ON position does not prevent free circuit breaker from tripping if a circuit or motor malfunction occurs. In this case, the handle remains in the ON position after the circuit breaker tripping. Unlocking is required to go to the tripped then the OFF position.

Shaft length

The shaft length is the distance between the side of the circuit breaker and the side of the enclosure:
- minimum shaft length is 45 mm
- maximum shaft length is 480 mm
- shaft length must be adjusted.

Description	Type	Degree of protection	Reference
Side rotary handle kit	Black handle	IP54	**LV426935**
	Red handle on yellow bezel (VDE standard, for machine control)	IP54 (1)	**LV426936**
Spare part: GV4 universal handle (for replacement of front. ext. or side rotary handle)	Black handle	IP54	**LV426997**
	Red handle on yellow bezel	IP54	**LV426998**
		IP65	**LV426999**

*(1) IP65 possible with **LV426935** kit (Black handle not used) + **LV426999** Red handle on yellow bezel universal handle.*

Dimensions:
page B6/128

Handle padlocking devices

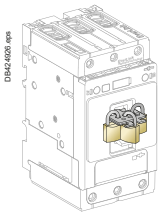
Padlocking systems can receive up to three padlocks with diameters of 5-8 mm (4-8 mm for rotary handles); padlocks not supplied. Locking in the OFF position guarantees isolation as per IEC 60947-2.

Direct rotary handle padlocking
By padlock – No accessory required.
- Lock in OFF position.
- Lock in ON position with simple mechanism modification.

Front Extended /Side rotary handle padlocking
By padlock – No accessory required.
- Lock in OFF position.
- Lock in ON position with simple mechanism modification (black handle only).

Door opening prevented.

Toggle handle padlocking
By padlock – removable toggle locking device required **29370**.
- Lock in OFF position.



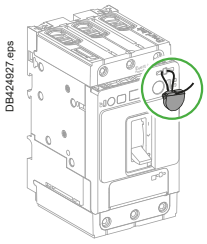
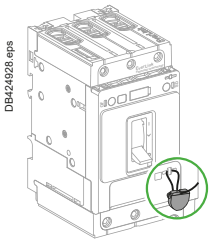
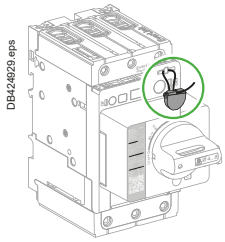
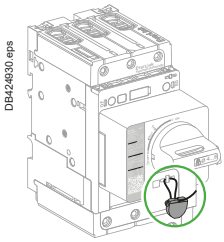
3 padlocks mounted on 29370 toggle locking device



29370 removable toggle locking device

Description	Reference
Removable toggle locking device for 1 to 3 padlocks	**29370**

Sealing devices

Control type	■ Front removal. ■ Access to auxiliaries.	■ Access to settings and test connector.
Toggle		
Rotary handle		

Description	Reference
Bag of 6 leads + 6 sealing accessories	**LV429375**



LV429375 leads + sealing accessories

Product references


PB121333.eps

LAD96595
EverLink connector

EverLink power connection

Description	Reference
EverLink connector	**LAD96595**


PB121334.eps

GV4LUG
crimped lug connector


PB121335.eps

LAD96590
transparent terminal shield

Crimp lug/busbar connection

Description		Sold in lots of	Reference
Crimped lug connector + screws		1	**GV4LUG**
Transparent terminal shield for crimped lug connector		1	**LAD96590**
Interphase barriers		6	**LV426920**
Spreader 3-pole	To increase the pitch to 35 mm	1	**LV426940**


PB121343.eps

LV426920
interphase barriers


PB121344.eps

LV426940
spreader 3-pole


PB121342.eps

LV426990
9 N.m green throwaway bits


PB121341.eps

LV426992
5 N.m yellow throwaway bits

Limited torque throwaway bits

Description	Sold in lots of	Reference
Green - 9 N.m	6	**LV426990**
Yellow - 5 N.m	6	**LV426992**

Note: *torque limiting breakaway bits may be used, particularly in the field, to tighten at the right torque EverLink™ or compression lug power connections.*


PB121336.eps

LV434206
pocket battery


PB121337.eps

TRV00910
maintenance case

Test tool, software, demo for GV4PEM

Test tool

Pocket battery Allows the GV4PEM or GV4PB controller to be powered for adjustments and tests when no internal source is available.	**LV434206**
Maintenance case Comprising: ■ USB maintenance interface ■ Power supply ■ GV4PEM cord ■ USB cord ■ RJ45/RJ45 male cord	**TRV00910**
Spare USB maintenance interface	**TRV00911**
USB interface spare power supply, 110-240 V AC, with 4 different socket adapters	**TRV00915**
Spare cord for connecting GV4PEM to USB maintenance interface	**TRV00917**


PB121338.eps

TRV00911
Spare USB maintenance interface


PB121340.eps

TRV00915
spare power supply 110-240 V AC


PB121339.eps

TRV00917
spare GV4PEM cord for USB maintenance interface

Software

Configuration and setting software EcoStruxure Power Commission	**Free download**

TeSys GV5/GV6

55 to 250 kW



Life Is On Schneider Electric

Product references

PB120638.eps



GV5P220F

Thermal-magnetic circuit breakers GV5P with screw clamp terminals up to 110 kW (1)

Control by direct rotary handle

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Thermal setting range (Ir)	Reference	Weight
400/415 V			500 V			660/690 V					
P	Icu	Ics (2)	P	Icu	Ics (2)	P	Icu	Ics (2)			
kW	kA	%	kW	kA	%	kW	kA	%	A		kg
55...75	36	100	**75...90**	30	100	**90... 110**	8	100	70…150	**GV5P150F**	2.4
	70	100		50	100		10	100		**GV5P150H**	
90...110	36	100	**110**	30	100	**110...132**	8	100	100…220	**GV5P220F**	2.6
	70	100		50	100		10	100		**GV5P220H**	

(1) Breakers have to be used with suitable rating of contactors, as defined in section A6.
(2) As % of Icu.

PB120633.eps



GV6P320F

Thermal-magnetic circuit breakers GV6P with screw clamp terminals up to 250 kW (1)

Control by direct rotary handle

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Thermal setting range (Ir)	Reference	Weight
400/415 V			500 V			660/690 V					
P	Icu	Ics (2)	P	Icu	Ics (2)	P	Icu	Ics (2)			
kW	kA	%	kW	kA	%	kW	kA	%	A		kg
132...160	36	100	**160...200**	25	100	**200...250**	10	100	160…320	**GV6P320F**	6.5
	70	100		50	100		10	100		**GV6P320H**	
200...250	36	100	**250...315**	25	100	**315...400**	10	100	250…500	**GV6P500F**	6.7
	70	100		50	100		10	100		**GV6P500H**	

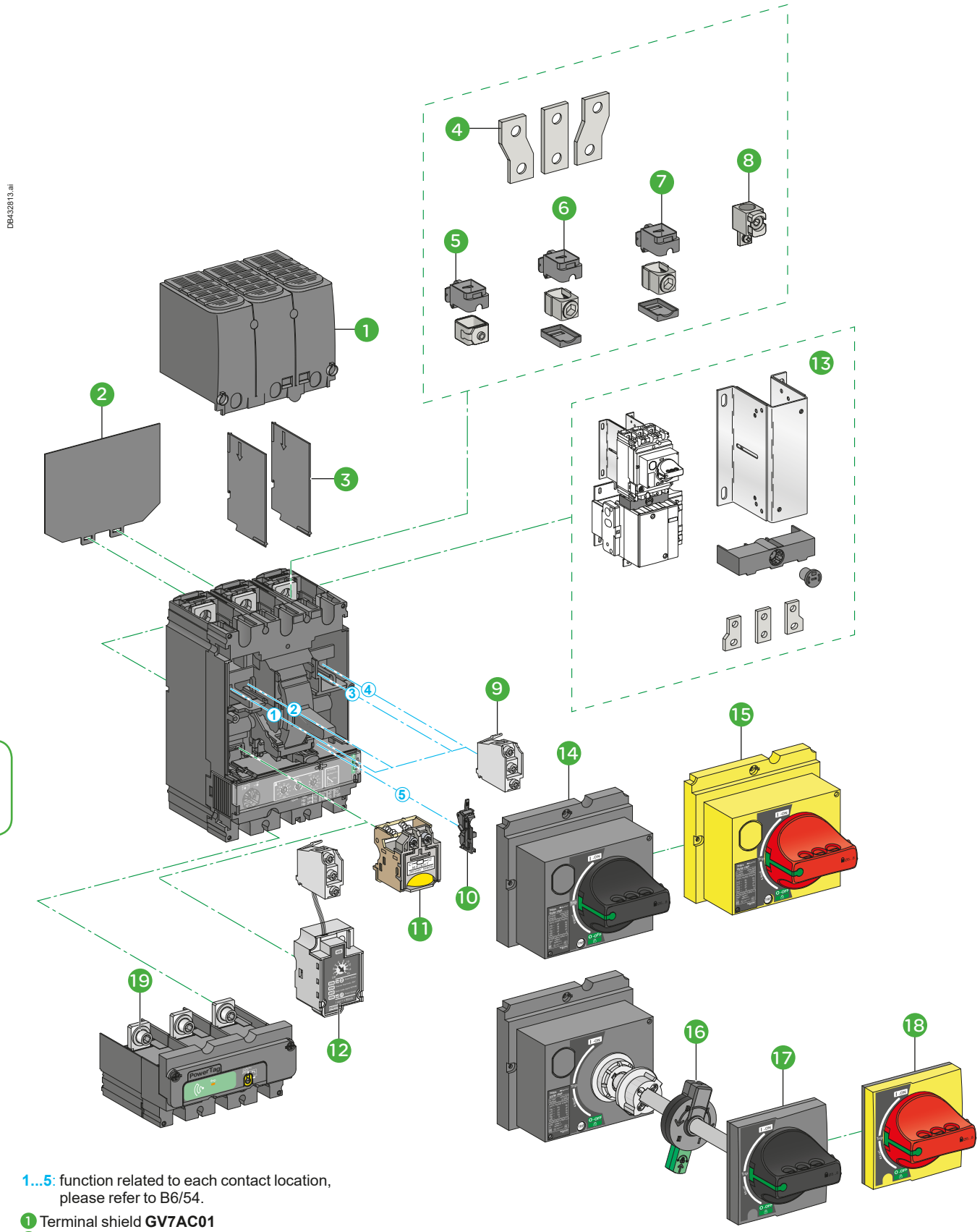
(1) Breakers have to be used with suitable rating of contactors, as defined in section A6.
(2) As % of Icu.

Thermal-magnetic circuit breakers GV5P/GV6P with screw clamp terminals (1)

Control by direct rotary handle

Thermal setting	3-Phase			Standard breaking capacity	High breaking capacity
	230 V	460 V	575 V		
A	HP	HP	HP	Reference	Reference
90…150	50	100	150	**GV5P150F**	**GV5P150H**
133…220	75	150	200	**GV5P220F**	**GV5P220H**
160…320	125	250	300	**GV6P320F**	**GV6P320H**
250…500	150	350	500	**GV6P500F**	**GV6P500H**

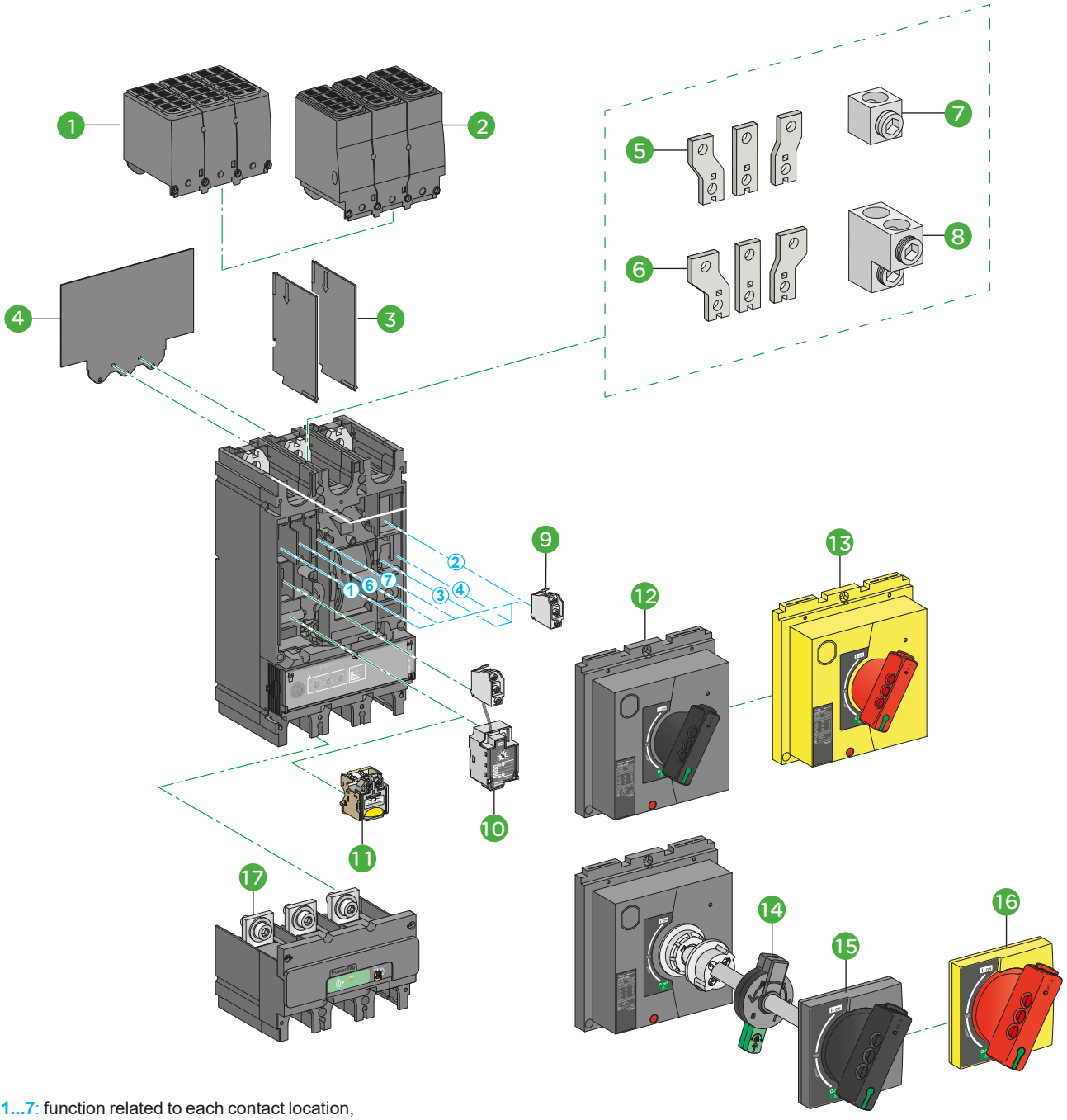
(1) Breakers have to be used with suitable rating of contactors, as defined in section A6.



1...5: function related to each contact location, please refer to B6/54.

1. Terminal shield **GV7AC01**
2. Insulating screen **GV7AC05**
3. Interphase barriers **GV7AC04**
4. Spreaders 45 mm **GV7AC03**
5. Steel connector **GV7AC021** (1.5-95 mm²)
6. Aluminum connector **LV429227** (25-95 mm²)
7. Aluminum connector **GV7AC022** (120-185 mm²)
8. Aluminum connector **LV429244** (120-240 mm²)
9. OF, SD, or SDE indication contacts **GV7AE11** (standard) / **GV7AB11** (for low level)
10. SDE adapter **LV429451**
11. AU (UVR) or AS (SHT) voltage release **GV7AU●●●/ GV7AS●●●**
12. SDTAM thermal fault module **LV429424**
13. Combination kit for contactor **GV7AC06/GV7AC07/GV7AC08**
14. Direct rotary handle black **GV5AP03** (shipped with the device)
15. Direct rotary handle red on yellow bezel **GV7AP04**
16. Open door shaft operator **LV426937**
17. Extended rotary handle black **GV7AP01**
18. Extended rotary handle red on yellow bezel **GV7AP02**
19. PowerTag M250 wireless energy sensor **LV434020**

DB432814.ai



1...7: function related to each contact location, please refer to B6/54.

1. Terminal shield 45 mm **LV432593**
2. Terminal shield 52.5 mm **LV432595**
3. Interphase barriers **LV432570**
4. Insulating screen **LV432578**
5. Spreader 52.5 mm **LV432490**
6. Spreader 70 mm **LV432492**
7. Aluminum connector **LV432479** (1 x 35-300 mm²)
8. Aluminum connector **LV432481** (2 x 35-300 mm²)
9. OF, SD, or SDE indication contacts **GV7AE11** (standard) / **GV7AB11** (for low level)
10. SDTAM thermal fault module **LV429424**
11. AU (UVR) or AS (SHT) voltage releases **GV7AU●●●/ GV7AUS●●●**
12. Direct rotary handle black **GV6AP03** (shipped with the device)
13. Direct rotary handle red on yellow bezel **LV432599**
14. Open door shaft operator **LV426937**
15. Extended rotary handle black **LV432598**
16. Extended rotary handle red on yellow bezel **LV432600**
17. PowerTag M630 wireless energy sensor **LV434022**

Add-on auxiliary contacts - OF contacts

These allow remote indication of the circuit breaker contact states. They can be used for signalling, electrical locking, relaying, etc. They are available in two versions: standard and low level. They include a terminal block and the auxiliary circuits leave the circuit breaker through a hole provided for this purpose.
They perform the following functions, depending on where they are located in the circuit breaker:

Location	Function	Application
1 and/or 4 (GV5) 1 and/or 4, 6, 7 (GV6)	C/O contact	Indicates the position of the circuit breaker poles.
2	Trip indication	Indicates that the circuit breaker has tripped due to an overload, a short-circuit, a differential fault or the operation of a voltage trip (undervoltage or shunt trip), or of the "push to trip" test button. It resets when the circuit breaker is reset.
3	Electrical fault indication	Indicates that the circuit breaker has tripped due to an overload, a short-circuit or a differential fault. It resets when the circuit breaker is reset.
5	Adapter for electrical fault indication	This accessory is mandatory for GV5 to provide electrical fault indication.

Type	Reference
Standard	**GV7AE11**
Low level	**GV7AB11**
Adapter for electrical fault indication	**LV429451**

Thermal fault module - SDTAM

GV5/ GV6 can be equipped with thermal fault module. This module have:
■ a contact to indicate overload fault in the circuit-breaker
■ a contact to open the contactor. In the event of overload or phase unbalance, this output is activated 400 ms before circuit-breaker tripping to open the contactor and avoid circuit breaker tripping.

Voltage	Reference
24...415 V AC/DC	**LV429424** (1)

Electric trips

These allow the circuit breaker to be tripped via an electrical control signal.
■ Undervoltage release (UVR) - GV7AU
■ Trips the circuit breaker when the control voltage drops below 35 % of its rated voltage.
■ Between 35 % and 70 % of the rated voltage opening is possible but not guaranteed.
■ Above 70 % of the rated voltage, opening does not take place.
■ Continuous duty rated coil.
■ Circuit breaker closing is possible only if the voltage exceeds 85 % of the rated voltage.
■ Shunt trip (SHT) - GV7AS
Trips the circuit breaker when the control voltage rises above 0.7 times the rated voltage.
■ Impulse type ⩾ 20 ms or maintained control signals.
■ Operation (GV7AU or GV7AS)
□ When the circuit breaker has been tripped by a GV7 AU or AS, it must be reset either locally.
□ Tripping has priority over manual closing: if a tripping order is present, manual action does not result in closing, even temporarily, of the contacts.
□ Durability: 50 % of the mechanical durability of the circuit breaker.

Type	Voltage	Reference
Undervoltage trip	48 V, 50/60 Hz	**GV7AU055**
	110…130 V, 50/60 Hz	**GV7AU107**
	200…240 V, 50/60 Hz	**GV7AU207**
	380…440 V, 50/60 Hz	**GV7AU387**
Shunt trip	48 V, 50/60 Hz	**GV7AS055**
	110…130 V, 50/60 Hz	**GV7AS107**
	200…240 V, 50/60 Hz	**GV7AS207**
	380…440 V, 50/60 Hz	**GV7AS387**

(1) ***LV429429*** *takes the place of the AU/AS electric trip coil and an auxiliary contact (C/O contact 1).*

Characteristics:
pages B6/136 and B6/137
Schemes:
page B6/144



LV432479



LV432490



LV432593



GV7AC04



GV6AP03



LV432599



GV7AP02

Cabling accessories

Cable connectors: The connectors for GV5 snap directly on to the device terminals or are secured by clips to right-angle and straight terminal extensions as well as spreaders. GV6 connectors are screwed directly to the device terminals.

Spreaders: Spreaders may be used to increase the pitch from 35 mm to 45 mm for GV5. The 45 mm pitch can be increased to 52.5 or 70 mm for GV6.

Long terminal shields: They are used for front connection with cables or insulated bars. They comprise two parts assembled with captive screws, forming an IP40 cover. The top part is equipped with sliding grids with break marks for precise adaptation to cables or insulated bars. The rear part completely blocks off the connection zone. Partially cut squares can be removed to adapt to all types of connection for cables with lugs or copper bars. Long terminal shields may be mounted upstream and downstream of the breaker.

Phase barriers: These interphase barriers are used for maximum insulation at the power-connection points.

Insulating screens: These are fited at the rear of the device which provides insuation. Their use is mandatory for devices with spreaders, installed on backplates, when terminal shields are not used.

GV5 Combination kits: These kits allow link between the circuit breaker and the contactor. The cover provides protection against direct finger contact. The kit comprises links, a protective shield and a depth adjustable metal bracket for the breaker.

Description	Application	Sold in lots of	Unit reference GV5	Unit reference GV6
Steel connectors (set of 3)	1.5…95 mm² ≤ 150 A	1	**GV7AC021**	**–**
Aluminium connectors (set of 3)	25…95 mm² ≤ 220 A	1	**LV429227**	
	120…185 mm² ≤ 220 A	1	**GV7AC022**	
	120…240 mm² ≤ 220 A	1	**LV429244**	
	35...300 mm²	1		**LV432479**
	2 x 35...300 mm²	1		**LV432481**
Spreader 3-pole (1)	35…45 mm pole pitch	1	**GV7AC03**	
	52.5 mm pole pitch	1		**LV432490**
	70 mm pole pitch	1		**LV432492**
Long terminal shield (IP40) (1)	35 mm pole pitch	1	**GV7AC01**	
	45 mm pole pitch	1		**LV432593**
	52.5 mm pole pitch	1		**LV432595**
Phase barriers (set of 6)		1	**GV7AC04**	**LV432570**
Insulating screens (set of 2)	45 mm	1	**GV7AC05**	
	70 mm			**LV432578**
Combination Kits (2)				
For contactor LC1 F115…F185	Connection kits between breaker and contactor	1	**GV7AC06**	
For contactor LC1 F225 and F265		1	**GV7AC07**	
For contactor LC1 D115 and D150		1	**GV7AC08**	

Direct rotary handle

The circuit breaker is always supplied direct rotary handle (black handle, black plate) as standard and it provides IP40 protection. The other type handles can be used by replacing this direct rotary handle. It includes a device for locking the circuit breaker in the O (Off) position by means of up to 3 padlocks with a shackle diameter of 5 to 8 mm (padlocks not included). A MCC conversion accessory allows the direct rotary handle to be mounted on the enclosure door. In this case, the door cannot be opened if the circuit breaker is in the “ON” position. Circuit breaker closing is inhibited if the enclosure door is open and prevents the device from being closed if the door is open.

Description	Type	Sold in lots of	Unit reference GV5	Unit reference GV6
Direct rotary handle	Black handle, black legend plate	1	**GV5AP03**	**GV6AP03**
	Red handle, yellow legend plate	1	**GV7AP04**	**LV432599**
MCC conversion accessory	Four mounting direct rotary handle on enclosure door	1	**GV7AP05**	**LV432606**

Extended rotary handle

Allows to operate a circuit breaker from the front of the switch board, which's installed in the back of an enclosure, which provides IP55 protection. It comprises:

- a unit which is screwed onto the front accessory cover of the circuit breaker,
- an assembly (handle mechanism and front plate) to be fitted on the enclosure door,
- an extension shaft which must be adjusted.
- The distance minimum and maximum distances between the mounting surface and the door are
  - 185...600 mm for GV5
  - 209...600 mm for GV6

It includes a device for locking the circuit breaker in the O (Off) position by means of up to 3 padlocks with a shackle diameter of 5 to 8 mm (padlocks not included) and disables opening enclosure door.

Description	Type	Sold in lots of	Unit reference GV5	Unit reference GV6
Extended rotary handle	Black handle, black legend plate	1	**GV7AP01**	**LV432598**
	Red handle, yellow legend plate	1	**GV7AP02**	**LV432600**

(1) Terminal shields cannot be used together with spreaders.
(2) The kit comprises links, a protective shield and a depth adjustable metal bracket for the breaker.

Dimensions:
page B6/141

Front extended rotary handles (cont.)

Operation when door is opened
An open door shaft operator can be used to operate the circuit breaker when door is opened. This accessory complies with UL508 A.
The indication of the three positions OFF (**O**), ON (**I**) and tripped (**Trip**) is visible on the circuit breaker.
The circuit breaker itself may be locked in OFF position when the door is opened by 1 padlock / lockout hasp, shackle Ø4-8 mm.

PB121328.eps



LV426937
Open door shaft operator

Description	Reference
Open door shaft operator	**LV426937**
Laser tool	**GVAPL01**

PB106297.eps



GVAPL01 Laser tool

Other accessories

Bag of 6 tamper seals + 6 cover caps (1 large, 5 small) for screw heads	**LV429375**

PB120637.eps



LVA429375
Sealing accessories

PowerTag Measurement module

Wireless-communication module
PowerTag is directly mounted on the bottom side of the circuit breaker.
It provides capability to measure energy, monitor voltage loss, and trigger alarms.
It then delivers useful data to a concentrator for monitoring and diagnosis of the associated circuit breaker.
In addition to monitoring and alarming, PowerTag solution provides a complete knowledge of real time electrical values with a rich and accurate data transfer every 5 seconds.
PowerTag energy sensors can be quickly and easily installed in new or existing panels at any time. Compared to traditional metering solutions, installation time and commissioning are much shorter with no wiring, hence an error proof high density solution and a built-in class 1 accuracy.

PB121345.eps



LV434020, LV434022

Functions
PowerTag energy sensor measures the following values in accordance with the IEC 61557-12 standard:
- ■ Energy (4 quadrants):
  - □ Active energy (Wh): total and partial, delivered and received
  - □ Active energy per phase (Wh): total
  - □ Reactive energy (VARh): partial, delivered and received
- ■ Power:
  - □ Active power (W): total and per phase
  - □ Reactive power (VAR): total
  - □ Apparent power (VA): total
- ■ Voltages (V): phase-to-phase (U12, U23, U31) and phase-to-neutral (V1N, V2N, V3N)
- ■ Currents (A): per phase (I1, I2, I3)
- ■ Frequency
- ■ Power factor
- ■ Voltage loss alarm:
  - □ PowerTag energy sensor sends a "voltage loss" alarm and the current-per-phase value before being de-energized
  - □ At "voltage loss", PowerTag adds an overload alarm if the current is higher than the rated current of the associated protective device.

Note: *functions listed above depend on concentrators/gateways.*

Description	Reference
PowerTag M250 3P: suitable for GV5 up to 220 A	**LV434020**
PowerTag M630 3P: suitable for GV6 up to 500 A	**LV434022**

Circuit breakers

Dimensions:
page B6/142

TeSys GB2

0.5 to 20 A

(for equipment and control circuits)



PB110899_20.eps



GB2CB

PB110901_20.eps



GB2CD

PB110902_20.eps



GB2DB

PB110900_20.eps



GB2CS

Introduction

GB2 thermal-magnetic circuit breakers protect and isolate the control circuits of industrial equipment with contactor coils, transformers….
They protect and isolate single-phase auxiliary circuits such as solenoid valves, electro-brakes, battery chargers, supplied from the control circuit voltage.

GB2CB, GB2CD, GB2DB

12 ratings are available, from 0.5 to 20 A, in single-pole (GB2CB), single-pole + neutral (GB2CD) and 2-pole (GB2DB) versions.
They have a magnetic tripping threshold set at between 12 and 16 In to withstand the current peaks generated by many industrial components.

GB2CS

2 ratings are available, 0.5 and 1 A, in single-pole version.
The magnetic tripping threshold is set between 5 and 7 In.

Functions, installation

Clip-on fixing onto all types of 35 mm ⊥ rails, on ⊔ rails and on Telequick mounting plates.
Upstream and downstream marking by means of AB1 clip-in markers.
Clear indication of “I” and “O” positions on the operator.
Tamper-proof device which requires no special maintenance (fixed magnetic and thermal tripping thresholds).

Selection for the protection of circuits supplied by transformers

Single-phase transformers.
Magnetising peak: 20 In.
Operation of magnetic trips: 13 In.

Power	Primary (1)		Secondary			
VA	220/240 V	380/415 V	24 V	48 V	110 V	220 V
40	GB2DB05	GB2DB05	GB2CD07	GB2CD06	GB2CD05	GB2CD05
63	GB2DB05	GB2DB05	GB2CD08	GB2CD07	GB2CD06	GB2CD05
100	GB2DB06	GB2DB05	GB2CD10	GB2CD07	GB2CD06	GB2CD05
160	GB2DB07	GB2DB06	GB2CD14	GB2CD09	GB2CD07	GB2CD06
250	GB2DB07	GB2DB06	GB2CD16	GB2CD12	GB2CD08	GB2CD07
400	GB2DB08	GB2DB07	GB2CD22	GB2CD14	GB2CD09	GB2CD07
630	GB2DB10	GB2DB08	–	GB2CD21	GB2CD12	GB2CD08
1000	GB2DB14	GB2DB09	–	–	GB2CD16	GB2CD10
1600	GB2DB20	GB2DB14	–	–	–	GB2CD14
2000	GB2DB21	GB2DB14	–	–	GB2CD22	GB2CD16
2500	GB2DB22	GB2DB20	–	–	–	GB2CD20
3000	GB2DB22	GB2DB20	–	–	–	GB2CD21
4000	–	GB2DB21	–	–	–	GB2CD22
5000	–	GB2DB22	–	–	–	–

*(1) If the breaking capacity of the **GB2** is insufficient, use a **GV2RT** with 2 poles connected in series.*

Product references

PB110899_20.eps



GB2CB●●

Circuit breakers with magnetic tripping threshold: 12 to 16 In

Single-pole

Conventional rated thermal current Ith (1)	Magnetic tripping current Id ± 20 %	Sold in lots of	Unit reference
A	A		
0.5	6.6	6	**GB2CB05**
1	14	6	**GB2CB06**
2	26	6	**GB2CB07**
3	40	6	**GB2CB08**
4	52	6	**GB2CB09**
5	66	6	**GB2CB10**
6	83	6	**GB2CB12**
8	108	6	**GB2CB14**
10	138	6	**GB2CB16**
12	165	6	**GB2CB20**
16	220	6	**GB2CB21**
20	270	6	**GB2CB22**

PB110901_20.eps



GB2CD●●

Single-pole + neutral

Conventional rated thermal current Ith (1)	Magnetic tripping current Id ± 20 %	Sold in lots of	Unit reference
A	A		
0.5	6.6	6	**GB2CD05**
1	14	6	**GB2CD06**
2	26	6	**GB2CD07**
3	40	6	**GB2CD08**
4	52	6	**GB2CD09**
5	66	6	**GB2CD10**
6	83	6	**GB2CD12**
8	108	6	**GB2CD14**
10	138	6	**GB2CD16**
12	165	6	**GB2CD20**
16	220	6	**GB2CD21**
20	270	6	**GB2CD22**

PB110902_20.eps



GB2DB●●

2-pole

Conventional rated thermal current Ith (1)	Magnetic tripping current Id ± 20 %	Sold in lots of	Unit reference
A	A		
0.5	6.6	3	**GB2DB05**
1	14	3	**GB2DB06**
2	26	3	**GB2DB07**
3	40	3	**GB2DB08**
4	50	3	**GB2DB09**
5	66	3	**GB2DB10**
6	83	3	**GB2DB12**
8	108	3	**GB2DB14**
10	138	3	**GB2DB16**
12	165	3	**GB2DB20**
16	220	3	**GB2DB21**
20	270	3	**GB2DB22**

(1) Conforming to IEC 60947-1.

Characteristics:
pages B6/146 to B6/148

Dimensions, schemes:
page B6/149

Product references

Circuit breakers with magnetic tripping threshold: 5 to 7 In

PB110900_20.eps



GB2CS●●

Single-pole

Conventional rated thermal current Ith (1)	Magnetic tripping current Id ± 20 %	Sold in lots of	Unit reference
A	A		
0.5	3.3	6	**GB2CS05**
1	6	6	**GB2CS06**

(1) Conforming to IEC 60947-1.

Accessories for circuit breakers GB2-CB, DB and CS

PB121347.eps



GB2G210

Description	Sold in lots of	Unit reference
Busbar set for supply to 10 GB2 DB or 20 GB2CB or GB2CS with 2 connectors	1	**GB2G210**
Supply connector	10	**GB2G01**

PB121348.eps



GB2G01

Characteristics:
pages B6/146 to B6/148

Dimensions, schemes:
page B6/149

TeSys GV, GB

Technical Data for Designers

Contents

TeSys GV2:
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> curves ..... B6/69 to B6/78
> characteristics - accessories ..... B6/79 to B6/81
> dimensions, schemes ..... B6/82 to B6/91

TeSys GV3:
> characteristics ..... B6/94 to B6/97
> curves ..... B6/98 to B6/103
> characteristics - accessories ..... B6/104 to B6/106
> dimensions, schemes ..... B6/107 to B6/109

TeSys GV4:
> characteristics ..... B6/112 to B6/115
> curves ..... B6/116 to B6/123
> characteristics - accessories ..... B6/124 to B6/125
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TeSys GV5/GV6:
> characteristics B6/132
> curves ..... B6/133 to B6/135
> characteristics - accessories ..... B6/136 to B6/137
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TeSys GB2:
> characteristics ..... B6/146 to B6/148
> dimensions, schemes B6/149

TeSys GV2

0.06 to 15 kW



Characteristics

Environment

Circuit breaker type				GV2L	GV2LE	GV2ME	GV2P	GV2RT
Conforming to standards				IEC/EN 60947-4-1, IEC/EN 60947-2				
				CSA C22.2 n°60947-4-1 (1)				
Product certifications				CCC, EAC, BV, LROS, DNV-GL, RINA, UL (1)	CCC, EAC, BV, RINA, UL (1)	CCC, UL, CSA, EAC, ATEX, BV, LROS, DNV-GL, RINA	CCC, UL, CSA, EAC, ATEX, BV, LROS, DNV-GL, RINA	CCC, UL, CSA, EAC, BV, LROS
Climatic withstand				According to IACS E10				
Degree of protection (front face)	Conforming to IEC 60529	Open mounted		Against direct finger contact: IP20				
		In enclosure		IP65 with GV2PC01 GV2PC02 enclosure	-	IP41 with GV2M●01 IP55 with GV2M●02 enclosure	IP 65 with GV2PC01 GV2PC02 enclosure	-
Shock resistance	Conforming to IEC 60068-2-27			30 gn - 11 ms				
Vibration resistance	Conforming to IEC 60068-2-6			5 gn (5 to 150 Hz)				
Ambient air temperature	Storage		°C	-40…+80				
	Operation	Open mounted	°C	-20…+60				
		In enclosure	°C	-20…+40				
Temperature compensation		Open mounted	°C	-20…+60				
		In enclosure	°C	-20…+40				
Flame resistance	Conforming to IEC 60695-2-11		°C	960				
Maximum operating altitude			m	2000				
Suitable for isolation	Conforming to IEC 60947-1 § 7-1-6			Yes				
Resistance to mechanical impact			J	0.5				
				IK04				
Sensitivy to phase failure				Yes, conforming to IEC 60947-4-1 § 8-2-1-5-2 for GV2ME & GV2P				

Technical characteristics

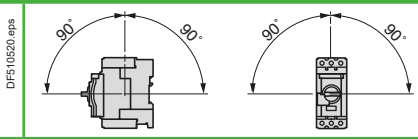
Circuit breaker type			GV2L	GV2LE	GV2ME	GV2P	GV2RT
Utilisation category	Conforming to IEC 60947-2		A				
	Conforming to IEC 60947-4-1		AC-3				
Rated operational voltage (Ue)	Conforming to IEC 60947-2	V	690				
Rated insulation voltage (Ui)	Conforming to IEC 60947-2	V	690				
Rated voltage	Conforming to UL 60947-4-1	V	-	-	600	600	600
	CSA C 22.2 n° 60947-4-1		480	480	600	600	600
Rated operational frequency	Conforming to IEC 60947-4-1 UL, CSA	Hz	50/60				
Rated impulse withstand voltage (U imp)	Conforming to IEC 60947-2	kV	6				
Total power dissipated per pole		W	1.8		2.5		
Mechanical durability (C.O.: Closing, Opening)		C.O.	100 000				
Electrical durability for AC-3/415V duty (C.O.: Closing, Opening)	415 V In	C.O.	100 000				
Duty class (maximum operating rate)		C.O./h	40		25		
Maximum conventional rated thermal current (Ith)	Conforming to IEC 60947-4-1	A	0.4...32	0.4...32	0.16...32	0.16...32	0.40...23
Rated duty	Conforming to IEC 60947-4-1		Continuous duty				

*(1) **GV2L03** to **GV2L22**, **GV2LE03** to **GV2LE22**.*
*(2) UL 60947-4-1 type E for **GV2P●●** (except 32 A).*

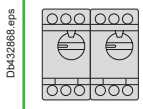
References: pages B6/11 to B6/18
Curves: pages B6/69 to B6/78
Dimensions: pages B6/82 to B6/91

Mounting characteristics

Operating position
Without derating, in relation to normal vertical mounting plane (1)



Products side by side



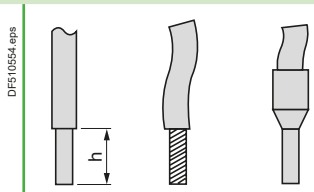
When several products **GV2ME●●**, **GV2P●●**, **GV2RT●●** are mounted side by side, the thermal trip setting Ir maybe need to be adjusted up to 1.1xIn.

Do not exceed the maximum thermal setting Ir.
E.g: **GV2ME14**, thermal setting range: 6...10, do not adjust Ir above 10 A.

Connection characteristics

Connection to screw clamp terminals or spring terminals

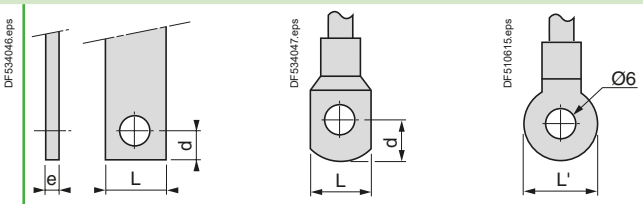
Bare cables



Circuit breaker type			GV2L		GV2LE		GV2ME		GV2P		GV2RT	
			Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Connection to screw clamp terminals (Max. number of conductors x c.s.a.)	Solid cable	mm²	2 x 1	2 x 6	2 x 1	2 x 6	2 x 1	2 x 6	2 x 1	2 x 6	2 x 1	2 x 6
	Flexible cable without cable end	mm²	2 x 1.5	2 x 6	2 x 1.5	2 x 6	2 x 1.5	2 x 6	2 x 1.5	2 x 6	2 x 1.5	2 x 6
	Flexible cable with cable end	mm²	2 x 1	2 x 4	2 x 1	2 x 4	2 x 1	2 x 4	2 x 1	2 x 4	2 x 1	2 x 4
Tightening torque		N.m	1.7									
Connection to spring terminals Number of conductors x c.s.a.	Solid cable	mm²	–	–	–	–	2 x 1 (2)	2 x 6	–	–	–	–
	Flexible cable without cable end	mm²	–	–	–	–	2 x 1.5 (2)	2 x 4	–	–	–	–

Connection by bars or lugs

Bars or lugs



Circuit breaker type			GV2ME●●6
Pitch	Without spreaders	mm	13.5
	With spreaders	mm	–
Bars or cables with lugs	e	mm	≤ 6
	L	mm	≤ 9.5
	L'	mm	≤ 9.5
	d	mm	≤ 10
Screws			M4
	Tightening torque	N.m	1.7
Bare cables (copper or aluminium) with connectors	Height (h)	mm	–
	C.s.a.	mm²	–
	Tightening torque	N.m	–

(1) When mounting on a vertical rail, fit a stop to prevent any slippage.
*(2) For cross-sections 1 to 1.5 mm², the use of an **LA9D99** cable end reducer is recommended.*

References:
pages B6/11 to B6/18
Curves:
pages B6/69 to B6/78
Dimensions:
pages B6/82 to B6/91

Characteristics

Breaking capacity of GV2L and GV2LE

Circuit breaker type				GV2LE									GV2L								
				03 to 06	07	08	10	14	16	20	22	32	03 to 05	06 & 07	08	10	14	16	20	22	32
Rating			A	0.4 to 1.6	2.5	4	6.3	10	14	18	25	32	0.4 to 1	1.6 to 2.5	4	6.3	10	14	18	25	32
Breaking capacity conforming to IEC 60947-2	230/240 V	Icu	kA	★	★	★	★	★	★	★	50	50	★	★	★	★	★	★	★	50	50
		Ics % (1)		★	★	★	★	★	★	★	100	100	★	★	★	★	★	★	★	100	100
	400/415 V	Icu	kA	★	★	★	★	★	15	15	15	10	★	★	★	★	★	50	50	50	50
		Ics % (1)		★	★	★	★	★	50	50	40	50	★	★	★	★	★	50	50	50	50
	440 V	Icu	kA	★	★	★	50	15	8	8	6	6	★	★	★	★	20	20	20	20	20
		Ics % (1)		★	★	★	100	100	50	50	50	50	★	★	★	★	75	75	75	75	75
	500 V	Icu	kA	★	★	★	50	10	6	6	4	4	★	★	★	★	10	10	10	10	10
		Ics % (1)		★	★	★	100	100	75	75	75	75	★	★	★	★	100	75	75	75	75
	690 V	Icu	kA	★	3	3	3	3	3	3	3	3	★	4	4	4	4	4	4	4	4
		Ics % (1)		★	75	75	75	75	75	75	75	75	★	100	100	100	100	100	100	100	100
Associated fuses (if required) if Isc > breaking capacity Icu conforming to IEC 60947-2 amendment 1	230/240 V	aM	A	★	★	★	★	★	★	★	80	80	★	★	★	★	★	★	★	100	100
		gG	A	★	★	★	★	★	★	★	100	100	★	★	★	★	★	★	★	125	125
	400/415 V	aM	A	★	★	★	★	★	63	63	80	80	★	★	★	★	★	80	100	100	100
		gG	A	★	★	★	★	★	80	80	100	100	★	★	★	★	★	100	125	125	125
	440 V	aM	A	★	★	★	50	50	50	50	63	63	★	★	★	★	50	63	80	80	80
		gG	A	★	★	★	63	63	63	63	80	80	★	★	★	★	63	80	100	100	100
	500 V	aM	A	★	★	★	50	50	50	50	50	50	★	★	★	★	50	50	50	50	50
		gG	A	★	★	★	63	63	63	63	63	63	★	★	★	★	63	63	63	63	63
	690 V	aM	A	★	16	25	32	32	40	40	40	40	★	20	25	40	40	50	50	50	50
		gG	A	★	20	32	40	40	50	50	50	50	★	25	32	50	50	63	63	63	63
Cable protection against thermal stress in the event of short-circuit (PVC insulated copper cables) Minimum c.s.a. protected at 40 °C and at Isc max.	1 mm²		kA	●	●	●	≤10	≤ 6	(2)	(2)	(2)	(2)	●	●	●	≤10	≤ 6	(2)	(2)	(2)	(2)
	1.5 mm²		kA	●	●	●	≤20	≤10	(2)	(2)	(2)	(2)	●	●	●	≤20	≤10	(2)	(2)	(2)	(2)
	2.5 mm²			●	●	●	●	●	●	●	●	(2)	●	●	●	●	●	●	●	●	(2)
	4…6 mm²			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

★ *> 100 kA.*
● *Cable c.s.a. protected.*
(1) As % of Icu.
(2) Cable c.s.a. not protected.

References:
pages B6/12 and B6/13
Curves:
pages B6/69 to B6/78
Dimensions:
pages B6/82 to B6/91

Characteristics

Breaking capacity of GV2ME, GV2RT and GV2P

Circuit breaker type				GV2ME and GV2RT										GV2P								
				01 to 06	07	08	10	14	16	20	21 & 22	32		01 to 06	07	08	10	14	16	20	21 & 22	32
Rating			A	0.1 to 1.6	2.5	4	6.3	10	14	18	23 & 25	32		0.1 to 1.6	2.5	4	6.3	10	14	18	23 & 25	32
Breaking capacity conforming to IEC 60947-2	230/240 V	Icu	kA	★	★	★	★	★	★	★	50	50		★	★	★	★	★	★	★	★	★
		Ics % (1)		★	★	★	★	★	★	★	100	100		★	★	★	★	★	★	★	★	★
	400/415 V	Icu	kA	★	★	★	★	★	15	15	15	10		★	★	★	★	★	★	50	50	50
		Ics % (1)		★	★	★	★	★	50	50	40	50		★	★	★	★	★	★	50	50	50
	440 V	Icu	kA	★	★	★	50	15	8	8	6	6		★	★	★	★	★	50	20	20	20
		Ics % (1)		★	★	★	100	100	50	50	50	50		★	★	★	★	★	75	75	75	75
	500 V	Icu	kA	★	★	★	50	10	6	6	4	4		★	★	★	★	50	42	10	10	10
		Ics % (1)		★	★	★	100	100	75	75	75	75		★	★	★	★	100	75	75	75	75
	690 V	Icu	kA	★	3	3	3	3	3	3	3	3		★	8	8	6	6	6	4	4	4
		Ics % (1)		★	75	75	75	75	75	75	75	75		★	100	100	100	100	100	100	100	100
Associated fuses (if required) if Isc > breaking capacity Icu conforming to IEC 60947-2	230/240 V	aM	A	★	★	★	★	★	★	★	80	80		★	★	★	★	★	★	★	★	★
		gG	A	★	★	★	★	★	★	★	100	100		★	★	★	★	★	★	★	★	★
	400/415 V	aM	A	★	★	★	★	★	63	63	80	80		★	★	★	★	★	★	100	100	100
		gG	A	★	★	★	★	★	80	80	100	100		★	★	★	★	★	★	125	125	125
	440 V	aM	A	★	★	★	50	50	50	50	63	63		★	★	★	★	★	50	63	80	80
		gG	A	★	★	★	63	63	63	63	80	80		★	★	★	★	★	63	80	100	100
	500 V	aM	A	★	★	★	50	50	50	50	50	50		★	★	★	★	50	50	50	50	50
		gG	A	★	★	★	63	63	63	63	63	63		★	★	★	★	63	63	63	63	63
	690 V	aM	A	★	16	25	32	32	40	40	40	40		★	20	25	40	40	50	50	50	50
		gG	A	★	20	32	40	40	50	50	50	50		★	25	32	50	50	63	63	63	63

★ > 100 kA.
(1) As % of Icu.

Ref.
Circuit breakers

Characteristics

Breaking capacity of GV2ME, GV2RT and GV2P (used in association with current limiter GV1L3)

Circuit breaker type				GV2ME and GV2RT									
				01 to 06	07	08	10	14	16	20	21	22	32
Rating			A	0.1 to 1.6	2.5	4	6.3	10	14	18	23	25	32
Breaking capacity conforming to IEC 60947-2	230/240 V	Icu	kA	★	★	★	★	★	★	★	★	★	★
		Ics % (1)		★	★	★	★	★	★	★	★	★	★
	400/415 V	Icu	kA	★	★	★	★	★	100	100	100	100	100
		Ics % (1)		★	★	★	★	★	50	50	40	40	40
	440 V	Icu	kA	★	★	★	★	★	50	20	20	20	20
		Ics % (1)		★	★	★	★	★	75	75	75	75	75
	500 V	Icu	kA	★	★	★	★	50	42	10	10	10	10
		Ics % (1)		★	★	★	★	100	100	75	75	75	75

Circuit breaker type				GV2P									
				01 to 06	07	08	10	14	16	20	21	22	32
Rating			A	0.1 to 1.6	2.5	4	6.3	10	14	18	23	25	32
Breaking capacity conforming to IEC 60947-2	230/240 V	Icu	kA	★	★	★	★	★	★	★	★	★	★
		Ics % (1)		★	★	★	★	★	★	★	★	★	★
	400/415 V	Icu	kA	★	★	★	★	★	★	★	★	★	★
		Ics % (1)		★	★	★	★	★	★	★	★	★	★
	440 V	Icu	kA	★	★	★	★	★	100	100	100	100	100
		Ics % (1)		★	★	★	★	★	50	50	50	50	50
	500 V	Icu	kA	★	★	★	★	100	100	100	100	100	100
		Ics % (1)		★	★	★	★	50	50	50	50	50	50
	690 V (3)	Icu = Ics	kA	★	50	50	50	50	50	50	50	50	50

Circuit breaker type				GV2ME									
				01 to 06	07	08	10	14	16	20	21	22	32
Rating			A	0.1 to 1.6	2.5	4	6.3	10	14	18	23	25	32
Cable protection against thermal stress in the event of short-circuit (PVC insulated copper cables)	Minimum c.s.a. protected at 40 °C at Isc max.	1 mm²		●	●	●	⩽ 10 kA	⩽ 6 kA	(2)	(2)	(2)	(2)	(2)
		1.5 mm²		●	●	●	⩽ 20 kA	⩽ 10 kA	(2)	(2)	(2)	(2)	(2)
		2.5 mm²		●	●	●	●	●	●	●	●	●	(2)
		4…6 mm²		●	●	●	●	●	●	●	●	●	●

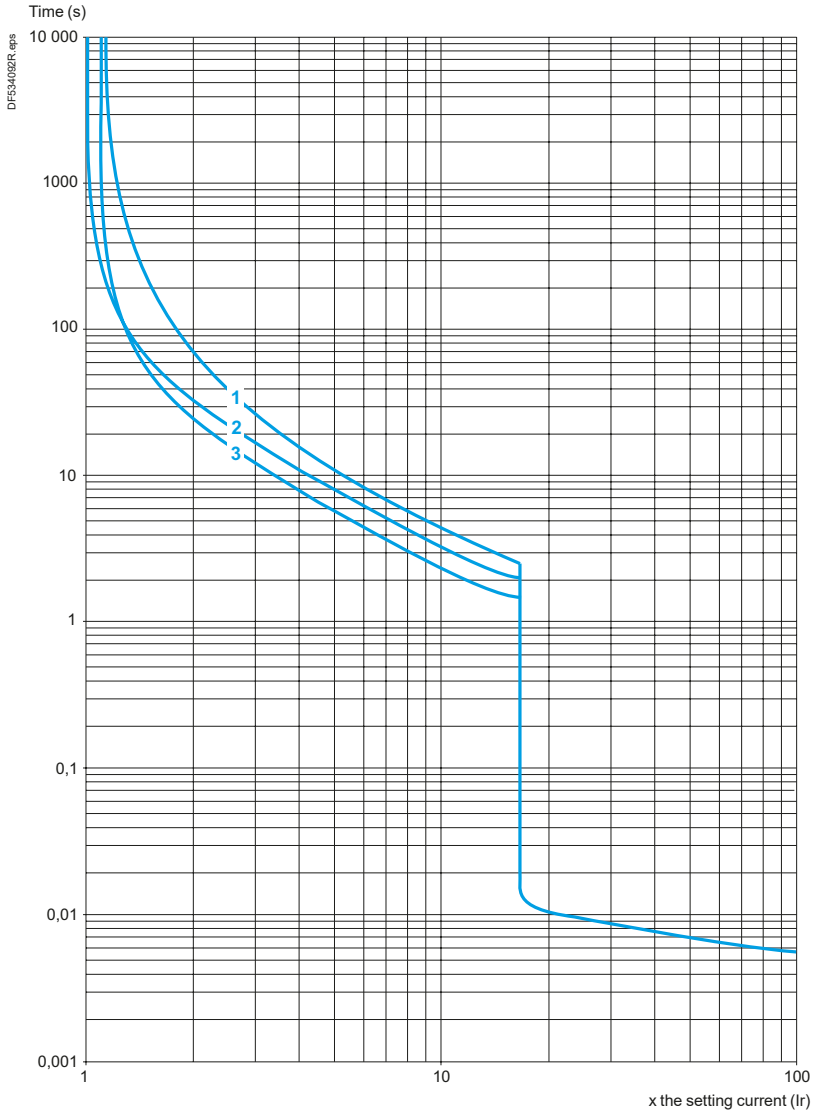
★ *> 100 kA.*
● *Cable c.s.a. protected.*
(1) As % of Icu.
(2) Cable c.s.a. not protected.
(3) With limiter ***LA9LB920****.*

References:
pages B6/14 to B6/18
Curves:
pages B6/75 to B6/78
Dimensions:
pages B6/85 to B6/90

Curves

Tripping curves for GV2L or LE combined with thermal overload relay LRD or LR2K

Average operating times at 20 °C related to multiples of the setting current



1 3 poles from cold state
2 2 poles from cold state
3 3 poles from hot state

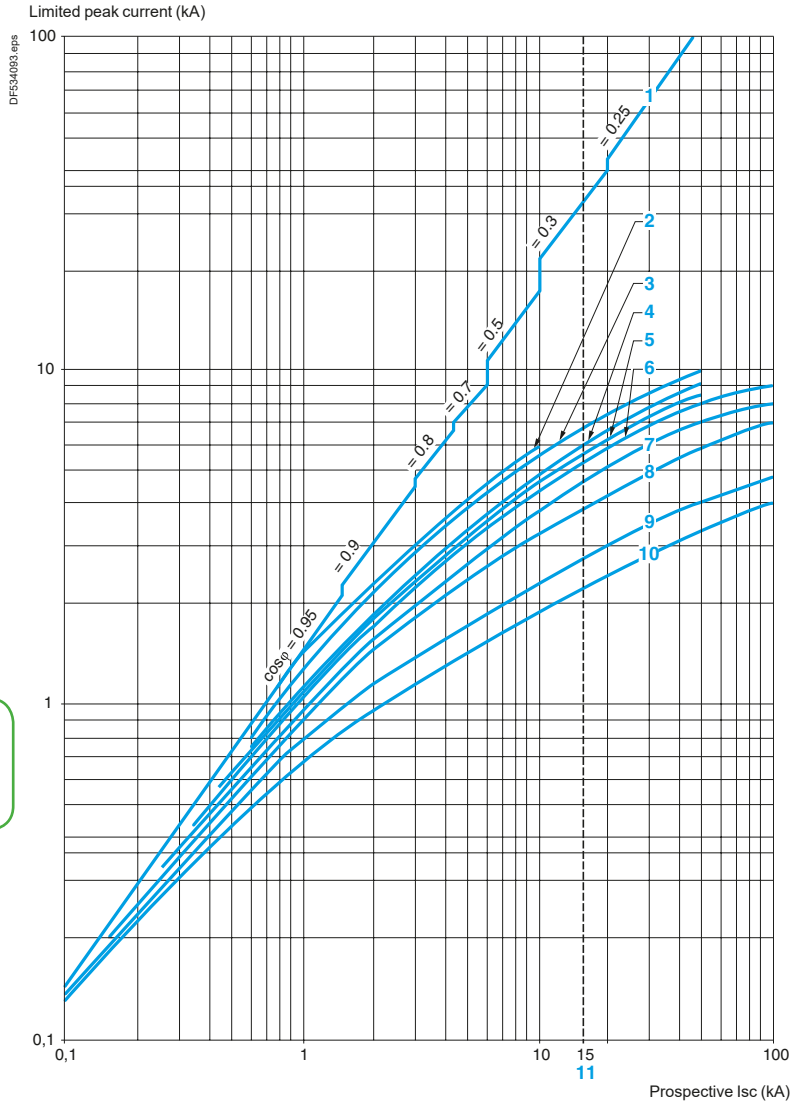
References:
pages B6/12 and B6/13
Characteristics:
pages B6/64 to B6/68
Dimensions:
pages B6/82 to B6/84, B6/91

Curves

Current limitation on short-circuit for GV2L and GV2LE only (3-phase 400/415 V)

Dynamic stress

I peak = f (prospective Isc) at 1.05 Ue = 435 V



1 Maximum peak current
2 32 A
3 25 A
4 18 A
5 14 A
6 10 A
7 6.3 A
8 4 A
9 2.5 A
10 1.6 A
11 Limit of rated ultimate breaking capacity on short-circuit of GV2LE (14, 18, 23 and 25 A ratings).

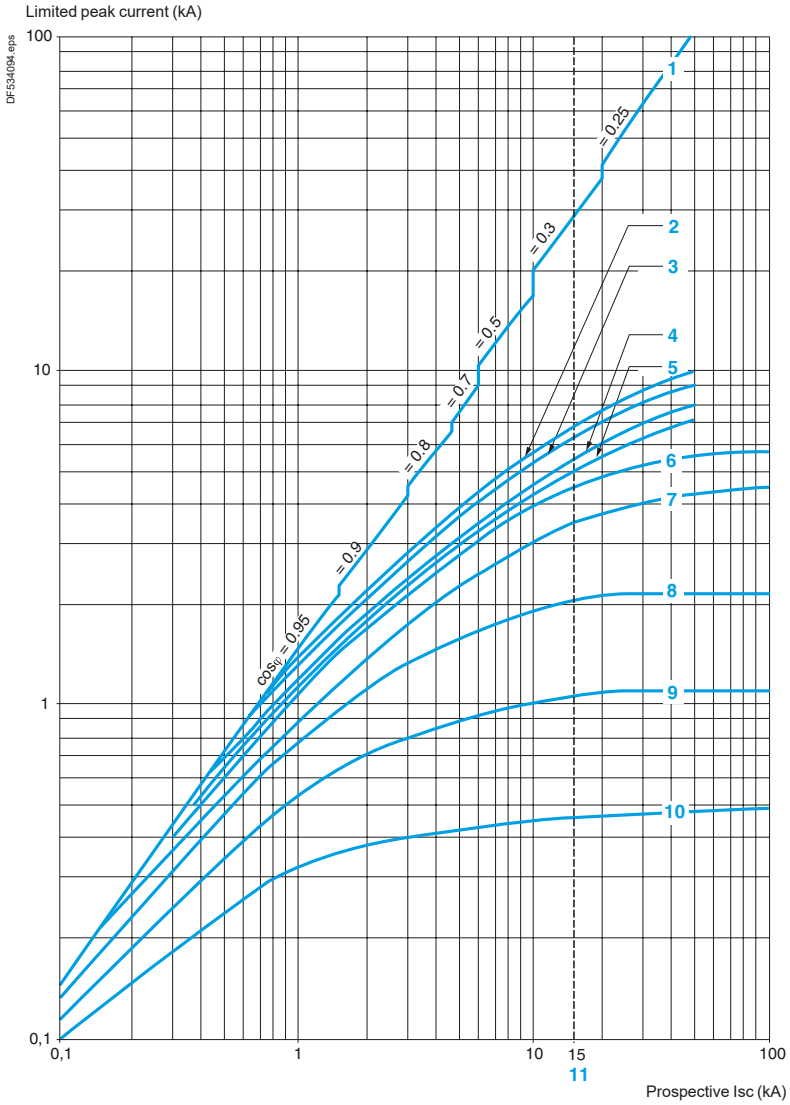
Ref.
Circuit breakers

Curves

Current limitation on short-circuit for GV2L and GV2LE + thermal overload relay LRD or LR2K (3-phase 400/415 V)

Dynamic stress

I peak = f (prospective Isc) at 1.05 Ue = 435 V



1 Maximum peak current
2 32 A
3 25 A
4 18 A
5 14 A
6 10 A
7 6.3 A
8 4 A
9 2.5 A
10 1.6 A
11 Limit of rated ultimate breaking capacity on short-circuit of GV2LE (14, 18, 23 and 25 A ratings).

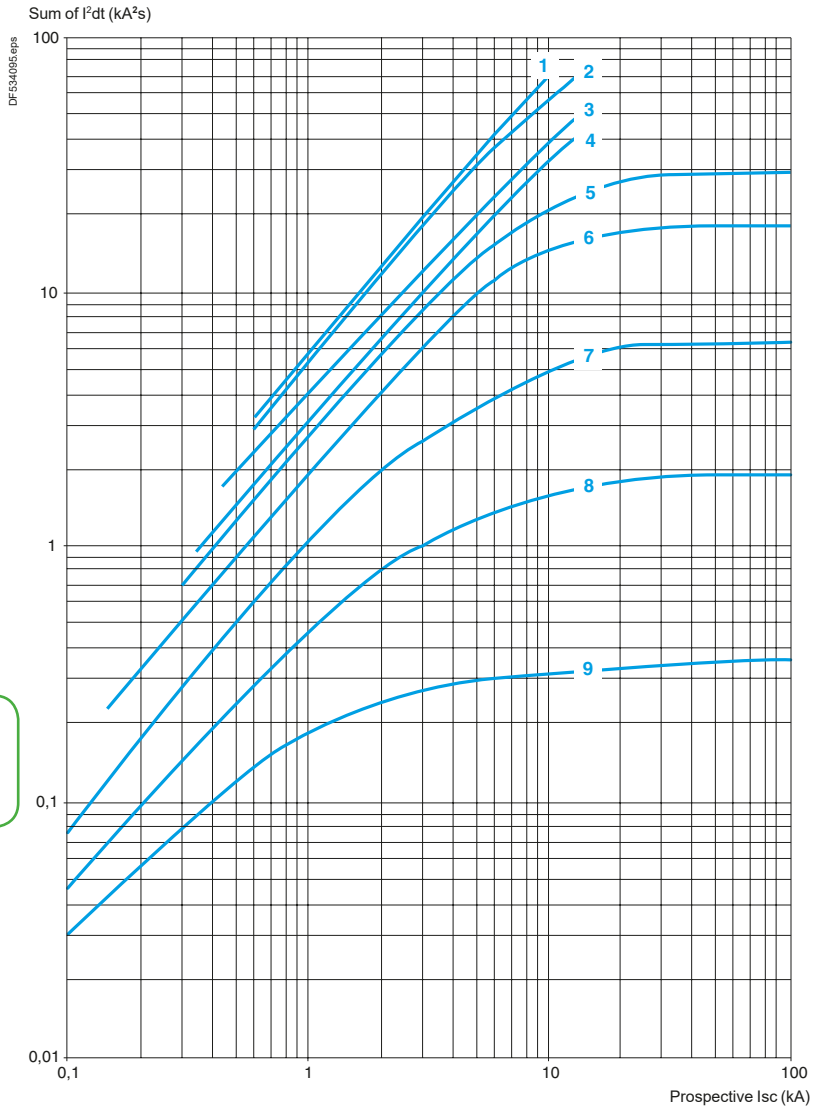
References:
pages B6/12 and B6/13
Characteristics:
pages B6/64 to B6/68
Dimensions:
pages B6/82 to B6/84, B6/91

Curves

Thermal limit on short-circuit for GV2LE only

Thermal limit in kA²s in the magnetic operating zone

Sum of I²dt = f (prospective Isc) at 1.05 Ue = 435 V



1 32 A
2 25 A
3 18 A
4 14 A
5 10 A
6 6.3 A
7 4 A
8 2.5 A
9 1.6 A

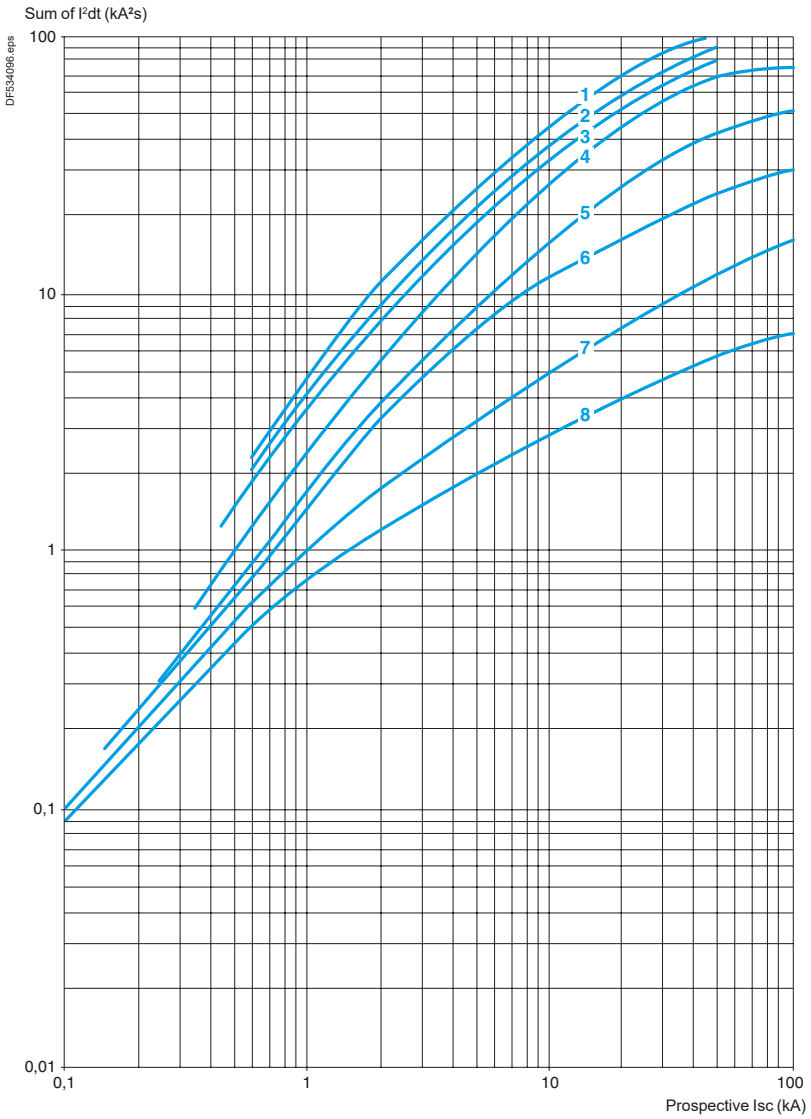
Ref.
Circuit breakers

Curves

Thermal limit on short-circuit for GV2L only

Thermal limit in kA²s in the magnetic operating zone

Sum of I²dt = f (prospective Isc) at 1.05 Ue = 435 V



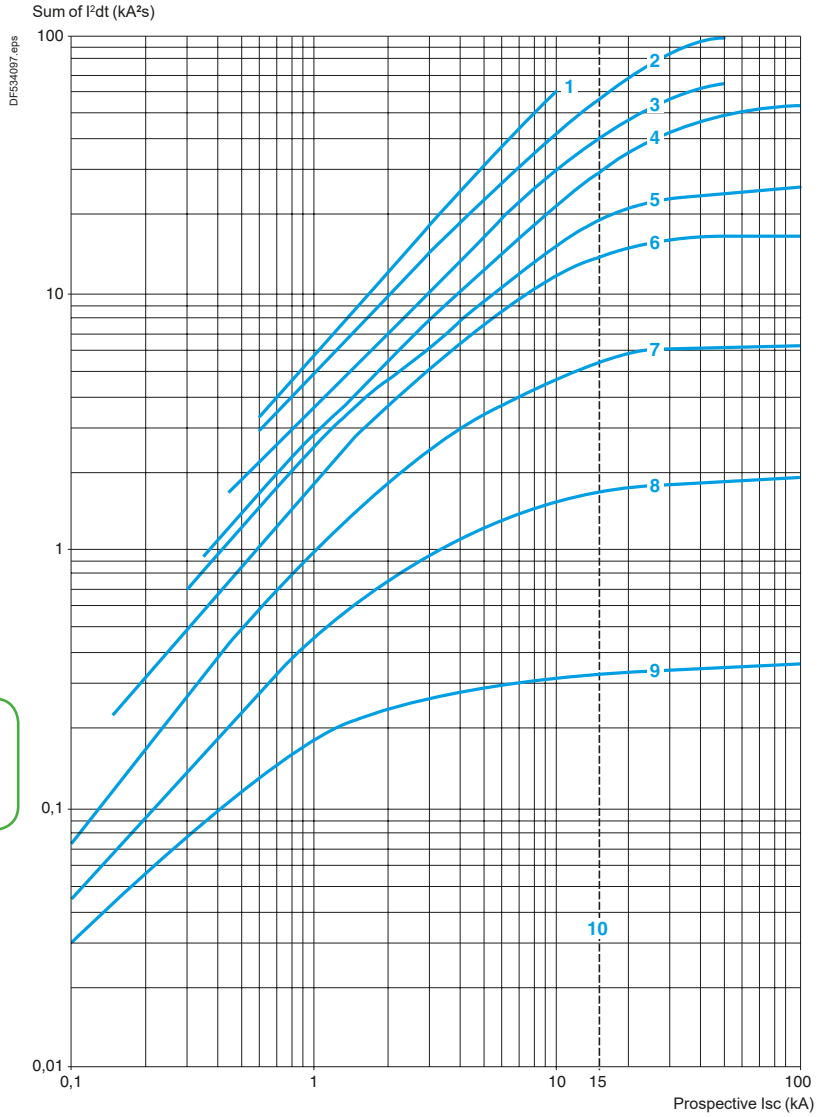
1 25 A and 32 A
2 18 A
3 14 A
4 10 A
5 6.3 A
6 4 A
7 2.5 A
8 1.6 A

Ref.
Circuit breakers

Thermal limit on short-circuit for GV2L and GV2LE + thermal overload relay LRD or LR2K

Thermal limit in kA²s in the magnetic operating zone

Sum of I²dt = f (prospective Isc) at 1.05 Ue = 435 V



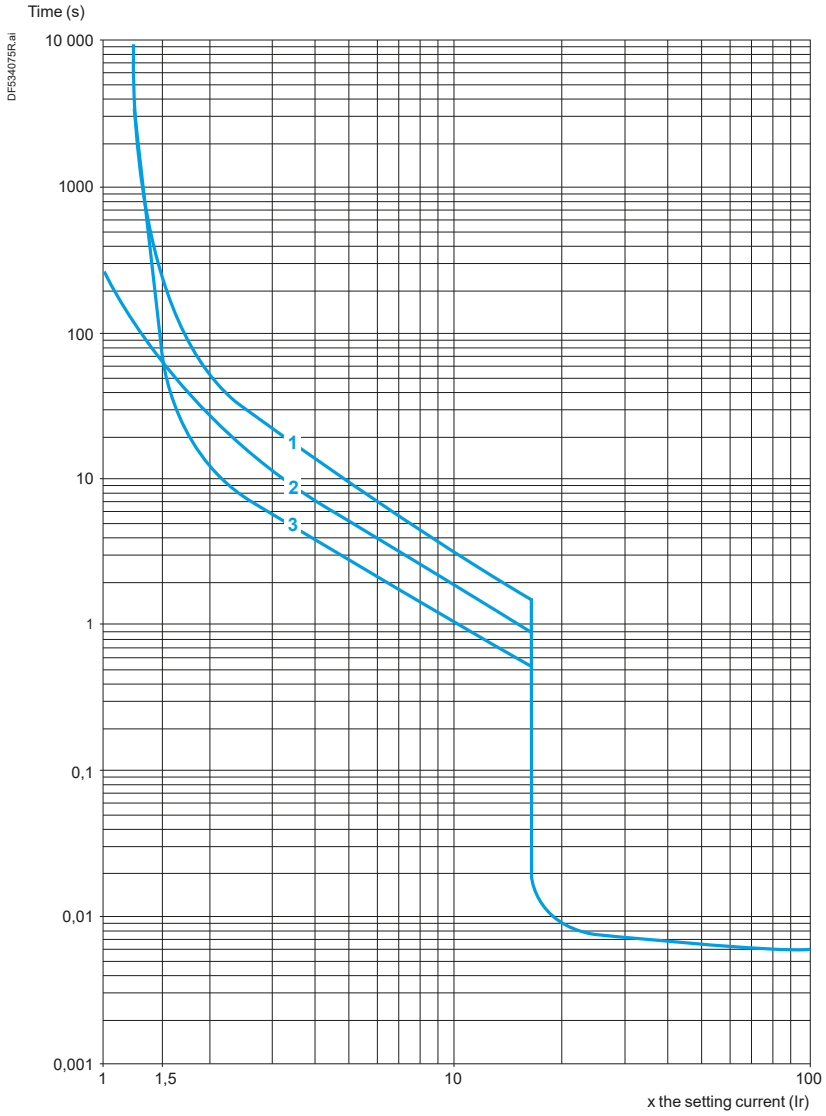
1 32 A (GV2LE32)
2 25 A and 32 A (GV2L32)
3 18 A
4 14 A
5 10 A
6 6.3 A
7 4 A
8 2.5 A
9 1.6 A
10 Limit of rated ultimate breaking capacity on short-circuit of GV2LE (14, 18, 23 and 25 A ratings).

Ref.
Circuit breakers

Curves

Thermal-magnetic tripping curves for GV2ME, GV2RT and GV2P

Average operating times at 20 °C related to multiples of the setting current



1 3 poles from cold state
2 2 poles from cold state
3 3 poles from hot state

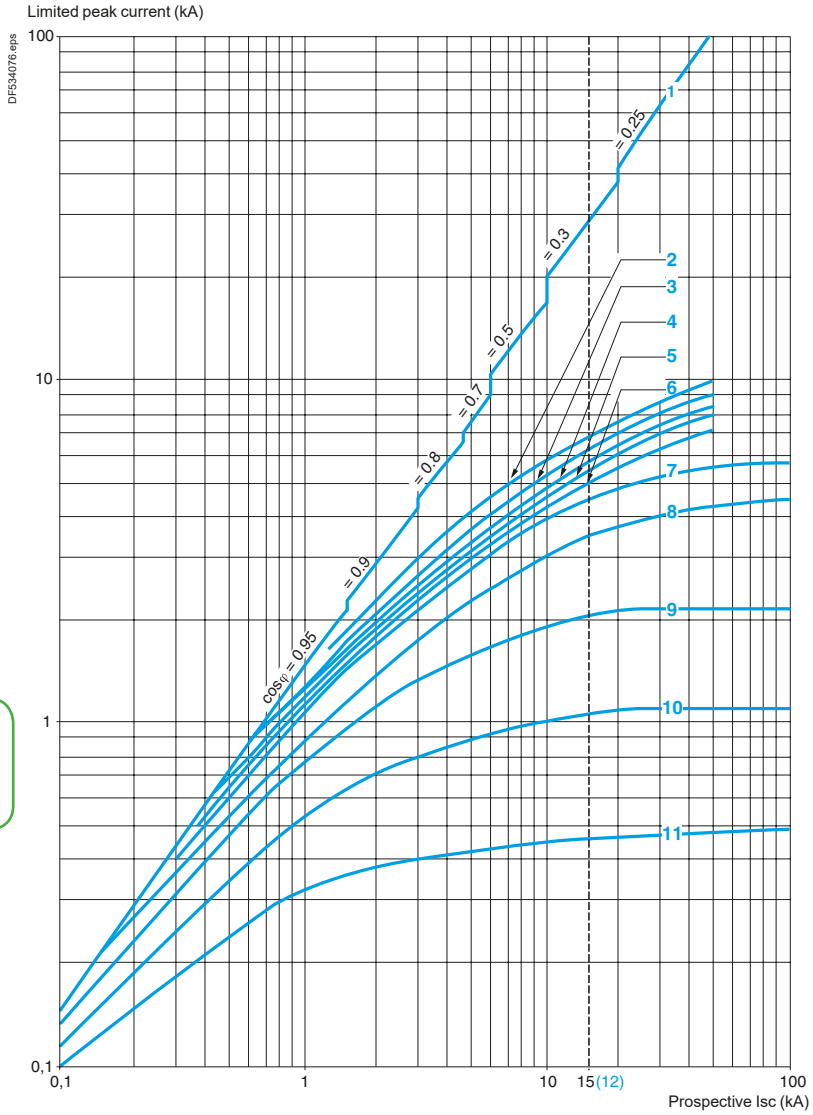
Ref.
Circuit breakers

Curves

Current limitation on short-circuit for GV2ME, GV2RT and GV2P (3-phase 400/415 V)

Dynamic stress

I peak = f (prospective Isc) at 1.05 Ue = 435 V



1 Maximum peak current
2 24 - 32 A
3 20 - 25 A
4 17 - 23 A
5 13 - 18 A
6 9 - 14 A
7 6 - 10 A
8 4 - 6.3 A
9 2.5 - 4 A
10 1.6 - 2.5 A
11 1 - 1.6 A
12 Limit of rated ultimate breaking capacity on short-circuit of GV2ME (14, 18, 23 and 25 A ratings)

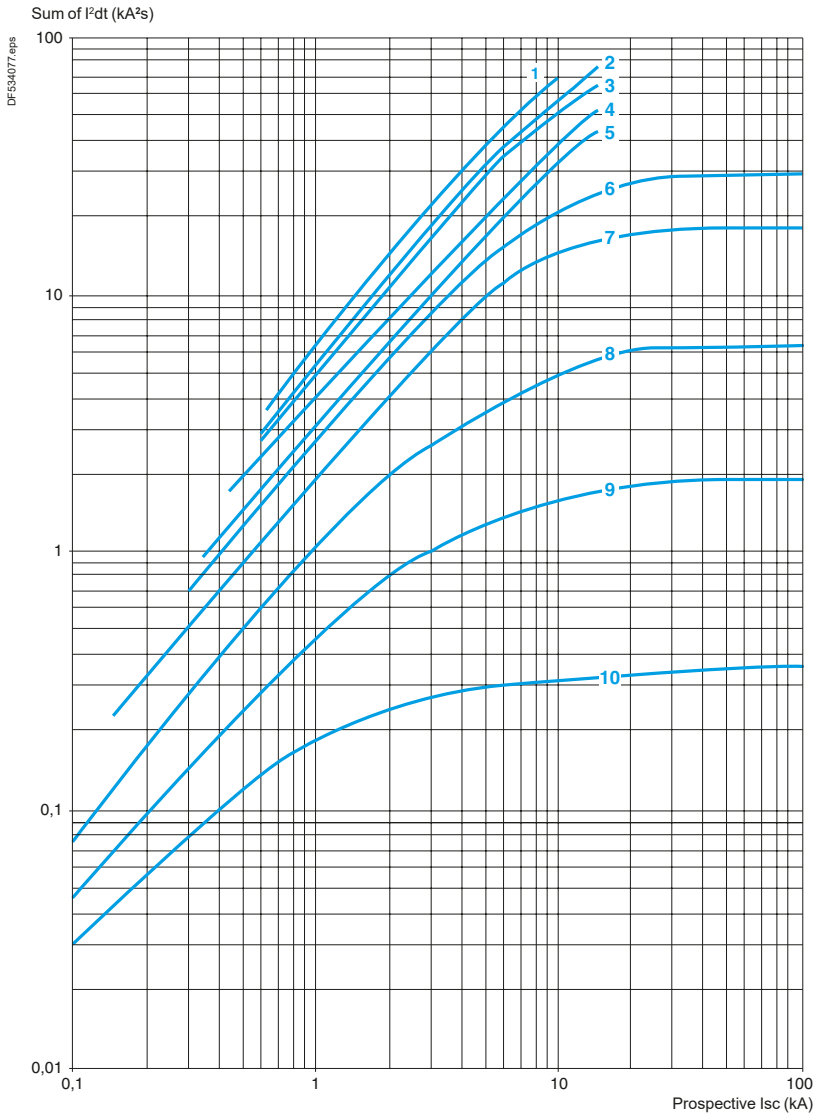
Ref.
Circuit breakers

Curves

Thermal limit on short-circuit for GV2ME and GV2RT

Thermal limit in kA²s in the magnetic operating zone

Sum of I²dt = f (prospective Isc) at 1.05 Ue = 435 V



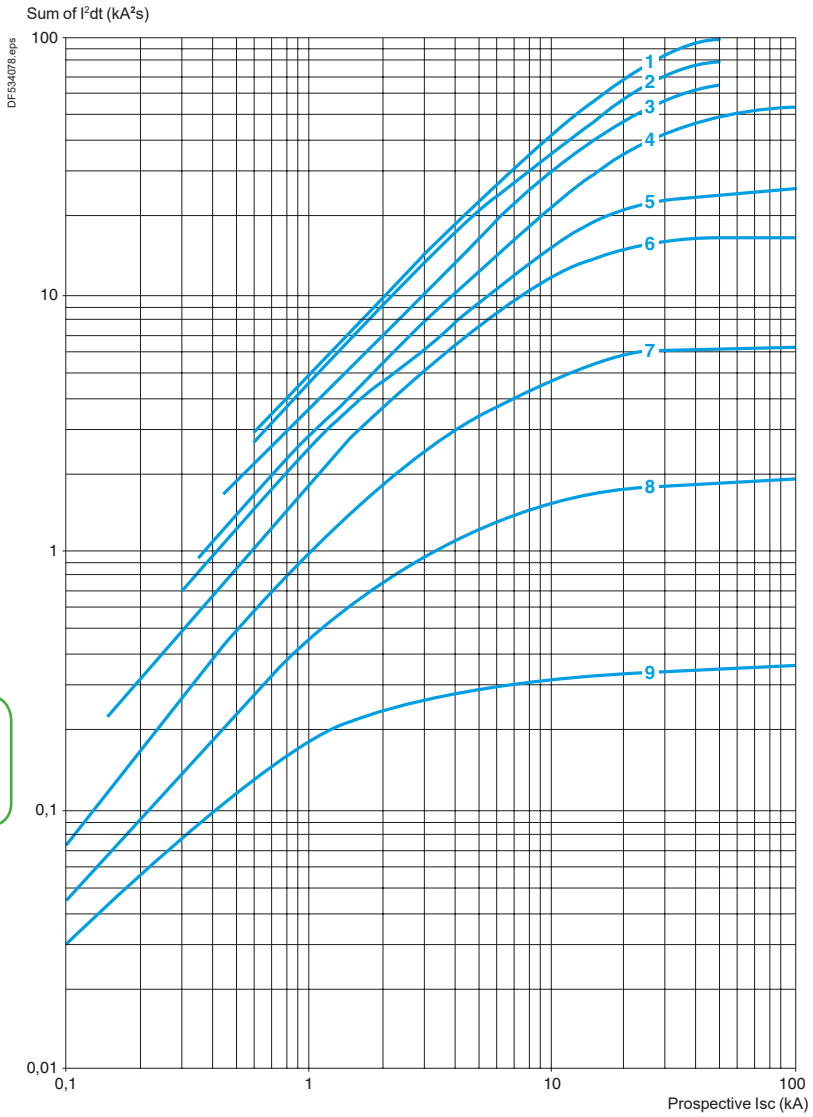
1 24 - 32 A
2 20 - 25 A
3 17 - 23 A
4 13 - 18 A
5 9 - 14 A
6 6 - 10 A
7 4 - 6.3 A
8 2.5 - 4 A
9 1.6 - 2.5 A
10 1 - 1.6 A

Ref.
Circuit breakers

Thermal limit on short-circuit for GV2P

Thermal limit in kA²s in the magnetic operating zone

Sum of I²dt = f (prospective Isc) at 1.05 Ue = 435 V



1 20 - 25 A, 24 - 32 A
2 17 - 23 A
3 13 - 18 A
4 9 - 14 A
5 6 - 10 A
6 4 - 6.3 A
7 2.5 - 4 A
8 1.6 - 2.5 A
9 1 - 1.6 A

Ref.
Circuit breakers

Characteristics

Characteristics of GV2 electric trips

Type of trip			GVAU●●● MN undervoltage trip	GVAX●●● MN undervoltage trip for GV2ME - safety device for dangerous machines	GVAS●●● MX shunt trip
Rated insulation voltage (Ui)	Conforming to IEC 60947-1	**V**	690	500	690
	Conforming to UL 60947-4-1, CSA C22.2 n° 60947-4-1	**V**	600	-	600
Operational voltage (Ue)	Conforming to IEC 60947-1	**V**	0.85...1.1 Uc	0.85...1.1 Uc	0.7...1.1 Uc
Drop-out voltage		**V**	0.7...0.35 Uc	0.7...0.35 Uc	0.75...0.2 Uc
Inrush consumption	~ ⎓	**VA**	12	12	14
Sealed consumption	~ ⎓	**VA**	3.5	3.5	5
Operating time	Conforming to IEC 60947-1	**ms**	From the moment the voltage reaches its operational value until opening of the circuit breaker. 10...15		
On-load factor			100 %		
Cabling (screw clamp connection)	Number of conductors		2 or 4		
	Solid cable	**mm²**	1...2.5		
	Flexible cable without cable end	**mm² AWG**	0.75...2.5		
	Flexible cable with cable end	**mm²**	0.75...2.5		
Tightening torque		**N.m**	1.4 max		
Mechanical durability (C.O.: Close - Open)		**C.O.**	30000 (GV2ME and GV2P)		

Ref.
Circuit breakers

References:
page B6/21

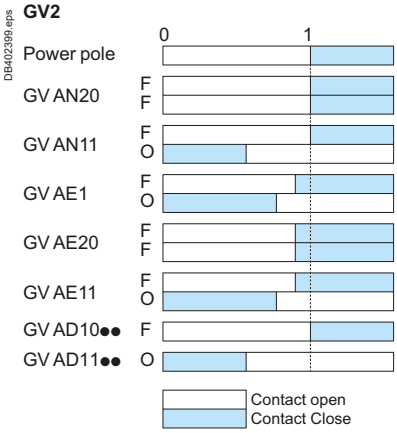
Dimensions:
pages B6/82 and B6/85

Characteristics

Type of contacts			Instantaneous auxiliary GVAN, GVAD							Fault signalling GVAD, GVAM11 (1)				Instantaneous auxiliary GVAE			
Rated insulation voltage (Ui) (associated insulation coordination)	Conforming to IEC 60947-1	V	690							690				250 (690 in relation to main circuit)			
	Conforming to UL 60947-4-1, CSA C22.2 n° 60947-4-1	V	600							300				300			
Conventional thermal current (Ith)	Conforming to IEC 60947-5-1	A	6							2.5				2.5			
	Conforming to UL 60947-5-1, CSA C22.2 n° 60947-5-1	A	5							1				1			
Mechanical durability (C.O.: Close - Open)		C.O.	100 000							1000				100 000			
Operational power and current conforming to IEC 60947-5-1. a.c. operation			AC-15/100 000 C.O.							AC-14/1000 C.O.				AC-15/100 000 C.O.			
	Rated operational voltage (Ue)	V	**48**	**110 127**	**230 240**	**380 415**	**440**	**500**	**690**	**24**	**48**	**110 127**	**230 240**	**24**	**48**	**110 127**	**230 240**
Operation	Operational power, normal conditions	VA	300	500	720	850	650	500	414	36	48	72	72	48	60	120	120
	Occasional breaking and making capacities, abnormal conditions	kVA	3	7	13	15	13	12	9	0.22	0.3	0.45	0.45	0.48	0.6	1.27	2.4
	Rated operational current (Ie)	A	6	4.5	3.3	2.2	1.5	1	0.6	1.5	1	0.5	0.3	2	1.25	1	0.5
Operational power and current conforming to IEC 60947-5-1. d.c.			DC-13/100 000 C.O.							DC-13/1000 C.O.				DC-13/100 000 C.O.			
	Rated operational voltage (Ue)	V	**24**	**48**	**60**	**110**	**240** (2)	**–**	**–**	**24**	**48**	**60**	**–**	**24**	**48**	**60**	**–**
Operation	Operational power, normal conditions	W	140	240	180	140	120	–	–	24	15	9	–	24	15	9	–
	Occasional breaking and making capacities, abnormal conditions	W	240	360	240	210	180	–	–	100	50	50	–	100	50	50	–
	Rated operational current (Ie)	A	6	5	3	1.3	0.5	–	–	1	0.3	0.15	–	1	0.3	0.15	–
Low power switching reliability of contact			**GVAE**: Number of failures for "n" million operating cycles (17 V-5 mA): = 10^{-6}														
Minimum operational conditions d.c. operation		V	17														
		mA	5														
Short-circuit protection			By **GB2CB●●** circuit breaker (rating according to operational current for Ue ≤ 415 V) or by gG fuse 10 A max											**GB2CB06** or gG fuse 10 A max			
Cabling, screw clamp terminals	Number of conductors		**1**			**2**											
	Solid cable	mm²	1…2.5			1…2.5											
	Flexible cable without cable end	mm²	0.75…2.5			0.75…2.5											
	Flexible cable with cable end	mm²	0.75…1.5			0.75…1.5											
	Tightening torque	N.m	1.4 max			1.4 max											
Cabling, spring terminal connections			**GVAN** only														
	Flexible cable without cable end	mm²	0.75…2.5			0.75…2.5				–				0.75…1.5			

Operation of instantaneous auxiliary contacts

GV2



Operation of fault signalling contacts

GVAM11
Change of state following tripping on short-circuit.

GVAD10●● and **GVAD01●●**
Change of state following tripping on short-circuit, overload or undervoltage.

(1) For application example of fault signalling contact and short-circuit signalling contact.
*(2) Add an RC circuit type **LA4D** to the load terminals.*

References:
page B6/21

Dimensions:
pages B6/82 and B6/85

Characteristics

Characteristics of 3-pole busbars GV2G●●●

			GV2G●●●
Rated insulation voltage (Ui)	Conforming to IEC 60947-1	V	690
Conventional thermal current (Ith)	Conforming to IEC 60439-1	A	63
Rated operational current (Ie)		A	63
Permissible peak current (I peak)		kA	11
Permissible thermal limit (I^2t)		kA^2s	104
Degree of protection	Conforming to IEC 60529		IP 20
Terminal block			Yes

Characteristics of terminal blocks GV2G05 and GV1G09 (for GV2ME and GV2P)

Rated insulation voltage (Ui)	Conforming to IEC 60947-1	V	690	
Conventional thermal current (Ith)	Conforming to IEC 60439-1	A	63	
Rated operational current (Ie)		A	63	115
Degree of protection	Conforming to IEC 60529		IP 20	
Connection	Solid cable	mm^2	1 x 1.5 to 25 or 2 x 1.5 to 6	
	Flexible cable without cable end	mm^2	1 x 1.5 to 16 or 2 x 1.5 to 4	
	Flexible cable with cable end	mm^2	1 x 1.5 to 16 or 2 x 1.5 to 4	
	Flexible or solid cable AWG		1 AWG 4	
Tightening torque	Connector	N.m	2.2	
	Screw clamp terminals	N.m	1.7	

Characteristics of current limiters (GV2ME and GV2P)

Type			GV1L3		LA9LB920	
Rated insulation voltage (Ui)	Conforming to IEC 60947-1	V	690		690	
Conventional thermal current (Ith)	Conforming to IEC 60947-1	A	63		63	
Rated operational current (Ie)		A	32		32	
Operating threshold	rms current	A	1500 (non adjustable threshold)		1000 (non adjustable threshold)	
Connection			1 conductor	2 conductors	1 conductor	2 conductors
	Solid cable	mm^2	1.5…25	1.5…10	1.5…25	1.5…10
	Flexible cable without cable end	mm^2	1.5…25	2.5…10	1.5…25	1.5…10
	Flexible cable with cable end	mm^2	1.5…16	1.5… 4	1.5…16	1.5… 4
Tightening torque		N.m	2.2			

Ref.
Circuit breakers

References:
page B6/21

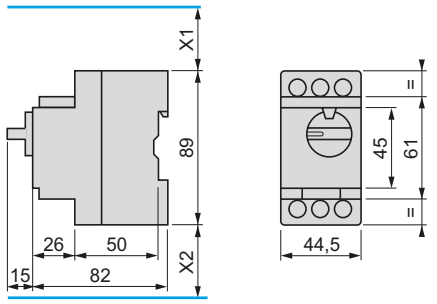
Dimensions:
page B6/89

Dimensions and mounting

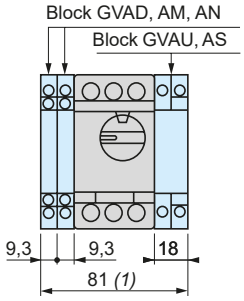
GV2L

Dimensions

DF537438.eps

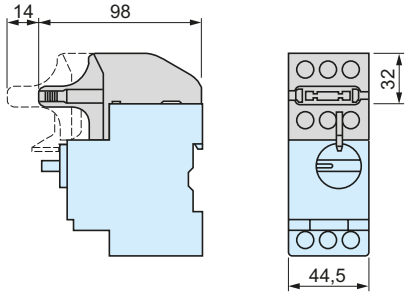


GVAD, AM, AN, AU, AS



GV2AK00

DF537439.eps



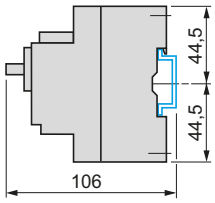
X1 Electrical clearance = 40 mm for Ue ⩽ 415 V, or 80 mm for Ue = 440 V, or 120 mm for Ue = 500 and 690 V.
X2 = 40 mm.

(1) Maximum.

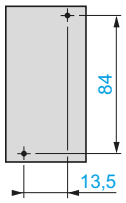
Mounting

On rail AM1DE200, AM1ED200 (35 x 15)

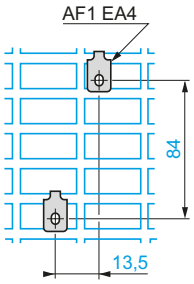
DF537440.eps



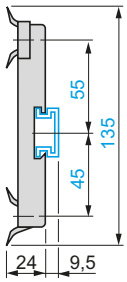
Panel mounted

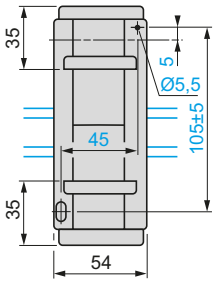


On pre-slotted mounting plate AM1PA



Adapter plate GK2AF01





7.5 mm height compensation plate GV1F03

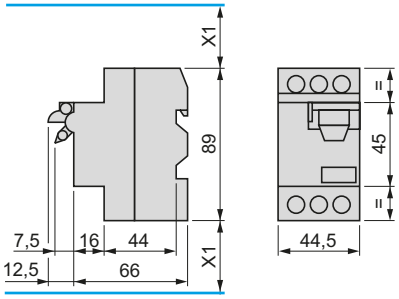
DF537441.eps



GV2LE

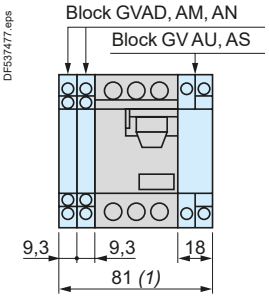
Dimensions

DF537442.eps



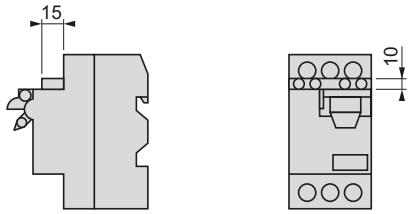
GVAD, AM, AN, AU, AS

DF537477.eps



GVAE

DF537443.eps



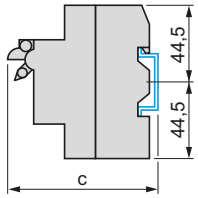
X1 Electrical clearance = 40 mm for Ue ⩽ 690 V.

(1) Maximum.

Mounting

On 35 mm ⎓ rail

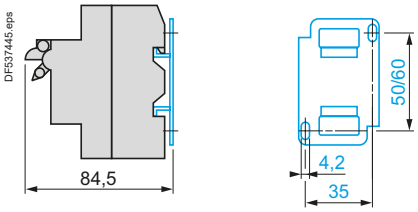
DF537444.eps



c = 80 on AM1DP200 (35 x 7.5) and 88 on AM1DE200, ED200 (35 x15)

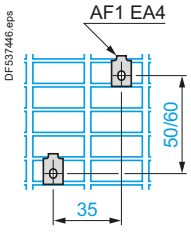
On panel with adapter plate GV2AF02

DF537445.eps



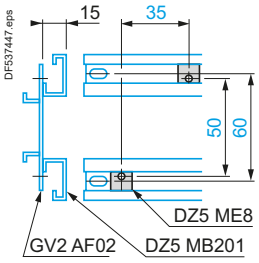
On pre-slotted plate AM1PA

DF537446.eps



On rails DZ5MB201

DF537447.eps

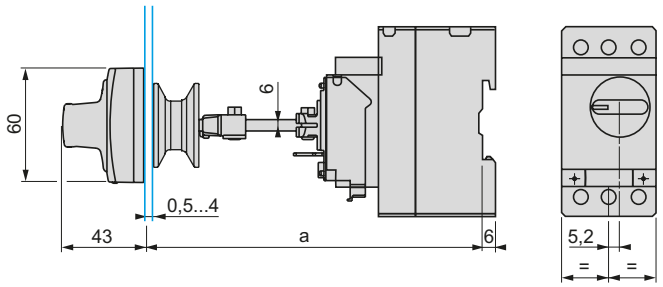


References: pages B6/12 to B6/13
Characteristics: pages B6/64 to B6/68
Curves: pages B6/69 to B6/78

Mounting

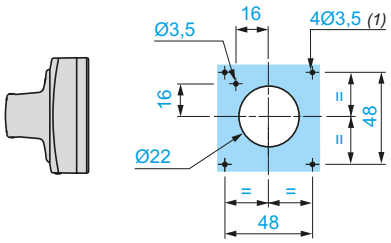
Mounting of external operator GV2APN01, GV2APN02 or GV2APN04 for motor circuit breakers GV2L

DB127415.eps



Door cut-out

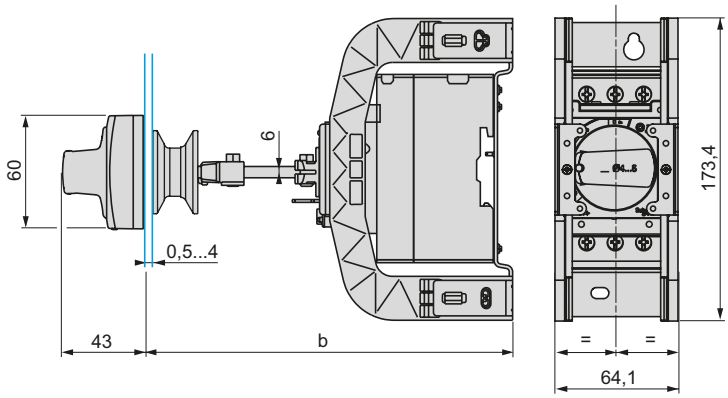
DB126634.eps



(1) For IP65 only.

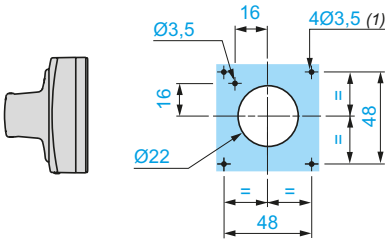
Mounting of external operator GVAPH02 for motor circuit breakers GV2L

DB127414.eps



Door cut-out

DB126634.eps

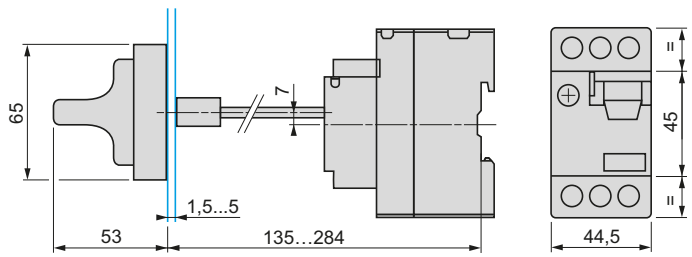


(1) For IP65 only.

	a		b	
	Mini	Maxi	Mini	Maxi
GV2APN●●	140	250		
GV2APN●● + GVAPH02			151	250
GV2APN●● + GVAPK11	250	434	-	-
GV2APN●● + GVAPH02 + GVAPK11	-	-	250	445

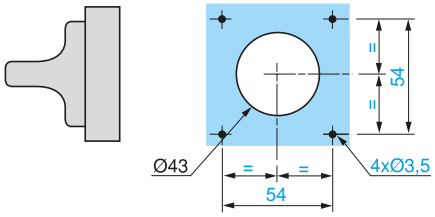
Mounting of external operator GV2AP03 for GV2LE

DB126649.eps



Door cut-out

DF569008.eps

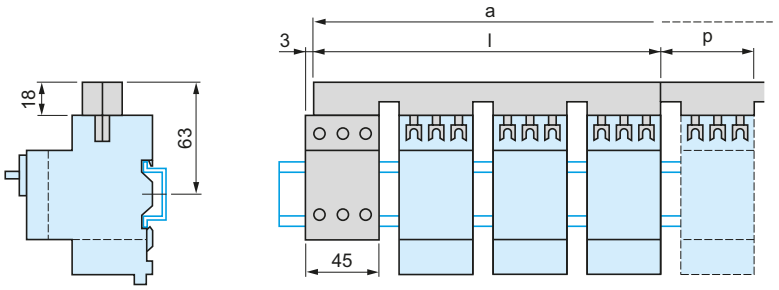


References:
page B6/24

GV2LE

Sets of busbars GV2G445, GV2G454, GV2G472, with terminal block GV2G05

DF537451.eps



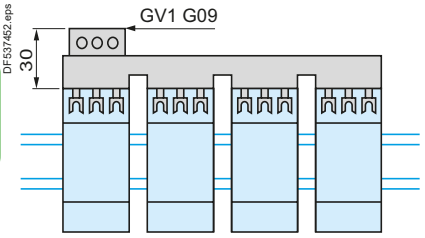
	l	p
GV2G445 (4 x 45 mm)	179	45
GV2G454 (4 x 54 mm)	206	54
GV2G472 (4 x 72 mm)	260	72

	a			
Number of tap-offs	**5**	**6**	**7**	**8**
GV2G445	224	269	314	359
GV2G454	260	314	368	422
GV2G472	332	404	476	548

Sets of busbars GV2LE

Sets of busbars GV2G●●● with term. block GV1G09

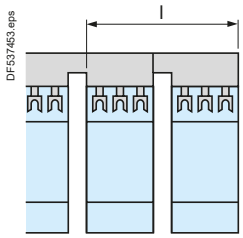
DF537452.eps



	l
GV2G245 (2 x 45 mm)	89
GV2G254 (2 x 54 mm)	98
GV2G272 (2 x 72 mm)	116

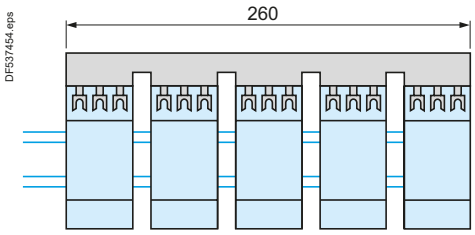
Sets of busbars GV2G245, GV2G254, GV2GR272

DF537453.eps



Set of busbars GV2G554

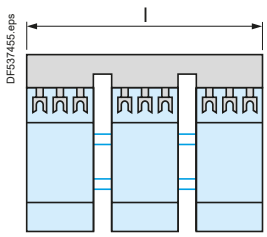
DF537454.eps



	l
GV2G345 (3 x 45 mm)	134
GV2G354 (3 x 54 mm)	152

Sets of busbars GV2G345 and GV2G354

DF537455.eps

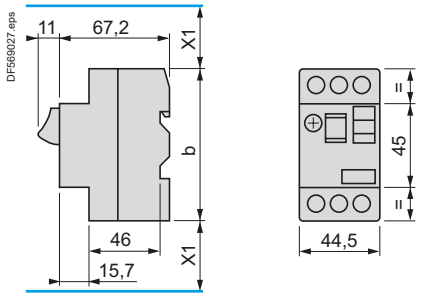


Ref.
Circuit breakers

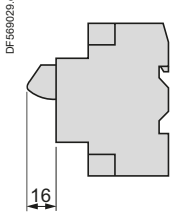
Dimensions and mounting

Dimensions

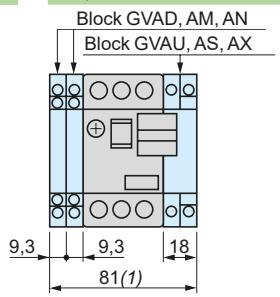
GV2ME



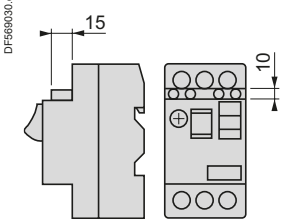
GVAX



GVAD, AM, AN, AU, AS, AX



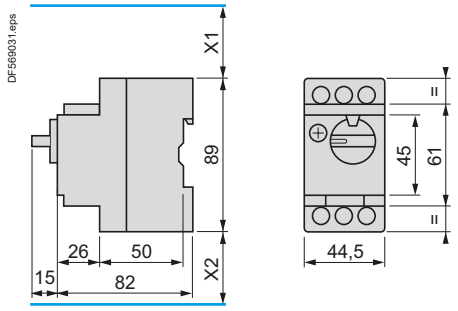
GVAE



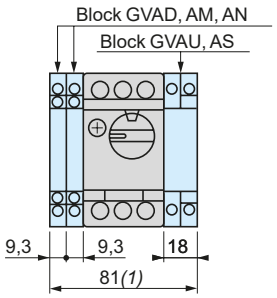
	b
GV2ME●●	89
GV2ME●●3	101

(1) Maximum.
X1 Electrical clearance = 40 mm for Ue ≤ 690 V

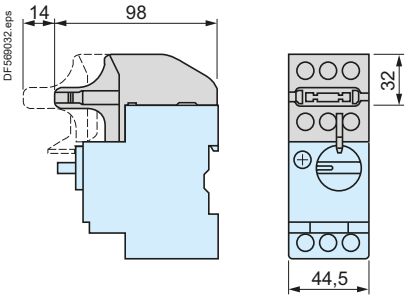
GV2P



GVAD, AM, AN, AU, AS

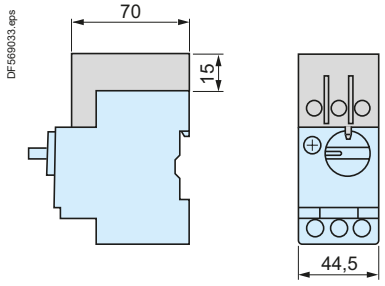


GV2AK00



(1) Maximum.
X1 Electrical clearance = 40 mm for Ue ≤ 415 V, or 80 mm for Ue = 440 V, or 120 mm for Ue = 500 and 690 V
X2 = 40 mm

GV2GH7



References:
pages B6/14 to B6/17

Characteristics:
pages B6/64 to B6/68

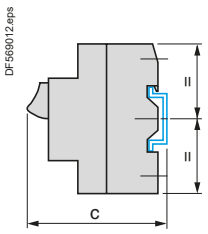
Curves:
pages B6/75 to B6/78

Dimensions and mounting

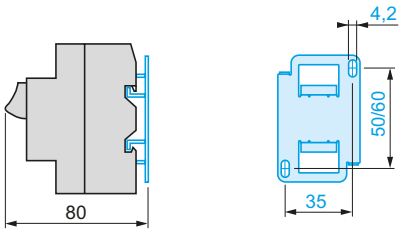
Mounting

GV2ME

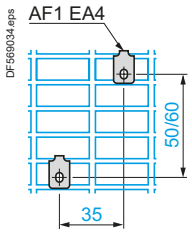
On 35 mm ⊔ rail



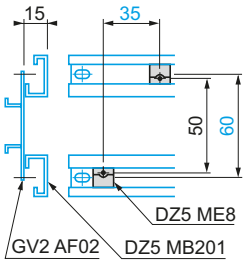
On panel with adapter plate GV2AF02



On pre-slotted plate AM1PA



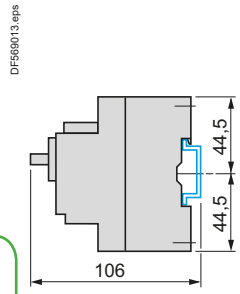
On rails DZ5MB201



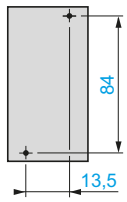
c = 78.5 on AM1 DP200 (35 x 7.5)
c = 86 on AM1 DE200, ED200 (35 x 15)

GV2P

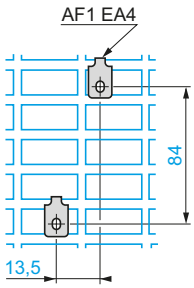
On rail AM1DE200, ED200 (35 x 15)



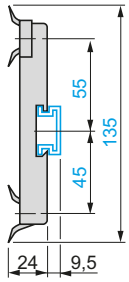
Panel mounted

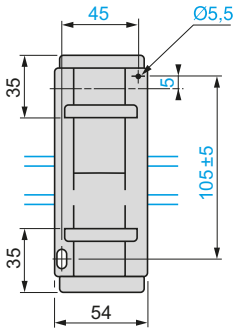


On pre-slotted plate AM1PA



Adapter plate GK2AF01

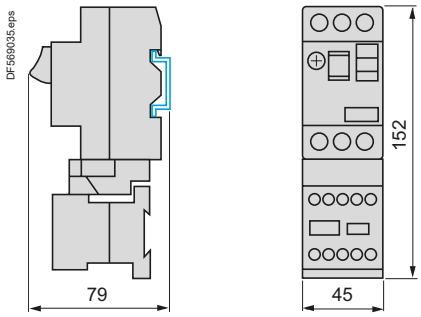




Dimensions

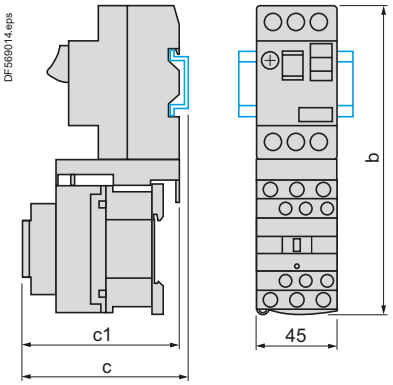
GV2AF01

Combination GV2ME + TeSys k contactor

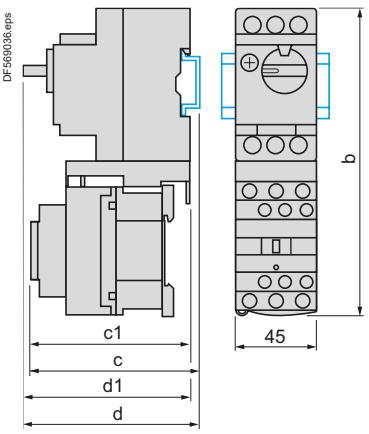


GV2AF3

Combination GV2ME + TeSys d contactor



Combination GV2P + TeSys d contactor



GV2ME +	LC1D09 …D18	LC1D25 and D32
b	176.4	186.8
c1	94.1	100.4
c	99.6	105.9

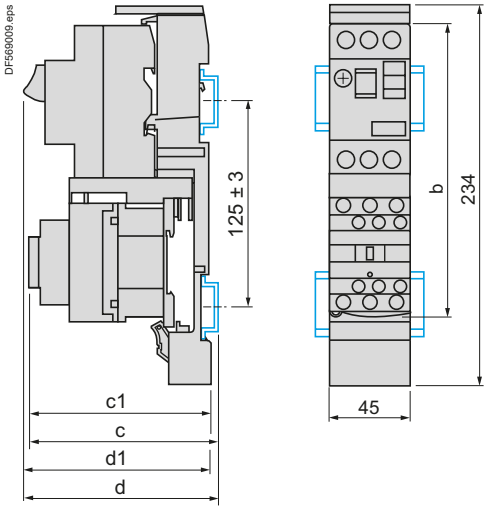
GV2P +	LC1D09 …D18	LC1D25 and D32
b	176.4	186.8
c1	100.1	106.4
c	105.6	111.9
d1	95	95
d	100.5	100.5

References: pages B6/14 to B6/17
Characteristics: pages B6/64 to B6/68
Curves: pages B6/75 to B6/78

Dimensions

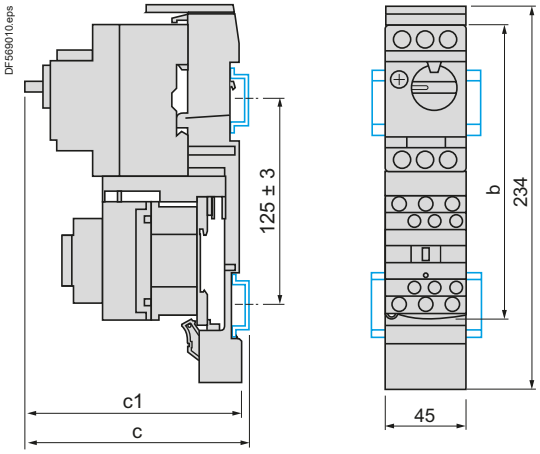
GV2AF4 + LAD311

Combination GV2ME + TeSys d contactor



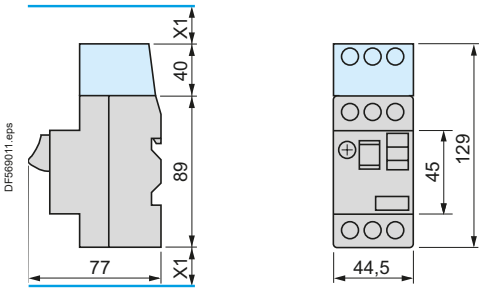
GV2ME +	LC1D09…D18	LC1D25 and D32
b	176.4	186.8
c1	130.1	136.4
c	135.6	141.9
d1	107	107
d	112.5	112.5

Combination GV2P + TeSys d contactor



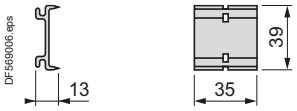
GV2P +	LC1D09…D18	LC1D25 and D32
b	176.4	186.8
c1	136.5	142.4
c	141.6	147.9

GV2ME + GV1L3 (current limiter)



X1 = 10 mm for Ue = 230 V
or 30 mm for 230 V < Ue ≤ 690 V

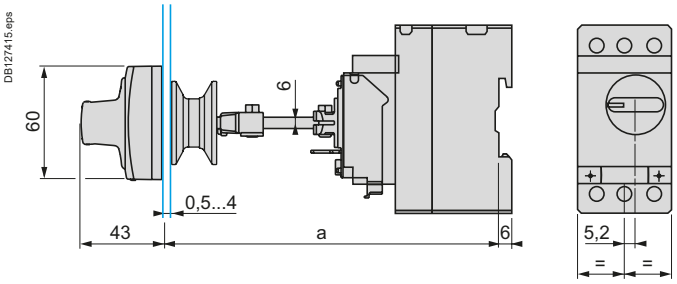
7.5 mm height compensation plate GV1F03



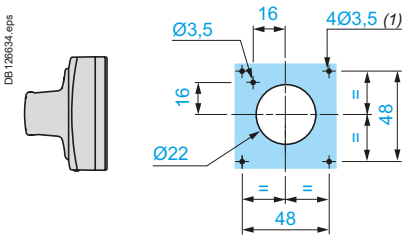
Ref.
Circuit breakers

Mounting

Mounting of external operator GV2APN01, GV2APN02 or GV2APN04 for motor circuit breakers GV2P

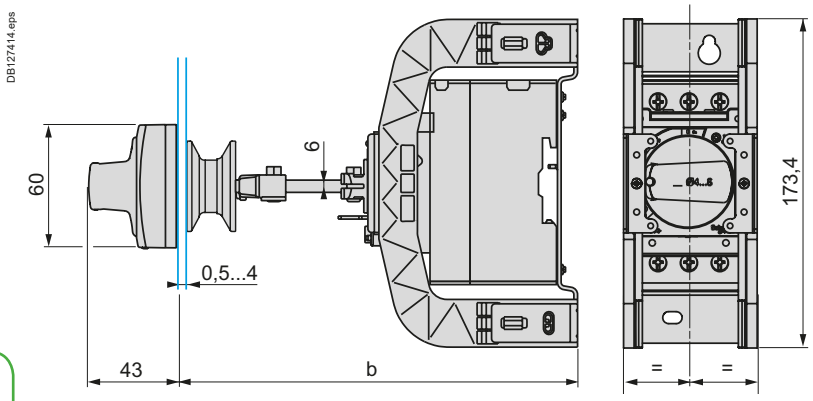


Door cut-out

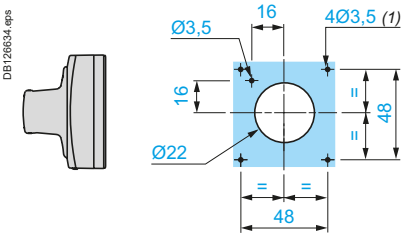


(1) For IP65 only.

Mounting of external operator GVAPH02 for motor circuit breakers GV2P



Door cut-out



(1) For IP65 only.

	a		b	
	Mini	Maxi	Mini	Maxi
GV2APN●●	140	250		
GV2APN●● + GVAPH02			151	250
GV2APN●● + GVAPK11	250	434	-	-
GV2APN●● + GVAPH02 + GVAPK11	-	-	250	445

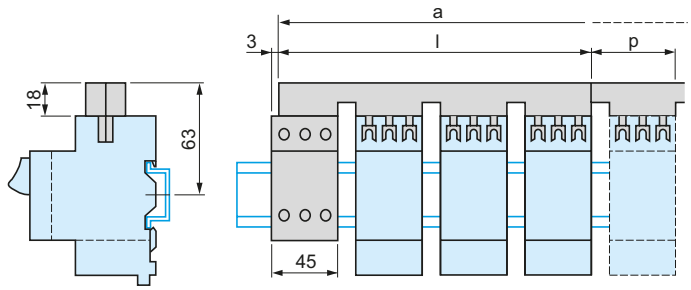
Ref.
Circuit breakers

References:
page B6/24

GV2ME, GV2P

Sets of busbars GV2G445, GV2G454, GV2G472, with terminal block GV2G05

DF569037.eps

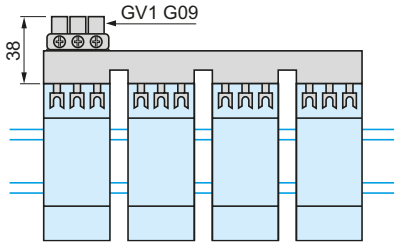


	l	p
GV2G445 (4 x 45 mm)	179	45
GV2G454 (4 x 54 mm)	206	54
GV2G472 (4 x 72 mm)	260	72

	a			
Number of tap-offs	**5**	**6**	**7**	**8**
GV2G445	224	269	314	359
GV2G454	260	314	368	422
GV2G472	332	404	476	548

Sets of busbars GV2G●●● with terminal block GV1G09

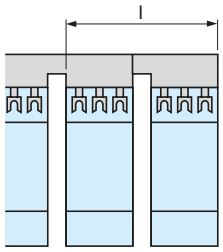
DF569028.eps



	l
GV2G245 (2 x 45 mm)	89
GV2G254 (2 x 54 mm)	98
GV2G272 (2 x 72 mm)	116

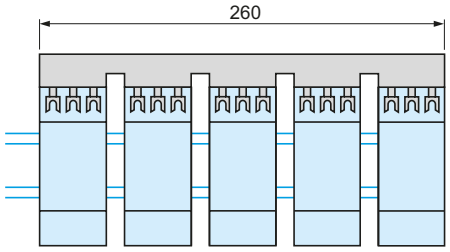
Sets of busbars GV2G245, GV2G254, GV2G272

DF569038.eps



Sets of busbars GV2G554

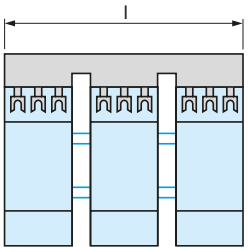
DF569039.eps



	l
GV2G345 (3 x 45 mm)	134
GV2G354 (3 x 54 mm)	152

Sets of busbars GV2G345 and GV2G354

DF569040.eps

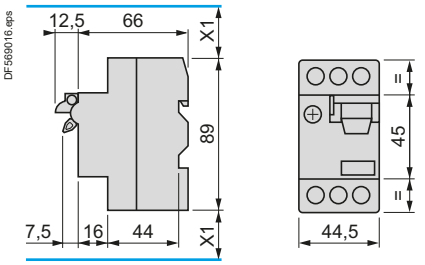


References:
page B6/23

Dimensions and mounting

GV2RT

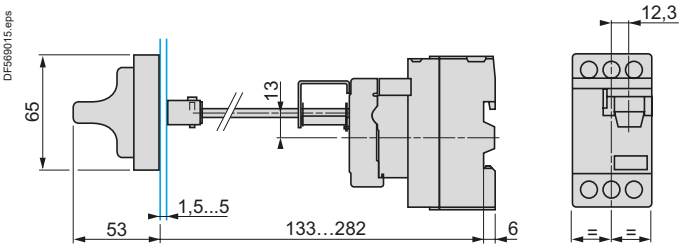
Dimensions



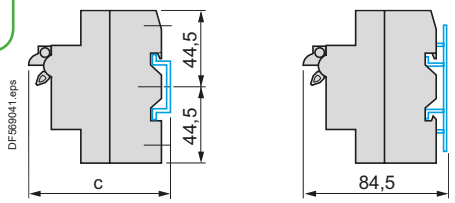
X1: Electrical clearance = 40 mm for Ue < 690 V

Mounting

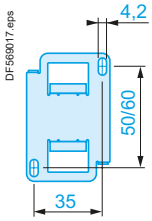
Mounting of external operator GV2AP03



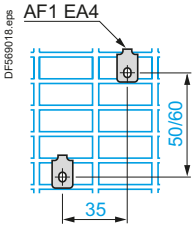
On 35 mm ⎓ rail



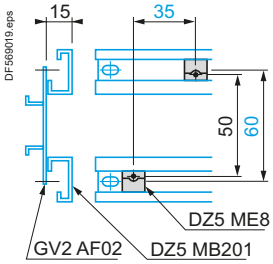
On panel with adapter plate GV2AF02



On pre-slotted plate AM1PA



On rails DZ5MB



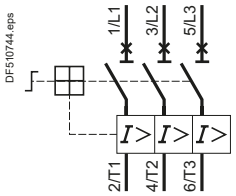
c = 80 on AM1DP200 (35 x 7.5)
c = 88 on AM1DE200, ED200 (35 x 15)

Ref.
Circuit breakers

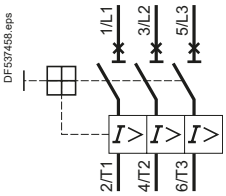
Schemes

Schemes

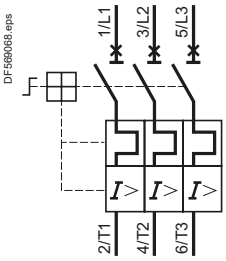
GV2L●●



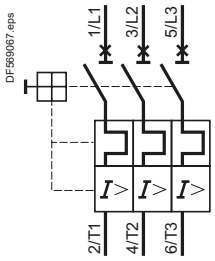
GV2LE●●



GV2P●●

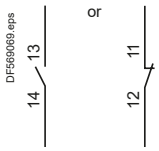


GV2ME●● and GV2RT

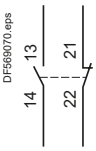


Front mounting add-on contact blocks Instantaneous auxiliary contacts

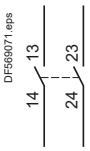
GVAE1



GVAE11

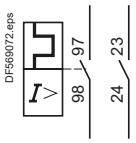


GVAE20

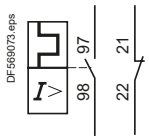


Front mounting add-on contact blocks Instantaneous auxiliary contacts and fault signalling contacts

GVAED101

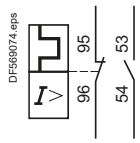


GVAED011

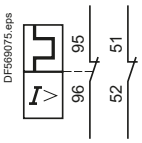


Side mounting add-on contact blocks Instantaneous auxiliary contacts and fault signalling contacts

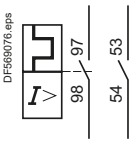
GVAD0110



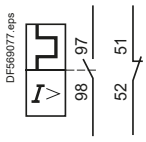
GVAD0101



GVAD1010

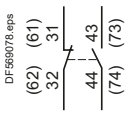


GVAD1001

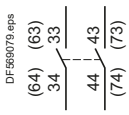


Instantaneous auxiliary contacts

GVAN11

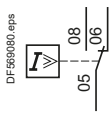


GVAN20



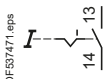
Short-circuit signalling contacts

GVAM11

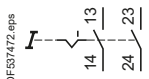


Start-Stop signalling contact blocks

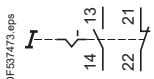
GK2AX10



GK2AX20

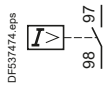


GK2AX50

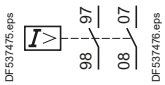


Fault signaling contact blocks

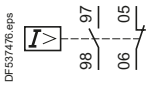
GK2AX12



GK2AX22

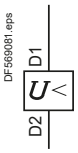


GK2AX52

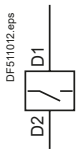


Voltage trips

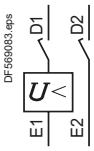
GVAU●●●



GVAS●●●

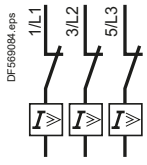


GVAX●●●

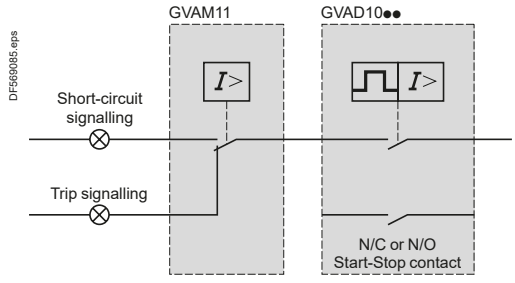


Current limiter

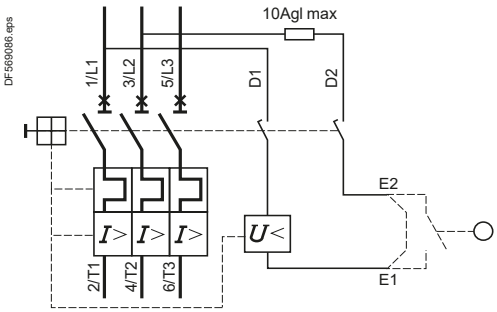
GV1L3



Use of fault signalling contact and short-circuit signalling contact



Connection of undervoltage trip for dangerous machines (conforming to INRS) on GV2ME only



References:
pages B6/11 to B6/24

TeSys GV3

5 to 45 kW



Characteristics

Environment

Circuit breaker type				GV3L	GV3P
Conforming to standards				IEC/EN 60947-4-1 IEC/EN 60947-2	IEC/EN 60947-4-1 IEC/EN 60947-2 UL 60947-4-1 CSA C22.2 n° 60947-4-1
Product certifications				CCC, EAC, BV, LROS, DNV-GL, ABS, UL [1], CSA [2]	CCC, UL, CSA, EAC, ATEX, BV, LROS, DNV-GL, ABS
Climatic withstand				According to IACS E10	
Degree of protection (front face)	Conforming to IEC 60529	Open mounted		Against direct finger contact: IP20	
		In enclosure		-	**GV3PC01** and **GV3PC02**: IP55
Shock resistance	Conforming to IEC 60068-2-27			On: 15 gn -11 ms (On: 5 gn -11 ms for GV3L73, GV3L80, GV3P73, GV3P80) Off: 30 gn -11 ms	
Vibration resistance [3]	Conforming to IEC 60068-2-6			4 gn (5…300 Hz)	
Ambient air temperature	Storage		**°C**	-40…+80	
	Operation	Open mounted	**°C**	-20…+60 [3]	
		In enclosure	**°C**	–	-20…+40
Temperature compensation		Open mounted	**°C**	–	-20…+60
		In enclosure	**°C**	–	-20…+40
Flame resistance	Conforming to IEC 60695-2-11		**°C**	960	
Maximum operating altitude			**m**	3000	
Suitable for isolation	Conforming to IEC 60947-1 § 7-1-6			Yes	–
Resistance to mechanical impact			**J**	–	10
					IK09 (in enclosure)
Sensitivity to phase failure				Yes, conforming to IEC 60947-4-1 § 8-2-1-5-2 for GV3P	

Technical characteristics

Circuit breaker type			GV3L	GV3P
Utilisation category	Conforming to IEC 60947-2		A	–
	Conforming to IEC 60947-4-1		–	AC-3
Rated operational voltage (Ue)	Conforming to IEC 60947-2	**V**	690	
Rated insulation voltage (Ui)	Conforming to IEC 60947-2	**V**	690	
Rated voltage	Conforming to UL 60947-4-1, CSA C 22.2 n° 60947-4-1	**V**		600
Rated operational frequency	Conforming to IEC 60947-4-1 UL, CSA	**Hz**	50/60	
Rated impulse withstand voltage (U imp)	Conforming to IEC 60947-2	**kV**	6	
Total power dissipated per pole		**W**	8	
Mechanical durability (C.O.: Close, Open)		**C.O.**	50 000	
Electrical durability for AC-3 duty	415 V In	**C.O.**	50 000 (20 000 for GV3L73, GV3P73, GV3L80, GV3P80)	
Duty class (maximum operating rate)		**C.O./h**	25	
Maximum conventional rated thermal current (Ith)	Conforming to IEC 60947-4-1	**A**	–	13 to 80
Rated duty	Conforming to IEC 60947-4-1			Continuous duty
Operating threshold of magnetic trips			14 I max	

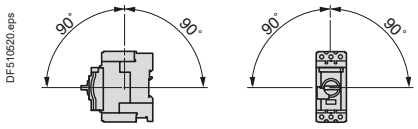
*(1) For **GV3L25** to **73**, may be followed by 6 or 1.*
*(2) For **GV3L**, **GV3L25** to **GV3L73** may be followed by 6 or 1 for use in conjunction with certified overload relay.*
(3) Leave a space of 9 mm between 2 circuit breakers: either an empty space, or side mounting add-on contact blocks. Side by side mounting is possible up to 40 °C.

Ref.
Circuit breakers

References: pages B6/26 and B6/27
Curves: pages B6/98 to B6/103
Dimensions: pages B6/107 and B6/108
Schemes: page B6/109

Mounting characteristics

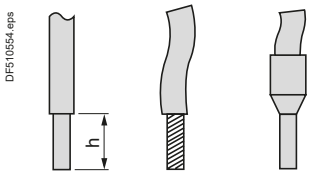
Operating position
Without derating, in relation to normal vertical mounting plane (1)



Connection characteristics

Connection to screw clamp terminals or spring terminals

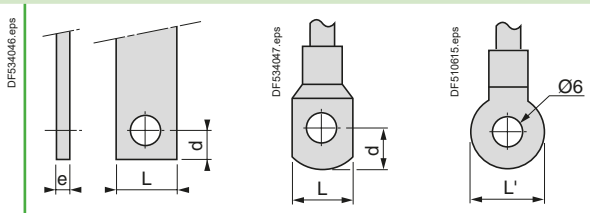
Bare cables



Circuit breaker type			GV3L		GV3P	
			Min.	Max.	Min.	Max.
Connection to screw clamp terminals (2) (Max. number of conductors x c.s.a.)	Solid cable	mm²	2 x 1	1 x 25 and 1 x 35	2 x 1	1 x 25 and 1 x 35
	Flexible cable without cable end	mm²	2 x 1	1 x 25 and 1 x 35	2 x 1	1 x 25 and 1 x 35
	Flexible cable with cable end	mm²	2 x 1	1 x 25 and 1 x 35	2 x 1	1 x 25 and 1 x 35
Tightening torque		N.m	5	5: 25 mm² 8: 35 mm²	5	5: 25 mm² 8: 35 mm²

Connection by bars or lugs

Bars or lugs



Circuit breaker type			GV3L●●6	GV3P●●6
Pitch	Without spreaders	mm	17.5	
	With spreaders	mm	–	
Bars or cables with lugs	e	mm	≤ 6	
	L	mm	≤ 13.5	
	L'	mm	≤ 16.5	
	d	mm	≤ 10	
Screws			M6	
	Tightening torque	N.m	6	
Bare cables (copper or aluminium) with connectors	Height (h)	mm	–	
	C.s.a.	mm²	–	
	Tightening torque	N.m	–	

(1) When mounting on a vertical rail, fit a stop to prevent any slippage.
*(2) For motor circuit breakers **GV3P**: BTR hexagon socket head screws, **Ever**Link® system. Require use of an insulated Allen key, in compliance with local electrical wiring regulations.*
*(3) For cross-sections 1 to 1.5 mm², the use of an **LA9D99** cable end reducer is recommended.*

Ref.
Circuit breakers

Characteristics

Breaking capacity of GV3L

Type				GV3L25	GV3L32	GV3L40	GV3L50	GV3L65	GV3L73	GV3L80
Breaking capacity of the circuit-breaker only or of the circuit-breaker combined with a thermal overload relay	230/240 V	Icu	**kA**	100	100	100	100	100	65	65
		Ics % (1)		100	100	100	100	100	100	100
	400/415 V	Icu	**kA**	100	100	50	50	50	50	50
		Ics % (1)		100	100	100	100	100	60	60
	440 V	Icu	**kA**	50	50	50	50	50	50	50
		Ics % (1)		100	100	100	100	100	60	60
	500 V	Icu	**kA**	12	12	12	12	12	12	12
		Ics % (1)		50	50	50	50	50	50	50
	690 V	Icu	**kA**	6	6	6	6	6	6	6
		Ics % (1)		50	50	50	50	50	50	50
Associated fuses (if required) for use with circuit breaker only or circuit breaker combined with a thermal overload relay if Isc > breaking capacity	230/240 V	aM	**A**	★	★	★	★	★	★	★
		gG	**A**	★	★	★	★	★	★	★
	415 V	aM	**A**	★	★	★	★	125	125	125
		gG	**A**	★	★	★	★	160	160	160
	440 V	aM	**A**	63	80	125	125	125	125	125
		gG	**A**	80	100	160	160	160	160	160
	500 V	aM	**A**	63	63	63	63	80	80	80
		gG	**A**	80	80	80	80	100	100	100
	690 V	aM	**A**	50	50	50	50	63	63	63
		gG	**A**	63	63	63	63	80	80	80
Use of circuit breakers without fuses				Minimum cable length (in metres) limiting the maximum short-circuit current to 35 kA maximum.						
	Cable c.s.a.		**mm²**	**≤ 25**	**35**	**50**	**70**	**95**	- (2)	- (2)
	Isc (rms) 3-phase, incoming (Ue = 415 V)	50 kA	**m**	5	6	8	10	13	- (2)	- (2)
		45 kA	**m**	5	5	7	8	10	- (2)	- (2)
		40 kA	**m**	5	5	5	5	8	- (2)	- (2)
		37 kA	**m**	5	5	5	5	5	- (2)	- (2)

★ *Fuse not required: breaking capacity Icn > Isc.*
(1) As % of Icu.
(2) Please consult your Regional Sales Office.

Ref.
Circuit breakers

Characteristics

Breaking capacity of GV3P

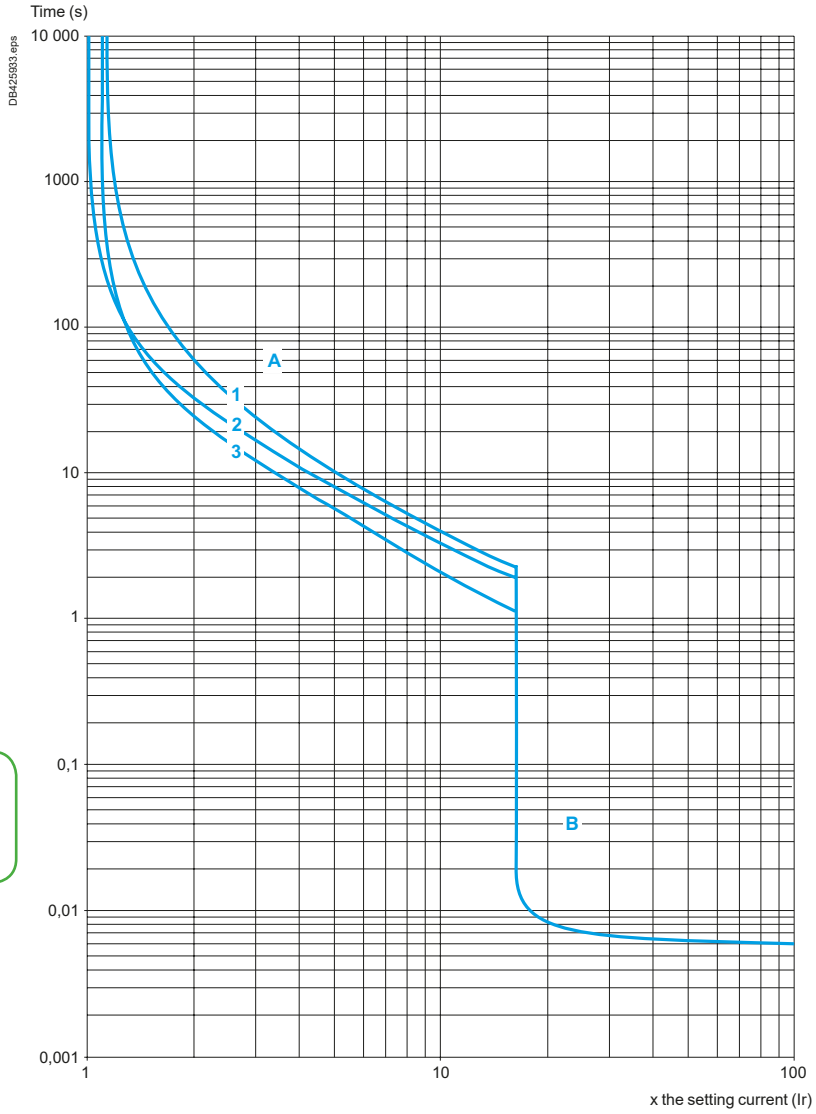
Motor circuit breaker type				GV3P								
				13	18	25	32	40	50	65	73	80
Rating			**A**	**13**	**18**	**25**	**32**	**40**	**50**	**65**	**73**	**80**
Breaking capacity conforming to IEC 60947-2	230/240 V	Icu	**kA**	100	100	100	100	100	100	100	100	100
		Ics % (1)		100	100	100	100	100	100	100	100	100
	400/415 V	Icu	**kA**	100	100	100	100	50	50	50	50	50
		Ics % (1)		100	100	100	100	100	100	100	60	60
	440 V	Icu	**kA**	50	50	50	50	50	50	50	50	50
		Ics % (1)		100	100	100	100	100	100	100	60	60
	500 V	Icu	**kA**	12	12	12	12	12	12	12	12	12
		Ics % (1)		50	50	50	50	50	50	50	50	50
	690 V	Icu	**kA**	6	6	6	6	6	6	6	6	6
		Ics % (1)		50	50	50	50	50	50	50	50	50
Associated fuses, if required if Isc > breaking capacity Icu	230/240 V	aM	**A**	★	★	★	★	★	★	★	★	★
		gG	**A**	★	★	★	★	★	★	★	★	★
	415 V	aM	**A**	★	★	★	★	125	125	125	125	125
		gG	**A**	★	★	★	★	160	160	160	160	160
	440 V	aM	**A**	63	80	125	125	125	125	125	125	125
		gG	**A**	80	100	160	160	160	160	160	160	160
	500 V	aM	**A**	63	63	63	63	80	80	80	80	80
		gG	**A**	80	80	80	80	100	100	100	100	100
	690 V	aM	**A**	50	50	50	50	63	63	63	63	63
		gG	**A**	63	63	63	63	80	80	80	80	80

★ *Fuse not required: breaking capacity Icn > Isc.*
(1) As % of Icu.

References: page B6/27
Curves: pages B6/101 to B6/103
Dimensions: page B6/107
Schemes: page B6/109

Tripping curves for GV3L combined with thermal overload relay LRD33

Average operating time at 20 °C without prior current flow



1 3 poles from cold state
2 2 poles from cold state
3 3 poles from hot state

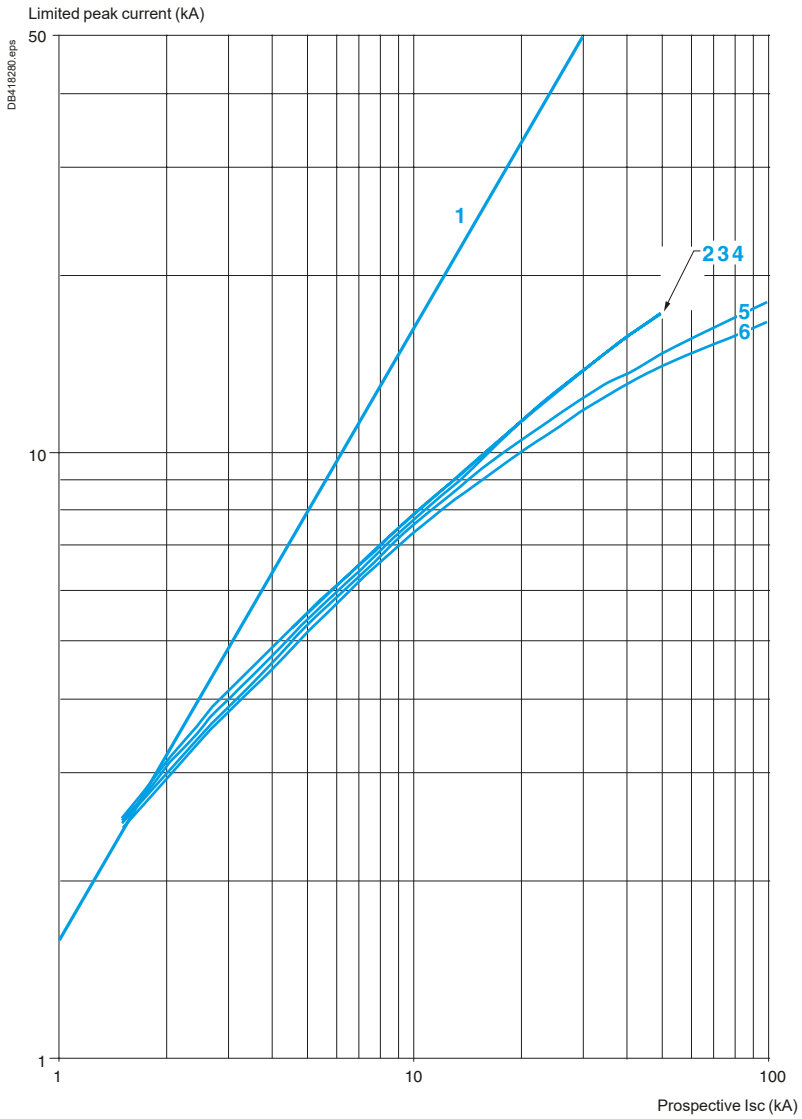
A Thermal overload relay protection zone
B GV3L protection zone

References: page B6/26
Characteristics: pages B6/94 to B6/96
Dimensions: pages B6/107 and B6/108
Schemes: page B6/109

Current limitation on short-circuit for GV3L (3-phase 400/415 V)

Dynamic stress

I peak = f (prospective Isc) at 1.05 Ue = 435 V



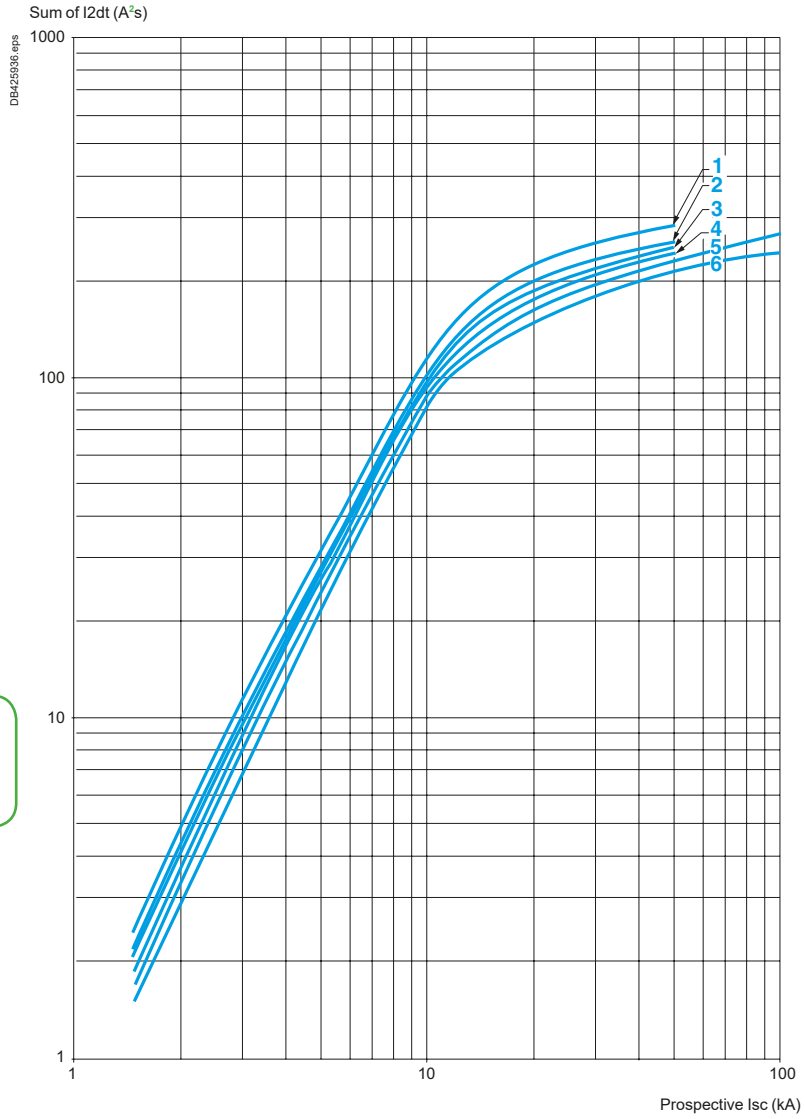
1 Maximum peak current
2 GV3L80 - GV3L73 - GV3L65
3 GV3L50
4 GV3L40
5 GV3L32
6 GV3L25

Ref.
Circuit breakers

Thermal limit on short-circuit for GV3L

Thermal limit in A^2s

Sum of I^2dt = f (prospective Isc) at 1.05 Ue = 435 V



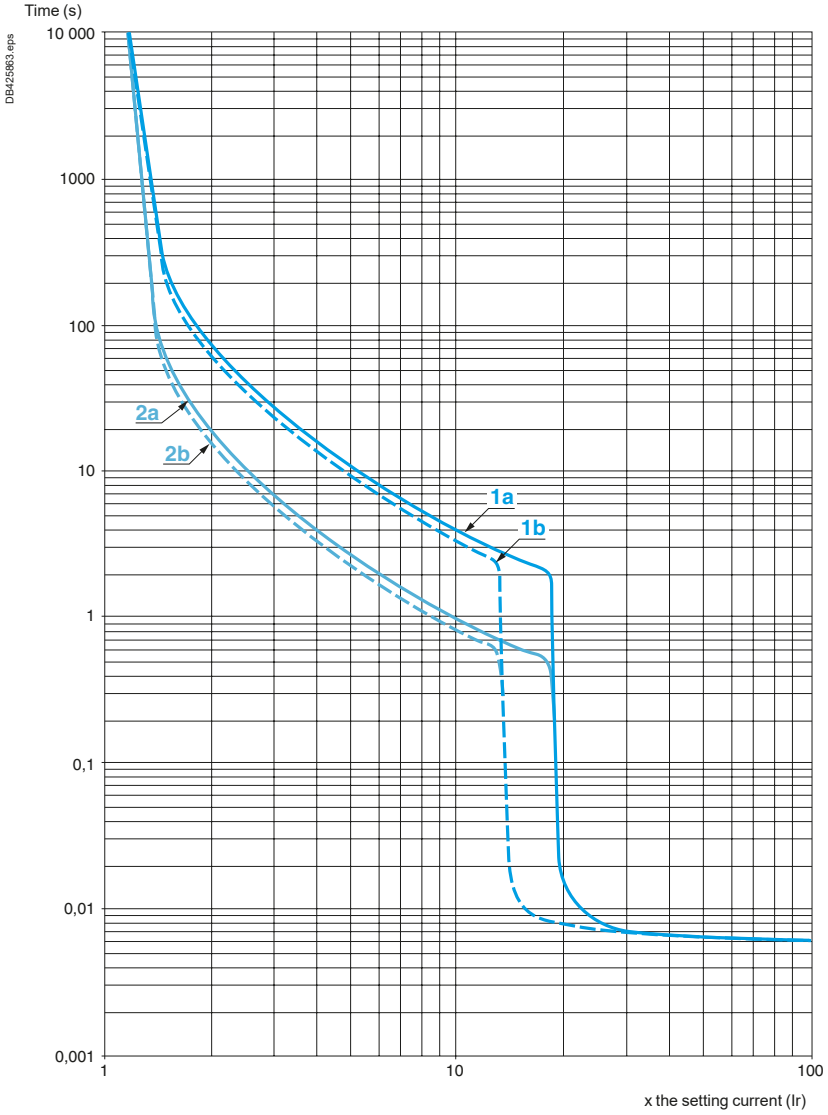
1 GV3L73 - GV3L80
2 GV3L65
3 GV3L50
4 GV3L40
5 GV3L32
6 GV3L25

Ref.
Circuit breakers

Curves

Thermal-magnetic tripping curves for GV3P

Average operating times at 20 °C related to multiples of the setting current



1a 3 poles from cold state (Ir mini.): GV3P
1b 3 poles from cold state (Ir maxi.): GV3P
2a 3 poles from hot state (Ir mini.): GV3P
2b 3 poles from hot state (Ir maxi.): GV3P

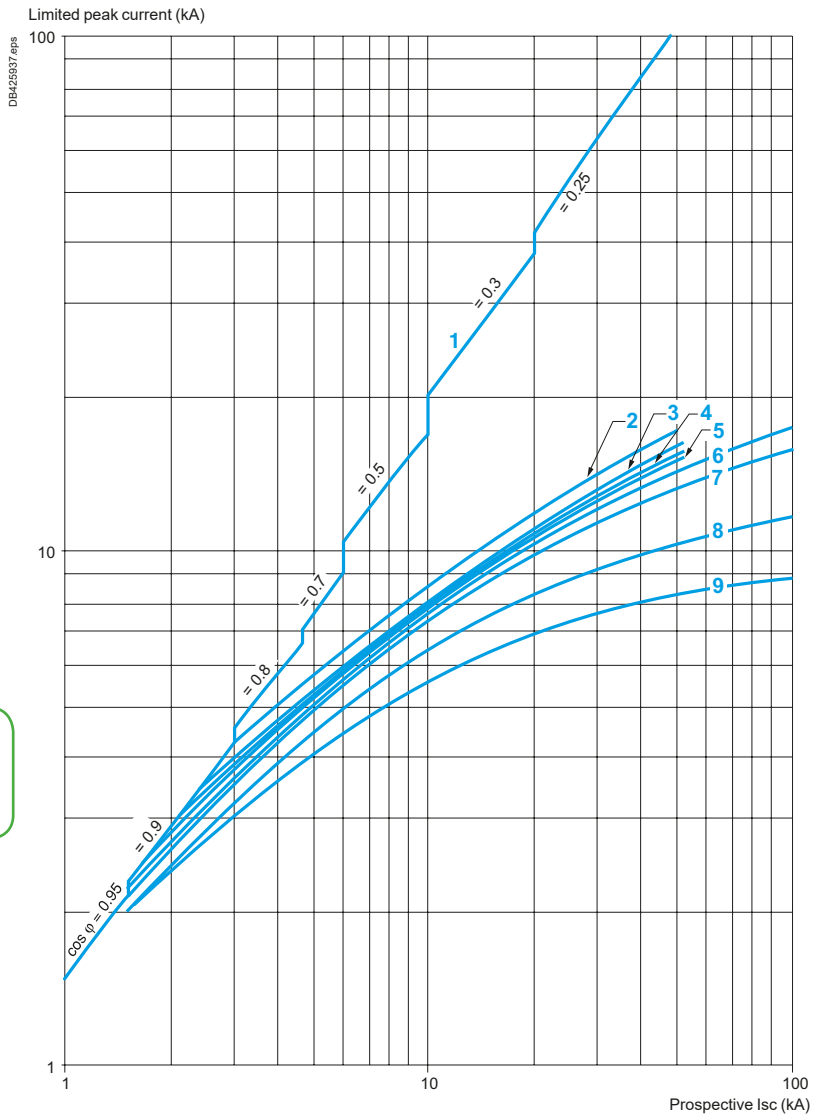
References:
page B6/27
Characteristics:
pages B6/94 to B6/97
Dimensions:
page B6/107
Schemes:
page B6/109

Curves

Current limitation on short-circuit for GV3P (3-phase 400/415 V)

Dynamic stress

I peak = f (prospective Isc) at 1.05 Ue = 435 V



1 Maximum peak current
2 70-80 A (GV3P80); 62-73 A (GV3P73)
3 48-65 A (GV3P65)
4 37-50 A (GV3P50)
5 30-40 A (GV3P40)
6 23-32 A (GV3P32)
7 17-25 A (GV3P25)
8 12-18 A (GV3P18)
9 9-13 A (GV3P13)

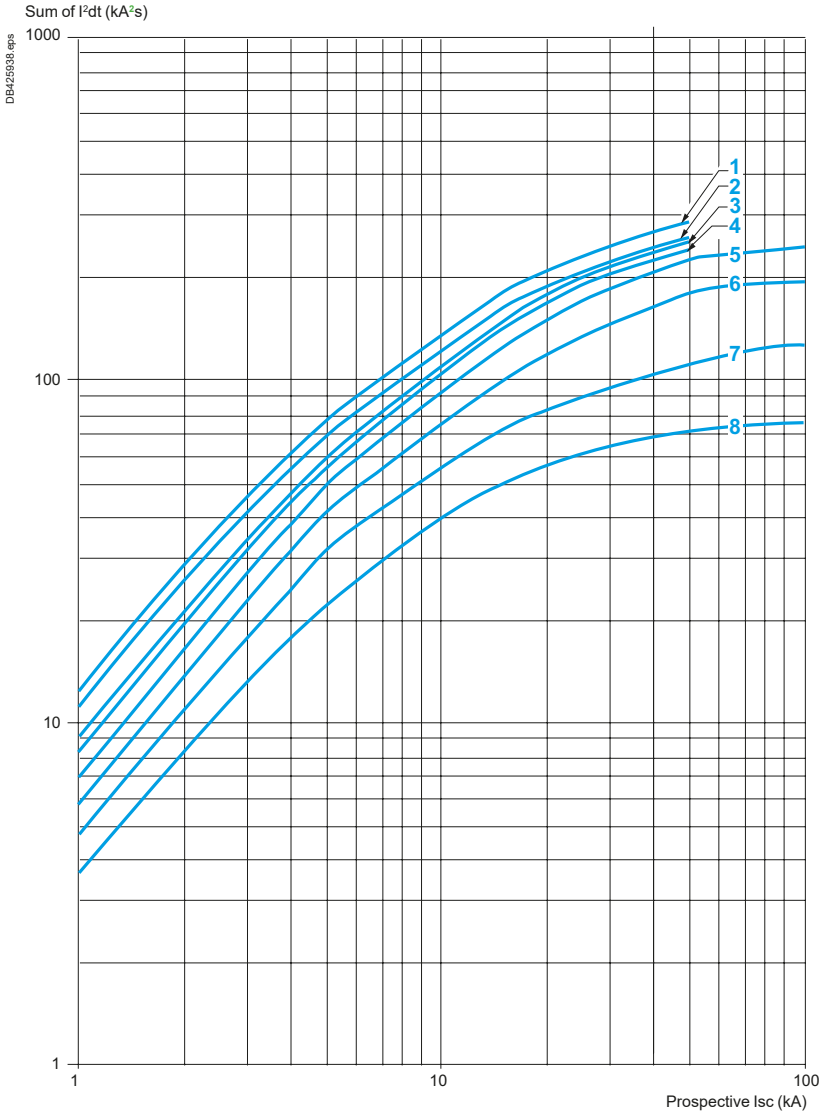
Ref.
Circuit breakers

Curves

Maximum thermal limit on short-circuit for GV3P

Thermal limit in kA²s in the magnetic operating zone

Sum of I²dt = f (prospective Isc) at 1.05 Ue = 435 V



1 70-80 (GV3P80) - 62-73 (GV3P73)
2 48-65 A (GV3P65)
3 37-50 A (GV3P50)
4 30-40 A (GV3P40)
5 23-32 A (GV3P32)
6 17-25 A (GV3P25)
7 12-18 A (GV3P18)
8 9-13 A (GV3P13)

Ref.
Circuit breakers

Characteristics

Characteristics of GV3 electric trips

Type of trip			GVAU●●● MN undervoltage trip	GVAS●●● MX shunt trip
Rated insulation voltage (Ui)	Conforming to IEC 60947-1	**V**	690	690
	Conforming to CSA C22-2 n°14, UL 508	**V**	600	600
Operational voltage (Ue)	Conforming to IEC 60947-1	**V**	0.85...1.1 Uc	0.7...1.1 Uc
Drop-out voltage		**V**	0.7...0.35 Uc	0.75...0.2 Uc
Inrush consumption	~ ⎓	**VA**	12	14
Sealed consumption	~ ⎓	**VA**	3.5	5
Operating time	Conforming to IEC 60947-1	**ms**	From the moment the voltage reaches its operational value until opening of the circuit breaker. 10...15	
On-load factor			100 %	
Cabling (spring connection)	Number of conductors		2 or 4	
	Solid cable	**mm²**	1...2.5	
	Flexible cable without cable end	**mm² AWG**	0.75...2.5	
	Flexible cable with cable end	**mm²**	0.75...2.5	
Tightening torque		**N.m**	1.4 max	
Mechanical durability (C.O.: Close - Open)		**C.O.**	10000 (GV3P and GV3L)	

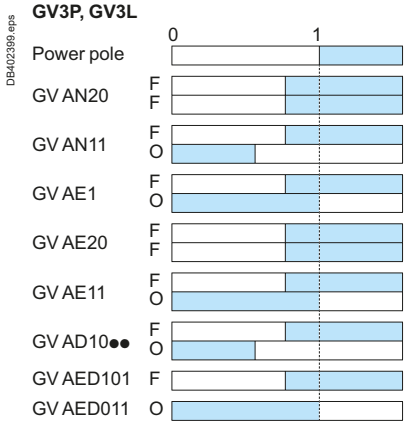
References: page B6/29
Dimensions: page B6/107
Schemes: page B6/109

Characteristics

Type of contacts			Instantaneous auxiliary GVAN, GVAD							Fault signalling GVAD, GVAM11 (1)				Instantaneous auxiliary GVAE			
Rated insulation voltage (Ui) (associated insulation coordination)	Conforming to IEC 60947-1	**V**	690							690				250 (690 in relation to main circuit)			
	Conforming to UL 60947-4-1, CSA C22.2 n° 60947-4-1	**V**	600							300				300			
Conventional thermal current (Ith)	Conforming to IEC 60947-5-1	**A**	6							2.5				2.5			
	Conforming to UL 60947-5-1, CSA C22.2 n° 60947-5-1	**A**	5							1				1			
Mechanical durability (C.O.: Close - Open)		**C.O.**	100 000							1000				100 000			
Operational power and current conforming to IEC 60947-5-1. a.c. operation			AC-15/100 000 C.O.							AC-14/1000 C.O.				AC-15/100 000 C.O.			
	Rated operational voltage (Ue)	**V**	**48**	**110 127**	**230 240**	**380 415**	**440**	**500**	**690**	**24**	**48**	**110 127**	**230 240**	**24**	**48**	**110 127**	**230 240**
Operation	Operational power, normal conditions	**VA**	300	500	720	850	650	500	400	36	48	72	72	48	60	120	120
	Occasional breaking and making capacities, abnormal conditions	**kVA**	3	7	13	15	13	12	9	0.22	0.3	0.45	0.45	0.48	0.6	1.27	2.4
	Rated operational current (Ie)	**A**	6	4.5	3.3	2.2	1.5	1	0.6	1.5	1	0.5	0.3	2	1.25	1	0.5
Operational power and current conforming to IEC 60947-5-1. d.c.			DC-13/100 000 C.O.							DC-13/1000 C.O.				DC-13/100 000 C.O.			
	Rated operational voltage (Ue)	**V**	**24**	**48**	**60**	**110**	**240** (2)	**–**	**–**	**24**	**48**	**60**	**–**	**24**	**48**	**60**	**–**
Operation	Operational power, normal conditions	**W**	140	240	180	140	120	–	–	24	15	9	–	24	15	9	–
	Occasional breaking and making capacities, abnormal conditions	**W**	240	360	240	210	180	–	–	100	50	50	–	100	50	50	–
	Rated operational current (Ie)	**A**	6	5	3	1.3	0.5	–	–	1	0.3	0.15	–	1	0.3	0.15	–
Low power switching reliability of contact			**GVAE**: Number of failures for “n” million operating cycles (17 V-5 mA): = 10^{-6}														
Minimum operational conditions d.c. operation		**V**	17														
		mA	5														
Short-circuit protection			By **GB2CB●●** circuit breaker (rating according to operational current for Ue ⩽ 415 V) or by gG fuse 10 A max											**GB2CB06** or gG fuse 10 A max			
Cabling, screw clamp terminals	Number of conductors		**1**			**2**											
	Solid cable	**mm²**	1…2.5			1…2.5											
	Flexible cable without cable end	**mm²**	0.75…2.5			0.75…2.5											
	Flexible cable with cable end	**mm²**	0.75…1.5			0.75…1.5											
	Tightening torque	**N.m**	1.4 max			1.4 max											
Cabling, spring terminal connections			**GVAN** only														
	Flexible cable without cable end	**mm²**	0.75…2.5			0.75…2.5				–				0.75…1.5			

Operation of instantaneous auxiliary contacts

GV3P, GV3L



Operation of fault signalling contacts

GVAM11
Change of state following tripping on short-circuit.

GVAD10●● and **GVAD01●●**
Change of state following tripping on short-circuit, overload or undervoltage.

(1) For application example of fault signalling contact and short-circuit signalling contact.
*(2) Add an RC circuit type **LA4D** to the load terminals.*

References: page B6/29
Dimensions: page B6/107
Schemes: page B6/109

Characteristics

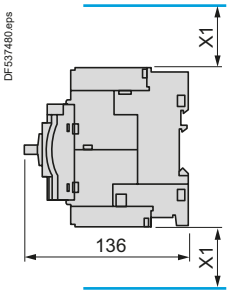
Characteristics of 3-pole busbars GV3G●●●

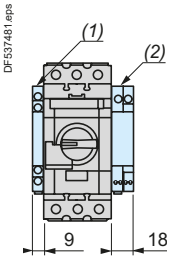
			GV3G●64
Rated insulation voltage (Ui)	Conforming to IEC 60947-1	**V**	690
Conventional thermal current (Ith)	Conforming to IEC 60439-1	**A**	115
Rated operational current (Ie)		**A**	115
Permissible peak current (I peak)		**kA**	20
Permissible thermal limit (I^2t)		**kA^2s**	300
Degree of protection	Conforming to IEC 60529		IP 20
Terminal block			–

References: page B6/29
Dimensions: page B6/107

GV3L, GV3P

Dimensions





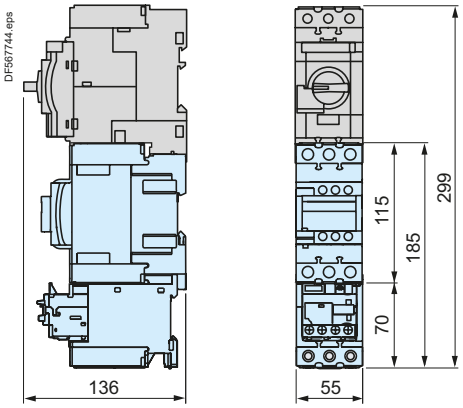
X1 = Electrical clearance (ISC max)
40 mm for Ue ⩽ 500 V, 50 mm for Ue ⩽ 690 V

*(1) Blocks **GVAN●●**, **GVAD●●** and **GVAM11**.*
*(2) Blocks **GV3AU●●** and **GV3AS●●**.*

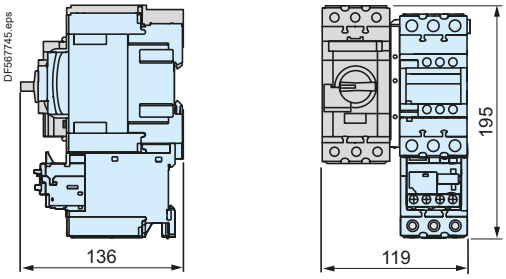
***Note:** Leave a space of 9 mm between 2 circuit breakers: either an empty space or side-mounting add-on contact blocks.*
Side by side mounting is possible up to 40 °C.

Mounting

Mounting with Tesys contactor LC1D40A…D80A and relay LR3D313…380 (1) (2) (3)

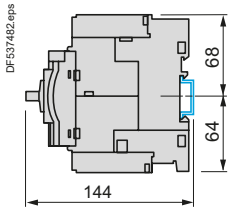


Side by side mounting with Tesys contactor LC1D40A…D73A (S-shape busbar system GV3S (1)**)**

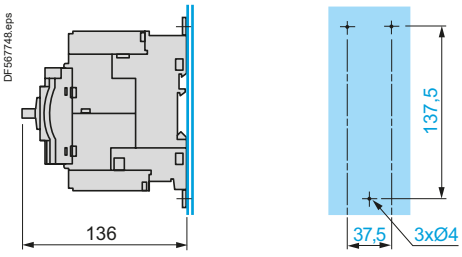


*(1) Mountings with c.b. up to **GV3L73**, **GV3P73**.*
*(2) For **GV3L80**, **GV3P80** use cable between components for dissipating heat. Consult online datasheets for values*
(3) S-shape busbar system suitable up to 73 A.

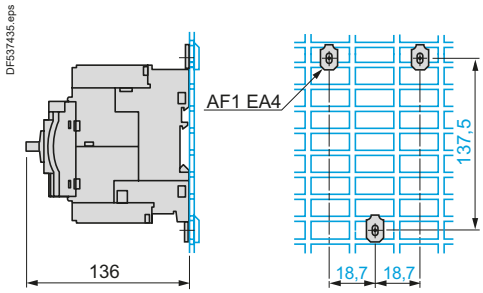
Mounting on rail AM1DE200 or AM1ED201



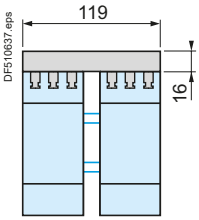
Panel mounting, using M4 screws



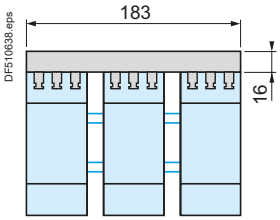
Mounting on pre-slotted plate AM1PA



Set of busbars GV3G264



Set of busbars GV3G364

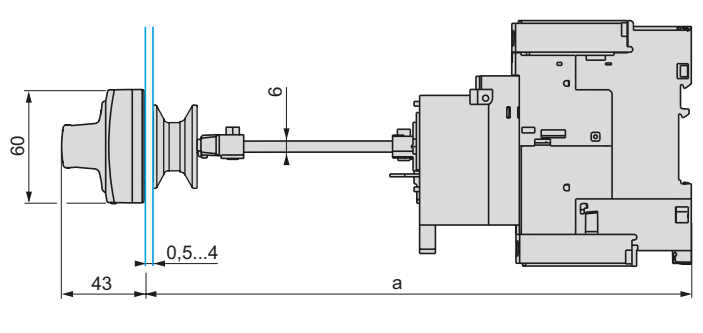


References: pages B6/26 and B6/27
Characteristics: pages B6/94 to B6/97
Curves: pages B6/98 to B6/103
Schemes: page B6/109

Mounting

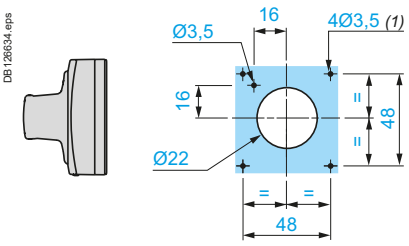
Mounting of external operator GV3APN01, GV3APN02 or GV3APN04 for motor circuit breakers GV3L

DB127416.eps



Door cut-out

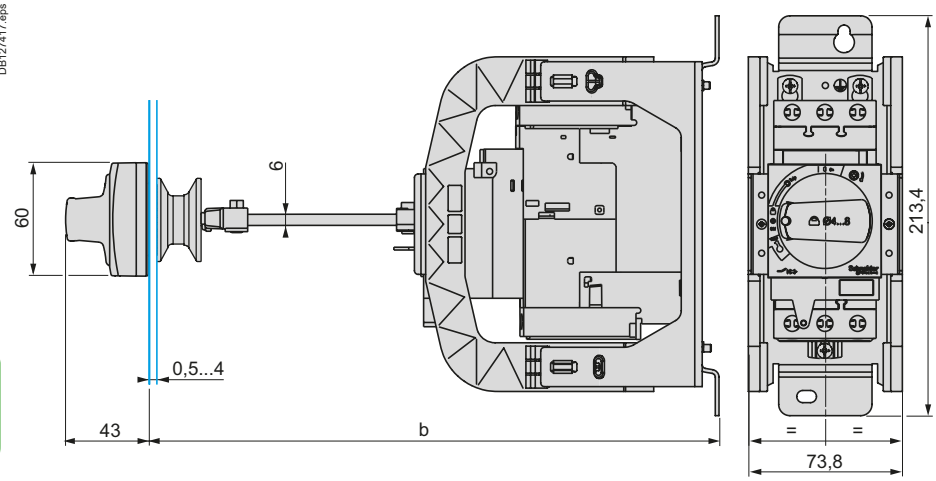
DB126634.eps



(1) For IP65 only.

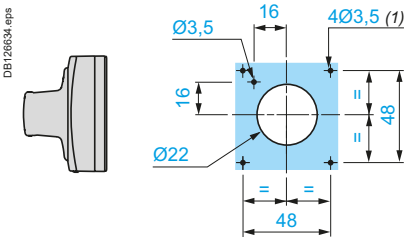
Mounting of external operator GVAPH03 for motor circuit breakers GV3L

DB127417.eps



Door cut-out

DB126634.eps



(1) For IP65 only.

	a		b	
	Mini	Maxi	Mini	Maxi
GV3APN●●	189	300	-	-
GV3APN●● + GVAPK12	300	481		
GV3APN●● + GVAPH03	-	-	200	300
GV3APN●● + GVAPH03 + GVAPK12	-	-	300	492

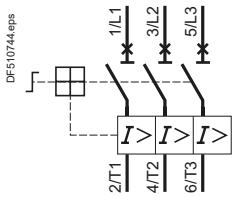
Ref.
Circuit breakers

References:
page B6/30

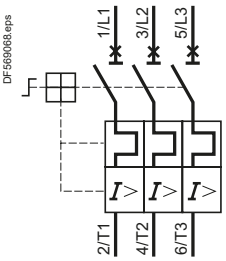
Schemes

Schemes

GV3L●●

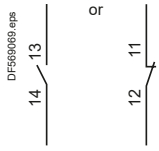


GV3P●●

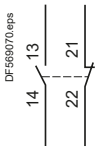


Front mounting add-on contact blocks
Instantaneous auxiliary contacts

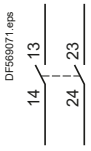
GVAE1



GVAE11

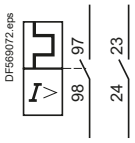


GVAE20

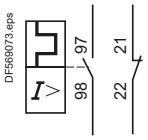


Front mounting add-on contact blocks
Instantaneous auxiliary contacts and fault signalling contacts

GVAED101

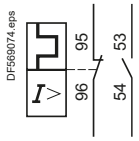


GVAED011

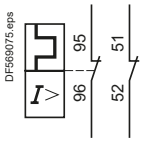


Side mounting add-on contact blocks
Instantaneous auxiliary contacts and fault signalling contacts

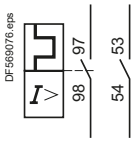
GVAD0110



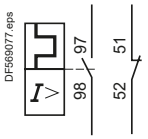
GVAD0101



GVAD1010

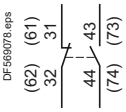


GVAD1001

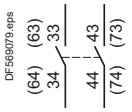


Instantaneous auxiliary contacts

GVAN11

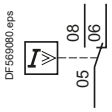


GVAN20



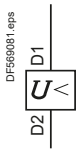
Short-circuit signalling contacts

GVAM11

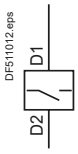


Voltage trips

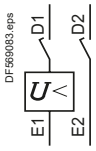
GVAU●●●



GVAS●●●

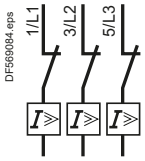


GVAX●●●

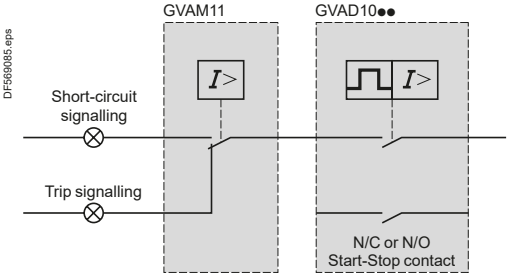


Current limiter

GV1L3

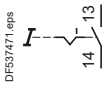


Use of fault signalling contact and short-circuit signalling contact

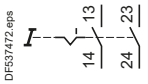


Start-Stop signalling contact blocks

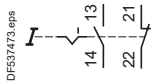
GK2AX10



GK2AX20

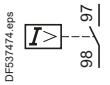


GK2AX50

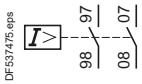


Fault signalling contact blocks

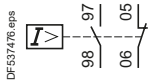
GK2AX12



GK2AX22



GK2AX52



References:
pages B6/26 to B6/29

Characteristics:
pages B6/94 to B6/97

Curves:
pages B6/98 to B6/103

Dimensions:
page B6/107

TeSys GV4

0.25 to 55 kW - 1/2 to 60 HP



Characteristics

Environment

Circuit breaker type				GV4L	GV4LE	GV4P	GV4PE	GV4PEM	GV4PB
Conforming to standards				IEC/EN 60947-1, IEC/EN 60947-2, IEC/EN 60947-4-1		IEC/EN 60947-1, IEC/EN 60947-2, IEC/EN 60947-4-1, UL 60497-4-1, CSA 22.2 n° 60497-4-1			IEC/EN 60947-2, IEC/ EN 60947-4-1
Product certifications				CCC, EAC, BV, EU-RO MR (1)		CCC, EAC, CSA (cCSAus), ATEX, BV, EU-RO MR (1)			UL 489, CSA C22.2 n°5
Climatic withstand				According to IACS E10					
Degree of protection (front face)	Conforming to IEC 60529	Open mounted		IP 40 front face except on connection area. Connection area: - IP20 with EverLink connector - IP40 with crimp lug connector and terminal shield.					
		In enclosure (2)		DRH = IP40 ERH = IP54 or IP65					
Shock resistance	Conforming to IEC 60068-2-27			15g - 11 ms		15g - 11 ms			
Vibration resistance	Conforming to IEC 60068-2-6			2.0 to 13.2 Hz and amplitude ±1 mm 13.2 to 100 Hz acceleration 0.7 g					
Ambient air temperature	Storage		°C	-50…+85					
	Operation		°C	-25…+70					
Temperature compensation			°C	Non applicable		-25…+60 (3)			
Flame resistance	Conforming to IEC 60695-2-11		°C	960					
Maximum operating altitude			m	2000 without derating. Up to 5000 with derating					
Suitable for isolation	Conforming to IEC 60947-1 § 7-1-6			Yes					
Resistance to mechanical impact			J	IK07 (2J)					
Sensitivity to phase failure				No		Yes			

Technical characteristics

Utilisation category	Conforming to IEC 60947-2		A	A	
	Conforming to IEC 60947-4-1		AC-3 (4)		
Rated operational voltage (Ue)	Conforming to IEC 60947-2	V	690		
Rated insulation voltage (Ui)	Conforming to IEC 60947-2	V	800		
Rated voltage	Conforming to CSA C22-2 n°1, UL 60947-4-1	V	Non applicable	600	
Rated operational frequency	Conforming to IEC 60947-4-1, UL, CSA	Hz	50/60		
Rated impulse withstand voltage (U imp)	Conforming to IEC 60947-2	kV	8		
Total power dissipated per pole		W	6.1	4.6	
Mechanical durability (C.O.: Closing, Opening)		C.O.	40000		
Electrical durability for AC-3/415V duty (C.O.: Closing, Opening)	415 V In	C.O.	5 000		
Duty class (maximum operating rate)		C.O./h	25		
Maximum conventional rated thermal current (Ith)	Conforming to IEC 60947-4-1	A	115		
Rated duty	Conforming to IEC 60947-4-1		Continuous duty		

(1) Refer to chapter on page A6/39 for details on Marine Classification Societies.

(2) DRH = with Direct Rotary Handle
ERH = with Extended Rotary Handle.

(3) For operation up to 70 °C, please consult your regional sales office.

(4) Up to 100 A.

Ref.
Circuit breakers

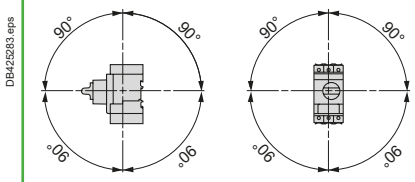
References:
pages B6/35 to B6/41

Curves:
pages B6/116 to B6/123

Dimensions, schemes:
pages B6/126 to B6/129

Mounting characteristics

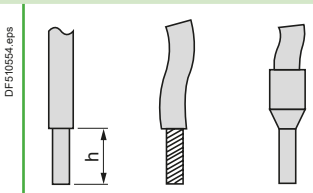
Operating position
Without derating, in relation to normal vertical mounting plane (1)



Power connection characteristics

Power connection by bare cables (EverLink connector)

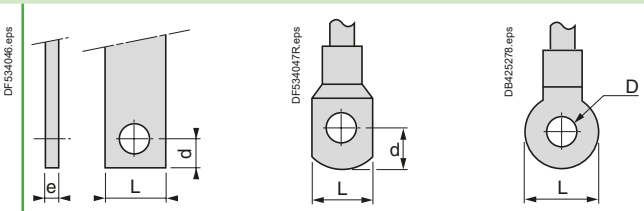
Bare cables



			Min.	Max.
Connection to screw clamp terminals (Max. number of conductors x c.s.a.)	Solid cable	**mm²** **AWG**	Cu 1 x 1.5 + 1 x 2.5 Cu 2 x 14	Cu 1 x 70 + 1 x 95 Cu 1 x 2/0 + 1 x 3/0
	Flexible cable without cable end	**mm²** **AWG**	Cu 1 x 1.5 + 1 x 2.5 Cu 2 x 6	Cu 1 x 50 + 1 x 70 Cu 1 x 1/0 + 1 x 2/0
	Flexible cable with cable end	**mm²** **AWG**	Cu 1 x 1.5 + 1 x 2.5 Cu 2 x 6	Cu 1 x 50 + 1 x 70 Cu 1 x 1/0 + 1 x 2/0
Tightening torque		**N.m**	5 ≤ 10 mm² / 8 AWG 9 ≥ 16 mm² / 6 AWG	
Stripping length (h)	Solid cable	**mm**	20	

Power connection by bars or lugs

Bars or lugs



Pitch	Without spreaders	**mm**	27
	With spreaders	**mm**	35
Bars or cables with lugs	e	**mm**	≤ 8
	L	**mm**	≤ 20
	d	**mm**	≤ 7
	D	**mm**	6.4
M6 Screws	Tightening torque	**N.m**	5 ≤ 10 mm² / 8 AWG 9 ≥ 16 mm² / 6 AWG

(1) When mounting on a vertical rail, fit a stop to prevent any slippage.

References:
pages B6/35 to B6/41
Curves:
pages B6/116 to B6/123
Dimensions, schemes:
pages B6/126 to B6/129

Characteristics

Breaking capacity of GV4L and GV4LE

Circuit breaker type				GV4L●●●B GV4LE●●●B				GV4L●●●N GV4LE●●●N								GV4LE●●●S							
Rating			A	25	50	80	115	2	3.5	7	12.5	25	50	80	115	2	3.5	7	12.5	25	50	80	115
Breaking capacity conforming to IEC 60947-2	230/240 V	Icu	kA	50				100								120							
		Ics % (1)		100				100								100							
	400/415 V	Icu	kA	25				50								100							
		Ics % (1)		100				100								100							
	440 V	Icu	kA	20				50								70							
		Ics % (1)		100				100								100							
	500 V	Icu	kA	10				25								30							
		Ics % (1)		100				100								100							
	525 V	Icu	kA	-				15								18							
		Ics % (1)		-				100								100							
	690 V	Icu	kA	-				8								10							
		Ics % (1)		-				25								25							

(1) As % of Icu.

Ref.
Circuit breakers

Characteristics

Breaking capacity of GV4P, GV4PE, GV4PB●●●B

Circuit breaker type				GV4P●●●B GV4PE●●●B GV4PEM●●●B GV4PB●●●B					GV4P●●●N GV4PE●●●N GV4PEM●●●N GV4PB●●●N								GV4P●●●S GV4PE●●●S GV4PEM●●●S GV4PB●●●S							
Rating			A	25	50	80	115		2	3.5	7	12.5	25	50	80	115	2	3.5	7	12.5	25	50	80	115
Breaking capacity conforming to IEC 60947-2	230/240 V	Icu	kA	50					100								120							
		Ics % (1)		100					100								100							
	400/415 V	Icu	kA	25					50								100							
		Ics % (1)		100					100								100							
	440 V	Icu	kA	20					50								70							
		Ics % (1)		100					100								100							
	500 V	Icu	kA	10					25								30							
		Ics % (1)		100					100								100							
	525 V	Icu	kA	-					15								18							
		Ics % (1)		-					100								100							
	690 V	Icu	kA	-					8								10							
		Ics % (1)		-					25								25							
Breaking capacity conforming to UL 60947-4-1 and CSA 22.2 n° 60947-4-1	120 V		kA	35					65								100							
	208 V		kA	35					65								100							
	240 V		kA	35					65								100							
	480Y / 277 V		kA	18					35								65							
	480 V (2)		kA	18					35								65							
	600Y / 347 V		kA	14					18								25							
	600 V (2)		kA	14					18								25							

(1) As % of Icu.
(2) Except for MCC suitable for TAP conductor protection, in motor group installation and GV4PB.

Ref.
Circuit breakers

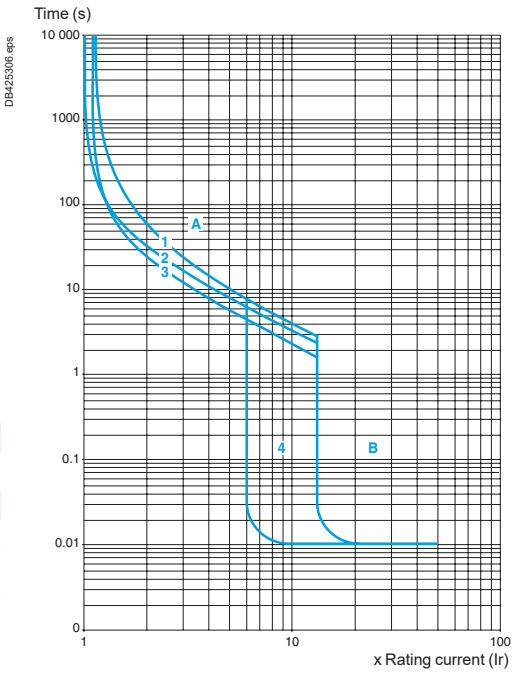
References: pages B6/37 to B6/41
Curves: pages B6/121 to B6/123
Dimensions, schemes: pages B6/126 to B6/129

Curves

Tripping curves for GV4L and GV4LE combined with thermal overload relay LRD or LR9

Average operating times at 20 ° C related to multiples of the setting current

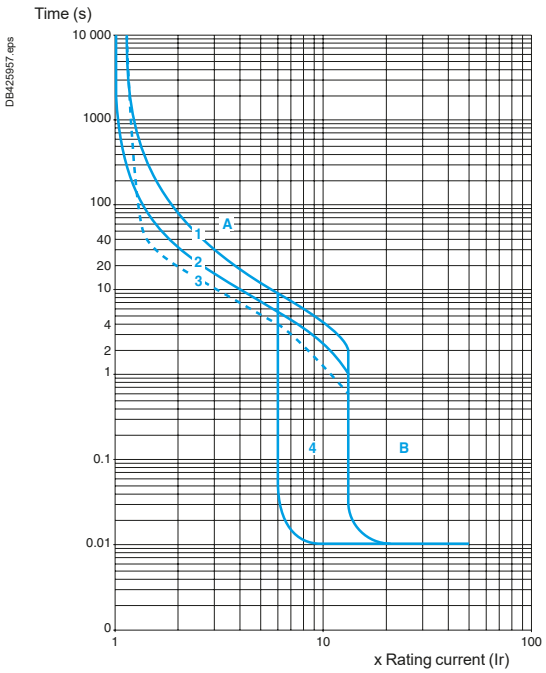
GV4L02 and GV4LE02 to 12 with LRD05 to LRD14, GV4L80 and GV4LE80 with LRD3363



1 3 poles from cold state
2 2 poles from cold state
3 3 poles from hot state
4 6 ...14 Ir

A Thermal overload relay protection zone
B GV4L protection zone

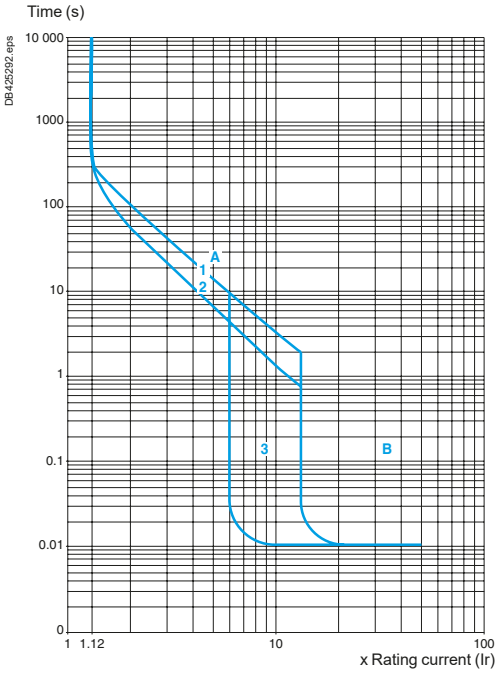
GV4L25 AND GV4LE25 with LRD318, LRD325
GV4L50 AND GV4LE50 with LRD332, LRD340, LRD350



1 3 poles from cold state
2 2 poles from cold state
3 3 poles from hot state
4 6 ...14 Ir

A Thermal overload relay protection zone
B GV4L protection zone

GV4L115 and GV4LE115 with class 10 LR9F5367, LR9D5369 and class 20 LR9D5567, LR9F5569



1 Cold state curve
2 Hot state curve
3 6 ...14 Ir

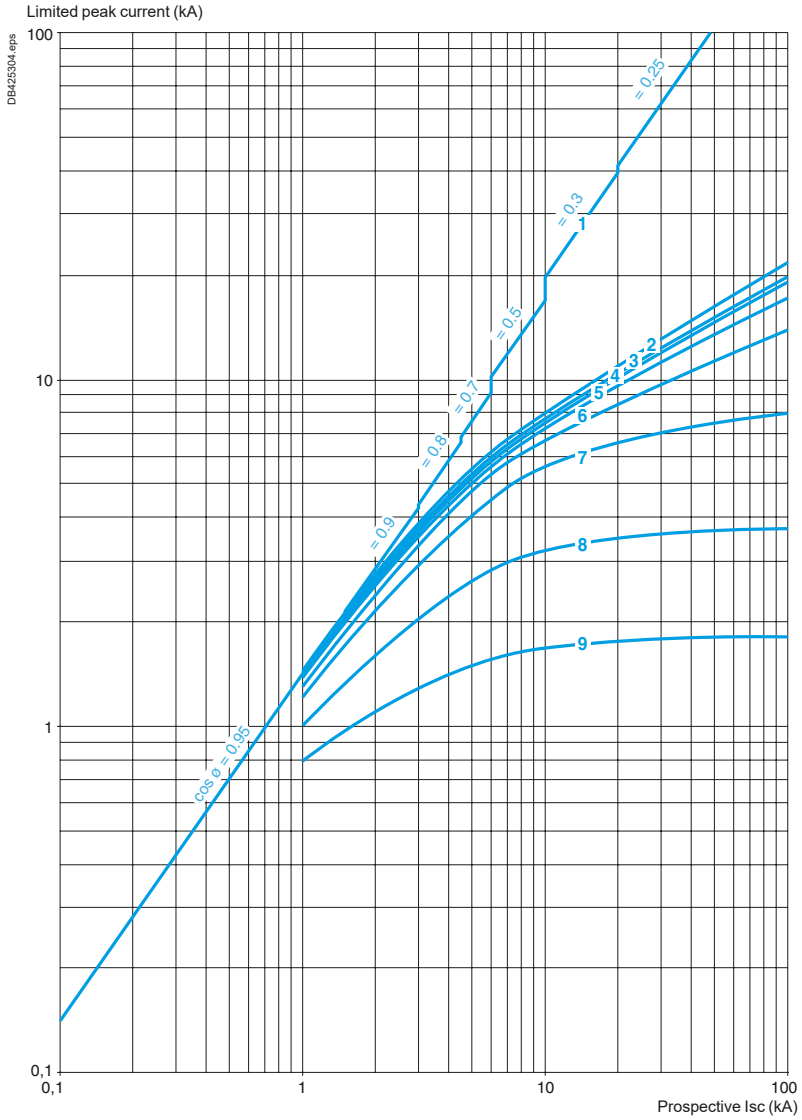
Ref.
Circuit breakers

Curves

Current limitation on short-circuit for GV4L, GV4LE (3-phase 400/415 V)

Dynamic stress

I peak = f (prospective Isc) at 1.05 Ue = 435 V



1 Maximum peak current
2 GV4L115
3 GV4L80
4 GV4L50
5 GV4L25
6 GV4L12
7 GV4L07
8 GV4L03
9 GV4L02

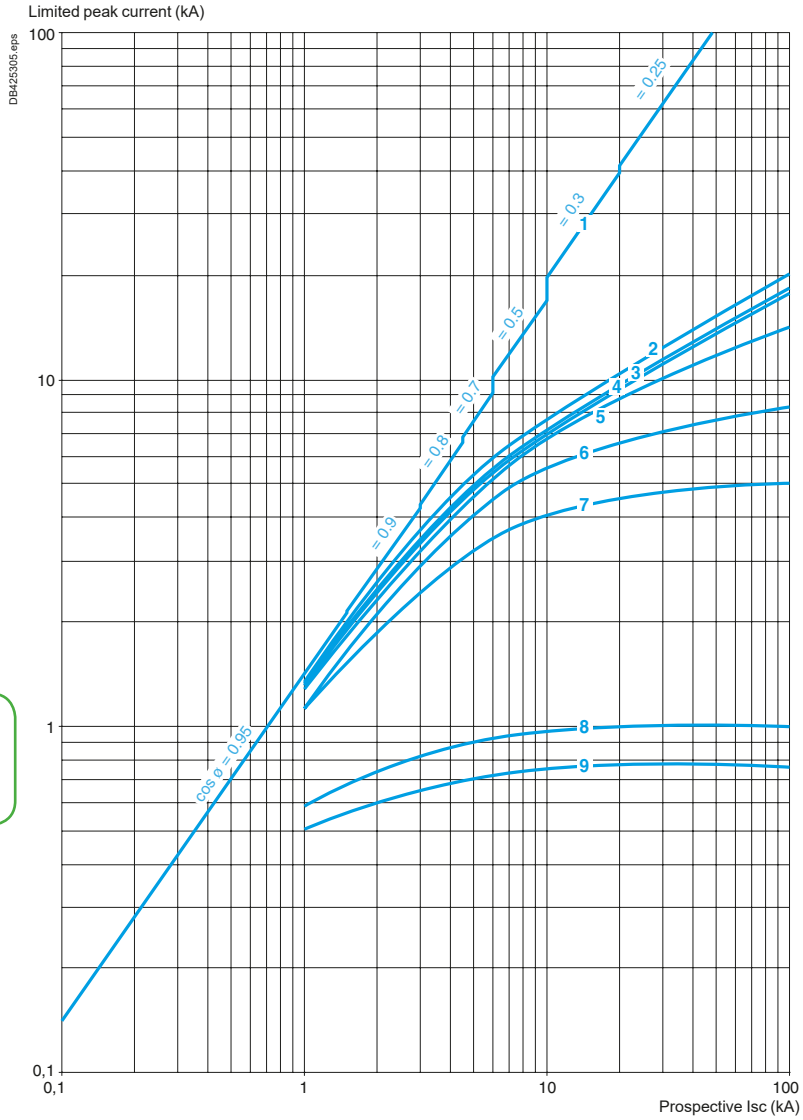
References:
page B6/35
Characteristics:
pages B6/112 to B6/114
Dimensions, schemes:
pages B6/126 to B6/129

Curves

Current limitation on short-circuit for GV4L, GV4LE + thermal overlaoad relay LRD or LR9 (3-phase 400/415 V)

Dynamic stress

I peak = f (prospective Isc) at 1.05 Ue = 435 V



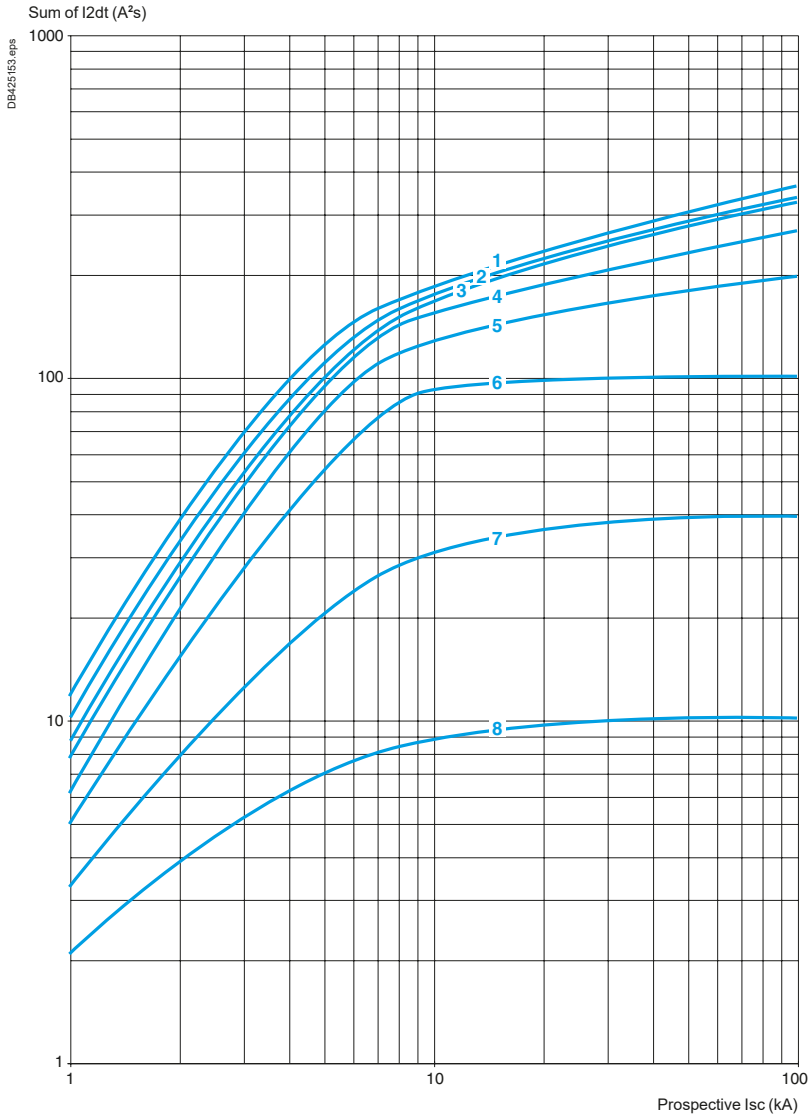
1 Maximum peak current
2 GV4L115 + LR9D5367 or LR9F5367
3 GV4L80 + LRD3361
4 GV4L50 + LRD340
5 GV4L25 + LRD325
6 GV4L12 + LRD313
7 GV4L07 + LRD12
8 GV4L03 + LRD07
9 GV4L02 + LRD07

Ref.
Circuit breakers

Thermal limit on short-circuit for GV4L, GV4LE

Thermal limit in A^2s

Sum of I^2dt = f (prospective Isc) at 1.05 Ue = 435 V



1 GV4L115
2 GV4L80
3 GV4L50
4 GV4L25
5 GV4L12
6 GV4L07
7 GV4L03
8 GV4L02

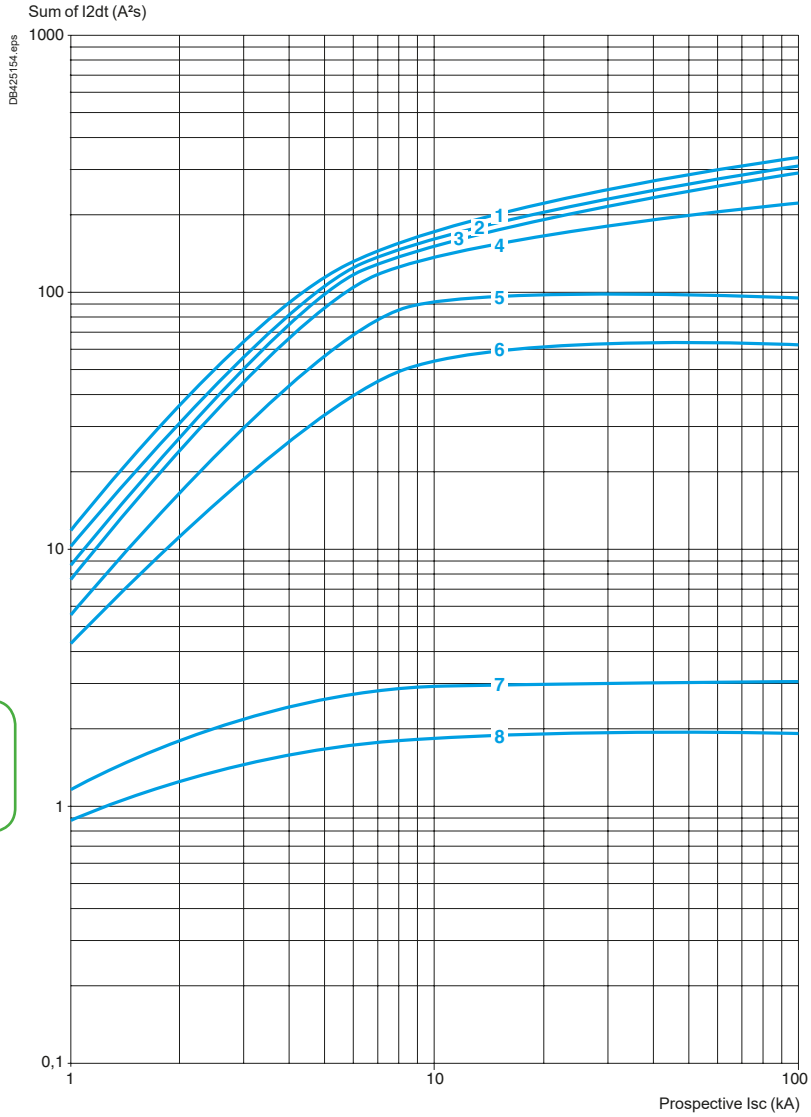
Ref.
Circuit breakers

Curves

Thermal limit on short-circuit for GV4L, GV4LE + thermal overlaoad relay LRD or LR9

Thermal limit in kA in the magnetic operating zone

Sum of I²dt = f (prospective Isc) at 1.05 Ue = 435 V



1 GV4L115 + LR9D5367 or LR9F5367
2 GV4L80 + LRD3361
3 GV4L50 + LRD340
4 GV4L25 + LRD325
5 GV4L12 + LRD313
6 GV4L07+ LRD12
7 GV4L03+ LRD07
8 GV4L02 + LRD07

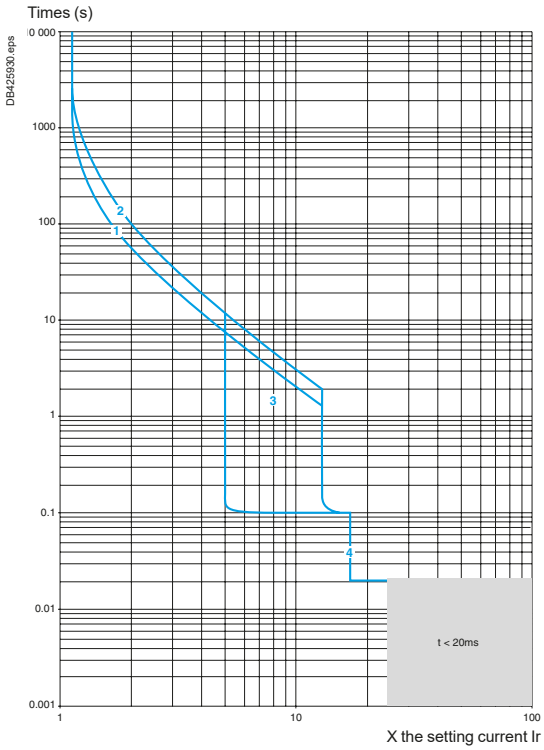
Ref.
Circuit breakers

Curves

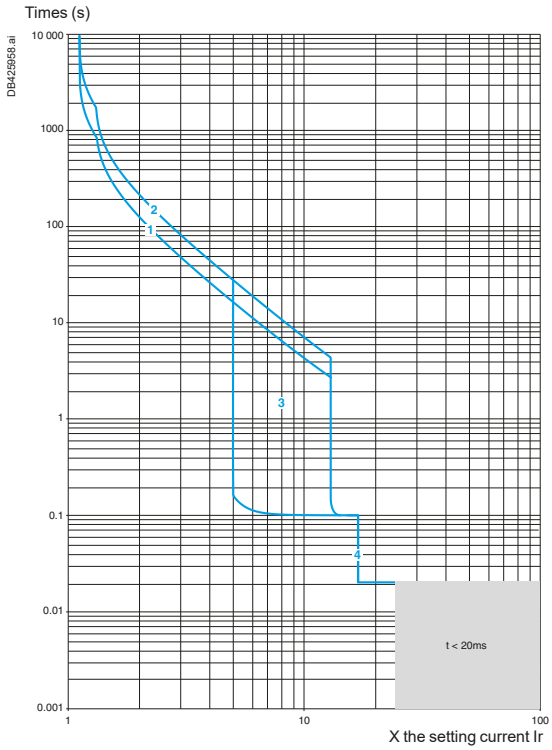
Thermal-magnetic tripping curves for GV4P, GV4PE, GV4PEM, GV4PB

Average operating times at 20 °C related to multiples of the setting current

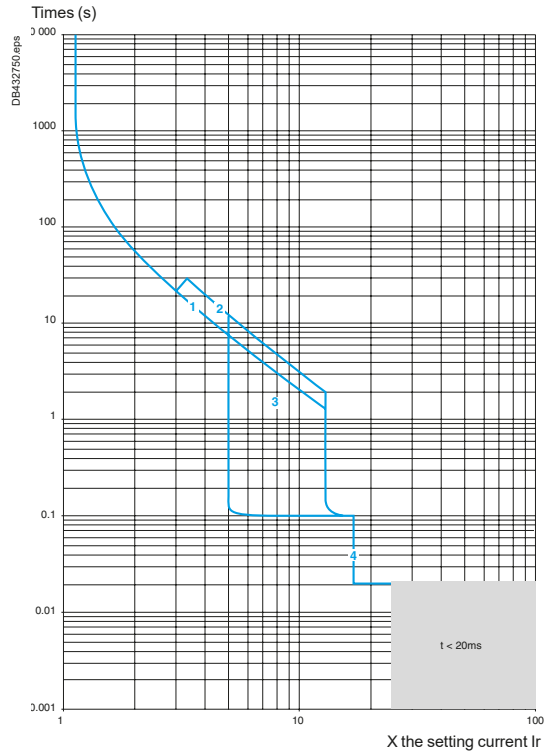
GV4P, GV4PE, GV4PEM



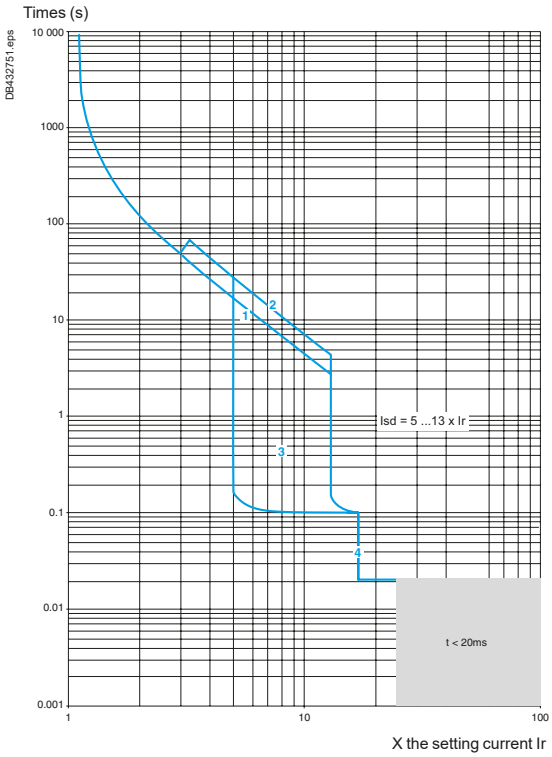
GV4P, GV4PE, GV4PEM



GV4PB



GV4PB



Hot state

1 Class 10
2 Class 20
3 Isd = 13 x Ir (GV4P - GV4PE); Isd = 5….13 x Ir (GV4PEM - GV4PB)
4 Ii = 17 In

Cold state

1 Class 10
2 Class 20
3 Isd = 13 x Ir (GV4P - GV4PE); Isd = 5…. 13 x Ir (GV4PEM - GV4PB)
4 Ii = 17 In

References:
pages B6/37 to B6/41

Characteristics:
pages B6/112 to B6/115

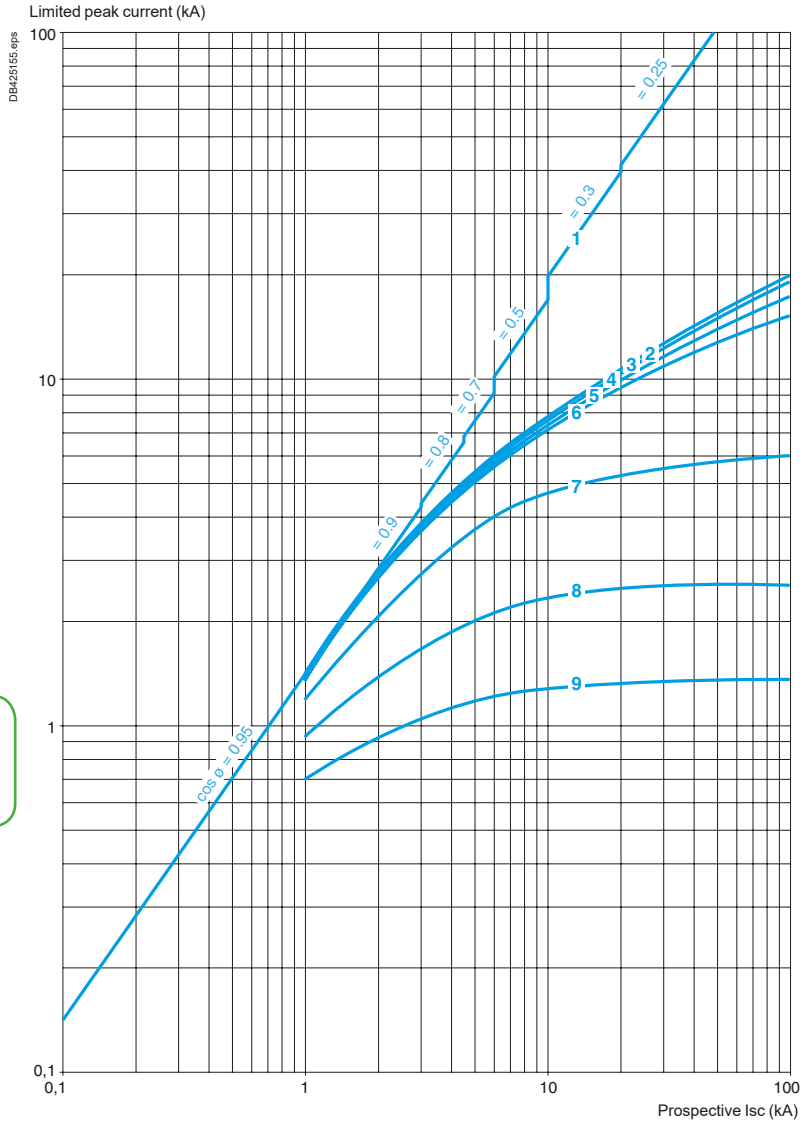
Dimensions, schemes:
pages B6/126 to B6/129

Curves

Current limitation on short-circuit for GV4P, GV4PE, GV4PEM, GV4PB (3-phase 400/415 V)

Dynamic stress

I peak = f (prospective Isc) at 1.05 Ue = 435 V



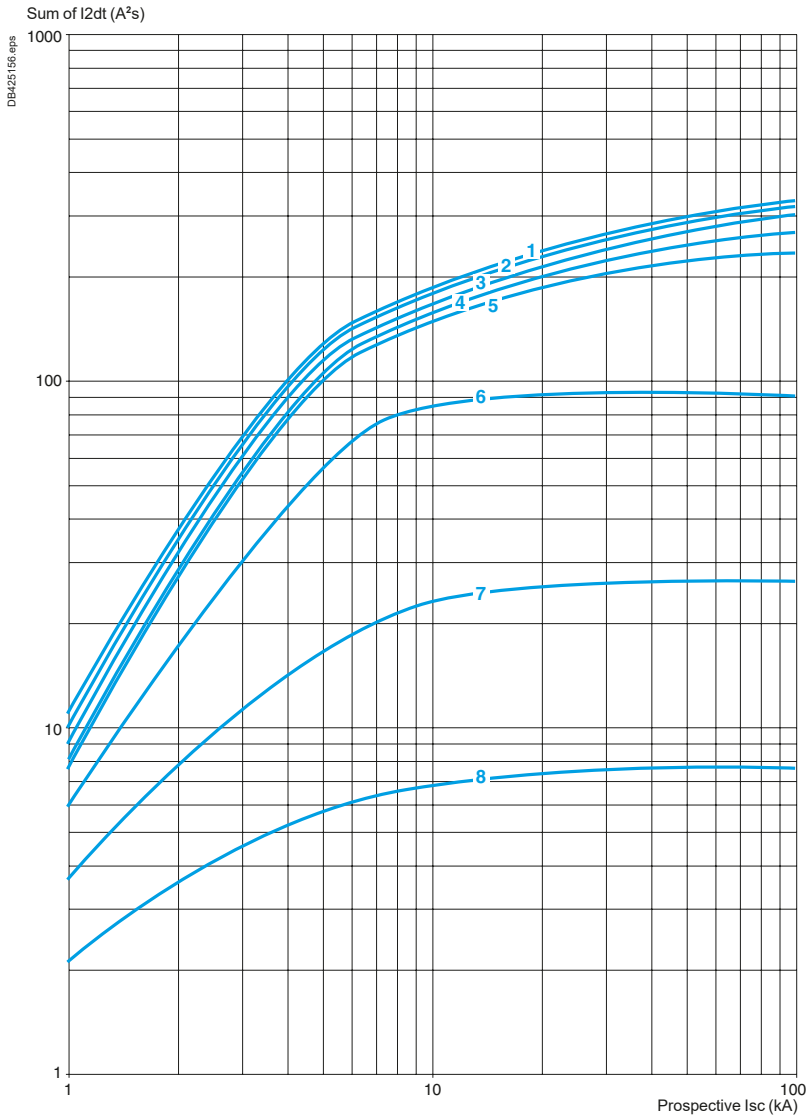
1 Maximum peak current
2 GV4P115
3 GV4P80
4 GV4P50
5 GV4P25
6 GV4P12
7 GV4P07
8 GV4P03
9 GV4P02

Ref.
Circuit breakers

Thermal limit on short-circuit for GV4P, GV4PE, GV4PEM, GV4PB

Thermal limit in kA²s in the magnetic operating zone

Sum of I²dt = f (prospective Isc) at 1.05 Ue = 435 V



1 GV4P115
2 GV4P80
3 GV4P50
4 GV4P25
5 GV4P12
6 GV4P07
7 GV4P03
8 GV4P02

References:
pages B6/37 to B6/41
Characteristics:
pages B6/112 to B6/115
Dimensions, schemes:
pages B6/126 to B6/129

Characteristics

Characteristics of electric trips

Type of trip			GV4AU●●● MN (undervoltage release)						
Rated insulation voltage (Ui)	Conforming to IEC 60947-1	V	= Ue						
Operational voltage (Ue)	Conforming to IEC 60947-1	V	24 V AC/DC	48 V AC/DC	110-130 V AC 125 V DC	208-240 V 60 Hz 220-240 V 50 Hz	277 V 60 Hz	380-415 V 60 Hz	440-480 V 60 Hz
Inrush consumption	~	VA	< 7 VA < 2 W	< 7 VA < 2 W	< 7 VA < 2 W	< 7 VA	< 7 VA	< 7 VA	< 7 VA
	⎓								
Sealed consumption	~	VA	< 7 VA < 2 W	< 7 VA < 2 W	< 7 VA < 2 W	< 7 VA	< 7 VA	< 7 VA	< 7 VA
	⎓								
Operating time	Conforming to IEC 60947-1	ms	< 50						
On-load factor			100 %						
Cabling (spring connection)	Number of conductors		1 per terminal						
	Solid cable	mm²	No solid cable allowed						
	Flexible cable without cable end	mm² AWG	Cu 0.5 mm² to 1.5 mm² Cu 20AWG to 16AWG						
	Flexible cable with cable end	mm²	No cable with cable end allowed						
Tightening torque		N.m	NA						
Mechanical durability (C.O.: Close - Open)		C.O.	20000						

Characteristics of electric trips

Type of trip			GV4AS●●● MX (Shunt trip)				
Rated insulation voltage (Ui)	Conforming to IEC 60947-1	V	= Ue				
Operational voltage (Ue)	Conforming to IEC 60947-1	V	24 V AC/DC	48 V AC/DC	110-130 V AC 125 V DC	208-240 V 60 Hz 220-240 V 50 Hz	380-415 V 50 Hz 440-480 V 60 Hz
Inrush consumption	~	VA	< 6 VA < 10 W	< 6 VA < 10 W	< 6 VA < 10 W	< 6 VA	< 6 VA
	⎓						
Sealed consumption	~	VA	< 4 VA < 1 W	< 4 VA < 1 W	< 4 VA < 1 W	< 4 VA	< 4 VA
	⎓						
Operating time	Conforming to IEC 60947-1	ms	< 50				
On-load factor			100 %				
Cabling (spring connection)	Number of conductors		1 per terminal				
	Solid cable	mm²	No solid cable allowed				
	Flexible cable without cable end	mm² AWG	Cu 0.5 mm² to 1.5 mm² Cu 20AWG to 16AWG				
	Flexible cable with cable end	mm²	No cable with cable end allowed				
Tightening torque		N.m	NA				
Mechanical durability (C.O.: Close - Open)		C.O.	20000				

References:
page B6/43

Characteristics

Auxiliary contact characteristics

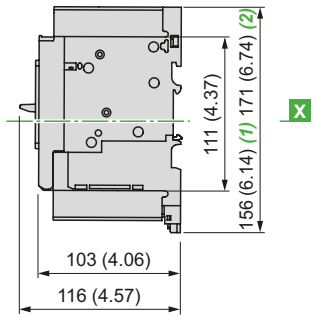
Type of contacts				Auxiliary contact block GV4AE11						SDx contact module for GV4PEM , GV4PB, GV4ADM1111					
Rated insulation voltage(Ui)	Conforming to IEC 60947-1		V	690						250					
	Conforming to CSA C22-2 n°14 UL 508		V	-						-					
Conventional thermal current (Ith)	Conforming to IEC 60947-5-1		A	5						5					
	Conforming to CSA C22-2 n°14 UL 508		A	5						5					
Mechanical durability (C.O.: Close - Open)			C.O.	40 000						100 000					
Operational power and current conforming to IEC 60947-5-1 a.c. operation	**Rated operational voltage (Ue)**		V	**24**	**48**	**110/ 127**	**230/ 240**	**380/ 440**	**660/ 690**	**48**	**110**	**230/ 240**	**380/ 415**	**440**	**690**
	Operational power (AC12)		VA	120	240	635	1200	2200	3450			400			
	Occasional breaking and making capacities		kVA	1.2	2.4	6.35	12	22	34.5						
	Operational current (Ie)	AC-12	A	5	5	5	5	5	5						
		AC-15	A	5	5	4	3	2.5	0.1		3	1.5			
Operational power and current conforming to IEC 60947-5-1 d.c. operation	**Rated operational voltage (Ue)**		V	**24**	**48**	**110**	**250**			**24**	**48**	**60**	**110**	**250**	
	Operational power (DC12)		W	120	120	66	75			50					
	Occasional breaking and making capacities		W	1200	1200	660	750								
	Rated operational current (Ie)	DC-12	A	5	2.5	0.6	0.3								
		DC-13	A	2.5	1.2	0.35	0.05			2			0.22	0.11	
		DC-14	A	1	0.2	0.05	0.03								
Low power switching reliability of contact				10^{-6} at 17 V / 2 mA											
Minimum operational conditions d.c. operation			V	17											
			mA	2											
Short-circuit protection				5 A fuse gG conforming to IEC 60947-5-1											
Spring terminals cabling	Number of conductors			1 per hole											
	Solid cable		mm²	-						0.2 to 1.5					
	Flexible cable without cable end		mm²	0.5 to 1.5						0.2 to 2.5					
	Flexible cable with cable end		mm²	-						0.25 to 1.5					

References:
page B6/42

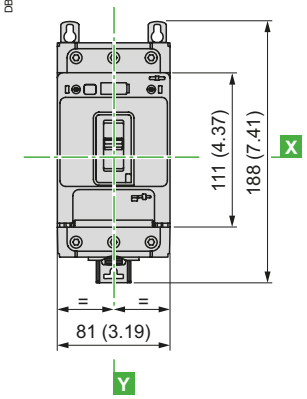
GV4 with toggle: GV4LE, GV4PE, GV4PEM, GV4PB

With EverLink® connector

DB432740.eps



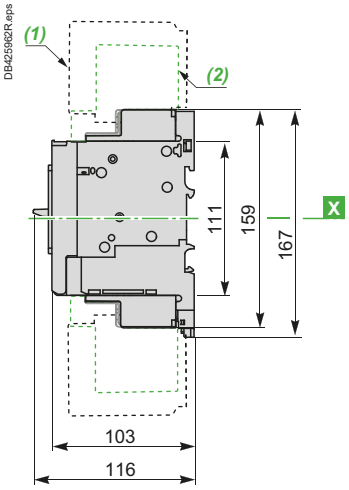
DB432741.eps



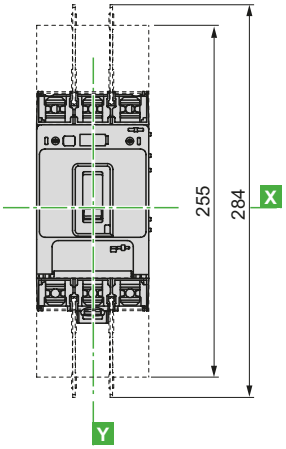
(1) ***GV4LE***, ***GV4PE***, ***GV4PEM***.
(2) ***GV4PB***.

With crimp lug connector

DB425982R.eps



DB425963.eps

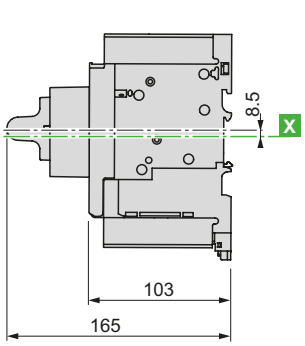


(1) *Interphases barriers.*
(2) *Long terminal shield.*

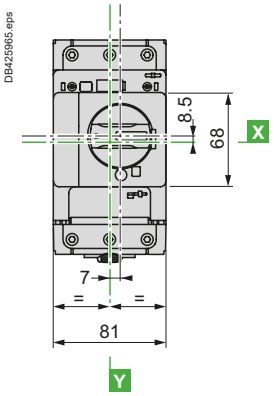
GV4 with rotary handle: GV4L, GV4P, or GV4LE, GV4PE, GV4PEM, GV4PB with GV4ADN01, GV4ADN02 direct mounting rotary handle

Dimensions

DB425964.eps

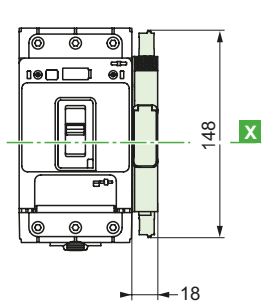


DB425965.eps



SDx module

DB425966.eps

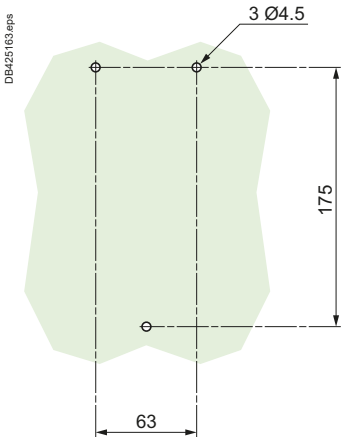


Ref.
Circuit breakers

GV4L, GV4P, GV4LE, GV4PE, GV4PEM, GV4PB

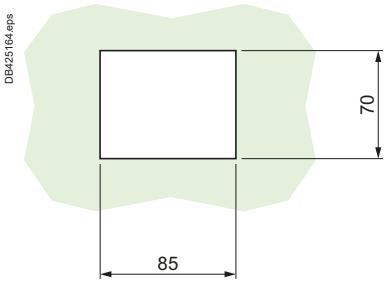
Panel mounting with M4 screws

DB425163.eps



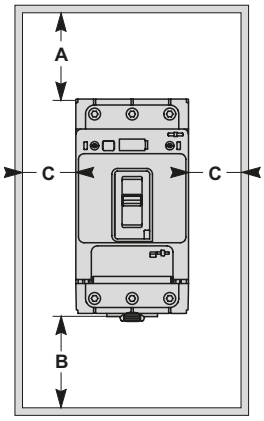
Door cut-out for rotary handle

DB425164.eps



Minimum safety clearance

DB425971.eps



Toggle-type, rotary handle-type: identical clearance values.

Safety clearance (mm)

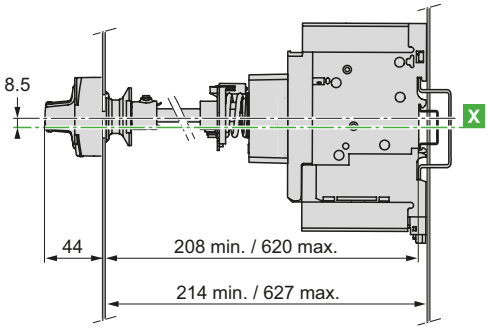
	Painted sheet metal			Bare sheet metal		
	A	B	C	A	B	C
No accessory	30	0	0	40	0	5
Interphase barriers	0	0	0	0	0	5
Long terminal shield	0	0	0	0	0	5

Ref.
Circuit breakers

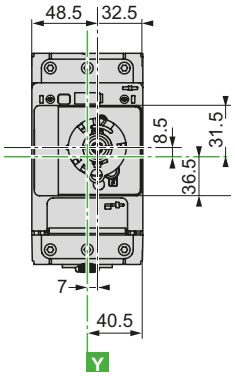
GV4 with extended rotary handle

Front extended rotary handle GV4APN01, GV4APN02, GV4APN04

DB436340.eps



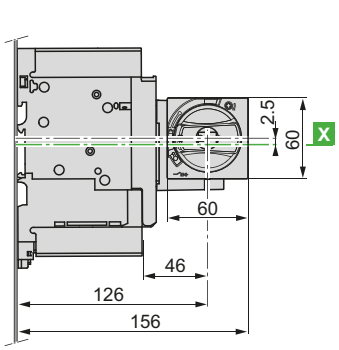
DB436341.eps



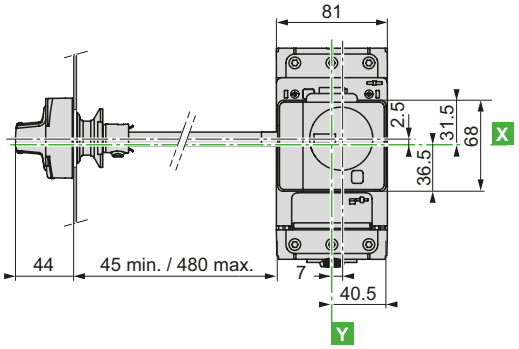
Ref.

Side (left or right) extended rotary handle LV426935, LV426936

DB425970.eps



DB425969.eps

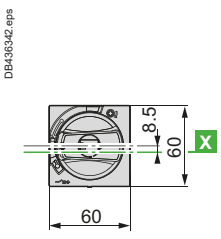


Circuit breakers

Front and side extended rotary handle, door/side panel cut-out

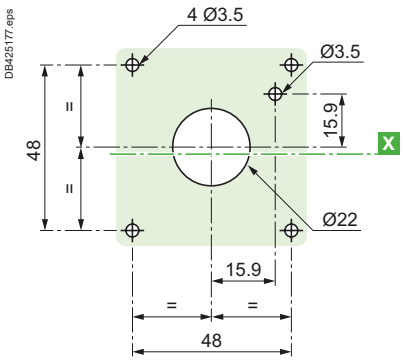
Front and side extended rotary handle

DB436342.eps



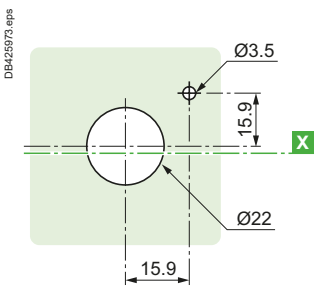
IP65, door panel cut-out

DB425177.eps



IP54, door/side panel cut-out

DB425973.eps

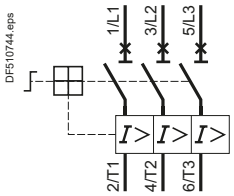


References:
pages B6/45 to B6/47

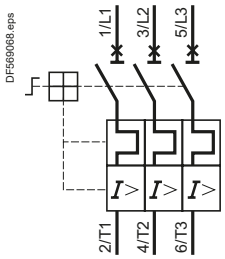
Schemes

Magnetic motor circuit breakers

GV4L, GV4LE



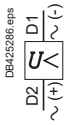
GV4P, GV4PE, GV4PEM, GV4PB



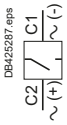
Accessories

Electrical trips

MN GV4AU●●●



MX GV4AS●●●



GV4AE11 auxiliary contacts

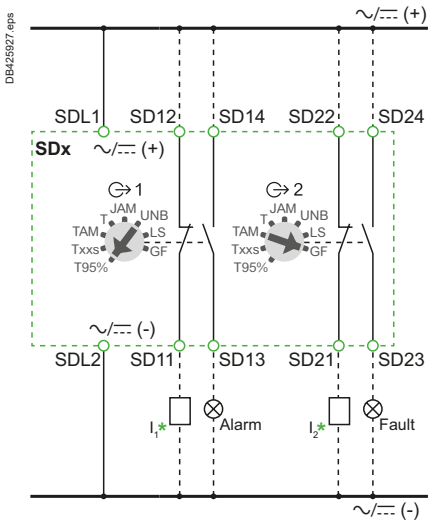
Used as OF contact



Used as SD contact



Side mounting add-on contact blocks
Instantaneous auxiliary contacts and fault signalling contacts



* I1, I2: PLC digital inputs - used as alarm inputs, as an example.

Ref.
Circuit breakers

TeSys GV5/GV6

55 to 250 kW





Characteristics

Environment

Circuit breaker type				GV5P/ GV6P
Conforming to standards				IEC/EN 60947-4-1 IEC/EN 60947-2 UL 60947-4-1 CSA C22.2 n° 60947-4-1
Product certifications				CB, UL, CSA, EAC, DNV-GL (1)
Climatic withstand				According to IACS E10
Degree of protection (front face)	Conforming to IEC 60529	Bare circuit breaker with terminal shields		IP40 with direct rotary handle
		Installed in switchboard		IP40 with direct rotary handle / IP43 with MCC conversion accessory/ IP55 with extended rotary handle
Shock resistance	Conforming to IEC 60068-2-27			15 gn -11 ms
Vibration resistance	Conforming to IEC 60068-2-6			2.5 gn (25 Hz)
Ambient air temperature	Storage in packing		°C	-50…+85
	Operation	Open mounted	°C	-25… +70
		In enclosure	°C	-25...+70
Flame resistance	Conforming to IEC 60695-2-11		°C	960
Maximum operating altitude			m	2000
Suitable for isolation	Conforming to IEC 60947-1 § 7-1-6			Yes
Resistance to mechanical impact			J	0.5
Sensitivity to phase failure				Yes

Technical characteristics

Circuit breaker type			GV5P150	GV5P220	GV6P320	GV6P500
Utilisation category	Conforming to IEC 60947-2		A			
	Conforming to IEC 60947-4-1		AC-3			
Rated operational voltage (Ue)	Conforming to IEC 60947-2	V	690			
Rated insulation voltage (Ui)	Conforming to IEC 60947-2	V	800			
Rated voltage	Conforming to UL 60947-4-1, CSA C22.2 n° 60947-4-1	V	600			
Rated operational frequency	Conforming to IEC 60947-4-1 UL, CSA	Hz	50/60			
Rated impulse withstand voltage (U imp)	Conforming to IEC 60947-2	kV	8			
Total power dissipated per pole		W	9.2	17.6	19.2	39.7
Mechanical durability (C.O.: Close, Open)		C.O.	40 000	20 000	15 000	15 000
Electrical durability for AC-3 duty	400/415 V (In)	C.O.	20 000	10 000	6 000	4 000
Duty class (maximum operating rate)		C.O./h	25			
Maximum conventional rated thermal current (Ith)	Conforming to IEC 60947-4-1	A	70…150	100...220	160...320	250...500
Rated duty	Conforming to IEC 60947-4-1		Continuous duty			

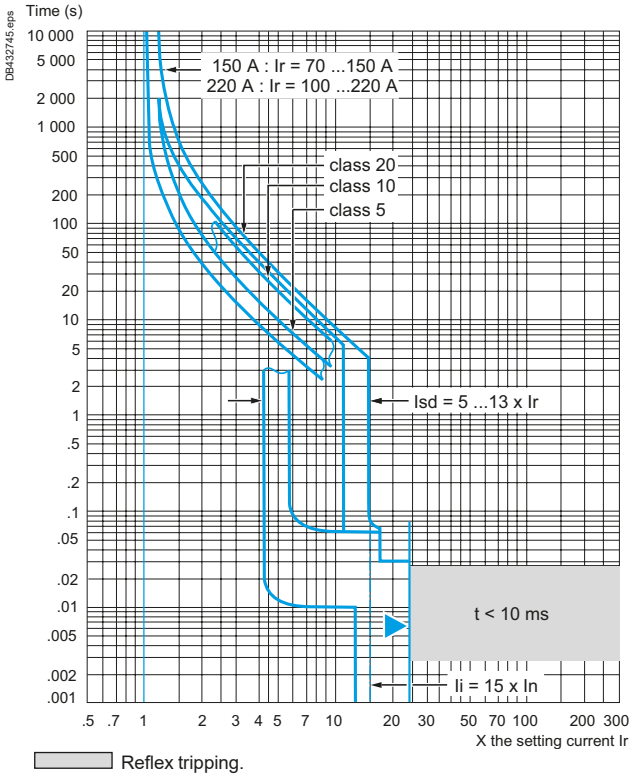
*(1) **EAC & DNV-GL** certifications are in progress. Please check with your nearest sales office for more details.*

Ref.
Circuit breakers

Curves

Thermal-magnetic tripping curves for GV5P

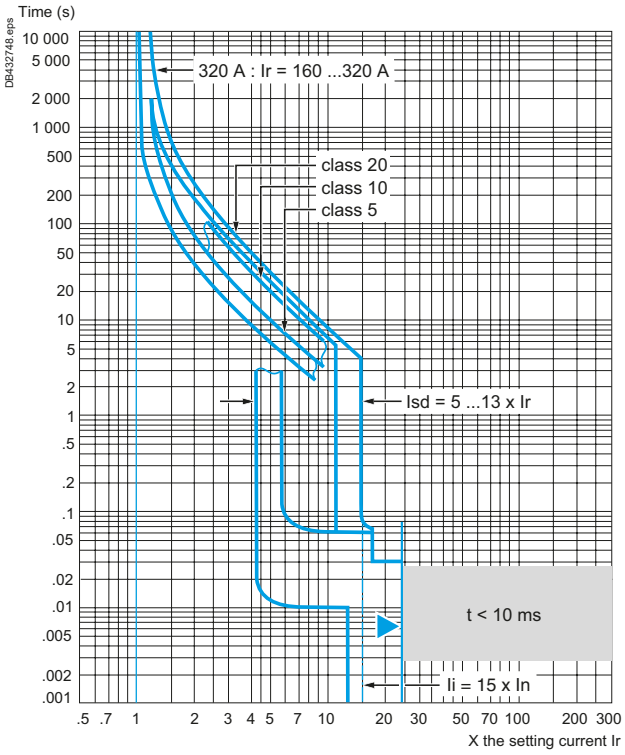
MicroLogic 2.2 M - 150/220 A



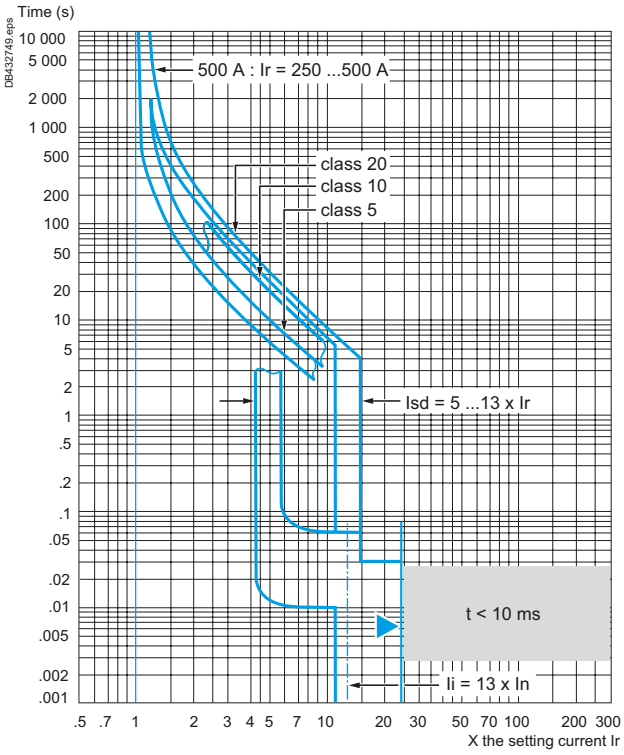
Reflex tripping.

Thermal-magnetic tripping curves for GV6P

MicroLogic 2.3 M - 320 A



MicroLogic 2.3 M - 500 A



Reflex tripping.

References:
pages B6/51 to B6/55

Characteristics:
page B6/132

Dimensions:
pages B6/138 to B6/143

Schemes:
page B6/144

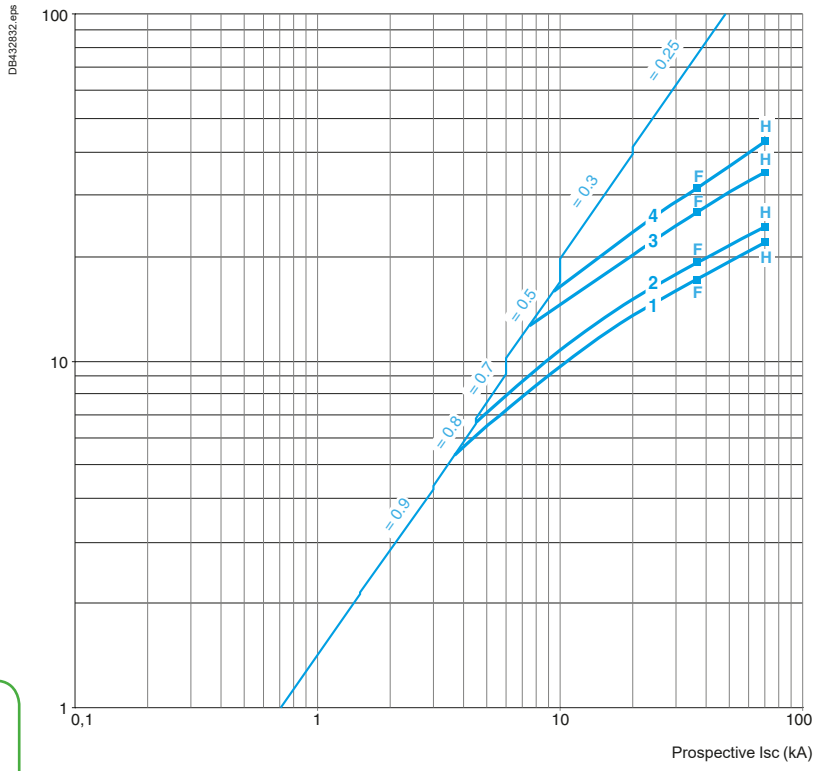
Curves

Current limitation on short-circuit (3-phase 400 - 415 V)

Dynamic stress

For GV5P/6P●●●F/H type

Limited peak current (kA)



Prospective Isc (kA)

1 GV5P150F/H
2 GV5P220F/H
3 GV6P320F/H
4 GV6P500F/H

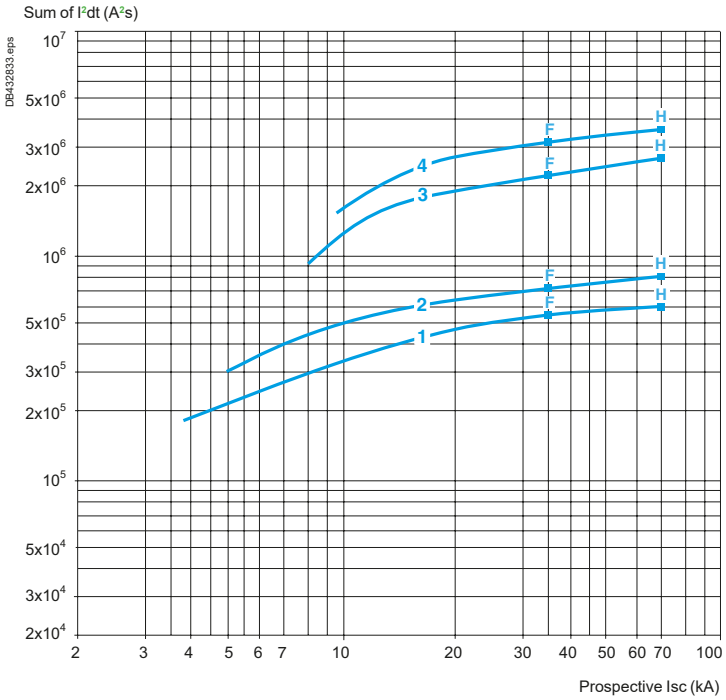
Ref.
Circuit breakers

Curves

Maximum thermal limit on short-circuit

Thermal limit in kA²s in the magnetic operating zone

Sum of I²dt = f (prospective Isc) at 1.05 Ue = 435 V



1 GV5P150F/H
2 GV5P220F/H
3 GV6P320F/H
4 GV6P500F/H

Ref.
Circuit breakers

Characteristics

Characteristics of GV5P/GV6P electric trips

Type of trip			GV7AU●●● undervoltage trip	GV7AS●●● shunt trip
Rated insulation voltage (Ui)	Conforming to IEC 60947-1	V	690	690
	Conforming to CSA C22-2 n°14, UL 508	V	600	600
Operational voltage (Ue)	Conforming to IEC 60947-1	V	0.85...1.1 Uc	0.7...1.1 Uc
Drop-out voltage		V	0.7...0.35 Uc	0.7...0.35 Uc
Inrush consumption	~	VA	< 10	
Sealed consumption	~	VA	< 5	
Operating time	Conforming to IEC 60947-1	ms	From the moment the voltage reaches its operational value until opening of the circuit breaker. < 50	
On-load factor			100 %	
Cabling	Number of conductors		1	
	Solid cable	mm^2	1.5	
	Flexible cable without cable end	mm^2	1.5	
	Flexible cable with cable end	mm^2	1	
Tightening torque		N.m	1.2	
Mechanical durability (C.O.: Close - Open)		C.O.	50 % of the mechanical durability of the circuit breaker.	

Characteristics of GV5P/GV6P thermal fault module

Type of trip			LV429424 (1)
Operational voltage (Ue)	Conforming to IEC 60947-1	V	24 to 415 V AC/ DC
Conventional thermal current (Ith)	Conforming to IEC 60947-5-1	A	80 mA max.

*(1) **LV429424** takes the place of the AU/AS electric trip coil and an auxiliary contact.*

Ref.
Circuit breakers

Characteristics

Auxiliary contact characteristics

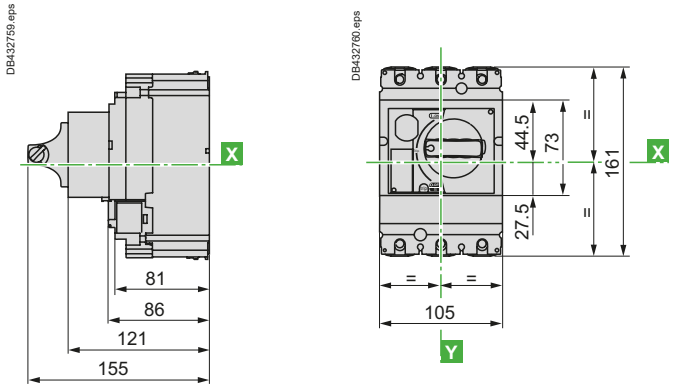
Type of contacts				GV7AE11						GV7AB11				
Rated insulation voltage(Ui) (associated insulation coordination)	Conforming to IEC 60947-1		V	690						690				
Conventional thermal current (Ith)	Conforming to IEC 60947-5-1		A	6						5				
Mechanical durability (C.O.: Close - Open)			C.O.	50 000						50 000				
Operational current conforming to IEC 60947-5-1 a.c. operation				AC-12 or AC-15. 50 000 C.O.						AC-12 or AC-15. 50 000 C.O.				
	Rated operational voltage (Ue)		V	**24**	**48**	**110**	**220/ 240**	**380/ 440**	**690**	**24**	**48**	**110**	**230/ 240**	**380/ 415**
	Rated operational current (Ie)	AC-12	A	6	6	6	6	6	6	5	5	5	5	5
		AC-15	A	6	6	5	4	2	0.1	3	3	2.5	2	1.5
Operational current conforming to IEC 60947-5-1 d.c. operation				DC-12 or DC-14. 50 000 C.O.						DC-12 or DC-14. 50 000 C.O.				
	Rated operational voltage (Ue)		V	**24**		**48**		**110**	**250**	**24**		**48**	**110**	**250**
	Rated operational current (Ie)	DC-12	A	6		2.5		0.6	0.3	5		2.5	0.6	0.3
		DC-14	A	1		0.2		0.05	0.03	1		0.2	0.05	0.03
Minimum operational conditions d.c. operation			V	24						4				
			mA	100						1				
Short-circuit protection				By **GB2CB●●** circuit breaker (rating according to operational current for Ue ≤ 415 V) or gG fuse, 10 A max.										
Cabling	Solid cable		mm^2	1 x 1.5 conductor						1 x 1.5 conductor				
	Flexible cable without cable end		mm^2	1 x 1.5 conductor						1 x 1.5 conductor				
	Flexible cable with cable end		mm^2	1 x 1.5 conductor						1 x 1.5 conductor				

Ref.
Circuit breakers

Dimensions and mounting

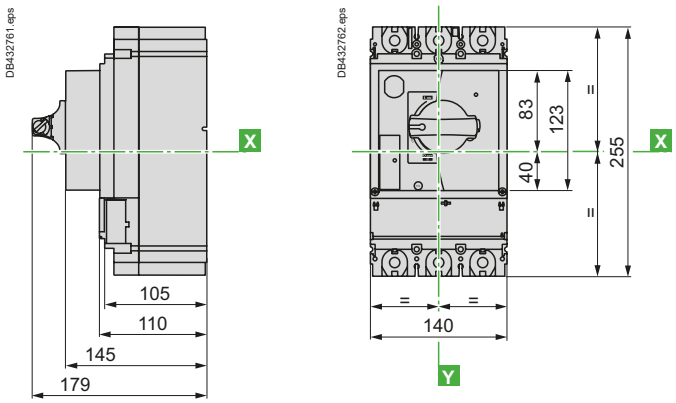
GV5P

Dimensions

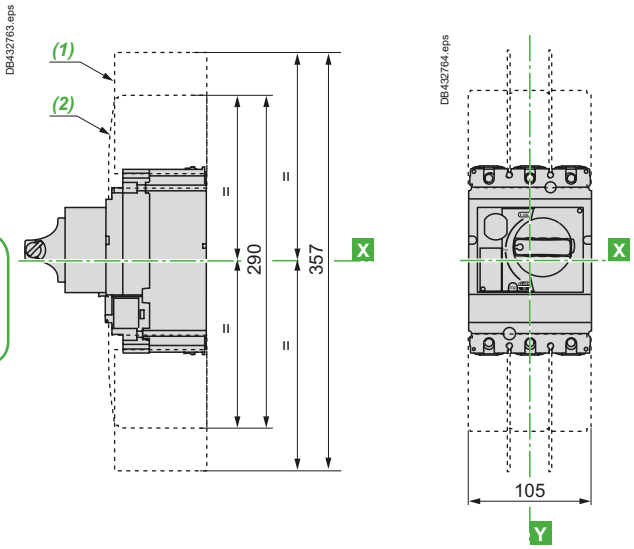


GV6P

Dimensions

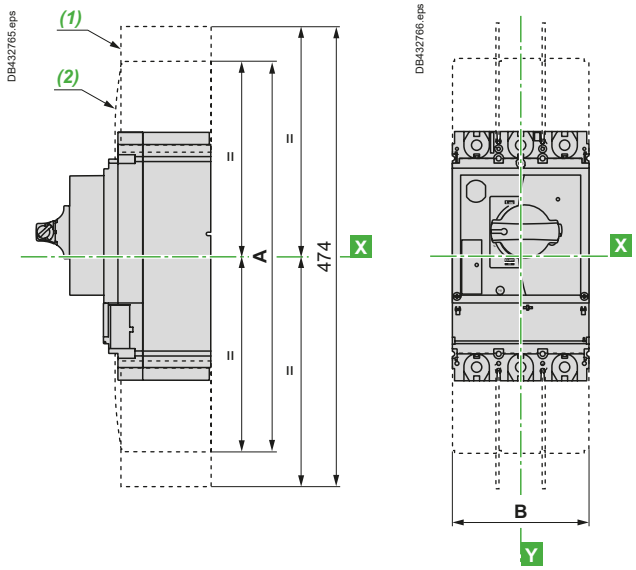


With long terminal shields or interphases barriers GV5P + GV7AC04/GV7AC01



(1) *Interphases barriers:* **GV7AC04**.
(2) *Terminal shield:* **GV7AC01**.

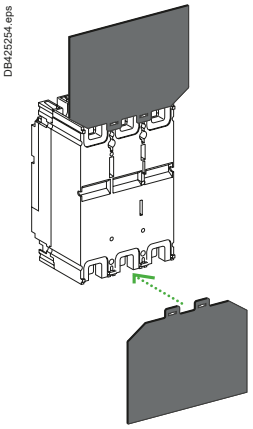
GV6P + LV432593 / LV432595 / LV432570



(1) *Interphases barriers:* **LV432570**.
(2) *Terminal shield:* **LV432593** *(45mm)* / **LV432595** *(52.5mm)* .

	A	B
LV432593	400	140
LV432595	480	157.5

Insulating screen



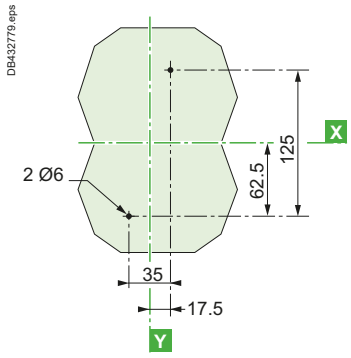
Motor circuit breaker		GV5P + GV7AC05	GV6P + LV432578
3P	**W x H x thickness (mm)**	140 x 105 x 1	203 x 175 x 1.5

References: pages B6/51 to B6/56
Characteristics: page B6/132
Curves: pages B6/133 to B6/135
Schemes: page B6/144

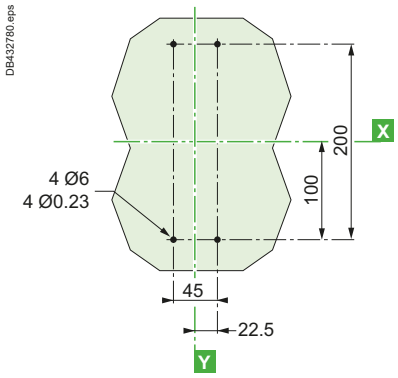
Dimensions and mounting

GV5P/GV6P

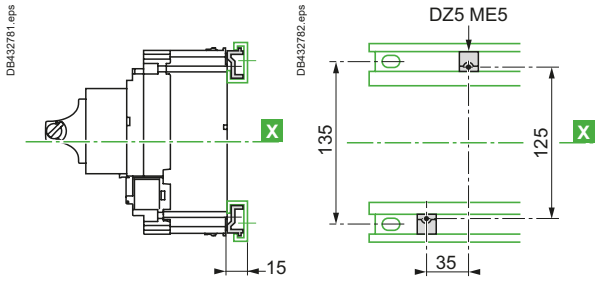
Panel mounting - GV5P



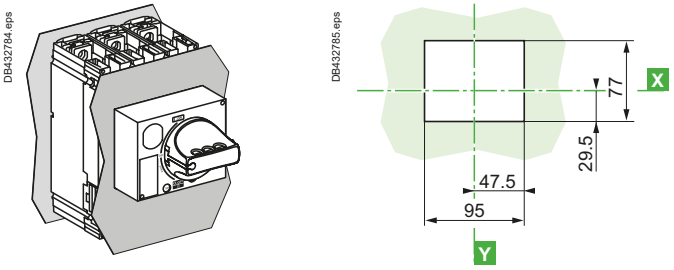
Panel mounting - GV6P



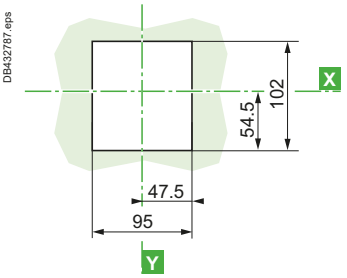
Mounting on 2 mounting rails for GV5P only



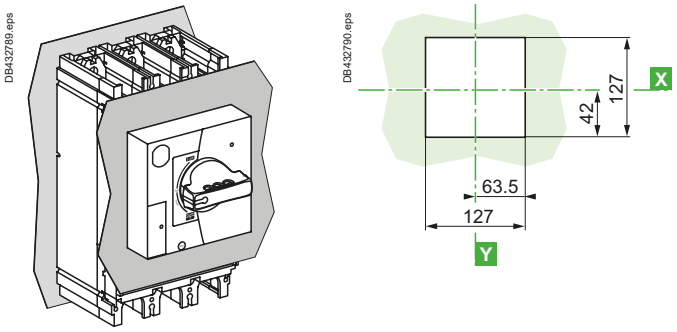
Door cut-out mounting GV5P



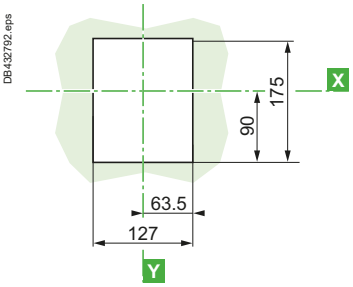
With access to trip unit



Door cut-out mounting GV6P



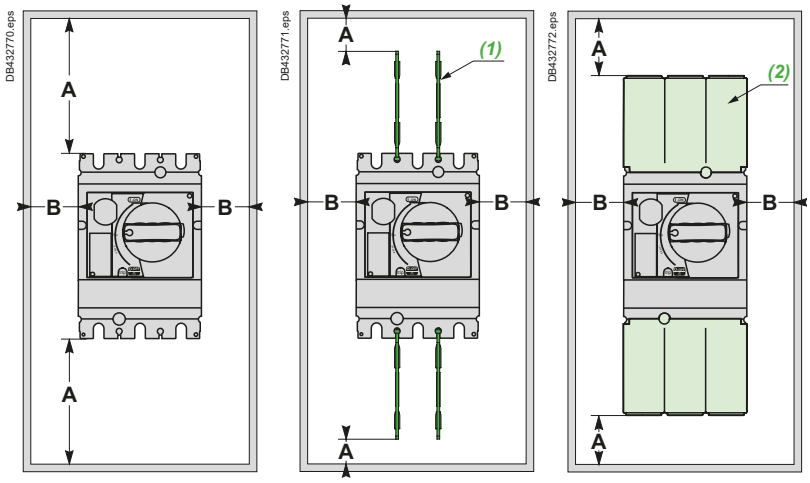
With access to trip unit



Ref.
Circuit breakers

GV5P

Minimum electrical clearance

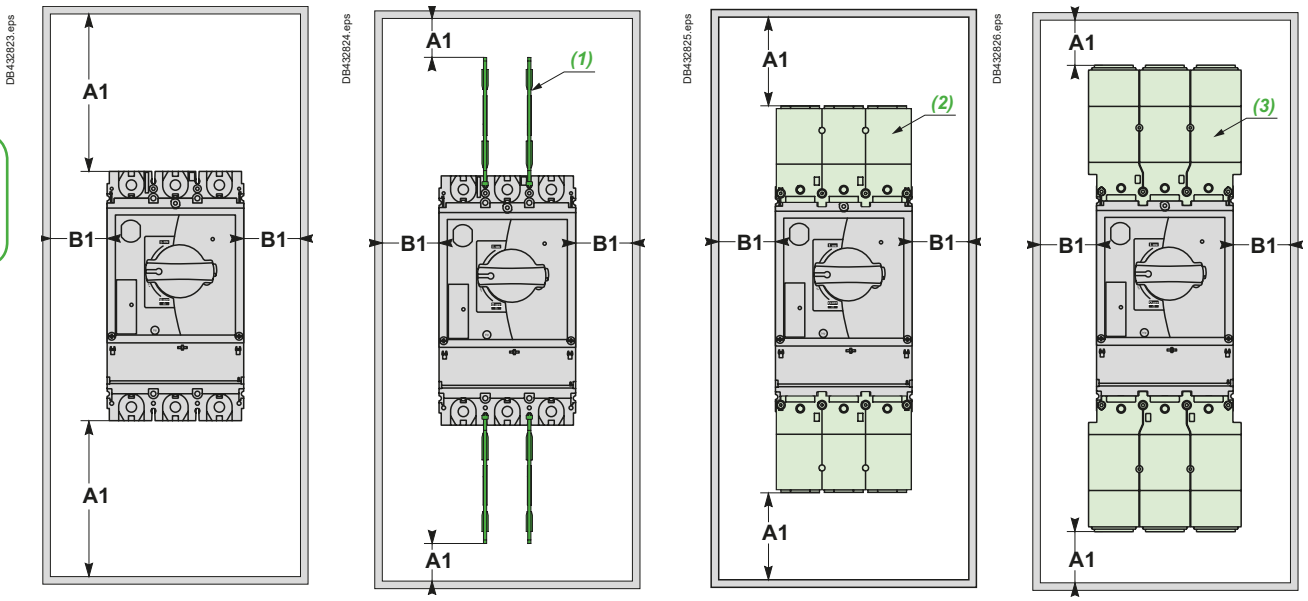


Clearance in mm

		Painted sheet metal		Bare metal plate	
		A	B	A	B
No accessories	V ≤ 500 V~	30	0	40	20
	V > 500 V~	-	-	-	-
Interphases barriers [1]	V ≤ 500 V~	0	0	10	20
	V > 500 V~	-	-	-	-
Terminal shield [2]	V ≤ 500 V~	0	0	10	10
	V > 500 V~	30	10	40	20

GV6P

Minimum electrical clearance



Clearance in mm

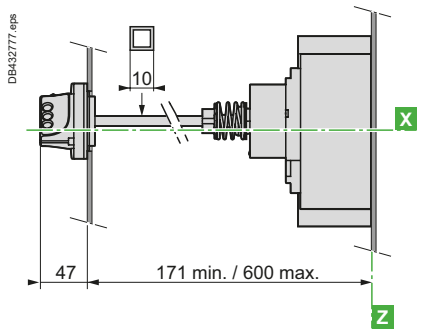
		Painted sheet metal		Bare sheet metal	
		A1	B1	A1	B1
No accessories	V ≤ 500 V~	30	0	40	20
	V > 500 V~	-	-	-	-
Interphase barriers [1]	V ≤ 500 V~	0	0	10	20
	V > 500 V~	-	-	-	-
Long terminal shield (LV432593) [2]	V ≤ 500 V~	30	0	40	10
	V > 500 V~	50	0	50	20
Long terminal shield (LV432595) [3]	V ≤ 500 V~	0	0	10	10
	V > 500 V~	30	0	30	20

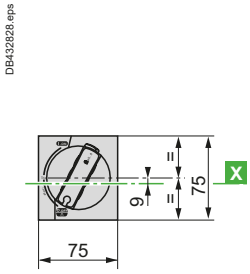
Ref.
Circuit breakers

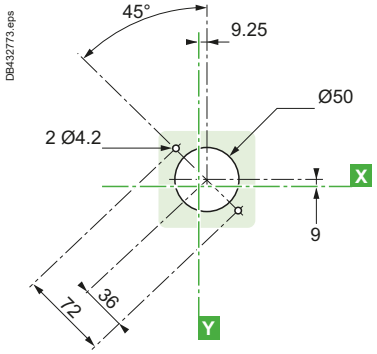
Dimensions and mounting

GV5P/GV6P

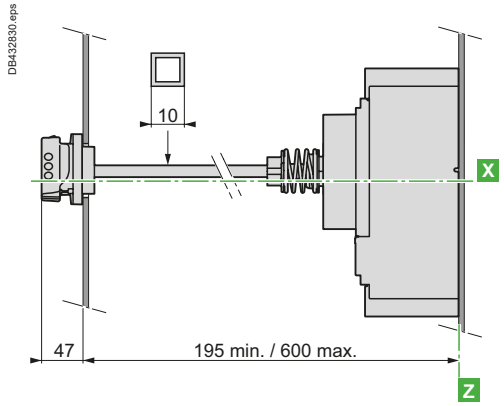
GV5 with extended rotary handle GV7AP01/ GV7AP02

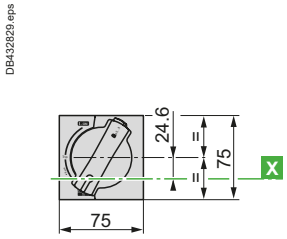


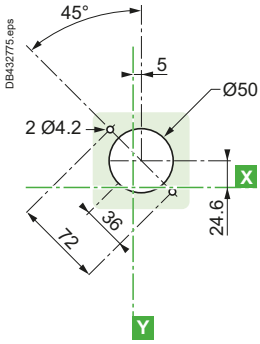




GV6 with extended rotary handle LV432598/ LV432600

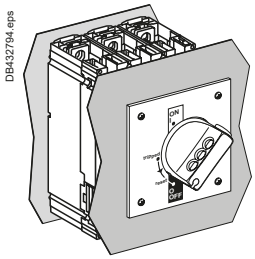


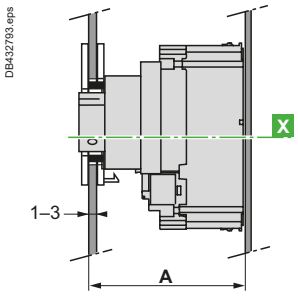


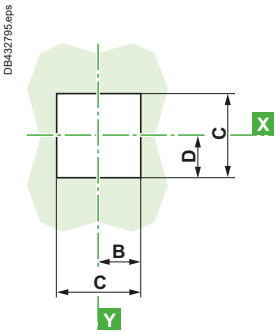


GV5P/GV6P

MCC type direct rotary handle





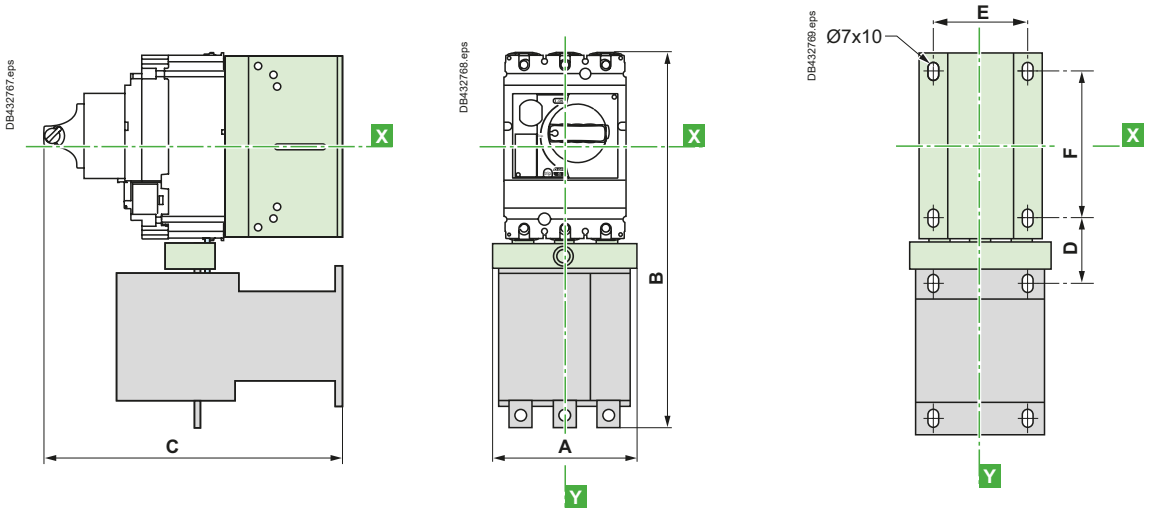


	A	B	C	D
150/220 A	125 ±2	50	100	41
320/500 A	149 ±2	72.5	145	51

Ref.
Circuit breakers

GV5P

Combination of GV5P and TeSys contactor LC1F●●●/LC1D●●● with kit GV7AC0●

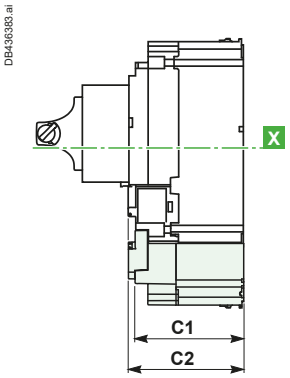


	A	B	C	D	E	F
GV5P + LC1F115 + GV7AC06	119	334	243	44	85	120
GV5P + LC1F150 + GV7AC06	119	334	243	46	85	120
GV5P + LC1F185 + GV7AC06	119	338	249	48	85	120
GV5P + LC1F225 + GV7AC07	131	358	249	57	85	120
GV5P + LC1F265 + GV7AC07	131	364	277	60	85	120
GV5P + LC1D115 + GV7AC08	120	332	205	48	85	120
GV5P + LC1D150 + GV7AC08	120	332	205	48	85	120

Minimum distance between 2 circuit breakers mounted side by side = 0

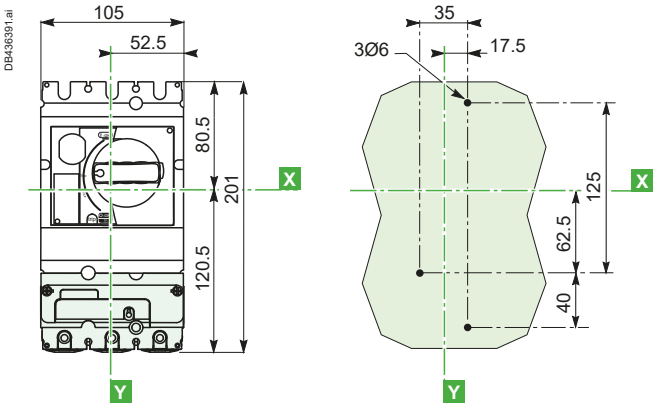
GV5P/GV6P

With additional PowerTag

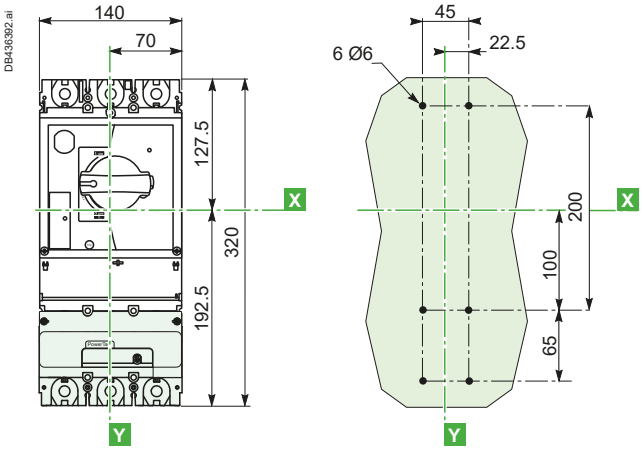


Type	C1	C2
GV5P	81	86
GV6P	95.5	110

GV5P with LV434020 / Panel mounting



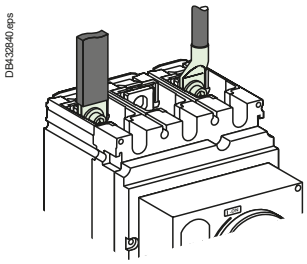
GV6P with LV434022 / Panel mounting



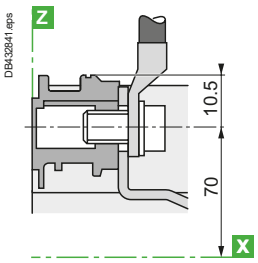
Dimensions and mounting

GV5P/GV6P

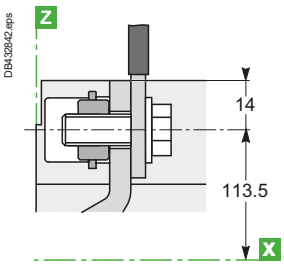
Front connection without accessories



GV5P
Cables with lugs bars

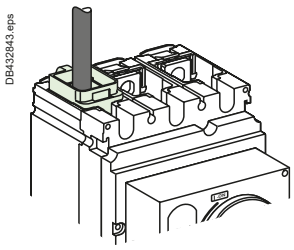


GV6P
Bars/cables with lugs

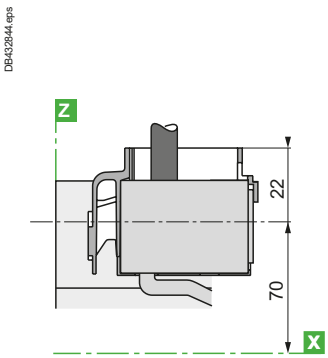


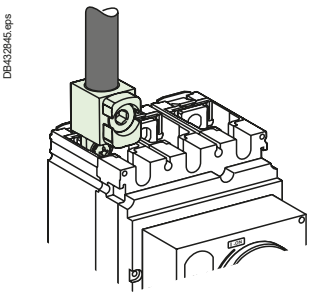
GV5P

Bare-cables connectors

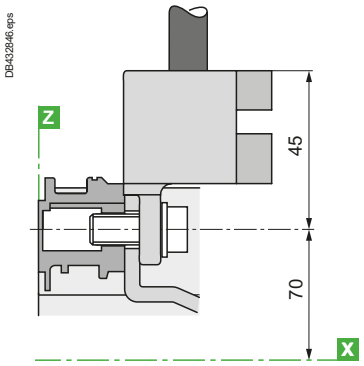


GV7AC021/LV429227/GV7AC022



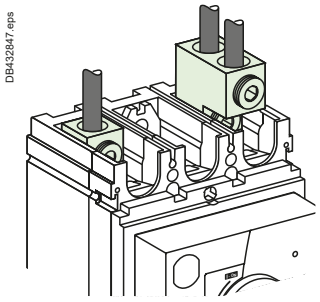


LV429244

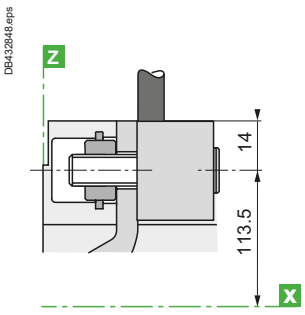


GV6P

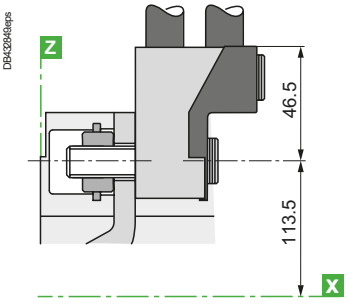
Bare-cables connectors



LV432479

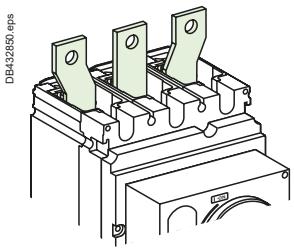


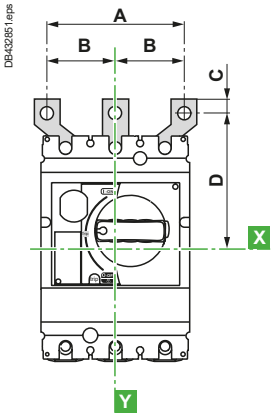
LV432481



GV5P/GV6P

Spreaders



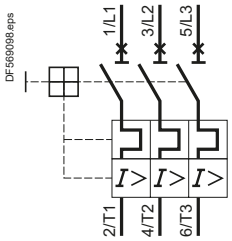


Type	A	B	C	D
GV5P/ Spreaders GV7AC03	114	45	11	100
GV6P/ Spreaders LV432490	135	52.5	15	152.5
GV6P/ Spreaders LV432492	170	70	15	166

Schemes

Motor circuit breakers

GV5P/ 6P



Add-on auxiliary contacts according to their location (1)

GV7AE11, GV7AB11

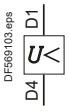
Location 1 C/O contact	Location 2 Trip indication	Location 3 Electrical fault indication (2)	Location 4 C/O contact
			

A self-adhesive label, supplied with the contact, can be affixed to the front face of the circuit-breaker to allow personalised marking according to the function of the contact or contacts.

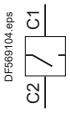
(1) See page B6/52 to B6/54.
*(2) Adapter **LV429451** is mandatory for electrical trip indication in GV5.*

Electric trips

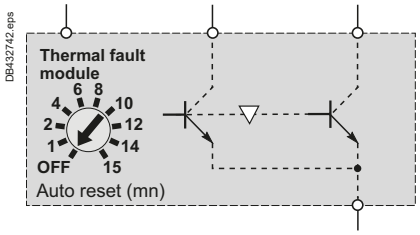
GV7AU●●●



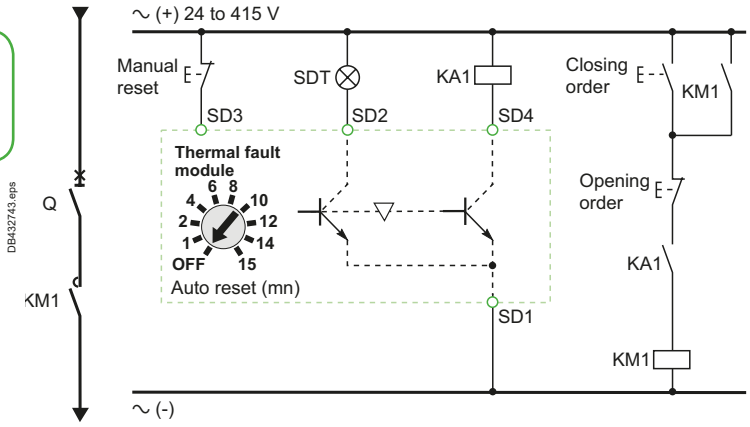
GV7AS●●●



Thermal fault module LV429424



Recommended application schemes for LV429424



SD1, **SD3:** thermal fault module input power supply
SD2: over-load fault signal output. This output will stay-put until reset
SD4: contactor control output
SD2 and SD4: Static outputs: 24 to 415 V AC / V DC; 80 mA max
KM1: LC1D or LC1F contactor
KA1: CA2 or CAD type control relays

Terminals shown in green **O** must be connected by customer.

Ref.
Circuit breakers

TeSys GB2

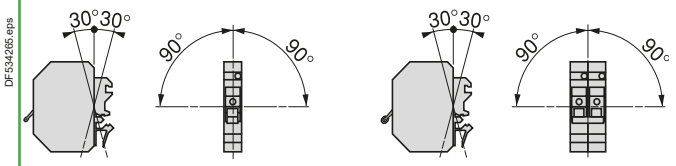
0.5 to 20 A

(for equipment and control circuits)



Characteristics

Environment

Circuit breaker type			GB2CB	GB2CD	GB2DB	GB2CS
Conforming to standards			IEC 60947-1, 947-2, EN 60947-1, 60947-2			
Product certifications			cCSAus (1)	cCSAus (1)	–	–
Degree of protection	Conforming to IEC 60529		IP 20			
Shock resistance	Conforming to IEC 60068-2-27		22 gn for 20 ms			
Vibration resistance	Conforming to IEC 60068-2-6		5 gn (5…110 Hz)			
Ambient air temperature around the device	Storage	°C	-40…+80			
	Operation	°C	-20…+60			
Flame resistance	Conforming to IEC 60695-2-11	°C	960			
Maximum operating altitude		m	3000			
Operating position	In relation to normal vertical mounting plane					
			GB2CB,CD, CS		GB2DB	

Cabling			Minimum c.s.a.	Maximum c.s.a.
	Solid cable	mm^2	1 x 0.75	1 x 6 or 2 x 4
	Flexible cable with cable end	mm^2	1 x 0.75	1 x 4 or 2 x 2.5
Tightening torque		N.m	1.2	

Technical characteristics

Utilisation category	Conforming to IEC 60947-2		A		A		A		A	
Rated operational voltage (Ue)	Conforming to IEC 60947-2	V	250 (2)		250		415		250 (2)	
	Conforming to CSA C22-2 Nr 14 and UL 1077	V	277		277		–		–	
Rated operational frequency	Conforming to IEC 60947-2	Hz	50/60		50/60		50/60		50/60	
Rated impulse withstand voltage (U imp)	Conforming to IEC 60947-2	kV	4		4		4		4	
Total power dissipated per pole		W	2		2		2		1.9	
Mechanical and electrical durability	C.O.: Closing - Opening	C.O.	8000		8000		8000		8000	

Operational current correction coefficient (a or ⎓)	According to the permissible ambient temperature	°C	-20	-10	0	+10	+20	+30	+40	+50	+60
	Correction coefficient		1.2	1.15	1.1	1.05	1	0.95	0.90	0.85	0.80

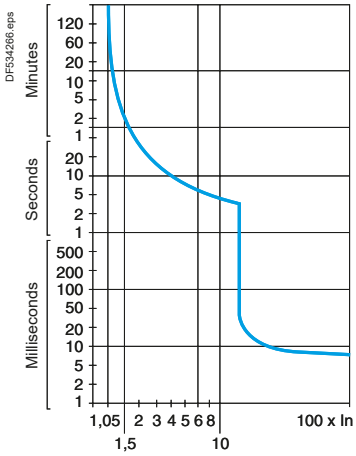
Tripping threshold	Of the magnetic trips		12…16 In	12…16 In	12…16 In	5…7 In

*(1) Except for **GB2CB16**, **GB2CB22**, **GB2CD16**, **GB2CD22**.*
*(2) Ue = 415 V when a **GB2** circuit breaker is fitted on every live conductor.*

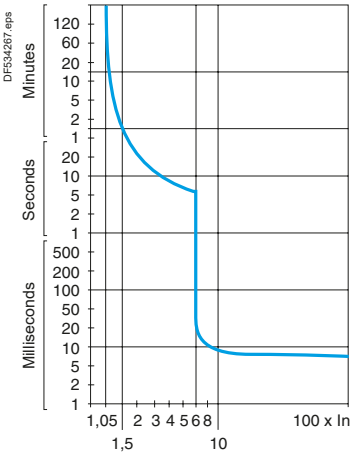
Tripping curves

Average operating time at 20 °C without prior current flow (cold state)

GB2CB, GB2CD, GB2 DB



GB2CS



References:
pages B6/59 and B6/60
Dimensions:
page B6/149
Schemes:
page B6/149

Characteristics

Circuit breaker type				GB2											
				CB05	CB06	CB07	CB08	CB09	CB10	CB12	CB14	CB16	CB20	CB21	CB22
Rating			A	0.5	1	2	3	4	5	6	8	10	12	16	20
Breaking capacity conforming to IEC 60947-2 ∿ 50/60 Hz	110 V	Icu	kA	50	50	15	10	6	3	3	3	2	2	2	2
		Ics % (1)		100	50	50	50	50	75	75	75	75	75	75	75
	230/240 V	Icu	kA	50	50	15	3	3	2	1.5	1.5	1.5	1.5	1.5	1.5
		Ics % (1)		25	25	25	50	50	75	75	75	75	75	75	75
Associated fuses, if required if Isc > breaking capacity Icu conforming to IEC 60947-2	110 V	aM	A	★	★	20	25	25	40	40	50	50	63	63	63
		gG	A	★	★	25	32	32	50	50	63	63	80	80	80
	230/240 V	aM	A	★	★	16	20	20	32	32	40	40	50	50	50
		gG	A	★	★	25	32	32	40	40	50	50	63	63	63

Circuit breaker type				GB2											
				CD05	CD06	CD07	CD08	CD09	CD10	CD12	CD14	CD16	CD20	CD21	CD22
Rating			A	0.5	1	2	3	4	5	6	8	10	12	16	20
Breaking capacity conforming to IEC 60947-2 ∿ 50/60 Hz	110 V	Icu	kA	50	50	15	10	6	3	3	3	2	2	2	2
		Ics % (1)		100	50	50	50	50	75	75	75	75	75	75	75
	230/240 V	Icu	kA	50	50	15	3	3	2	1.5	1.5	1.5	1.5	1.5	1.5
		Ics % (1)		25	25	25	50	50	75	75	75	75	75	75	75
Associated fuses, if required if Isc > breaking capacity Icu conforming to IEC 60947-2	110 V	aM	A	★	★	20	25	25	40	40	50	50	63	63	63
		gG	A	★	★	25	32	32	50	50	63	63	80	80	80
	230/240 V	aM	A	★	★	16	20	20	32	32	40	40	50	50	50
		gG	A	★	★	25	32	32	40	40	50	50	63	63	63

Circuit breaker type				GB2											
				DB05	DB06	DB07	DB08	DB09	DB10	DB12	DB14	DB16	DB20	DB21	DB22
Rating			A	0.5	1	2	3	4	5	6	8	10	12	16	20
Breaking capacity conforming to IEC 60947-2 ∿ 50/60 Hz	110 V	Icu	kA	50	50	15	10	6	3	3	3	2	2	2	2
		Ics % (1)		100	50	50	50	50	75	75	75	75	75	75	75
	230/240 V	Icu	kA	50	50	15	3	3	2	1.5	1.5	1.5	1.5	1.5	1.5
		Ics % (1)		25	25	25	50	50	75	75	75	75	75	75	75
	400/415 V	Icu	kA	50	50	15	3	3	2	1.5	1.5	1.5	1.5	1.5	1.5
		Ics % (1)		25	25	25	50	50	75	75	75	75	75	75	75
Associated fuses, if required if Isc > breaking capacity Icu conforming to IEC 60947-2	110 V	aM	A	★	★	20	25	25	40	40	50	50	63	63	63
		gG	A	★	★	25	32	32	50	50	63	63	80	80	80
	230/240 V	aM	A	★	★	16	20	20	32	32	40	40	50	50	50
		gG	A	★	★	25	32	32	40	40	50	50	63	63	63
	400/415 V	aM	A	★	★	16	20	20	32	32	40	40	50	50	50
		gG	A	★	★	25	32	32	40	40	50	50	63	63	63

(1) As % of Icu.
★ *Fuse not required. Breaking capacity Icu > Isc.*

References:
pages B6/59 and B6/60
Dimensions:
page B6/149
Schemes:
page B6/149

Characteristics

Circuit breaker type				GB2											
				●●05	●●06	●●07	●●08	●●09	●●10	●●12	●●14	●●16	●●20	●●21	●●22
Breaking capacity (Icu) conforming to IEC 60947-2 ⎓		24 V	kA	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
		48 V	kA	1	1	1	1	1	1	1	1	–	–	–	–
Operational current conforming to IEC 60947-5-1 ⎓	DC-12	24 V	A	0.5	1	2	3	4	5	6	8	10	12	16	20
		48 V	A	0.5	1	2	3	4	5	6	8	10	12	16	20
	DC-13	24 V	A	0.5	1	2	3	4	5	6	8	10	12	16	20
		48 V	A	0.5	1	2	3	4	5	6	8	–	–	–	–

Circuit breaker type				GB2	
				CS05	CS06
Rating			A	0.5	1
Breaking capacity conforming to IEC 60947-2 ∿ 50/60 Hz	110 V	Icu	kA	50	50
		Ics % (1)		100	100
	230/240 V	Icu	kA	50	50
		Ics % (1)		25	25
	400/415 V (2)	Icu	kA	50	50
		Ics % (1)		25	25
Breaking capacity (Icu) conforming to IEC 60947-2 ⎓		24 V	kA	1.5	1.5
		48 V	kA	1	1
Operational current conforming to IEC 60947-5-1 ⎓	DC-12	24 V	A	0.5	1
		48 V	A	0.5	1
	DC-13	24 V	A	0.5	1
		48 V	A	0.5	1

Maximum permissible line length for star-delta starting (length of cable containing 2 or more conductors)	With contactors LC●D09 …D18	Operational voltage		V	**48**	**110**	**230**	**48**	**110**	**230**
		C.s.a.	0.60 mm²	m	(3)	31	365	6	85	230
			0.75 mm²	m	(3)	39	460	8	110	290
			1 mm²	m	(3)	52	610	10	145	380
			1.5 mm²	m	(3)	78	910	15	220	570
			2.5 mm²	m	(3)	130	1520	26	360	950
			4 mm²	m	(3)	200	2400	41	580	1500
	With contactors LC●D25…D32	Operational voltage		V	**48**	**110**	**230**	**48**	**110**	**230**
		C.s.a.	0.60 mm²	m	(3)	(3)	230	(3)	56	230
			0.75 mm²	m	(3)	(3)	290	(3)	70	290
			1 mm²	m	(3)	(3)	390	(3)	95	380
			1.5 mm²	m	(3)	(3)	580	(3)	140	570
			2.5 mm²	m	(3)	(3)	970	(3)	230	950
			4 mm²	m	(3)	(3)	1500	(3)	375	1500
	With contactors LC●D40…D80	Operational voltage		V	**48**	**110**	**230**	**48**	**110**	**230**
		C.s.a.	0.60 mm²	m	(3)	(3)	46	(3)	13	100
			0.75 mm²	m	(3)	(3)	60	(3)	17	130
			1 mm²	m	(3)	(3)	80	(3)	22	170
			1.5 mm²	m	(3)	(3)	120	(3)	34	250
			2.5 mm²	m	(3)	(3)	190	(3)	56	420
			4 mm²	m	(3)	(3)	310	(3)	90	680

(1) As % of Icu.
*(2) One **GB2CS** circuit breaker on each live conductor.*
(3) Use relays.

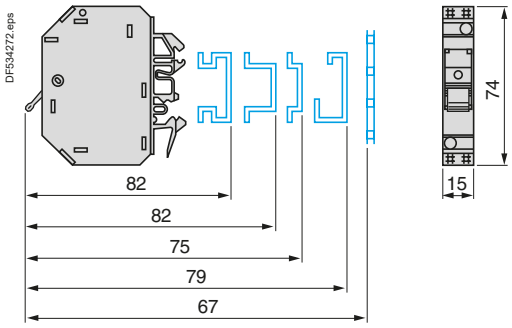
Ref.
Circuit breakers

References:
pages B6/59 and B6/60
Dimensions:
page B6/149
Schemes:
page B6/149

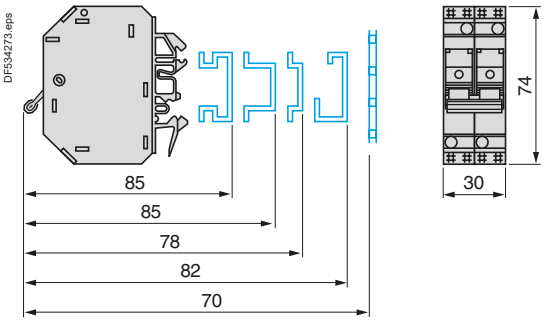
Dimensions and schemes

Dimensions

GB2CB●●, GB2CD●●, GB2CS●●



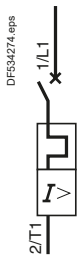
GB2DB●●



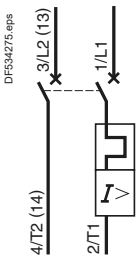
Marking: up to twelve AB1 R clip-in markers.

Schemes

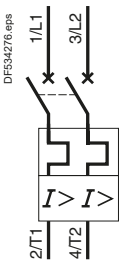
GB2CB●●



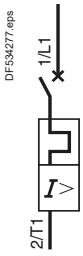
GB2CD●●



GB2DB●●



GB2CS●●



References:
pages B6/59 and B6/60

Characteristics:
pages B6/146 to B6/148

TeSys SK, K, D
Control relays

TeSys SK, K Relays - For control of TeSys K contactor coils and other devices

Type of product		Pages
Mini relay - 2 contacts, simultaneous action TeSys SK, SKE		B7/2
Relays - 4 contacts, simultaneous action TeSys K		B7/4
Auxiliary contact blocks, accessories		B7/6

TeSys D Relays - For control of TeSys D contactor coils and other devices

Relays and auxiliary contact blocks 5 contacts, simultaneous action TeSys D		B7/8
Accessories		B7/10

Technical Data for Designers B7/13

PB121522.tif



CA2SK11●●

Mini-control relays

- Width of mini-control relays 27 mm.
- Mounting on 35 mm ⎓ rail.
- Connection by connectors.

Control circuit supply	Auxiliary contacts		Basic reference, to be completed by adding the voltage code (1)
a.c. supply	2	–	**CA2SK20●●**
	1	1	**CA2SK11●●**
d.c. supply	2	–	**CA3SK20●●**
	1	1	**CA3SK11●●**

PB121523.eps



CA2SKE20●●

Mini-control relay with alternating contacts

This mini-control relay with alternating contacts (see function diagram page B7/17) makes it possible to automatically split the operating time between 2 circuits of a redundant system.
By regularly energising the “safety circuits”, this device makes it possible to ensure that they are operating correctly.

- Width of mini-control relay 45 mm.
- Fixing by Ø4 screws.
- Connection by connectors.
- Cannot be fitted with front-mounted auxiliary contact block.
- Cannot be fitted with coil suppressor module.

Control circuit supply	Auxiliary contacts		Basic reference, to be completed by adding the voltage code (1)
a.c. supply	2	–	**CA2SKE20●●**

(1) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Mini-control relays CA2SK and CA2SKE

Volts ∼ 50/60 Hz	**24**	**48**	**110**	**120**	**220**	**230**	**240**	**380**	**400**
Code	B7	E7	F7	G7	M7	P7	U7	Q7	V7

Mini-control relays CA3SK

Volts ⎓	**12**	**24**	**36**	**48**	**72**
Code	JD	BD	CD	ED	SD

Control relays

Characteristics: pages B7/14 and B7/15
Dimensions: page B7/16
Schemes: page B7/17

Product references

PB111639_R.eps



LA1SK●●

Instantaneous auxiliary contact blocks

Clip-on front mounting

For use on control relays	Maximum number of blocks per contactor	Composition		Reference
CA2SK20	1	2	–	**LA1SK20**
		–	2	**LA1SK02**
		1	1	**LA1SK11**

PB111640_R.eps



LA4SK●1●

Suppressor modules

Connection without need for tools by clipping onto right-hand side of contactor

For use on control relays	Type	For voltages	Sold in lots of	Unit reference
CA2SK and **CA3SK**	Varistor (1)	∿ and ⎓ 24 V…48 V	10	**LA4SKE1E**
		∿ and ⎓ 110 V…250 V	10	**LA4SKE1U**
	Diode (2)	⎓ 24 V…250 V	10	**LA4SKC1U**

(1) Protection provided by limiting the transient voltage to 2 Uc max.
Maximum reduction of transient voltage peaks.
Slight increase in drop-out time (1.1 to 1.5 times the normal time).
(2) No overvoltage or oscillating frequency.
Slight increase in drop-out time (1.1 to 1.5 times the normal time).

Characteristics: page B7/15
Dimensions: page B7/16
Schemes: page B7/17

PB121524.eps



CA2KN22●●

PB121526.eps



CA2KN●●5●●

PB121543.eps



CA3KN●●3●●

PB121525.eps



CA3KN●●7●●

Control relays for a.c. control circuit

- Mounting on 35 mm ⎓ rail or Ø4 screw fixing.
- Screws in the open "ready-to-tighten" position.

Control circuit Consumption	Auxiliary contacts		Basic reference, to be completed by adding the voltage code (1)
Screw clamp connections			
4.5 VA	4	–	**CA2KN40●●**
	3	1	**CA2KN31●●**
	2	2	**CA2KN22●●**
Spring terminal connections			
4.5 VA	4	–	**CA2KN403●●**
	3	1	**CA2KN313●●**
	2	2	**CA2KN223●●**
Faston connectors, 1 x 6.35 or 2 x 2.8			
4.5 VA	4	–	**CA2KN407●●**
	3	1	**CA2KN317●●**
	2	2	**CA2KN227●●**
Solder pins for printed circuit boards			
4.5 VA	4	–	**CA2KN405●●**
	3	1	**CA2KN315●●**
	2	2	**CA2KN225●●**

Control relays for d.c. control circuit

- Mounting on 35 mm ⎓ rail or Ø4 screw fixing.
- Screws in the open "ready-to-tighten" position.

Screw clamp connections			
3 W	4	–	**CA3KN40●●**
	3	1	**CA3KN31●●**
	2	2	**CA3KN22●●**
Spring terminal connections			
3 W	4	–	**CA3KN403●●**
	3	1	**CA3KN313●●**
	2	2	**CA3KN223●●**
Faston connectors, 1 x 6.35 or 2 x 2.8			
3 W	4	–	**CA3KN407●●**
	3	1	**CA3KN317●●**
	2	2	**CA3KN227●●**
Solder pins for printed circuit boards			
3 W	4	–	**CA3KN405●●**
	3	1	**CA3KN315●●**
	2	2	**CA3KN225●●**

(1) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):
Control relays CA2K (0.8...1.15 Uc) *(0.85...1.1 Uc)*

Volts ∼ 50/60 Hz	**12**	**20**	**24(2)**	**36**	**42**	**48**	**110**	**115**	**127**	**220/ 230**	**230**	**230/ 240**	**380/ 400**	**400**	**400/ 415**	**440**	**500**	**660/ 690**
Code	J7	Z7	B7	C7	D7	E7	F7	FE7	FC7	M7	P7	U7	Q7	V7	N7	R7	S7	Y7

Up to and including 240 V, coil with integral suppression device available: add **2** to the code required. Example: **J72**
Control relays CA3K (0.8...1.15 Uc)

Volts ⎓	**12**	**20**	**24(2)**	**36**	**48**	**60**	**72**	**100**	**110**	**125**	**200**	**220**	**230**	**240**	**250**
Code	JD	ZD	BD	CD	ED	ND	SD	KD	FD	GD	LD	MD	MPD	MUD	UD

Coil with integral suppression device available: add **3** to the code required. Example: **JD3**.

(2) When connecting an electronic sensor or timer in series with the coil of the control relay, select a 20 V coil (∼ code Z7, ⎓ code ZD) so as to compensate for the incurred voltage drop.

Characteristics: pages B7/18 and B7/19
Dimensions: page B7/20
Schemes: page B7/21

PB121527.eps



CA4KN40●●●

Low consumption control relays d.c. control circuit

- Mounting on 35 mm ⎓ rail or Ø4 screw fixing.
- Screws in the open "ready-to-tighten" position.

Control circuit Consumption	Auxiliary contacts		Basic reference, to be completed by adding the voltage code (1)
Screw clamp connections			
1.8 W	4	–	**CA4KN40●●**
	3	1	**CA4KN31●●**
	2	2	**CA4KN22●●**
Spring terminal connections			
1.8 W	4	–	**CA4KN403●●**
	3	1	**CA4KN313●●**
	2	2	**CA4KN223●●**
Faston connectors, 1 x 6.35 or 2 x 2.8			
1.8 W	4	–	**CA4KN407●●**
	3	1	**CA4KN317●●**
	2	2	**CA4KN227●●**
Solder pins for printed circuit boards			
1.8 W	4	–	**CA4KN405●●**
	3	1	**CA4KN315●●**
	2	2	**CA4KN225●●**

(1) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):
Control relays CA4K (Wide range coil: 0.7...1.3 Uc)

Volts ⎓	**12**	**20**	**24**	**48**	**72**	**110**	**120**
Code	JW3	ZW3	BW3	EW3	SW3	FW3	GW3

Coil with integral suppression device fitted as standard, by bi-directional peak limiting diode.

Characteristics: pages B7/18 and B7/19
Dimensions: page B7/20
Schemes: page B7/21

Product references

PB121528.eps



LA1KN22

PB111987_R.eps



LA1KN●●3

PB111988_R.eps



LA1KN●●7

Instantaneous auxiliary contact blocks

Clip-on front mounting, 1 per control relay

Connection	Composition		Reference
Screw clamp terminals	2	–	**LA1KN20**
	–	2	**LA1KN02**
	1	1	**LA1KN11**
	4	–	**LA1KN40** (1)
	3	1	**LA1KN31** (1)
	2	2	**LA1KN22** (1)
	1	3	**LA1KN13** (1)
	–	4	**LA1KN04** (1)
Spring terminals	2	–	**LA1KN203**
	–	2	**LA1KN023**
	1	1	**LA1KN113**
	4	–	**LA1KN403** (1)
	3	1	**LA1KN313** (1)
	2	2	**LA1KN223** (1)
	1	3	**LA1KN133** (1)
	–	4	**LA1KN043** (1)
Faston connectors 1 x 6.35 or 2 x 2.8	2	–	**LA1KN207**
	–	2	**LA1KN027**
	1	1	**LA1KN117**
	4	–	**LA1KN407** (1)
	3	1	**LA1KN317** (1)
	2	2	**LA1KN227** (1)
	1	3	**LA1KN137** (1)
	–	4	**LA1KN047** (1)

Electronic time delay contact blocks

- Relay output with common point changeover contact, ∼ or ⎓ 240 V, 2 A maximum
- Control voltage 0.85...1.1 Uc
- Maximum switching capacity 250 VA or 150 W
- Operating temperature -10...+ 60 °C
- Reset time: 1.5 s during the time delay period 0.5 s after the time delay period

Clip-on front mounting, 1 per control relay

PB121529.eps



LA2KT2E

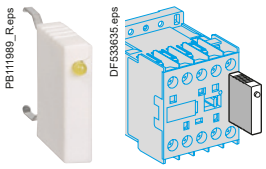
Voltage	Type	Timing range	Composition	Reference
V		s		
∼ or ⎓ 24...48	On-delay	1...30	1	**LA2KT2E**
∼ 110...240	On-delay	1...30	1	**LA2KT2U**

Other versions Electronic timers type RE4.
Please consult your Regional Sales Office.

*(1) Block of 4 contacts for use on **CA2K** and **CA3K**.*

Characteristics: page B7/19
Dimensions: page B7/20
Schemes: page B7/21

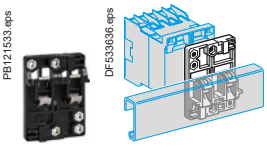
Product references



LA4KC1B

Suppressor modules incorporating LED indicator

Mounting and connection	Type	For voltages	Sold in lots of	Unit reference
Clips onto front of relay with locating device. No tools required.	Varistor (1)	∿ and ⎓ 12...24 V	5	**LA4KE1B**
		∿ and ⎓ 32...48 V	5	**LA4KE1E**
		∿ and ⎓ 50...129 V	5	**LA4KE1FC**
		∿ and ⎓ 130...250 V	5	**LA4KE1UG**
	Diode + Zener diode (2)	⎓ 12...24 V	5	**LA4KC1B**
		⎓ 32...48 V	5	**LA4KC1E**
	RC (3)	∿ 220...250 V	5	**LA4KA1U**



LA9D973

Mounting accessories

Description	Application		Sold in lots of	Unit reference
Mounting plates	On 1 ⊏⊐ rail	Clip-on	1	**LA9D973**
	On 2 ⊏⊐ rails	110/120 mm fixing centres	10	**DX1AP25**



LA9D90

Marking accessories

Description	Application		Sold in lots of	Unit reference
Marker holder	Clip-on fixing on front face	–	100	**LA9D90**
Clip-in markers	4 maximum per relay	Strips of 10 identical numbers 0 to 9	25	**AB1R●** (4)
		Strips of 10 identical capital letters A to Z	25	**AB1G●** (4)



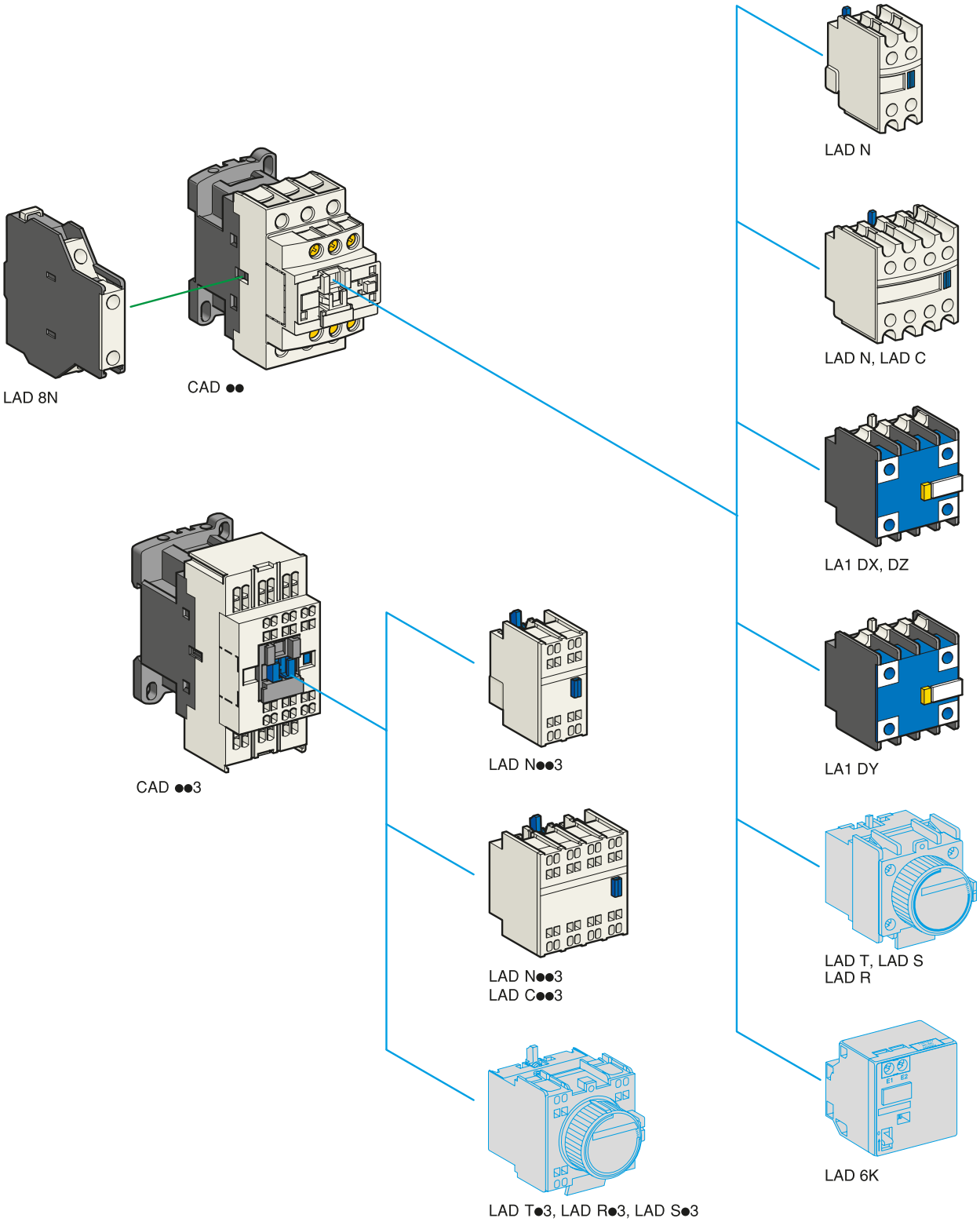
AB1R9

(1) Protection provided by limiting the transient voltage to 2 Uc max.
Maximum reduction of transient voltage peaks.
Slight increase in drop-out time (1.1 to 1.5 times the normal time).
(2) No overvoltage or oscillating frequency.
Polarised component.
Slight increase in drop-out time (1.1 to 1.5 times the normal time).
(3) Protection by limiting the transient voltage to 3 Uc max. and limitation of the oscillating frequency.
Slight increase in drop-out time (1.2 to 2 times the normal time).
(4) Complete the reference by replacing the dot with the required character.

Dimensions:
page B7/20

Schemes:
page B7/21

DF5226461.eps



See page opposite for mounting possibilities according to control relay type and rating

Life Is On Schneider Electric

Product references

PB114200_R.eps



CAD50●●

PB114198_R.eps



CAD503●●

PB121539.eps



LADN22

PB121530.eps



LA1DY20

Control relays for connection by screw clamp terminals

Type	Number of contacts	Composition		Basic reference, to be completed by adding the control voltage code (1)
Instantaneous	5	5	–	**CAD50●●** (3)
		3	2	**CAD32●●** (3)

Control relays for connection by spring terminals

Instantaneous	5	5	–	**CAD503●●**
		3	2	**CAD323●●**

Instantaneous auxiliary contact blocks for connection by screw clamp terminals

For use in normal operating environments

Number of contacts	Maximum number per relay – Clip-on mounting: front	side	Composition		Reference	
2	1	–	1	1	**LADN11**	
	–	1 on LH side	1	1	**LAD8N11** (6)	
	1	–	2	–	**LADN20**	
	–	1 on LH side	2	–	**LAD8N20** (6)	
	1	–	–	2	**LADN02**	
	–	1 on LH side	–	2	**LAD8N02** (6)	
4 (4)	1	–	2	2	**LADN22**	**LADN22S** (7)
			1	3	**LADN13**	
			4	–	**LADN40**	
			–	4	**LADN04**	
			3	1	**LADN31**	
4 (4)	1	–	2	2	**LADC22**	

Including 1 N/O and 1 N/C make before break.

With dust and damp protected contacts, for use in particularly harsh industrial environments

Number of contacts	Maximum number per relay – Front mounting	Composition: protected (5)			not protected		Reference
2	1	2	–	–	–	–	**LA1DX20**
		–	2	–	–	–	**LA1DX02**
		2	–	2	–	–	**LA1DY20** (8)
4 (4)	1	2	–	–	2	–	**LA1DZ40**
		2	–	–	1	1	**LA1DZ31**

Instantaneous auxiliary contact blocks for connection by spring terminals

This type of connection is not possible for contact blocks LAD 8 and blocks with dust and damp protected contacts.
For all other instantaneous auxiliary contact blocks, add the digit **3** to the end of the references selected above.
Example: **LADN11** becomes **LADN113**.

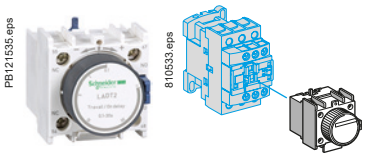
(1) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office).

a.c. supply												
Volts ∿	**24**	**42**	**48**	**110**	**115**	**220**	**230**	**240**	**380**	**400**	**415**	**440**
50/60 Hz	B7	D7	E7	F7	FE7	M7	P7	U7	Q7	V7	N7	R7
d.c. supply (coils with integral suppression device fitted as standard)												
Volts ⎓	**12**	**24**	**36**	**48**	**60**	**72**	**110**	**125**	**220**	**250**	**440**	
U from 0.7 to 1.25 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD	
Low consumption (coils with integral suppression device fitted as standard)												
Volts ⎓	**5**	**12**	**20**	**24**	**48**	**110**	**220**	**250**				
Code	AL	JL	ZL	BL	EL	FL	ML	UL				

(2) LC: low consumption.
*(3) To order control relays with connection by lugs, add the digit **6** to the end of the selected reference.*
Example: CAD50●● becomes CAD506●●.
(4) Blocks with 4 auxiliary contacts cannot be used on low consumption control relays.
(5) Product fitted with 4 earth screen continuity terminals.
(6) These contact blocks are allowed with AC coil control relay only.
(7) With red front face - for safety chain indication.
(8) With 2 earth screen continuity poles.

Characteristics: pages B7/22 to B7/24
Curves: page B7/25
Dimensions: page B7/26
Schemes: page B7/27

Product references



LADT2

Time delay auxiliary contact blocks for connection by screw clamp terminals (1)

Number and type of contacts	Maximum number per relay	Time delay		Reference
	Front mounting	Type	Range	
1 N/C and 1 N/O	1	On-delay	0.1…3 s (2)	**LADT0**
			0.1…30 s	**LADT2**
			10…180 s	**LADT4**
			1…30 s (3)	**LADS2**
		Off-delay	0.1…3 s (2)	**LADR0**
			0.1…30 s	**LADR2**
			10…180 s	**LADR4**

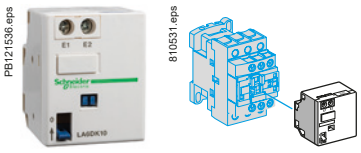
(Sealing cover: see page B8/28)

Time delay auxiliary contact blocks for connection by spring terminals

Add the digit **3** to the references selected above. Example: **LADT0** becomes **LADT03**.

Mechanical latch blocks (4)

Unlatching control	Maximum number per relay	Basic reference to be completed (5)
	Front mounting	
Manual or electric	1	**LAD6K10●**



LAD6K10

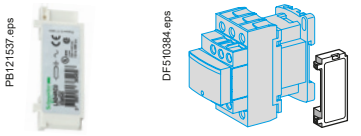
Suppressor modules

These modules clip onto the top of the control relay and the electrical connection is instantly made. Fitting of an input module is still possible.

RC circuits (Resistor-Capacitor)

- Effective protection for circuits highly sensitive to “high frequency” interference.
- Voltage limited to 3 Uc maximum and oscillating frequency limited to 400 Hz maximum.
- Slight time delay on drop-out (1.2 to 2 times the normal time).

For mounting on	Operational voltage	Reference
CAD ∿	∿ 24…48 V	**LAD4RCE**
	∿ 50…127 V	**LAD4RCG**
	∿ 110…250 V	**LAD4RCU**



LAD4RCU

Varistors (peak limiting)

- Protection provided by limiting the transient voltage value to 2Uc maximum.
- Maximum reduction of transient voltage peaks.
- Slight time delay on drop-out (1.1 to 1.5 times the normal time).

CAD ∿	∿ 24…48 V	**LAD4VE**
	∿ 50…127 V	**LAD4VG**
	∿ 110…250 V	**LAD4VU**

Freewheel diode

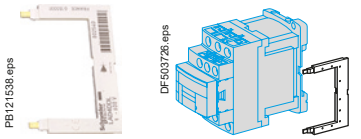
- No overvoltage or oscillating frequency.
- Increase in drop-out time (6 to 10 times the normal time).
- Polarised component.

CAD ⎓	⎓ 5…600 V	**LAD4DDL**

Bidirectional peak limiting diode (6)

- Protection provided by limiting the transient overvoltage value to 2Uc maximum.
- Maximum reduction of transient voltage peaks.

CAD ∿	∿ 24 V	**LAD4TB**
	∿ 72 V	**LAD4TS**
CAD ⎓	⎓ 24 V	**LAD4TBDL**
	⎓ 72 V	**LAD4TSDL**
	⎓ 125 V	**LAD4TGDL**
	⎓ 250 V	**LAD4TUDL**
	⎓ 600 V	**LAD4TXDL**



LAD4DDL

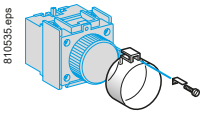
(1) These contact blocks cannot be used on low consumption control relays.
(2) With extended scale from 0.1 to 0.6 s.
(3) With switching time of 40 ms ±15 ms between opening of the N/C contact and closing of the N/O contact.
(4) Power should not be simultaneously applied or maintained to the mechanical latching block of the CAD N. The duration of the control signal to the mechanical latching block and the CAD N should be ⩾ 100 ms.
(5) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Volts ∿ and ⎓	24	32/36	42/48	60/72	100	110/127	220/240	256/277	380/415
Code	B	C	E	EN	K	F	M	U	Q

*(6) **CAD●●** ⎓ and low consumption control relays are fitted with a built-in bi-directional peak limiting diode suppressor as standard. On control relays produced after 15th July 2004, this diode is removable. It can therefore be replaced by the user (see references **LAD4T●●●** above). It can also be replaced by a freewheel diode **LAD4DDL**. If a d.c. or low consumption control replay is used without suppression, the standard suppressor should be replaced with a blanking plug **LAD9DL**.*

Characteristics: pages B7/22 to B7/24 | Illustrations: page B7/8 | Curves: page B7/25 | Dimensions: page B7/26 | Schemes: page B7/27





LA9D901



LAD9ET1S



LXD1

Accessories (to be ordered separately)

Description	For mounting on	Sold in lots of	Unit reference
For marking			
Sheet of 64 blank legends, self-adhesive, 8 x 33 mm	CAD, LAD (4 contacts)	10	**LAD21**
Sheet of 112 blank legends, self-adhesive, 8 x 12 mm	LAD (2 contacts), LADT		**LAD22**
Strips of blank, self-adhesive legends for printing by plotter (4 sets of 5 strips)	All products	35	**LAD24**
"SIS Label" labelling software for legends LAD 21 and LAD 22, supplied on CD-Rom	Multi-language version: English, French, German, Italian, Spanish	1	**XBY2U**
Legend holder, snap-in, 8 x 18 mm	LC1D09...38 LC1DT20...40 LADN (4 contacts) LADT, LAD R	100	**LAD90**
For protection			
Sealing cover	LADT, LAD R	1	**LA9D901**
Safety cover preventing access to the moving contact carrier	CAD	1	**LAD9ET1**
Red cover (for safety chain indication)	CAD	1	**LAD9ET1S**

Spare parts: coils

Specifications

- Average consumption at 20 °C:
  - inrush (cos φ = 0.75) 50/60 Hz: 70 VA at 50 Hz,
  - sealed (cos φ = 0.3) 50/60 Hz: 8 VA at 60 Hz,
- Operating range (θ < 60 °C): 0.85 to 1.1 Uc

Control circuit voltage Uc	Average resistance at 20 °C ±10 %	Inductance of closed circuit	Reference (1) 50/60 Hz
V	V	H	
12	6.3	0.26	**LXD1J7**
21 (2)	5.6	0.24	**LXD1Z7**
24	6.19	0.26	**LXD1B7**
32	12.3	0.48	**LXD1C7**
36	–	–	**LXD1CC7**
42	19.15	0.77	**LXD1D7**
48	25	1	**LXD1E7**
60	–	–	**LXD1EE7**
100	–	–	**LXD1K7**
110	130	5.5	**LXD1F7**
115	–	–	**LXD1FE7**
120	159	6.7	**LXD1G7**
127	192.5	7.5	**LXD1FC7**
200	–	–	**LXD1L7**
208	417	16	**LXD1LE7**
220/230	539	22	**LXD1M7** (3)
230	595	21	**LXD1P7**
230/240	645	25	**LXD1U7** (4)
277	781	30	**LXD1W7**
380/400	1580	60	**LXD1Q7**
400	1810	64	**LXD1V7**
415	1938	74	**LXD1N7**
440	2242	79	**LXD1R7**
480	2300	85	**LXD1T7**
500	2499	–	**LXD1S7**
575	3294	–	**LXD1SC7**
600	3600	135	**LXD1X7**
690	5600	190	**LXD1Y7**

(1) The last 2 digits in the reference represent the voltage code.
(2) Voltage for special coils fitted in control relays with serial timer module with 24 V supply.
(3) This coil can be used on 240 V at 60 Hz.
(4) This coil can be used on 230/240 V at 50 Hz and on 240 V only at 60 Hz.

TeSys SK, K, D

Technical Data for Designers

Contents

TeSys SK:
> characteristics ..... B7/14 and B7/15
> dimensions B7/16
> schemes B7/17

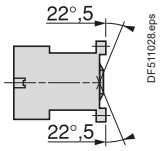
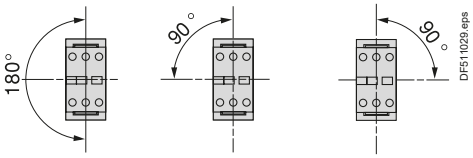
TeSys K:
> characteristics ..... B7/18 and B7/19
> dimensions B7/20
> schemes B7/21

TeSys D:
> characteristics ..... B7/22 to B7/24
> curves B7/25
> dimensions B7/26
> schemes B7/27

Characteristics

Environment

Rated insulation voltage (Ui)	Conforming to IEC 60947, CSA 22-2 n° 14, UL 508	**V**	690
Conforming to standards			IEC/EN 60947-5-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.5
Approvals			cULus, CCC, EAC, CB certification
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact IP2X
Ambient air temperature around the device	Storage	**°C**	-50…+70
	Operation	**°C**	-20…+50
Maximum operating altitude	Without derating	**m**	2000

Operating position	**Vertical axis**  Without derating	**Horizontal axis**  Without derating

Connection by connectors			**Min.**	**Max.**
	Solid cable	**mm²**	1 x 1.5 or 2 x 1.5	1 x 6 or 2 x 4
	Flexible cable without cable end	**mm²**	1 x 0.5 or 2 x 0.35	1 x 6 or 2 x 2.5
	Flexible cable with cable end	**mm²**	1 x 0.35 or 2 x 0.35	1 x 6 or 2 x 1.5
Tightening torque	Pozidriv n° 1 head	**N.m**	0.8	
Terminal referencing	Conforming to standards EN 50005 and EN 50011		Up to 4 contacts	

Control circuit characteristics

Control relay			**CA2SK**	**CA2SKE**	**CA3SK**
Rated control circuit voltage (Uc)		**V**	∼ 24…400		⎓ 12…72
Control voltage limits (≤ 50 °C)	For operation		0.85…1.1 Uc		0.85…1.1 Uc
	For drop-out		≤ 0.20 Uc		≤ 0.10 Uc
Average consumption at 20 °C and at Uc	Inrush		16 VA	23 VA	2.2 W
	Sealed		4.2 VA	4.9 VA	2.2 W
Heat dissipation		**W**	1.4	1.5	2.2
Operating time at 20 °C and at Uc	Between coil energisation and				
	opening of the N/C contacts	**ms**	8…16		10…18
	closing of the N/O contacts	**ms**	7…14		8…12
	Between coil de-energisation and				
	opening of the N/O contacts	**ms**	6…8		4…6
	closing of the N/C contacts	**ms**	8…10		6…8
Maximum operating rate	In operating cycles per hour		1200		1200
Mechanical durability at Uc in millions of operating cycles	50/60 Hz coil		10		–
	Standard ⎓ coil		–		10

Ref.

Control relays

References: pages B7/2 and B7/3

Dimensions: page B7/16

Schemes: page B7/17

Characteristics

Auxiliary contact characteristics of mini-control relays and instantaneous contact blocks

Rated operational voltage (Ue)		**V**	Up to 690
Rated insulation voltage (Ui)	Conforming to IEC 96047	**V**	690
Conventional rated thermal current (Ith)	For ambient temperature ≤ 55 °C	**A**	10
Frequency of the operational current		**Hz**	Up to 400
Short-circuit protection	Conforming to IEC 60947, gl fuse	**A**	10

Operational power of contacts conforming to IEC 60947

	a.c. supply, category AC-15 Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current (cos φ 0.7) = 10 times the power broken (cos φ 0.4).							**d.c. supply, category DC-13** Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.					
	V	**24**	**48**	**110/ 127**	**220/ 230**	**380/ 400**	**440**	**V**	**24**	**48**	**110**	**220**	**440**
1 million operating cycles	**VA**	48	96	240	440	800	880	**W**	120	80	60	52	51
3 million operating cycles	**VA**	17	34	86	158	288	317	**W**	55	38	30	28	26
10 million operating cycles	**VA**	7	14	36	66	120	132	**W**	15	11	9	8	7
Occasional making capacity	**VA**	1000	2050	5000	10000	14000	13 000	**W**	720	600	400	300	230

Ref.
Control relays

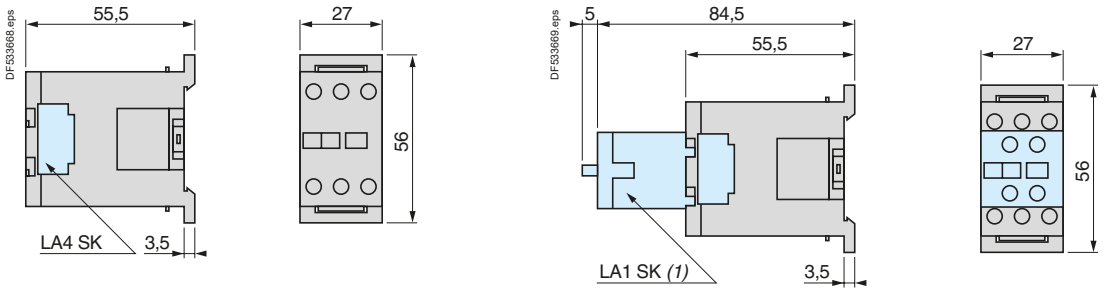
References: page B7/3
Dimensions: page B7/16
Schemes: page B7/17

Dimensions and mounting

Dimensions

Mini-control relays

CA2SK and CA3SK



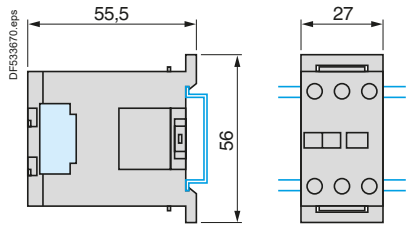
(1) Only on CA2SK20.

Mounting

Mini-control relays

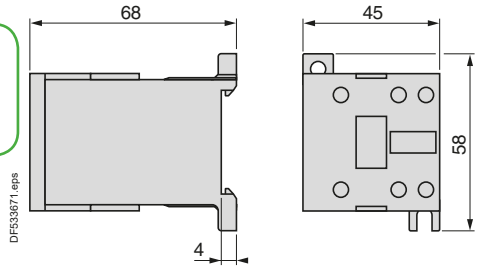
CA2SK and CA3SK

On mounting rail NSYDR200BD or NSYDR200 (⎓ 35 mm)



Dimensions

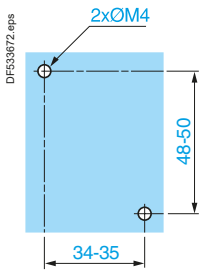
CA2SKE



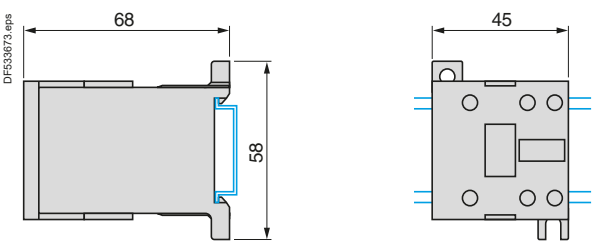
Mounting

CA2SKE

On panel



On mounting rail NSYDR200BD or NSYDR200 (⎓ 35 mm)

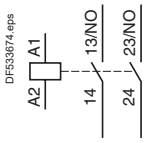


Ref.
Control relays

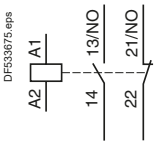
Schemes

Schemes

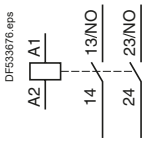
CA2SK20, CA3SK20
2 N/O



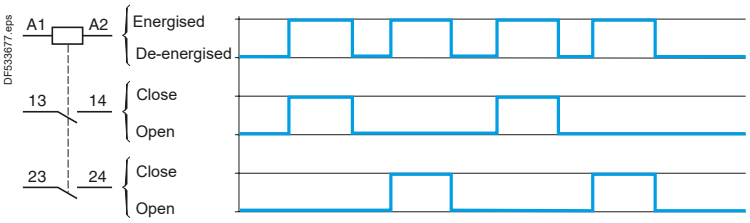
CA2SK11, CA3SK11
1 N/O + 1 N/C



CA2SKE
2 N/O

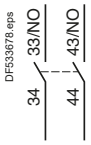


CA2SKE
Function diagram

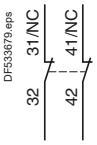


Instantaneous auxiliary contacts

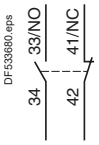
2 N/O
LA1SK20



2 N/C
LA1SK02



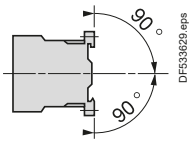
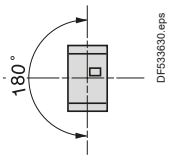
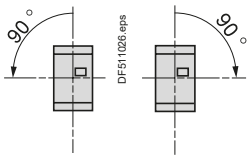
1 N/O + 1 N/C
LA1SK11



Ref.
Control relays

Characteristics

Environment

Conforming to standards			IEC/EN 60947-5-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.5		
Product certifications			UL, CSA, CCC, EAC, CB certification		
Operating positions			**Vertical axis**  Without derating	**Horizontal axis**  Without derating	 Possible positions for **CA2K** only, with derating, please consult your Regional Sales Office.
Connection			**Min.**	**Max.**	**Max. to IEC 60947**
Screw clamp connections	Solid cable	**mm²**	1 x 1.5	2 x 4	1 x 4 + 1 x 2.5
	Flexible cable without cable end	**mm²**	1 x 0.75	2 x 4	2 x 2.5
	Flexible cable with cable end	**mm²**	1 x 0.34	1 x 1.5 + 1 x 2.5	1 x 1.5 + 1 x 2.5
Spring terminals	Solid cable	**mm²**	1 x 0.75	1 x 1.5	2 x 1.5
	Flexible cable without cable end	**mm²**	1 x 0.75	1 x 1.5	2 x 1.5
Faston connectors	Clip	**mm**	2 x 2.8 or 1 x 6.35		
Solder pins for printed circuit board	With locating device between power and control circuits		4 mm x 35 microns		
Tightening torque	Philips head n° 2 and Ø6	**N.m**	0.8		
Terminal referencing	Conforming to standards EN 50005 and EN 50011		Up to 8 contacts		
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact IP2x (devices with screw clamp terminals or pins for printed circuit board)		
Ambient air temperature around the device	Storage	**°C**	-50...+80		
	Operation	**°C**	-25...+50		
Maximum operating altitude	Without derating	**m**	2000		
Vibration resistance	Control relay open		2 gn		
5...300 Hz	Control relay closed		4 gn		
Flame resistance	Conforming to IEC 60695-2-11		850 °C		
Shock resistance (1/2 sine wave, 11 ms)	Control relay open		10 gn		
	Control relay closed		15 gn		

Control circuit characteristics

Control relay type			**CA2K**	**CA3K**	**CA4K**
Rated control circuit voltage (Uc)		**V**	~ 12...690	⎓ 12...250	⎓ 12...120
Control voltage limits (y 50 °C) single voltage coil	For operation		0.8...1.15 Uc	0.8...1.15 Uc	0.7...1.3 Uc
	For drop-out		⩽ 0.2 Uc	⩽ 0.1 Uc	⩽ 0.1 Uc
Mechanical durability at Uc In millions of operating cycles	50/60 Hz coil		10	–	–
	Standard ⎓ coil		–	20	–
	Wide range, low consumption ⎓ coil		–	–	30
Maximum operating rate	In operating cycles per hour		10 000	10 000	6000
Average consumption at 20 °C and at Uc	Inrush		30 VA	3 W	1.8 W
	Sealed		4.5 VA	3 W	1.8 W
Heat dissipation		**W**	1.3	3	1.8
Operating time at 20 °C and at Uc	Between coil energisation and opening of the N/C contacts	**ms**	5...15	25...35	25...35
	Between coil energisation and closing of the N/O contacts	**ms**	10...20	30...40	30...40
	Between coil de-energisation and opening of the N/O contacts	**ms**	10...20	10	10...20
	Between coil de-energisation and closing of the N/C contacts	**ms**	15...25	15	15...25
Maximum immunity to microbreaks		**ms**	2	2	2

Ref.
Control relays

References: pages B7/4 to B7/7
Dimensions: page B7/20
Schemes: page B7/21

Characteristics

Contact characteristics of control relays and instantaneous contact blocks

Number of auxiliary contacts	On **CA●K**		4
	On **LA1K**		2 or 4 for **CA2K** and **CA3K**, 2 for **CA4K**
Rated operational voltage (Ue)	Up to	**V**	690
Rated insulation voltage (Ui)	Conforming to IEC 60947	**V**	690
	Conforming to UL 60947-5-1, CSA C22.2 n° 60947-5-1	**V**	600
Conventional thermal current (Ith)	For ambient temperature ≤ 50 °C	**A**	10
Frequency of the operational current		**Hz**	Up to 400
Minimum switching capacity	U min	**V**	17
	I min	**mA**	5
Short-circuit protection	Conforming to IEC 60947, gG fuse	**A**	10
Rated making capacity	Conforming to IEC 60947		
	I rms	**A**	110
Short-time rating	Permissible for		
	1 s	**A**	80
	500 ms	**A**	90
	100 ms	**A**	110
Insulation resistance		**MΩ**	> 10
Non-overlap distance	CA●K and LA1K: linked contacts conforming to INRS, BIA and CNA specifications	**mm**	0.5 (see schemes page B7/21)

Operational power of contacts conforming to IEC 60947

a.c. supply, category AC-15

Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current (cos φ 0.7) = 10 times the power broken (cos φ 0.4)

	V	24	48	110/127	220/230	380/400	440	600/690
1 million operating cycles	**VA**	48	96	240	440	800	880	1200
3 million operating cycles	**VA**	17	34	86	158	288	317	500
10 million operating cycles	**VA**	7	14	36	66	120	132	200
Occasional making capacity	**VA**	1000	2050	5000	10000	14000	13000	9000

d.c. supply, category DC-13

Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.

	V	24	48	110	220	440	600
1 million operating cycles	**W**	120	80	60	52	51	50
3 million operating cycles	**W**	55	38	30	28	26	25
10 million operating cycles	**W**	15	11	9	8	7	6
Occasional making capacity	**W**	720	600	400	300	230	200

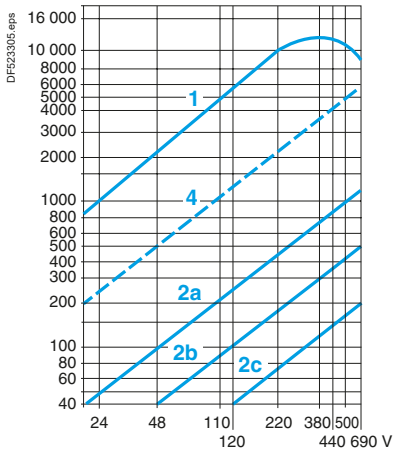
1 Breaking limit of contacts valid for:
■ maximum of 50 operating cycles at 10 s intervals (power broken = making current x cos φ 0.7).

2 Electrical durability of contacts for:
■ 1 million operating cycles (**2a**)
■ 3 million operating cycles (**2b**)
■ 10 million operating cycles (**2c**).

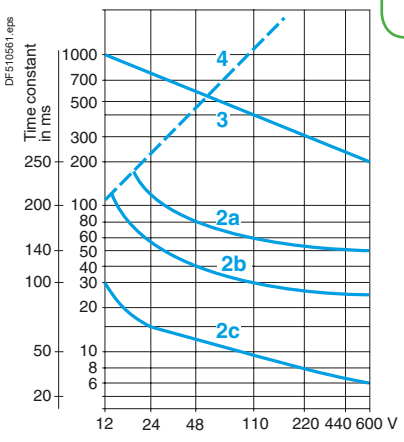
3 Breaking limit of contacts valid for:
■ maximum of 20 operating cycles at 10 s intervals with current passing for 0.5 s per operating cycle.

4 Thermal limit

Power broken in VA



Power broken in W



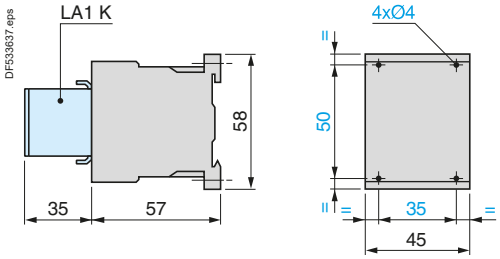
References: page B7/6
Dimensions: page B7/20
Schemes: page B7/21

Dimensions and mounting

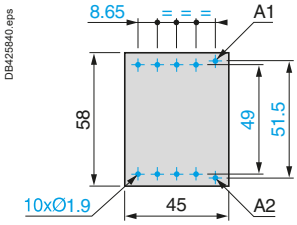
Control relays

CA2K, CA3K, CA4K

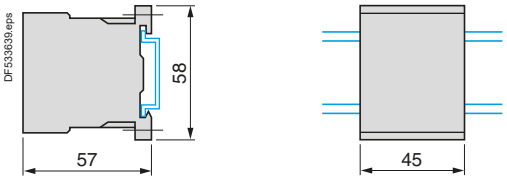
On panel



On printed circuit board

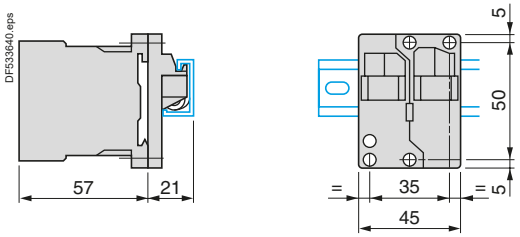


On mounting rail NSYDR200BD or NSYDR200 (⎓ 35 mm)



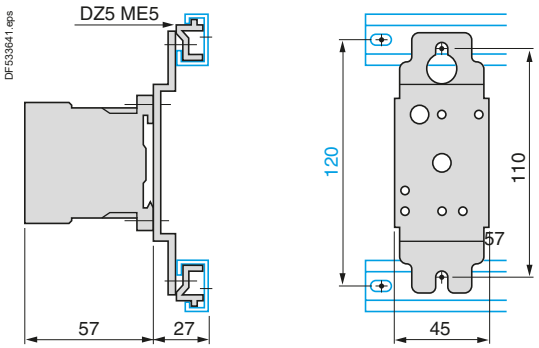
LA9D973

On asymmetrical rail with clip-on mounting plates



DX1AP25

On asymmetrical rail with clip-on mounting plates

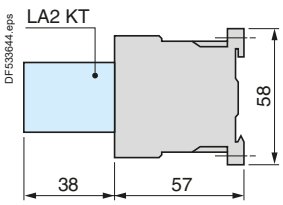


Electronic time delay contact blocks

LA2KT

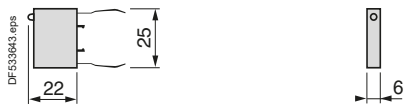


On control relay

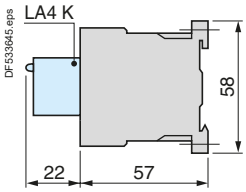


Suppressor modules

LA4K



On control relay



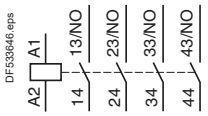
References:
pages B7/4 to B7/7
Characteristics:
pages B7/18 and B7/19
Schemes:
page B7/21

Schemes

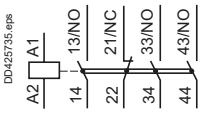
Control relays

CA2K, CA3K, CA4K

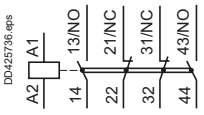
4 N/O



3 N/O + 1 N/C

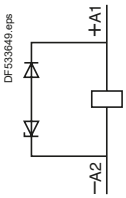


2 N/O + 2 N/C

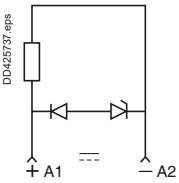


With integral suppression device

CA3K



CA4K

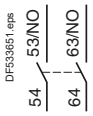


Instantaneous auxiliary contact blocks LA1K

For CA2K, CA3K, CA4K

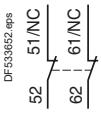
2 N/O

LA1KN20, LA1 KN207



2 N/C

LA1KN02, LA1 KN027



1 N/O + 1 N/C

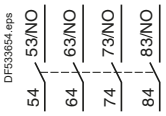
LA1KN11, LA1 KN117



For CA2K, CA3K

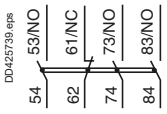
4 N/O

LA1KN40, LA1 KN407



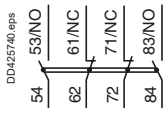
3 N/O + 1 N/C

LA1KN31, LA1 KN317



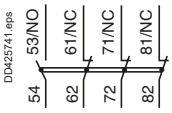
2 N/O + 2 N/C

LA1KN22, LA1KN227



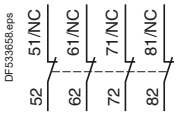
1 N/O + 3 N/C

LA1KN13, LA1KN137



4 N/C

LA1KN04, LA1KN047

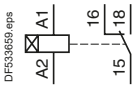


Electronic time delay contact blocks LA2KT

For CA2K, CA3K, CA4K

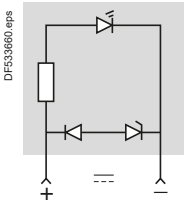
1 C/O

LA2KT2

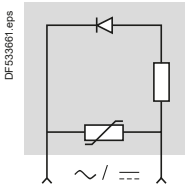


Suppressor modules

LA4KC



LA4KE



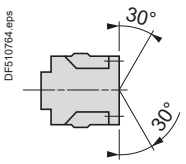
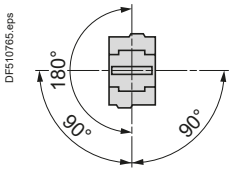
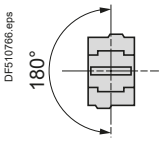
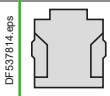
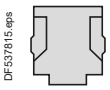
References:
pages B7/4 to B7/7

Characteristics:
pages B7/18 and B7/19

Dimensions:
page B7/20

Characteristics

Environment

Control relay type				CAD ∿	CAD ⎓	CAD ⎓ low consumption
Rated insulation voltage (Ui)	Conforming to IEC 60947-5-1 Overvoltage category III and degree of pollution 3		**V**	690	690	690
	Conforming to UL, CSA		**V**	600	600	600
Rated impulse withstand voltage (Uimp)	Conforming to IEC 60947		**kV**	6	6	6
Separation of electrical circuits	Conforming to IEC 60536			Reinforced insulation up to 400 V		
Conforming to standards				IEC/EN 60947-5-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.5		
Product certifications				UL, CSA, CCC, EAC, CB certification, EU-MR-RO by DNV-GL		
Degree of protection	Conforming to IEC 60529			Front face protected against direct finger contact IP 2X		Protection against direct finger contact IP 2X
Ambient air temperature around the device	Storage		**°C**	-60…+80		
	Operation (1)		**°C**	-40…+60		
	Allowed (1)		**°C**	+60...+70 at Uc to 1,●● x Uc		
Maximum operating altitude	Without derating		**m**	3000	3000	3000
Operating positions	Without derating in the following positions					
	Positions that are not allowed					
Shock resistance (2) half sine wave for 11ms	Control relay open			10 gn	10 gn	10 gn
	Control relay closed			15 gn	15 gn	15 gn
Vibration resistance (2) 5…300 Hz	Control relay open			2 gn	2 gn	2 gn
	Control relay closed			4 gn	4 gn	4 gn
Screw clamp connections	Flexible conductor without cable end	1 conductor	**mm²**	1…4	1…4	1…4
		2 conductors	**mm²**	1…4	1…4	1…4
	Flexible conductor with cable end	1 conductor	**mm²**	1…4	1…4	1…4
		2 conductors	**mm²**	1…2.5	1…2.5	1…2.5
	Solid conductor without cable end	1 conductor	**mm²**	1…4	1…4	1…4
		2 conductors	**mm²**	1…4	1…4	1…4
	Tightening torque		**N.m**	1.7	1.7	1.7
Spring terminal connections	1 or 2 flexible or rigid conductors without cable end		**mm²**	1…2.5	1…2.5	1…2.5

(1) As per IEC60947-1, operating time and drop out voltage given and tested for -5...+40 °C.
(2) In the least favourable direction, without change of contact state, with coil supplied at Uc.

Ref.
Control relays

References: pages B7/9 to B7/11
Curves: page B7/25
Dimensions: page B7/26
Schemes: page B7/27

Characteristics

Control circuit characteristics

Control relay type				CAD ∼	CAD ⎓	CAD low consumption
Rated control circuit voltage (Uc)			**V**	12…690	12…440	⎓ 5…72
Control voltage limits						
	Operation	With coil 50/60 Hz		0.8…1.1 Uc at 50 Hz	–	–
				0.85…1.1 Uc at 60 Hz	–	–
		With standard coil, wide range		–	0.7…1.25 Uc	0.7…1.25 Uc
	Drop-out			0.3…0.6 Uc	0.1…0.25 Uc	0.1…0.25 Uc
Average consumption at 20 °C and at Uc		∼ 50/60 Hz (at 50 Hz)	**VA**	Inrush: 70	–	–
				sealed: 8	–	–
		With standard coil	**W**	–	Inrush or sealed: 5.4	Inrush or sealed: 2.4
Operating time (at rated control circuit voltage and at 20 °C)		Between coil energisation and - opening of the N/C contacts	**ms**	4…19	55 ± 15 %	67 ± 15 %
		- closing of the N/O contacts	**ms**	12…22	63 ± 15 %	77 ± 15 %
		Between coil de-energisation and - opening of the N/O contacts	**ms**	4…12	20 ± 20 %	27 ± 20 %
		- closing of the N/C contacts	**ms**	6…17	25 ± 20 %	35 ± 20 %
Short supply failure		Maximum duration without affecting hold-in of the device	**ms**	2	2	2
Maximum operating rate		In operating cycles per second		3	3	3
Mechanical durability In millions of operating cycles		With coil 50/60 Hz (at 50 Hz)		30	–	–
		With standard coil ⎓ wide range		–	30	30
Time constant L/R			**ms**	–	28	40

Ref.
Control relays

References: pages B7/9 to B7/11
Curves: page B7/25
Dimensions: page B7/26
Schemes: page B7/27

Characteristics

Characteristics of instantaneous contacts incorporated in the control relay

Number of contacts				5
Rated operational voltage (Ue)	Up to		**V**	690
Rated insulation voltage (Ui)	Conforming to IEC 60947-5-1		**V**	690
	Conforming to UL, CSA		**V**	600
Conventional thermal current (Ith)	For ambient temperature ≤ 60 °C		**A**	10
Frequency of the operational current			**Hz**	25...400
Minimum switching capacity	U min		**V**	17
	I min		**mA**	5
Short-circuit protection	Conforming to IEC 60947-5-1			gG fuse: 10 A
Rated making capacity	Conforming to IEC 60947-5-1	I rms		∼ 140, ⎓ 250
Short-time rating	Permissible for	1 s	**A**	100
		500 ms	**A**	120
		100 ms	**A**	140
Insulation resistance			**MΩ**	> 10
Non-overlap time	Guaranteed between N/C and N/O contacts		**ms**	1.5 (on energisation and on de-energisation)
Tightening torque	Philips head n° 2 and Ø6		**N.m**	1.7
Non-overlap distance				Linked contacts in association with auxiliary contacts LADN
Mechanically linked contacts	Conforming to IEC 60947-5-1			The 3 N/O contacts and the 2 N/C contacts of CAD N32 are linked mechanically by one mobile contact carrier.

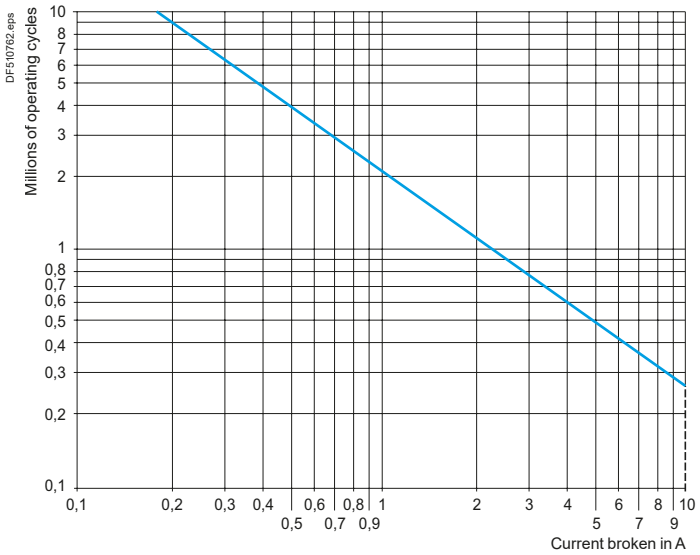
References: pages B7/9 to B7/11
Curves: page B7/25
Dimensions: page B7/26
Schemes: page B7/27

Rated operational power of contacts (conforming to IEC 60947-5-1)

a.c. supply, categories AC-14 and AC-15

Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet:
making current (cos φ 0.7) = 10 times the power broken (cos φ 0.4).

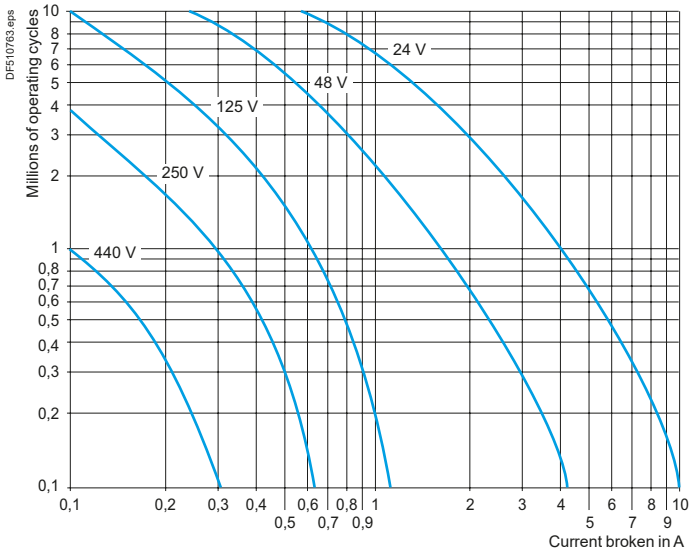
	V	24	48	115	230	400	440	600
1 million operating cycles	**VA**	60	120	280	560	960	1050	1440
3 million operating cycles	**VA**	16	32	80	160	280	300	420
10 million operating cycles	**VA**	4	8	20	40	70	80	100



d.c. supply, category DC-13

Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the power.

Operating cycles	V	24	48	125	250	440
1 million	**W**	96	76	76	76	44
3 million	**W**	48	38	38	32	–
10 million	**W**	14	12	12	–	–

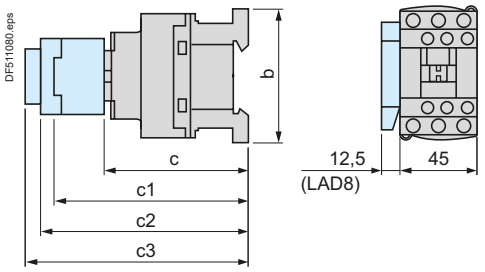


Ref.
Control relays

Dimensions and mounting

Dimensions

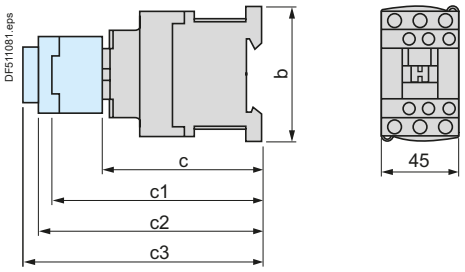
CAD ∼



CAD		32 50	323 503
b		77	99
c	without cover or add-on blocks	84	84
	with cover, without add-on blocks	86	86
c1	with LADN or C (2 or 4 contacts)	117	117
c2	with LAD6K10	129	129
c3	with LADT, R, S	137	137
	with LADT, R, S and sealing cover	141	141

Operating cycles	V	24	48	125	250	440
1 million	W	120	90	75	68	61
3 million	W	70	50	38	33	28
10 million	W	25	18	14	12	10

CAD ⎓ or LC (low consumption)

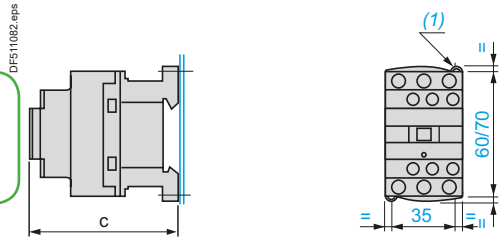


CAD		32 50	323 503
b		77	99
c	without cover or add-on blocks	93	93
	with cover, without add-on blocks	95	95
c1	with LADN or C (2 or 4 contacts)	126	126
c2	with LAD6K10	138	138
c3	with LADT, R, S	146	146
	with LADT, R, S and sealing cover	150	150

Mounting

CAD

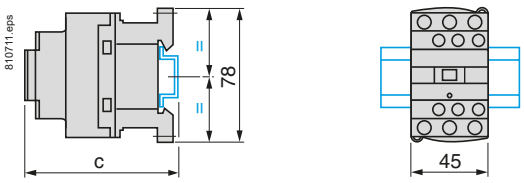
Panel mounted



		CAD ∼	CAD ⎓ or LC
c	with cover	86	95

(1) 2 elongated holes 4.5 x 9.

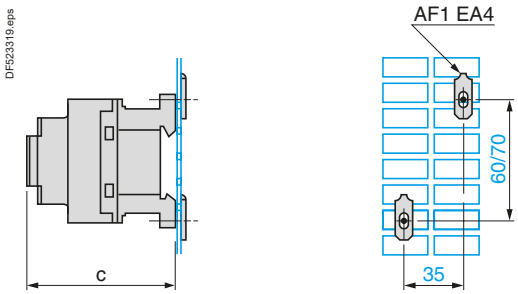
Mounted on rail NSYDR200BD or NSYDR200



		CAD ∼	CAD ⎓ or LC
c	(NSYDR200BD) (2)	88	97
c	(NSYDR200BD) (2)	96	105

(2) With cover.

Mounted on plate AM1P



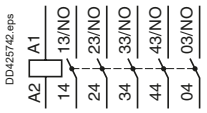
		CAD ∼	CAD ⎓ or LC
c	with cover	86	95

References:
pages B7/9 to B7/11
Illustration:
page B7/8
Characteristics:
pages B7/22 to B7/24
Curves:
page B7/25
Schemes:
page B7/27

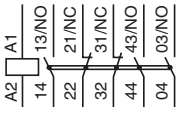
Schemes

Instantaneous auxiliary contacts

5 N/O — **CAD50**



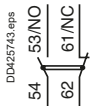
3 N/O + 2 N/C — **CAD32**



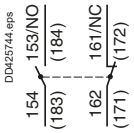
Instantaneous auxiliary contact blocks

1 N/O + 1 N/C

LADN11



LAD8N11 (1)

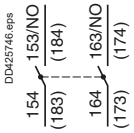


2 N/O

LADN20

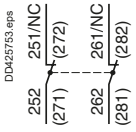


LAD8N20 (1)

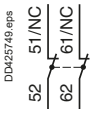


2 N/C

LAD8N02



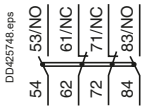
LADN02



(1) The figures in brackets are for the device mounted on the RH side of the control relay.

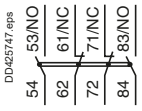
2 N/O + 2F N/C

LADN22



1 N/O + 3 N/C

LADN13



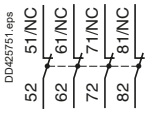
4 N/O

LADN40



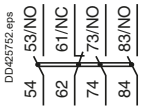
4 N/C

LADN04



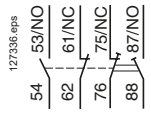
3 N/O + 1 N/C

LADN31



2 N/O + 2 N/C including 1 N/O + 1 N/C make before break

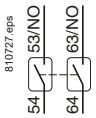
LADC22



With dust and damp protected contacts

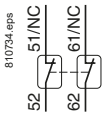
2 N/O protected

LA1DX20



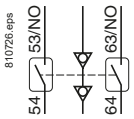
2 N/C protected

LA1DX02



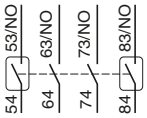
2 N/O protected (2) **with 2 cable screen terminals**

LA1DY20



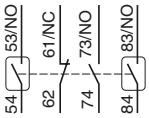
2 N/O protected + 2 N/O non protected

LA1DZ40



2 N/O protected + 1 N/O + 1 N/C non protected

LA1DZ31

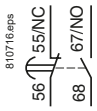


(2) Product fitted with 4 earth screen continuity terminals.

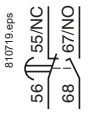
Time delay auxiliary contact blocks

On-delay 1 N/O + 1 N/C

LADT

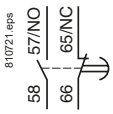


LADS



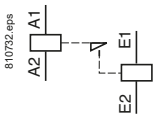
Off-delay 1 N/O + 1 N/C

LADR



Mechanical latch blocks

LAD6K10



References: pages B7/9 to B7/11 | Illustration: page B7/8 | Characteristics: pages B7/22 to B7/24 | Curves: page B7/25 | Dimensions: page B7/26

TeSys D, SK, K, SKGC, GC, GY, GF Contactors

TeSys D, D Green contactors

Type of product	Range	Pages
AC/DC compatible coil contactors - TeSys D Green AC-3, AC-1, UL CSA	From 9 to 80 A	B8/2
AC-3 applications - 3-pole, 4-pole contactors	From 9 to 150 A	B8/8
AC-1 applications - 3-pole, 4-pole contactors	From 25 to 200 A	B8/9
UL CSA standards - 3-pole contactors	From 25 to 200 A	B8/14
Reversing, changeover pre-assembled contactors	From 9 to 150 A	B8/15
AC/DC compatible coil, reversing contactors - TeSys D Green	From 9 to 80 A	B8/17
Contactors for switching capacitor banks	From 12.5 to 60 kVAR	B8/20
Auxiliary contact blocks – accessories – spare coils for TeSys D, TeSys D Green		B8/22





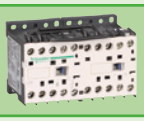


TeSys SK, K Mini-contactors

Mini-contactors TeSys SK	Up to 6 A	B8/37
Mini-contactors TeSys K	From 6 to 16 A	B8/39
Reversing pre-assembled mini-contactors TeSys K	From 6 to 16 A	B8/43
Auxiliary contact blocks - accessories		B8/48









S207 Contactors for railways applications.
Click on image to download.



S335 Contactors for electrodomestic application.
Click on image to download.

Contactors for use in modular enclosures / Din rail

Mini-contactors TeSys SKGC	Up to 20 A	B8/51
Modular contactors TeSys GC	From 16 to 100 A	B8/53
Dual tariff contactors TeSys GY	16, 25, 40 or 100 A	B8/54
Impulse relay TeSys GF	Up to 16 A	B8/55
Auxiliary contact blocks - accessories TeSys GC, GY		B8/56









TeSys D Green, enriching TeSys D family

TeSys D conventional contactors 9 to 150 A, for motor control and other applications.

TeSys D Green delivers a consistent low consumption range of contactors from 9 A to 80 A, covering control voltage from 24 to 250 V, with same coils for AC and DC.





When implemented with other Schneider Electric products*, TeSys D Green contactors are part of a comprehensive solution that is ideal for all types of industrial machines and processes.



TeSys LR9D

By combining a **TeSys D** Green contactor with our new **TeSys LR9D** electronic overload relay, you will have less heat generation, and further reduce energy consumption.



* such as PLC I/O type M580, M340, M221 or M241 or extended I/O type Advantys STB range, or in association with electronic overload relays LR9D or **TeSys T**.



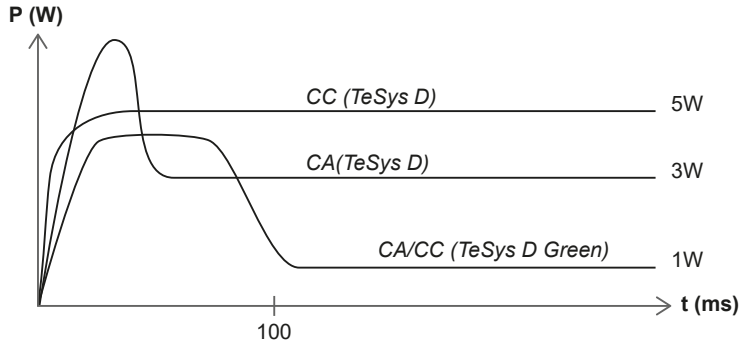
Highly competitive coil consumption

Small changes can generate big savings. The new **TeSys D** Green contactor is equipped with an innovative electronic coil. These electronic-coil contactors require **up to 80 % less energy** than electro-mechanical contactors.This innovation results in concrete values: for example, large plants can noticeably reduce their energy bills and heat dissipation in cabinet.

Available in → 09-12-18 A 25-32-38 A 40-50-65-80 A

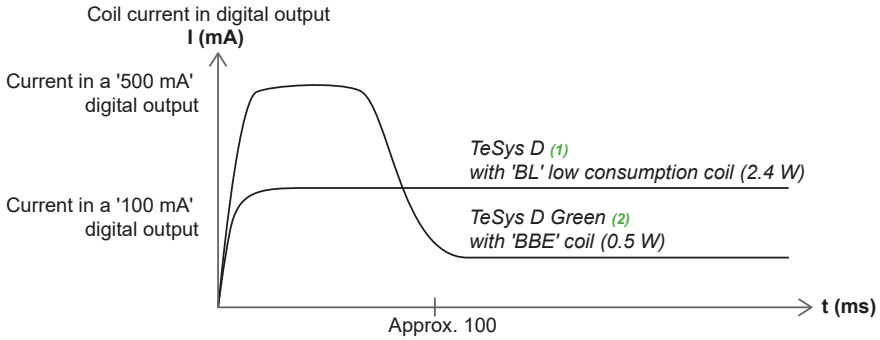
Coil currents comparison

TeSys D Green (AC/DC coil) vs Tesys D (AC, DC coils)



TeSys D Green brings a significant reduction of energy consumption.

TeSys D Green ("BBE" coil) vs TeSys D (low consumption "BL" coil)



(1) Up to 38 A.
(2) 40 to 80 A.

TeSys D Green is well adapted to direct control by PLC static outputs, even in its high ratings.

Product references

PB116859.eps



LC1D09●●●

PB116857.eps



LC1D40A●●●

TeSys D Green contactors have a dark grey casing and a 3-character code voltage.

3-pole contactors - Motor control up to 37 kW / 400 V - Category AC-3

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 (θ ≤ 60 °C)						Rated operational current in AC-3 440 V up to	Instantaneous auxiliary contacts		Basic reference, to be completed by adding the control voltage code	Weight
220 V 230 V	380 V 400 V	415 V	440 V	500 V	660 V 690 V				Fixing (1)	
kW	kW	kW	kW	kW	kW	A				kg
Connection by screw clamp terminals										
2.2	4	4	4	5.5	5.5	9	1	1	**LC1D09●●●**	0.368
3	5.5	5.5	5.5	7.5	7.5	12	1	1	**LC1D12●●●**	0.373
4	7.5	9	9	10	10	18	1	1	**LC1D18●●●**	0.378
5.5	11	11	11	15	15	25	1	1	**LC1D25●●●**	0.433
7.5	15	15	15	18.5	18.5	32	1	1	**LC1D32●●●**	0.438
9	18.5	18.5	18.5	18.5	18.5	38	1	1	**LC1D38●●●**	0.442
Power connections by EverLink® BTR (2) screw connectors and control by screw clamp terminal										
11	18.5	22	22	22	30	40	1	1	**LC1D40A●●●**	0.992
15	22	25	30	30	33	50	1	1	**LC1D50A●●●**	0.997
18.5	30	37	37	37	37	65	1	1	**LC1D65A●●●**	1.002
22	37	37	37	37	37	66	1	1	**LC1D80A●●●**	1.002
Connection for lugs or bars (4)										

For LC1D40A to LC1D80A, insert a figure 6 before the voltage code.
Example: LC1D40A●●● becomes LC1D40A6●●●

Auxiliary contact blocks and add-on modules

See pages B8/22 to B8/28.

Control voltage codes

AC/DC or 24 V DC supply

Volts	24 (DC only)	24-60	48-130	100-250
LC1D09 ...D38, LC1D40A ... D80A				
U 0.85...1.1 Uc		BNE	EHE	KUE
LC1D09 ... D38				
U 0.8 ... 1.2 Uc	BNE			
LC1D40A ... D80A				
U 0.8…1.2 Uc	BBE			

*(1) **LC1D09** to **D80A**: clip-on mounting on 35 mm ⊔ rail **NSYSDR** or screw fixing.*
(2) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference LADALLEN4, see B8/28).
(3) Please consult your Regional Sales Office.

Contactors

PB116859.eps



LC1D09●●●

PB116857.eps



LC1D40A●●●

DB424871.eps



LC1D60A●●●

TeSys D Green contactors have a dark grey casing and a 3-character code voltage.

3-pole contactors - Load control from 25 to 80 A - Category AC-1

Non inductive loads maximum current ($\theta \leq 60$ °C) utilisation category AC-1	Number of poles	Instantaneous auxiliary contacts			Partial reference, to be completed by adding the control voltage code Fixing (1)	Weight
A						kg
Connection by screw clamp terminals						
25	3	1	1		**LC1D09●●●**	0.368
				or	**LC1D12●●●**	0.373
32	3	1	1		**LC1D18●●●**	0.378
40	3	1	1		**LC1D25●●●**	0.433
50	3	1	1		**LC1D32●●●**	0.438
				or	**LC1D38●●●**	0.442
Connection by EverLink®, BTR screw connectors (2)						
60	3	1	1		**LC1D40A●●●**	0.992
80	3	1	1		**LC1D50A●●●**	0.997
				or	**LC1D65A●●●** (3)	1.002
				or	**LC1D80A●●●** (3)	1.002
Connection for lugs or bars						
For LC1D40A to LC1D80A, insert a figure 6 before the voltage code. Example: LC1D40A●●● becomes LC1D40A6●●●						
4-pole contactors						
Connection by EverLink®, BTR (2) screw connectors						
60	4	1	1		**LC1DT60A●●●**	1.230
80	4	1	1		**LC1DT80A●●●**	1.290
Connection for lugs or bars						
For LC1DT60A to LC1DT80A, insert a figure 6 before the voltage code. Example: LC1DT60A●●● becomes LC1DT60A6●●●						
4-pole changeover contactors						
Connection by EverLink®, BTR (2) screw connectors						
60	4	1	1		**LC2DT60A●●●**	2.460
80	4	1	1		**LC2DT80A●●●**	2.580

Control voltage codes

AC/DC 24 V DC supply

Volts	24 (DC only)	24-60	48-130	100-250
LC1D09…D80A and LC●DT60A...DT80A				
U 0.85 .... 1.1 Uc		BNE	EHE	KUE
LC1D09 .... D38				
U 0.8 .... 1.2 Uc	BNE			
LC1D40 to LC1D80A, LC●DT60A to LC●DT80A				
U 0.8…1.2 Uc	BBE			

*(1) **LC1D09** to **D80A**, **LC●DT60A** and **LC●DT80A**: clip-on mounting on 35 mm ⊔ rail **NSYSDR** or screw fixing.*
*(2) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LADALLEN4**, see page B8/28).*
(3) Coordination tables according to the number of operation cycles, consult online datasheets for values.

Contactors

Product references

PB116859.eps



LC1D09●●●

PB116857.eps



LC1D40A●●●

TeSys D Green contactors have a dark grey casing and a 3-character code voltage.

3-pole contactors conforming to UL and CSA standards (North American market) - 25 to 80 A

Standard power ratings of motors 50/60 Hz						Associated cable type 75 °C-Cu	Continuous current	Type of contactor required Partial reference, to be completed by adding the control voltage code
Single-phase 1 Ø		3-phase 3 Ø						Fixing, connection (1)
115 V	230 V 240 V	200 V 208 V	230 V 240 V	460 V 480 V	575 V 600 V			
HP	HP	HP	HP	HP	HP		A	
Connection by screw clamp terminals								
1/3	1	2	2	5	7.5	AWG 18 - 10	25	**LC1D09●●●**
0.5	2	3	3	7.5	10	AWG 18 - 10	25	**LC1D12●●●**
1	3	5	5	10	15	AWG 18 - 8	32	**LC1D18●●●**
2	3	7.5	7.5	15	20	AWG 14 - 6	40	**LC1D25●●●**
2	5	10	10	20	25	AWG 14 - 6	50	**LC1D32●●●**
Power connections by EverLink® BTR (2) screw connectors and control by spring terminals								
3	5	10	10	30	30	AWG 16 - 2	60	**LC1D40A●●●**
3	7.5	15	15	40	40	AWG 16 - 2	70	**LC1D50A●●●**
5	10	20	20	40	50	AWG 16 - 2	80	**LC1D65A●●●**
5	10	20	20	40	50	AWG 16 - 2	80	**LC1D80A●●●**
Connection for lugs or bars								

For LC1D40A to LC1D80A, insert a figure 6 before the voltage code.
Example: LC1D40A●●● becomes LC1D40A6●●●

Applications with High-Fault Short-Circuit Current ratings

High-fault short-circuit current ratings are: 100 kA at 600 V with Class J fuses and 85 kA (D09-38), 100 kA (D40A-65A) at 480 V and 50 kA at 600 V with circuit breakers.

Control voltage codes

AC/DC 24 V DC supply

Volts	24 (DC only)	24-60	48-130	100-250
LC1D09 ... D32, LC1D40A ... D80A				
U 0.85 .... 1.1 Uc		BNE	EHE	KUE
LC1D09 ... D38				
U 0.8 .... 1.2 Uc	BNE			
LC1D40A ... D80A				
U 0.8…1.2 Uc	BBE			

*(1) **LC1D09** to **D80**: clip-on mounting on 35 mm ⊔ rail **NSYSDR** or screw fixing.*
*(2) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LADALLEN4**, see page B8/28).*

Contactors

Characteristics: pages B8/59 to B8/65
Curves: page B8/68
Dimensions: pages B8/76 to B8/78
Schemes: pages B8/79 and B8/80
Click HERE for access to online contactor selector

TeSys D Green contactors - Coordination with PLC output modules (static/relay/triac)

Selection of PLC coordinated contactors

Laboratory tests have been carried out in order to validate trouble free contactor closings and openings with different PLC output modules.
The coil must be defined according to the contactor rating range and output module.
See selection table below.

The PLC your are using				>>>	Compatible contactors (1)	Coil code
PLC type	**Output type**	**Output I (A)**	**Output module commercial reference**			
M221 / M241 / M251	Static output: 24 V DC	0.5	TM3DQ8●●● and Q16●●● (T, TG, U, UG)	>>>	LC1D09●● to LC1D38●●,	BL, BNE
					LC1D40A●●● to LC1D80A, LC1DT60A●●● to LC1DT80A●●●	BBE
		0.3 (sealed) 0.8 (inrush)	TM3XTYS4	>>>	LC1D40A●●● to LC1D80A, LC1DT60A●●● to LC1DT80A●●●	BBE, BD, BNE
		0.1	TM3DQ16●● and Q32●● (TK, UK)	>>>	LC1D09●● to LC1D38●●	BL
	Relay output: 24 V DC / 230 V AC	2	TM3DQ8 and DQ16 (R,RG), TM3DM8 and DM24 (R,RG)	>>>	LC1D09●● to LC1D38●●, LC1D40A●●● to LC1D80A, LC1DT60A●●● to LC1DT80A●●●	Code of any DC coil up to 24 V or any AC coil up to 230 V
M340 / M580	Static output: 24 V DC	0.5	BMXDDO1602 and DM16022	>>>	LC1D09●● to LC1D38●●	BL, BNE
					LC1D40A●●● to LC1D80A, LC1DT60A●●● to LC1DT80A●●●	BBE
		0.1	BMXDDO3202, BMXDDM3202K, BMXDDO6402K	>>>	LC1D09●● to LC1D38●●	BL
	Relay output: 24 V DC / 230 V AC	2	BMXDRA0805 and DM16025	>>>	LC1D09●● to LC1D38●●, LC1D40A●●● to LC1D80A, LC1DT60A●●● to LC1DT80A●●●	Code of any DC coil up to 24 V or any AC coil up to 230 V
	Triac output: 230 V AC	0.6	BMXDAO1605	>>>	LC1D09●● to LC1D38●●, LC1D40●●● to LC1D80A●●●, LC1DT60A●●● to LC1DT80A●●●	Code of any AC coil up to 230 V (P7 code = 230 V)
ADVANTYS	Static output: 24 V DC	0.5	STBDDO3200	>>>	LC1D09●● to LC1D38●●	BL, BNE
					LC1D40A●●● to LC1D80A, LC1DT60A●●● to LC1DT80A●●●	BBE
	Triac output: 230 V AC	2	STBDAO8210	>>>	LC1D09●● to LC1D38●●, LC1D40A●●● to LC1D80A, LC1DT60A●●● to LC1DT80A●●●	Code of any AC coil up to 230 V (P7 code = 230 V AC)

Coils consumption characteristics

Coil type	Uc DC - min -max	Average consumption at UC DC / 20 °C	
		Inrush	Sealed
BL	24 V - 0.8 Uc to 1.1 Uc	2.4 W - 2.4 VA	2.4 W - 2.4 VA
BNE		14 W - 14 VA	0.7 W - 0.7 VA
BBE		11 W - 11 VA	0.5 W - 0.5 VA

*(1) Replace dot by coil code. Ex **LC1D09●●** becomes **LC1D09BL**.*

PB121349.eps



LC1D09●●

PB121350.eps



LC1D25●●

PB120609.eps



LC1D80A●●

PB121351.eps



LC1D95●●

PB121352.eps



LC1D115●●

3-pole contactors - Motor control up to 75 kW at 400 V, in category AC-3

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 (θ ≤ 60 °C)							Rated operational current in AC-3 440 V up to	Instantaneous auxiliary contacts		Basic reference, to be completed by adding the control voltage code	Weight (2)
220 V 230 V	380 V 400 V	415 V	440 V	500 V	660 V 690 V	1000 V				Fixing (1)	
kW	kW	kW	kW	kW	kW	kW	A				kg
Connection by screw clamp terminals											
2.2	4	4	4	5.5	5.5	–	9	1	1	**LC1D09●●**	0.320
3	5.5	5.5	5.5	7.5	7.5	–	12	1	1	**LC1D12●●**	0.325
4	7.5	9	9	10	10	–	18	1	1	**LC1D18●●**	0.330
5.5	11	11	11	15	15	–	25	1	1	**LC1D25●●**	0.370
7.5	15	15	15	18.5	18.5	–	32	1	1	**LC1D32●●**	0.375
9	18.5	18.5	18.5	18.5	18.5	–	38	1	1	**LC1D38●●**	0.380
Power connections by EverLink® BTR screw connectors (3) and control by screw clamp terminal											
11	18.5	22	22	22	30	–	40	1	1	**LC1D40A●●**	0.850
15	22	25	30	30	33	–	50	1	1	**LC1D50A●●**	0.855
18.5	30	37	37	37	37	–	65	1	1	**LC1D65A●●**	0.860
22	37	37	37	37	37	–	66	1	1	**LC1D80A●●**	0.860
Connection by screw clamp terminals or connectors											
22	37	45	45	55	45	45	80	1	1	**LC1D80●●**	1.590
25	45	45	45	55	45	45	95	1	1	**LC1D95●●**	1.610
30	55	59	59	75	80	65	115	1	1	**LC1D115●●**	2.500
40	75	80	80	90	100	75	150	1	1	**LC1D150●●**	2.500

Connection by lugs or bars

In the references selected above, insert a figure **6** before the voltage code.
Example: **LC1D09●●** becomes **LC1D096●●**.

Separate components

Auxiliary contact blocks and add-on modules: see pages B8/22 to B8/28.

(1) LC1D09 to D80A: clip-on mounting on 35 mm ⊔ rail NSYSDR *or screw fixing.*
LC1D80 to D95 ∿: clip-on mounting on 35 mm ⊔ rail NSYSDR *or 75 mm ⊔ rail AM1DL or screw fixing.*
LC1D80 to D95 ⎓: clip-on mounting on 75 mm ⊔ rail AM1DL or screw fixing.
LC1D115 and D150: clip-on mounting on 2 x 35 mm ⊔ rails NSYSDR *or screw fixing.*

Standard control circuit voltages (for other voltages, please consult your Regional Sales Office)

a.c. supply

Volts	24	42	48	110	115	220	230	240	380	400	415	440	500
LC1D09…D150 (D115 and D150 coils with built-in suppression as standard, by bi-directional peak limiting diode).													
50/60 Hz	B7	D7	E7	F7	FE7	M7	P7	U7	Q7	V7	N7	R7	S7
LC1D09…D65 (not available with "connection for lugs or bars")													
50 Hz	B5	D5	E5				P5						
LC1D80…D115													
50 Hz	B5	D5	E5	F5	FE5	M5	P5	U5	Q5	V5	N5	R5	S5
60 Hz	B6	–	E6	F6	–	M6	–	U6	Q6	–	–	R6	–

d.c. supply

Volts	12	24	36	48	60	72	110	125	220	250	440
LC1D09…D38 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)											
U 0.7…1.25 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
LC1D40A …D65A (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)											
U 0.75…1.25 Uc	JD	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	RD
LC1D80…D95											
U 0.85…1.1 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
U 0.75…1.2 Uc	JW	BW	CW	EW	–	SW	FW	–	MW	–	–
LC1D115 and D150 (coil with built-in suppression device as standard)											
U 0.75…1.2 Uc	–	BD	–	ED	ND	SD	FD	GD	MD	UD	RD

Low consumption

Volts ⎓	5	12	20	24	48	110	220	250
LC1D09…D38 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)								
U 0.8…1.25 Uc	AL	JL	ZL	BL	EL	FL	ML	UL

a.c. / d.c. supply - low consumption

See TeSys D Green, page B8/4

For other voltages between 5 and 690 V, see pages B8/31 to B8/34.
*(2) The weights indicated are for contactors with a.c. control circuit. For d.c. or low consumption control circuit, add 0.160 kg from **LC1D09** to **D38**, 0.075 kg from **LC1D40A** to **D80A** and 1 kg for **LC1D80** and **D95**.*
*(3) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LADALLEN4**, see page B8/28).*
(4) For these coil voltages, choose from TeSys D Green *contactors. Same product ref. radical, just add BBE coil voltage code for 24 V DC, BNE for 24-60V AC/DC, EHE for 48-130 V AC/DC, KUE for 100-250 V AC/DC. Exemple: **LC1D40ABBE**.*

Characteristics: pages B8/59 to B8/65
Dimensions: pages B8/72 to B8/75
Schemes: pages B8/79 to B8/80
Click **HERE** for access to online contactor selector

PB121353.eps



LC1D123●●

PB120690.eps



LCD80A3●●

3-pole contactors - Motor control up to 30 kW at 400 V, in category AC-3

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 (θ ≤ 60 °C)							Rated operational current in AC-3 440 V up to	Instantaneous auxiliary contacts		Basic reference, to be completed by adding the control voltage code
220 V 230 V	380 V 400 V	415 V	440 V	500 V	660 V 690 V	1000 V				Fixing [1]
kW	kW	kW	kW	kW	kW	kW	A			
Power and control connections by spring terminals										
2.2	4	4	4	5.5	5.5		9	1	1	**LC1D093●●**
3	5.5	5.5	5.5	7.5	7.5		12	1	1	**LC1D123●●**
4	7.5	9	9	10	10		18	1	1	**LC1D183●●**
5.5	11	11	11	15	15		25	1	1	**LC1D253●●**
7.5	15	15	15	18.5	18.5		32 [2]	1	1	**LC1D323●●**
Power connections by EverLink® BTR screw connectors [3] and control by spring terminals										
11	18.5	22	22	22	30		40	1	1	**LC1D40A3●●**
15	22	25	30	30	33		50	1	1	**LC1D50A3●●**
18.5	30	37	37	37	37		65	1	1	**LC1D65A3●●**
22	37	37	37	37	37		66	1	1	**LC1D80A3●●**

Connection by Faston connectors

These contactors are fitted with Faston connectors: 2 x 6.35 mm on the power poles and 1 x 6.35 mm on the coil and auxiliary terminals.
For contactors LC1D09 and LC1D12 only, replace the figure **3** with a **9** in the references selected above.
Example: **LC1D093●●** becomes **LC1D099●●**.

Separate components

Auxiliary contact blocks and add-on modules: see pages B8/22 to B8/28.

(1) LC1D09 to D32: clip-on mounting on 35 mm ⊔ rail NSYSDR *or screw fixing.*

Standard control circuit voltages (for other voltages, please consult your Regional Sales Office)

a.c. supply												
Volts	**24**	**42**	**48**	**110**	**115**	**220**	**230**	**240**	**380**	**400**	**415**	**440**
LC1D09…D80A												
50/60 Hz	B7	D7	E7	F7	FE7	M7	P7	U7	Q7	V7	N7	R7
d.c. supply												
Volts	**12**	**24**	**36**	**48**	**60**	**72**	**110**	**125**	**220**	**250**	**440**	
LC1D09…D32 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)												
U 0.7…1.25 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD	
LC1D40A…D65A (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)												
U 0.75…1.25 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD	
Low consumption												
Volts ⎓	**5**	**12**	**20**	**24**	**48**	**110**	**220**	**250**				
LC1D09…D32 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)												
U 0.8…1.25 Uc	AL	JL	ZL	BL	EL	FL	ML	UL				

For other voltages between 5 and 690 V, see pages B8/31 to B8/34.

(2) Must be wired with 2 x 4 mm² cables in parallel on the upstream side. On the downstream side, outgoing terminal block ***LAD331*** *may be used (Quickfit technology, see page B1/18). When wired with a single cable, the product is limited to 25 A (11 kW/400 V motors).*

(3) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference ***LADALLEN4****, see page B8/28).*

Contactors

PB121354.eps



LC1D09●●

PB120691.eps



LC1D80A●●

3-pole contactors - Load control from 25 to 200 A in category AC-1

Non inductive loads maximum current (θ ≤ 60 °C) utilisation category AC-1	Number of poles	Instantaneous auxiliary contacts		Basic reference, to be completed by adding the control voltage code Fixing (1)	Weight (2)
A					kg
Connection by screw clamp terminals					
25	3	1	1	**LC1D09●●**	0.320
				or **LC1D12●●**	0.325
32	3	1	1	**LC1D18●●**	0.330
40	3	1	1	**LC1D25●●**	0.370
50	3	1	1	**LC1D32●●**	0.375
				or **LC1D38●●**	0.380
Connection by EverLink®, BTR screw connectors (3)					
60	3	1	1	**LC1D40A●●**	0.850
80	3	1	1	**LC1D50A●●**	0.855
				or **LC1D65A●●** (4)	0.860
				or **LC1D80A●●** (4)	0.860
Connection by screw clamp terminals or connectors					
125	3	1	1	**LC1D80●●**	1.590
				or **LC1D95●●** (4)	1.610
200	3	1	1	**LC1D115●●**	2.500
				or **LC1D150●●** (5)	2.500

3-pole contactors for connection by lugs

In the references selected above, insert a figure **6** before the voltage code.
Example: **LC1D09●●** becomes **LC1D096●●**.

Standard control circuit voltages
(for other voltages, please consult your Regional Sales Office)

a.c. supply													
Volts	**24**	**42**	**48**	**110**	**115**	**220**	**230**	**240**	**380**	**400**	**415**	**440**	**500**
LC1D09...D150 (LC1D115 and D150 coils with built-in suppression device as standard)													
50/60 Hz	B7	D7	E7	F7	FE7	M7	P7	U7	Q7	V7	N7	R7	S7
LC1D09…D65 (not available with "connection for lugs or bars")													
50 Hz	B5	D5	E5				P5						
LC1D80...D150													
50 Hz	B5	D5	E5	F5	FE5	M5	P5	U5	Q5	V5	N5	R5	S5
60 Hz	B6	–	E6	F6	–	M6	–	U6	Q6	–	–	R6	–

d.c. supply											
Volts	**12**	**24**	**36**	**48**	**60**	**72**	**110**	**125**	**220**	**250**	**440**
LC1D09…D38 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)											
U 0.7…1.25 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
LC1D40A …D65A (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)											
U 0.75…1.25 Uc	JD	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	RD
LC1 or LP1D80 and **D95**											
U 0.85…1.1 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
U 0.75…1.2 Uc	JW	BW	CW	EW	–	SW	FW	–	MW	–	–
LC1D115 and **D150** (coils with built-in suppression device fitted as standard)											
U 0.75…1.2 Uc	–	BD	–	ED	ND	SD	FD	GD	MD	UD	RD

Low consumption								
Volts ⎓	**5**	**12**	**20**	**24**	**48**	**110**	**220**	**250**
LC1D09…D38 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)								
U 0.8…1.25 Uc	AL	JL	ZL	BL	EL	FL	ML	UL

For other voltages between 5 and 690 V, see pages B8/31 to B8/34.

*(1) **LC1D09** to **D80A**: clip-on mounting on 35 mm ⊔ rail **NSYSDR** or screw fixing.*
*__LC1D80__ and __D95__ ∿: clip-on mounting on 35 mm ⊔ rail **NSYSDR** or 75 mm ⊔ rail **AM1DL** or screw fixing.*
*__LC1__ or __LP1D80__ to __D95__ ⎓: clip-on mounting on 75 mm ⊔ rail **AM1DL** or screw fixing.*
*__LC1D115__ and __D150__: clip-on mounting on 2 x 35 mm ⊔ rails **NSYSDR** or screw fixing.*

*(2) The weights indicated are for contactors with a.c. control circuit. For d.c. or low consumption control circuit, add 0.160 kg from **LC1D09** to **D38**, 0.075 kg from **LC1D40A** to **D80A** and 1 kg for **LC1D80** and **D95**.*

*(3) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LADALLEN4**, see page B8/28).*

(4) Coordination tables according to the number of operating cycles, see AC-1 curve, page A6/40.

(5) 32 A with 2 x 4 mm² cables connected in parallel.

(6) For these coil voltages, choose from TeSys D *Green contactors. Same product ref. radical, just add BBE coil voltage code for 24 V DC, BNE for 24-60 V AC/DC, EHE for 48-130 V AC/DC, KUE for 100-250 V AC/DC. Exemple: **LC1D40ABBE**.*

Contactors

PB121355.eps



LC1D123●●

PB120692.eps



LC1D80A3●●

3-pole contactors - Load control from 16 to 80 A in category AC-1

Non inductive loads maximum current (θ ≤ 60 °C) utilisation category AC-1	Number of poles	Instantaneous auxiliary contacts		Basic reference, to be completed by adding the control voltage code Fixing (1)	Weight (2)
A					kg
Connection by spring terminals					
16	3	1	1	**LC1D093●●** (3)	0.320
			or	**LC1D123●●** (3)	0.325
25	3	1	1	**LC1D183●●** (4)	0.335
			or	**LC1D253●●** (5)	0.325
			or	**LC1D323●●** (5)	0.325
Power connections by EverLink® BTR screw connectors (6) and control by spring terminals					
60	3	1	1	**LC1D40A3●●**	0.850
80	3	1	1	**LC1D50A3●●** (7)	0.855
			or	**LC1D65A3●●** (7)	0.860
			or	**LC1D80A3●●** (7)	0.860

3-pole contactors for connection by Faston connectors

These contactors are fitted with Faston connectors: 2 x 6.35 mm on the power poles and 1 x 6.35 mm on the coil terminals. For contactors LC1D09 and LC1D12 only, in the references selected from the previous page, insert a figure **9** before the voltage code. Example: **LC1D09●●** becomes **LC1D099●●**.

Separate components

Auxiliary contact blocks and add-on modules: see pages B8/22 to B8/28.

Standard control circuit voltages
(for other voltages, please consult your Regional Sales Office)

a.c. supply													
Volts	**24**	**42**	**48**	**110**	**115**	**220**	**230**	**240**	**380**	**400**	**415**	**440**	**500**
LC1D09...D80A													
50/60 Hz	B7	D7	E7	F7	FE7	M7	P7	U7	Q7	V7	N7	R7	S7

d.c. supply												
Volts	**12**	**24**	**36**	**48**	**60**	**72**	**110**	**125**	**220**	**250**	**440**	
LC1D09…D32 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)												
U 0.7…1.25 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD	
LC1D40A…D65A (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)												
U 0.75…1.25 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD	

Low consumption								
Volts ⎓	**5**	**12**	**20**	**24**	**48**	**110**	**220**	**250**
LC1D09…D32 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)								
U 0.8…1.25 Uc	AL	JL	ZL	BL	EL	FL	ML	UL

For other voltages between 5 and 690 V, see pages B8/31 to B8/34.
*(1) **LC1D09** to **D80A**: clip-on mounting on 35 mm ⊥ rail **NSYSDR** or screw fixing.*
*(2) The weights indicated are for contactors with a.c. control circuit. For d.c. or low consumption control circuit, add 0.160 kg from **LC1D09** to **D38** and 0.075 kg from **LC1D40A** to **D80A**.*
(3) 20 A with 2 x 2.5 mm² cables connected in parallel.
(4) 32 A with 2 x 4 mm² cables connected in parallel.
(5) 40 A with 2 x 4 mm² cables connected in parallel.
*(6) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LADALLEN4**, see page B8/28).*
(7) Coordination tables according to the number of operating cycles, see AC-1 curve, page A6/40.

Characteristics: pages B8/59 to B8/65
Dimensions: pages B8/72 to B8/75
Schemes: pages B8/79 to B8/80
Click HERE for access to online contactor selector

PB121356.eps



LC1DT20●●

PB121357.eps



LC1DT80A●●

PB108321.eps



LC1D65008●●

4-pole contactors - Load control, 20 to 200 A in category AC-1

Non inductive loads maximum current ($\theta \leq 60$ °C) utilisation category AC-1	Number of poles		Instantaneous auxiliary contacts		Basic reference, to be completed by adding the control voltage code / Fixing (1)	Weight (2)
A						kg
Connection by screw clamp terminals						
20	4	–	1	1	**LC1DT20●●**	0.365
	2	2	1	1	**LC1D098●●**	0.365
25	4	–	1	1	**LC1DT25●●**	0.365
	2	2	1	1	**LC1D128●●**	0.365
32	4	–	1	1	**LC1DT32●●**	0.425
	2	2	1	1	**LC1D188●●**	0.425
40	4	–	1	1	**LC1DT40●●**	0.425
	2	2	1	1	**LC1D258●●**	0.425
Connection by EverLink®, BTR screw connectors						
60	4	–	1	1	**LC1DT60A●●**	1.090
80	4	–	1	1	**LC1DT80A●●**	1.150
Connection by screw clamp terminals or connectors						
60	2	2	–	–	**LC1D40008●●**	1.440
					or **LP1D40008●●**	2.210
80	2	2	–	–	**LC1D65008●●**	1.450
					or **LP1D65008●●**	2.220
125	4	–	–	–	**LC1D80004●●**	1.760
					or **LP1D80004●●**	2.685
	2	2	–	–	**LC1D80008●●**	1.840
					or **LP1D80008●●**	2.910
200	4	–	–	–	**LC1D115004●●**	2.860

4-pole contactors for connection by lugs or bars

In the references selected above, insert a figure 6 before the voltage code.
Example: **LC1DT20●●** becomes **LC1DT206●●**.

Standard control circuit voltages (for other voltages, please consult your Regional Sales Office)

a.c. supply

Volts	24	42	48	110	115	220	230	240	380	400	415	440	500
LC1D09...D150 and LC1DT20...DT80A (LC1D115 and D150 coils with built-in suppression device as standard)													
50/60 Hz	B7	D7	E7	F7	FE7	M7	P7	U7	Q7	V7	N7	R7	–
LC1D80...D115													
50 Hz	B5	D5	E5	F5	FE5	M5	P5	U5	Q5	V5	N5	R5	S5
60 Hz	B6	–	E6	F6	–	M6	–	U6	Q6	–	–	R6	–

d.c. supply

Volts	12	24	36	48	60	72	110	125	220	250	440
LC1D09…D25 and LC1DT20...DT40 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)											
U 0.75…1.25 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
LC1DT60A …DT80A (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)											
U 0.75…1.25 Uc	JD	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	RD
LP1D40...D80											
U 0.85…1.1 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
U 0.75…1.2 Uc	JW	BW	CW	EW	–	SW	FW	–	MW	–	–
LC1D115 (coil with built-in suppression device as standard)											
U 0.75…1.2 Uc	–	BD	–	ED	ND	SD	FD	GD	MD	UD	RD

Low consumption

Volts ⎓	5	12	20	24	48	110	220	250
LC1D09...D25 and LC1DT20...DT40 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)								
U 0.8…1.25 Uc	AL	JL	ZL	BL	EL	FL	ML	UL

For other voltages between 5 and 690 V, see pages B8/31 to B8/34.

*(1) **LC1D09** to **D38** and **LC1DT20** to **DT80A**: clip-on mounting on 35 mm ⊔ rail **NSYSDR** or screw fixing.*
*__LC1D80__ ∿: clip-on mounting on 35 mm ⊔ rail **NSYSDR** or 75 mm ⊔ rail **AM1DL** or screw fixing.*
*__LC1__ or __LP1D80__ ⎓: clip-on mounting on 75 mm ⊔ rail **AM1DL** or screw fixing.*
*__LC1D115__ and __D150__: clip-on mounting on 2 x 35 mm ⊔ rails **NSYSDR** or screw fixing.*
*(2) The weights indicated are for contactors with a.c. control circuit. For d.c. or low consumption control circuit, add 0.160 kg from **LC1D09** to **D38**, 0.075 kg from **LC1DT60A** and **D80A** and 1 kg for **LC1D80**.*
*(3) For these coil voltages, choose from TeSys D Green contactors. Same product ref. radical, just add BBE coil voltage code for 24 V DC, BNE for 24-60 V AC/DC, EHE for 48-130 V AC/DC, KUE for 100-250 V AC/DC. Exemple: **LC1DT60ABBE**.*

Characteristics: pages B8/59 to B8/65
Dimensions: pages B8/72 to B8/75
Schemes: pages B8/79 to B8/80
Click HERE for access to online contactor selector

Product references

PB108325.eps



LC1DT253●●

PB108326.eps



LC1DT80A3●●

4-pole contactors - Load control, 20 to 80 A in category AC-1

Non inductive loads maximum current ($\theta \leq 60$ °C) utilisation category AC-1	Number of poles		Instantaneous auxiliary contacts		Basic reference, to be completed by adding the voltage code Fixing [1]	Weight [2]
A						kg
Connection by spring terminals						
20	4	–	1	1	**LC1DT203●●**	0.380
	2	2	1	1	**LC1D0983●●**	0.380
25	4	–	1	1	**LC1DT253●●**	0.380
	2	2	1	1	**LC1D1283●●**	0.380
32	4	–	1	1	**LC1DT323●●**	0.425
	2	2	1	1	**LC1D1883●●**	0.425
40	4	–	1	1	**LC1DT403●●**	0.425
	2	2	1	1	**LC1D2583●●**	0.425
Connection by EverLink®, BTR screw connectors and control circuit by spring terminals						
60	4	–	1	1	**LC1DT60A3●●**	1.090
80	4	–	1	1	**LC1DT80A3●●**	1.150

Separate components

Auxiliary contact blocks and add-on modules: see pages B8/22 to B8/28.

Standard control circuit voltages
(for other voltages, please consult your Regional Sales Office)

a.c. supply

Volts	24	42	48	110	115	220	230	240	380	400	415	440	500
LC1D09...D25 and LC1DT20...DT80A (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)													
50/60 Hz	B7	D7	E7	F7	FE7	M7	P7	U7	Q7	V7	N7	R7	–

d.c. supply

Volts	12	24	36	48	60	72	110	125	220	250	440
LC1D09…D25 and LC1DT20... DT40 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)											
U 0.7…1.25 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
LC1DT60A...80A (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)											
U 0.75…1.25 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD

Low consumption

Volts ⎓	5	12	20	24	48	110	220	250
LC1D09...D25 and LC1DT20...DT40 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)								
U 0.8…1.25 Uc	AL	JL	ZL	BL	EL	FL	ML	UL

For other voltages between 5 and 690 V, see pages B8/31 to B8/34.

*(1) **LC1D09** to **D38** and **LC1DT20** to **DT80A**: clip-on mounting on 35 mm ⊥ rail **NSYSDR** or screw fixing.*

*(2) The weights indicated are for contactors with a.c. control circuit. For d.c. or low consumption control circuit, add 0.160 kg from **LC1D09** to **D38**, 0.075 kg for **LC1DT60A** and **DT80A**.*

PB121349.eps



LC1D09●●

PB121350.eps



LC1D25●●

PB120609.eps



LC1D80A●●

PB121351.eps



LC1D95●●

Contactors conforming to UL and CSA standards (North American market) - 25 to 160 A

Standard power ratings of motors 50/60 Hz						Associated cable type 75 °C-Cu	UL continuous current	Type of contactor required Basic reference, to be completed
Single-phase 1 Ø		3-phase 3 Ø						
120 V	240 V	208 V	240 V	480 V	600 V			Fixing, connection (1)
HP	HP	HP	HP	HP	HP		A	
Connection by screw clamp terminals								
1/3	1	2	2	5	7.5	AWG 18 - 10	25	**LC1D09●●**
0.5	2	3	3	7.5	10	AWG 18 - 10	25	**LC1D12●●**
1	3	5	5	10	15	AWG 18 - 8	32	**LC1D18●●**
2	3	7.5	7.5	15	20	AWG 14 - 6	40	**LC1D25●●**
2	5	10	10	20	25	AWG 14 - 6	50	**LC1D32●●** (2)
2	5	10	10	20	25	AWG 14 - 6	50	**LC1D38●●** (2)
Power connections by EverLink® BTR screw connectors and control by spring terminals								
3	5	10	10	30	30	AWG 16 - 2	60	**LC1D40A●●**
3	7.5	15	15	40	40	AWG 16 - 2	70	**LC1D50A●●**
5	10	20	20	40	50	AWG 16 - 2	80	**LC1D65A●●**
5	10	20	20	40	50	AWG 16 - 2	80	**LC1D80A●●**
Connection by screw clamp terminals or connectors								
7.5	15	25	30	60	60	AWG 10 - 2	110	**LC1D80●●**
7.5	15	25	30	60	60	AWG 10 - 2	110	**LC1D95●●**
–	–	30	40	75	100	AWG 8-1/0	160	**LC1D115●●**
–	–	40	50	100	125	AWG 8-1/0	160	**LC1D150●●**

Applications with High-Fault Short-Circuit ratings

High-fault short-circuit current ratings are: 100 kA (D09-80, D115-150) at 600 V with Class J fuses and 85 kA (D09-38), 100 kA (D40A-80, D115-150) at 480 V and 50 kA (D09-80, D115-150) at 600 V with circuit breakers.

Application example

For a 15 HP-230 V motor
Select a contactor type **LC1D50A**.
Information: the contactor rating selected corresponds to “size 2”, the associated cable is type AWG3 75 °C-Cu.

Standard control circuit voltages (for other voltages, please consult your Regional Sales Office)

a.c. supply

Volts	24	42	48	110	115	120	208	220	230	240	380	400	415	440	480	500
LC1D09…D150 (D115 and D150 coils with built-in suppression device as standard)																
50/60 Hz	B7	D7	E7	F7	FE7	G7 (3)	LE7 (3)	M7	P7	U7	Q7	V7	N7	R7	T7 (3)	S7
LC1D09…D65 (not available with "connection for lugs or bars")																
50 Hz	B5	D5	E5						P5							
LC1D80…D115																
50 Hz	B5	D5	E5	F5	FE5	G5	–	M5	P5	U5	Q5	V5	N5	R5	–	S5
60 Hz	B6	–	E6	F6	–	G6	L6	M6	–	U6	Q6	–	–	R6	T6	–

d.c. supply

Volts	12	24	36	48	60	72	110	125	220	250	440
LC1D09…D32 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)											
U 0.7…1.25 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
LC1D40A…D65A (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)											
U 0.75…1.25 Uc	JD	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	RD
LC1D80 and D95											
U 0.85…1.1 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
U 0.75…1.2 Uc	JW	BW	CW	EW	–	SW	FW	–	MW	–	–
LC1D115 and D150 (coils with built-in suppression device as standard)											
U 0.75…1.2 Uc	–	BD	–	ED	ND	SD	FD	GD	MD	UD	RD

Low consumption

Volts ⎓	5	12	20	24	48	72	110	220	250
LC1D09…D38 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)									
U 0.8…1.25 Uc	AL	JL	ZL	BL	EL	SL	FL	ML	UL

*(1) **LC1D09** to **D65A**: clip-on mounting on 35 mm ⊥ rail **NSYSDR** or screw fixing.*
__LC1D80__ and __LC1D95__: clip-on mounting on 35 mm ⊥ rail __NSYSDR__ or 75 mm ⊥ rail __AM1DL__ or screw fixing.
__LC1D115__ and __D150__: clip-on mounting on 2 x 35 mm ⊥ rails __NSYSDR__ or screw fixing.
(2) Versions with spring terminals __LC1D323__ and __LC1D383__ are not certified UL/CSA.
(3) Contactors __LC1D40A__, __50A__, __65A__, __80A__: for this coil voltage use is only on 60 Hz.
(4) For these coil voltages, choose from TeSys D Green contactors. Same product ref. radical, just add BBE coil voltage code for 24 V DC, BNE for 24-60 V AC/DC, EHE for 48-130 V AC/DC, KUE for 100-250 V AC/DC. Exemple: __LC1D40ABBE__.

Characteristics: pages B8/59 to B8/65
Dimensions: pages B8/72 to B8/75
Schemes: pages B8/79 to B8/80
Click HERE for access to online contactor selector

PB108301.eps



LC2D12●●

PB108340.eps



LC2D65A●●

PB121358.eps



LC2D1156●●

3-pole reversing contactors - Motors up to 75 kW / 400 V in category AC-3

Horizontally mounted - Pre-wired power connections.

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 (θ ≤ 60 °C)							Rated operational current in AC-3 440 V up to	Instantaneous auxiliary contacts per contactor		Contactors supplied with coil Basic reference, to be completed by adding the control voltage code	Weight (2)
220 V 230 V	380 V 400 V	415 V	440 V	500 V	660 V 690 V	1000 V				Fixing (1)	
kW	kW	kW	kW	kW	kW	kW	A				kg
With mechanical interlock, without electrical interlocking, for connection by screw clamp terminals or connectors											
2.2	4	4	4	5.5	5.5	–	9	1	1	**LC2D09●●** (3)	0.687
3	5.5	5.5	5.5	7.5	7.5	–	12	1	1	**LC2D12●●** (3)	0.697
4	7.5	9	9	10	10	–	18	1	1	**LC2D18●●** (3)	0.707
5.5	11	11	11	15	15	–	25	1	1	**LC2D25●●** (3)	0.787
7.5	15	15	15	18.5	18.5	–	32	1	1	**LC2D32●●** (3)	0.797
9	18.5	18.5	18.5	18.5	18.5	–	38	1	1	**LC2D38●●** (3)	0.807
11	18.5	22	22	22	30	–	40	1	1	**LC2D40A●●**	1.870
15	22	25	30	30	33	–	50	1	1	**LC2D50A●●**	1.880
18.5	30	37	37	37	37	–	65	1	1	**LC2D65A●●**	1.890
22	37	45	45	55	45	–	80	1	1	**LC2D80●●**	3.200
25	45	45	45	55	45	–	95	1	1	**LC2D95●●**	3.200
With mechanical interlock and electrical interlocking, for connection by screw clamp terminals or connectors											
30	55	59	59	75	80	65	115	1	1	**LC2D115●●**	6.350
40	75	80	80	90	100	75	150	1	1	**LC2D150●●**	6.400

Connection by lugs or bars

For reversing contactors LC2D09 to LC2D38, LC2D115 and LC2D150, in the references selected above, insert a figure **6** before the voltage code. Example: **LC2D09●●** becomes **LC2D096●●**.
To build a 40 to 65 A reversing contactor, for connection by lugs, order 2 contactors **LC1D●●A6** and mechanical interlock **LAD4CM** (see page B8/29).

Component parts

Auxiliary contact blocks and add-on modules: see pages B8/22 to B8/28.

*(1) LC2D09 to D65A: clip-on mounting on 35 mm ⊔ rail **NSYSDR** or screw fixing.*
*LC2D80 and D95: clip-on mounting on 35 mm ⊔ rail **NSYSDR** or 75 mm ⊔ rail **AM1DL** or screw fixing.*
*LC2D115 and D150: clip-on mounting on 35 mm ⊔ rail **NSYSDR** or screw fixing.*

Standard control circuit voltages (for other voltages, please consult your Regional Sales Office)

a.c. supply

Volts	24	42	48	110	115	220	230	240	380	400	415	440	500
LC2D09…D150 (D115 and D150 coils with built-in suppression device as standard)													
50/60 Hz	B7	D7	E7	F7	FE7	M7	P7	U7	Q7	V7	N7	R7	S7
LC2D80…D115													
50 Hz	B5	D5	E5	F5	FE5	M5	P5	U5	Q5	V5	N5	R5	S5
60 Hz	B6	–	E6	F6	–	M6	–	U6	Q6	–	–	R6	–

d.c.supply

Volts	12	24	36	48	60	72	110	125	220	250	440
LC2D09…D38 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)											
U 0.7…1.25 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
LC2D40A…D65A (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)											
U 0.75…1.25 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD

Low consumption

Volts ⎓	5	12	20	24	48	110	220	250
LC2D09...D38 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)								
U 0.8…1.25 Uc	AL	JL	ZL	BL	EL	FL	ML	UL

For other voltages between 5 and 690 V, see pages B8/31 to B8/34.
*(2) The weights indicated are for contactors with a.c. control circuit. For d.c. or low consumption control circuit, add 0.330 kg for **LC2D09** to **D38**, 0.150 kg for **LC1D40A** to **D65A**.*
*(3) For reversing contactors with electrical interlocking pre-wired at the factory, add suffix **V** to the references selected above. Example: **LC2D09P7** becomes **LC2D09P7V**.*

***Note:** when assembling a reversing contactor, it is good practice to incorporate a 50 ms time delay.*

PB108305.eps



LC2D123●●

3-pole reversing contactors - Motors up to 15 kW / 400 V in category AC-3

Pre-wired power connections.
Mechanical interlock without electrical interlocking.

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 (θ ≤ 60 °C)						Rated operational current in AC-3 440 V up to	Instantaneous auxiliary contacts per contactor		Contactors supplied with coil Basic reference, to be completed by adding the voltage code	Weight (2)
220 V 230 V	380 V 400 V	415 V	440 V	500 V	660 V 690 V				Fixing (1)	
kW	kW	kW	kW	kW	kW	A				kg
For connection by spring terminals										
2.2	4	4	4	5.5	5.5	9	1	1	**LC2D093●●**	0.687
3	5.5	5.5	5.5	7.5	7.5	12	1	1	**LC2D123●●**	0.697
4	7.5	9	9	10	10	18	1	1	**LC2D183●●**	0.707
5.5	11	11	11	15	15	25	1	1	**LC2D253●●**	0.787
7.5	15	15	15	18.5	18.5	32 (3)	1	1	**LC2D323●●**	0.797
Power connection by EverLink®, BTR screw connectors (4) and control by spring terminals										
11	18.5	22	22	22	30	40	1	1	**LC2D40A3●●**	1.870
15	22	25	30	30	33	50	1	1	**LC2D50A3●●**	1.880
18.5	30	37	37	37	37	65	1	1	**LC2D65A3●●**	1.890
For connection by Faston connectors										

All power connections are to be made by the customer.
These contactors are fitted with Faston connectors: 2 x 6.35 mm on the power poles and 1 x 6.35 mm on the coil terminals.
For reversing contactors LC2D09 and LC2D12 only, in the references selected above, replace the figure **3** before the voltage code with a figure **9**.
Example: **LC2D093●●** becomes **LC2D099●●**.

Component parts

Auxiliary contact blocks and add-on modules: see pages B8/22 to B8/28.
*(1) LC2D09 to D32: clip-on mounting on 35 mm ⊥⌐ rail **NSYSDR** or screw fixing.*

Standard control circuit voltages (for other voltages, please consult your Regional Sales Office)

a.c. supply													
Volts	**24**	**42**	**48**	**110**	**115**	**220**	**230**	**240**	**380**	**400**	**415**	**440**	**500**
LC2D09…D65A													
50/60 Hz	B7	D7	E7	F7	FE7	M7	P7	U7	Q7	V7	N7	R7	S7

d.c. supply											
Volts	**12**	**24**	**36**	**48**	**60**	**72**	**110**	**125**	**220**	**250**	**440**
LC2D09…D32 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)											
U 0.7…1.25 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
LC2D40A …D65A (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)											
U 0.75…1.25 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD

Low consumption								
Volts ⎓	**5**	**12**	**20**	**24**	**48**	**110**	**220**	**250**
LC2D09...D32 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)								
U 0.8…1.25 Uc	AL	JL	ZL	BL	EL	FL	ML	UL

For other voltages between 5 and 690 V, see pages B8/31 to B8/34.
*(2) The weights indicated are for reversing contactors with a.c. control circuit. For d.c. or low consumption control circuit, add 0.330 kg for **LC2D09** to **D38**, 0.150 kg for **LC1D40A** to **D65A**.*
*(3) Must be wired with 2 x 4 mm² cables in parallel on the upstream side. On the downstream side, outgoing terminal block **LAD331** may be used (Quickfit technology, see page B1/18).When wired with a single cable, the product is limited to 25 A (11 kW/400 V motors).*
*(4) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LADALLEN4**, see page B8/28).*

Contactors

Characteristics: pages B8/59 to B8/65
Dimensions: pages B8/81 and B8/82
Schemes: pages B8/83 and B8/84
Click HERE for access to online contactor selector

DB424874.eps



LC2D09●●●

DB424870.eps



LC2D40A●●●

TeSys D Green contactors have a dark grey casing and a 3-character code voltage.

3-pole reversing contactors - Motors up to 37 kW / 400 V in category AC-3

Pre-wired power connections

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 (θ ≤ 60 °C)						Rated operational current in AC-3 440 V up to	Instantaneous auxiliary contacts per contactor		Contactors supplied with coil Partial reference, to be completed by adding the control voltage code Fixing [1]	Weight
220 V 230 V	380 V 400 V	415 V	440 V	500 V	660 V 690 V					
kW	kW	kW	kW	kW	kW	A				kg
With mechanical interlock, without electrical interlocking, for connection by screw clamp terminals or Everlink BTR screw connectors [2] [3]										
2.2	4	4	4	5.5	5.5	9	1	1	**LC2D09●●●**	0.783
3	5.5	5.5	5.5	7.5	7.5	12	1	1	**LC2D12●●●**	0.793
4	7.5	9	9	10	10	18	1	1	**LC2D18●●●**	0.803
5.5	11	11	11	15	15	25	1	1	**LC2D25●●●**	0.913
7.5	15	15	15	18.5	18.5	32	1	1	**LC2D32●●●**	0.923
9	18.5	18.5	18.5	18.5	18.5	38	1	1	**LC2D38●●●**	0.933
11	18.5	22	22	22	30	40	1	1	**LC2D40A●●●** [2]	2.154
15	22	25	30	30	33	50	1	1	**LC2D50A●●●** [2]	2.164
18.5	30	37	37	37	37	65	1	1	**LC2D65A●●●** [2]	2.174
22	37	37	37	37	37	66	1	1	**LC2D80A●●●** [2]	2.174

Auxiliary contact blocks and add-on modules

See pages B8/22 to B8/28.

Coil voltage codes

AC/DC 24 V DC supply

Volts	24 (DC only)	24-60	48-130	100-250
LC2D09...D32, LC2D40A ... D80A				
U 0.85...1.1 Uc		BNE	EHE	KUE
LC2D09...D38				
U 0.8...1.2 Uc	BNE			
LC2D40A ...D80A				
U 0.8...1.2 Uc	BBE			

*(1) **LC2D09** to **D80A**: clip-on mounting on 35 mm ⊔ rail **NSYSDR** or screw fixing.*
*(2) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LADALLEN4**, see page B8/28).*
(3) Electrical interlocking is recommended when 2 orders (direct and reverse) could appeared in the same time.

PB108324.eps



LC2DT20●●

PB121359.eps



LC2D115004●●

4-pole changeover contactor pairs - 20 to 200 A in category A-1

Pre-assembled. Pre-wired power connections

LC2DT20 to LC2DT40: mechanical interlock without electrical interlocking.
LC2D80004: order separately 2 auxiliary contact blocks LADN●1 to obtain electrical interlocking between the 2 contactors (see page B8/22).
For electrical interlocking incorporated in the mechanical interlock, please consult your Regional Sales Office.
LC2D115004: mechanical interlock with integral, pre-wired electrical interlocking.

For connection by screw clamp terminals or connectors

Utilisation category AC-1 Non-inductive loads Maximum rated operational current ($\theta \leq 60$ °C)	Instantaneous auxiliary contacts per contactor		Contactors supplied with coil Basic reference, to be completed by adding the voltage code (1) Fixing (2)	Weight
A				kg
20	1	1	**LC2DT20●●**	0.730
25	1	1	**LC2DT25●●**	0.730
32	1	1	**LC2DT32●●**	0.850
40	1	1	**LC2DT40●●**	0.850
125	–	–	**LC2D80004●●**	3.200
200	–	–	**LC2D115004●●**	7.400

For connection by lugs or bars

20	1	1	**LC2DT206●●**	0.730
25	1	1	**LC2DT256●●**	0.730
32	1	1	**LC2DT326●●**	0.850
40	1	1	**LC2DT406●●**	0.850

For customer assembly

For connection by screw clamp terminals or connectors

60	1	1	**LC1DT60A●●** (3)	–
80	1	1	**LC1DT80A●●** (3)	–

For connection by lugs or bars

60	1	1	**LC1DT60A6●●** (3)	–
80	1	1	**LC1DT80A6●●** (3)	–

Auxiliary contact blocks and add-on modules: see pages B8/22 to B8/28.

Note: when assembling changeover contactor pairs, it is good practice to incorporate a 50 ms time delay.
(1) See note (1) on next page.
*(2) **LC2DT20** to **LC2DT80**: clip-on mounting on 35 mm ⊥ rail **NSYSDR** or screw fixing.*
*__LC2D80:__ clip-on mounting on 35 mm ⊥ rail **NSYSDR** or 75 mm ⊥ rail **AM1DL** or screw fixing.*
*__LC2D115__: clip-on mounting on 2 x 35 mm ⊥ rails **NSYSDR** or screw fixing.*
*(3) For these operational currents, order 2 identical contactors and a mechanical interlock **LAD4CM** (see page B8/29).*

Contactors

Characteristics: pages B8/59 to B8/65
Dimensions: pages B8/81 and B8/82
Schemes: pages B8/83 and B8/84
Click HERE for access to online contactor selector



Example of necessary components for customer assembly:
2 x LC1DT80A3●● contactors + LAD4CM mechanical interlock

4-pole changeover contactor pairs for 20 to 80 A control in category AC-1

Pre-assembled, for customer assembly

Pre-wired power connections, for connection by spring terminals.

Utilisation category AC-1 Non-inductive loads Maximum rated operational current (θ ≤ 60 °C)	Instantaneous auxiliary contacts per contactor		Contactors supplied with coil Basic reference, to be completed by adding the control voltage code Fixing (1)
A			
20	1	1	**LC2DT203●●**
Power connection by EverLink®, BTR screw connectors (2) and control by spring terminals			
60	1	1	**LC1DT60A3●●** (3)
80	1	1	**LC1DT80A3●●** (3)

Separate components

Auxiliary contact blocks and add-on modules: see pages B8/19 to B8/19.

Standard control circuit voltages
(for other voltages, please consult your Regional Sales Office)

a.c. supply

Volts	24	42	48	110	115	220	230	240	380	400	415	440	500
LC2DT20…DT40, LC2DT60A…DT80A													
50/60 Hz	B7	D7	E7	F7	FE7	M7	P7	U7	Q7	V7	N7	R7	–
LC2D80004…D115004													
50 Hz	B5	D5	E5	F5	FE5	M5	P5	U5	Q5	V5	N5	R5	S5
60 Hz	B6	–	E6	F6	–	M6	–	U6	Q6	–	–	R6	–

d.c. supply

Volts	12	24	36	48	60	72	110	125	220	250	440
LC2DT20…DT40, LC1DT60…DT80 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)											
U 0.7…1.25 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD

Low consumption

Volts ⎓	5	12	20	24	48	110	220	250
LC2DT20...DT40 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)								
U 0.8…1.25 Uc	AL	JL	ZL	BL	EL	FL	ML	UL

For other voltages between 5 and 690 V, see pages B8/19 to B8/19.
*(1) Clip-on mounting on 35 mm ⊔ rail **NSYSDR** or screw fixing.*
*(2) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LADALLEN4**, see page B8/19).*
*(3) For these operational currents, order 2 identical contactors and a mechanical interlock **LAD4CM** (see page B8/19).*

Contactors

PB115163.eps



LC1DFK●●

PB115164.eps



LC1DGK●●, LC1DLK●●, LC1DMK●●

PB115167.eps



LC1DPK●●, LC1DTK●●

PB115169.eps



LC1DWK12●●

Contactors for switching 3-phase capacitor banks (power factor correction)

Special contactors **LC1D●K** are designed for switching 3-phase, single or multiple-step capacitor banks (up to 6 steps). Over 6 steps, it is recommanded to use chokes in order to limit the inrush current and thus improve the lifetime of the installation. The contactors are conform to standards IEC 60070 and 60831, UL and CSA.

Contactor applications

Specification

Contactors fitted with a block of early make poles and damping resistors, limiting the value of the current on closing to 60 In max.
This current limitation increases the life of all the components of the installation, in particular that of the fuses and capacitors.

Operating conditions

Short-circuit protection must be provided by gI type fuses rated at 1.7…2 In.
It will ensure the service continuity of the whole installation in case of a capacitor contactor end of life

Maximum operational power

The power values given in the selection table below are for the following operating conditions:

Prospective peak current at switch-on	LC1D●K		200 In
Maximum operating rate	LC1DFK, DGK, DLK, DMK		240 operating cycles/hour
	LC1DPK, DTK, DWK		100 operating cycles/hour
Electrical durability at nominal load	All contactor ratings	400 V	300 000 operating cycles
		690 V	200 000 operating cycles

Operational power at 50/60 Hz (1) θ ≤ 60 °C (2)				Instantaneous auxiliary contacts		Tightening torque on cable end	Basic reference, to be completed by adding the voltage code (3)	Weight
230 V	400 V 415 V	440 V	690 V					
kVAR	kVAR	kVAR	kVAR	N/O	N/C	N.m		kg
7	12.5	12.5	21	1	2	1.7	**LC1DFK●●**	0.430
9.5	16.7	16.7	28.5	1	2	2.5	**LC1DGK●●**	0.450
11	20	21	33	1	2	2.5	**LC1DLK●●**	0.600
14	25	27	42	1	2	2.5	**LC1DMK●●**	0.630
17	30	32	50	1	2	5	**LC1DPK●●**	1.300
22	40	43	67	1	2	5	**LC1DTK●●**	1.300
35	63	67	104	1	2	9	**LC1DWK12●●**	1.650

Switching of multiple-step capacitor banks (with equal or different power ratings)

The correct contactor for each step is selected from the above table, according to the power rating of the step to be switched.
Example: 50 kVAR 3-step capacitor bank. Temperature: 50 °C and U = 400 V or 440 V.
One 25 kVAR step: contactor LC1DMK, one 15 kVAR step: contactor LC1DGK,
and one 10 kVAR step: contactor LC1DFK.

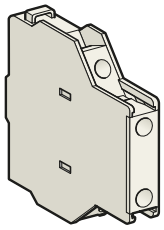
(1) Operational power of the contactor according to the scheme on the page opposite.
(2) The average temperature over a 24-hour period, in accordance with standards IEC 60070 and 60831 is 45 °C.
(3) Standard control circuit voltages (the delivery time is variable, please consult your Regional Sales Office):

Volts	24	48	110	120	220	230	240	380	400	415	440
50/60 Hz	B7	E7	F7	G7	M7	P7	U7	Q7	V7	N7	R7

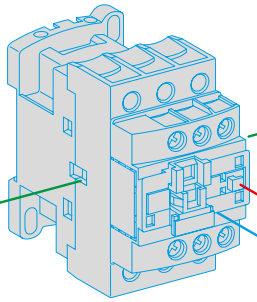
Dimensions, schemes:
page B8/85

Click **HERE** for access to online contactor selector

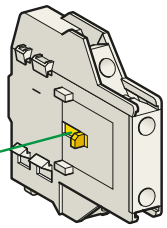
DB425485.eps



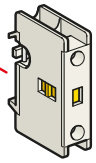
LAD8N (1)



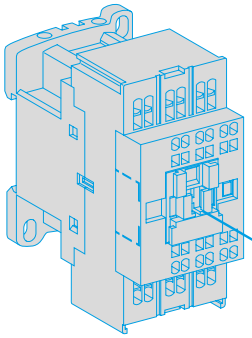
LC1 D●●



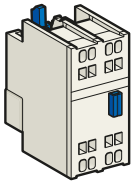
LAD 8N



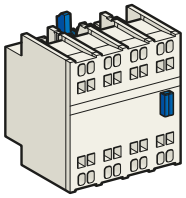
LAD N10, N01



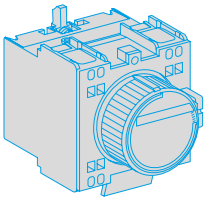
LC1 D●●3



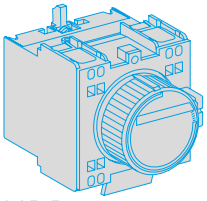
LAD N●●3



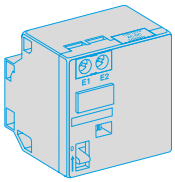
LAD N●●3
LAD C●●3



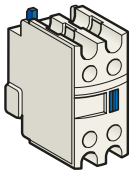
LAD T●3
LAD S23



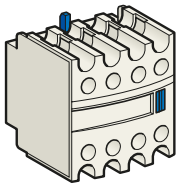
LAD R●3



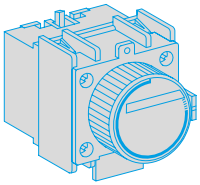
LA6 DK
or
LAD 6K



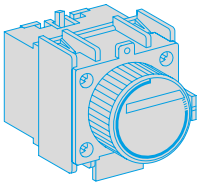
LAD N



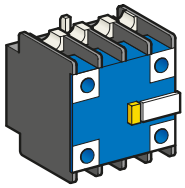
LAD N
LAD C



LAD T
LAD S2



LAD R



LA1 DX, DY, DZ

See page opposite for mounting possibilities according to the contactor type

(1) No left side mounting on TeSys D Green *contactors.*

PB121389.eps



LADN11

PB121388.eps



LAD8N11

PB121544.eps



LA1DX●●, LA1DZ●●

Instantaneous auxiliary contact blocks for connection by screw clamp terminals

For use in normal operating environments

Clip-on mounting	Number of contacts per block	Composition					Reference	
Front	1	–	–	–	1	–	**LADN10**	
		–	–	–	–	1	**LADN01**	
	2	–	–	–	1	1	**LADN11**	
		–	–	–	2	–	**LADN20**	
		–	–	–	–	2	**LADN02**	
	4	–	–	–	2	2	**LADN22**	**LADN22S** (4)
		–	–	–	1	3	**LADN13**	
		–	–	–	4	–	**LADN40**	
		–	–	–	–	4	**LADN04**	
		–	–	–	3	1	**LADN31**	
	4 incl. 1 N/O & 1 N/C make before break	–	–	–	2	2	**LADC22**	
Side (contact blocks compatible with AC coil contactors only)	2	–	–	–	1	1	**LAD8N11**	
		–	–	–	2	–	**LAD8N20**	
		–	–	–	–	2	**LAD8N02**	
For terminal referencing conforming to EN 50012								
Front on 3P contactors and 4P contactors 20 to 80 A	2	–	–	–	1	1	**LADN11G**	
	4	–	–	–	2	2	**LADN22G**	
Front on 4P contactors 125 to 200 A	2	–	–	–	1	1	**LADN11P**	
	4	–	–	–	2	2	**LADN22P**	
With dust and damp protected contacts, for use in particularly harsh industrial environments								
Front	2	–	2	–	–	–	**LA1DX20**	
		1	1	–	–	–	**LA1DX11**	
		2	–	–	–	–	**LA1DX02**	
		–	2	2	–	–	**LA1DY20** (2)	
	4	–	2	–	2	–	**LA1DZ40**	
		–	2	–	1	1	**LA1DZ31**	

Instantaneous auxiliary contact blocks for connection by lugs

This type of connection is not possible for blocks with 1 contact or blocks with dust and damp protected contacts. For all other instantaneous auxiliary contact blocks, add the figure **6** to the end of the references selected above. Example: **LADN11** becomes **LADN116**.

Instantaneous auxiliary contact blocks for connection by spring terminals

This type of connection is not possible for LAD8, LADN with 1 contact or blocks with dust and damp protected contacts. For all other contact blocks, add the figure **3** to the end of the references selected above.
Example: **LADN11** becomes **LADN113**.

Instantaneous auxiliary contact blocks for connection by Faston connectors

This type of connection is not possible for LAD8, LADN with 1 contact or blocks with dust and damp protected contacts. For all other contact blocks, add the figure **9** to the end of the references selected above.
Example: **LADN11** becomes **LADN119**.

Maximum number of auxiliary contacts that can be fitted:

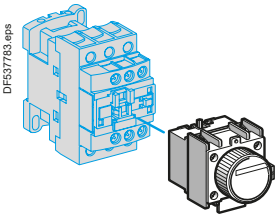
Contactors			Instantaneous auxiliary contacts					Time delay
Type	Number of poles and size		Side mounted		Front mounted			Front mounted
					1 contact	2 contacts	4 contacts	
AC	3P	LC1D09…D38	1 on LH or 1 on RH side(1)	and	–	1	or 1	or 1
AC/DC		LC1D40A…D80A	1 on LH or 1 on RH side	and	–	1	or 1	or 1
		LC1D80 and D95 (50/60 Hz)	1 on each side	or	2	and 1	or 1	or 1
		LC1D80 and D95 (50 or 60 Hz)	1 on each side	and	2	and 1	or 1	or 1
		LC1D115 and D150	1 on LH side	and	–	1	or 1	or 1
	4P	LC1DT20…DT40	1 on LH side	and	–	1	or 1	or 1
		LC1DT60A and DT80A	1 on LH or 1 on RH side	and	–	1	or 1	or 1
		LC1D40008, D65008 and D80	1 on each side	or	1	or 1	or 1	or 1
		LC1D115	1 on each side	and	1	or 1	or 1	or 1
DC	3P	LC1D09…D38	–		–	1	or 1	or 1
		LC1D40A…D80A	–		–	1	or 1	or 1
		LC1D80 and D95	–		1	or 1	or 1	or 1
		LC1D115 and D150	1 on LH side	and	–	1	or 1	or 1
	4P	LC1DT20…DT40	–		–	1	or 1	or 1
		LC1DT60A and DT80A	–		–	1	or 1	or 1
		LC1D40008, D65008 and D80	–		2	and 1	or 1	or 1
		LC1D115	1 on each side		–	and 1	or 1	or 1
LC (3) (5)	3P	LC1D09…D38	–		–	1	–	–
	4P	LC1DT20…DT40	–		–	1	–	–

(1) 1 on LH side for AC coils - 1 on RH side for AC/DC coils.
(2) Device fitted with 4 earth screen continuity terminals.
(3) LC: low consumption.
(4) With red front face - for safety chain indication.
(5) LA1D●●● dust & damp proof auxiliary contact blocks not allowed.

Characteristics: pages B8/66 and B8/67
Curves: page B8/68
Dimensions: pages B8/72 and B8/73

Product references





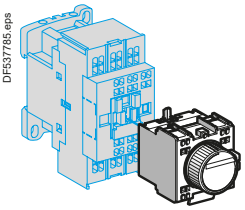
LADT●

Time delay auxiliary contact blocks for connection by screw clamp terminals

Maximum number of auxiliary contact blocks that can be fitted per contactor, see page B8/22.
Sealing cover to be ordered separately, see page B8/28.
LADT0 and LADR0: with extended scale from 0.1 to 0.6 s.
LADS2: with switching time of 40 ms ± 15 ms between opening of the N/C contact and closing of the N/O contact.

Clip-on mounting	Number of contacts	Time delay		Reference
		Type	Setting range	
Front	1 N/O + 1 N/C	On-delay	0…3 s	**LADT0**
			1…30 s	**LADT2**
			10…180 s	**LADT4**
			1…30 s	**LADS2**
		Off-delay	0…3 s	**LADR0**
			1…30 s	**LADR2**
			10…180 s	**LADR4**





LADT●3

Time delay auxiliary contact blocks for connection by lugs

Add the figure **6** to the end of the references selected above. Example: **LADT0** becomes **LADT06**.

Time delay auxiliary contact blocks for connection by spring terminals

Add the figure **3** to the end of the references selected above. Example: **LADT0** becomes **LADT03.**

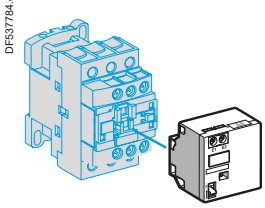
Time delay auxiliary contact blocks for connection by Faston connectors

Add the figure **9** to the end of the references selected above. Example: **LADT0** becomes **LADT09**.

Mechanical latch blocks (1)

Clip-on mounting	Unlatching control	For use on contactor	Basic reference, to be completed by adding the control voltage code (2)
Front	Manual or electric	LC1D09…D38 (∿ or ⎓) (3) LC1DT20…DT40 (∿ or ⎓)	**LAD6K10●**
		LC1D40A…D80A (3 P ∿ or ⎓) LC1DT60A and DT80A (4 P ∿ or ⎓)	**LA6DK10●**
		LC1D80…D150 (3 P ∿) LC1D80 and D115 (3 P ⎓) LC1D80 (4 P ∿) LC1D80 and D115 (4 P ∿) LP1D80 and LC1D115 (4 P ⎓)	**LA6DK20●**





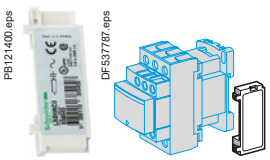
LAD6K10●

(1) The mechanical latch block must not be powered up at the same time as the contactor. The duration of the control signal for the mechanical latch block and the contactor should be:
≥ 100 ms for a contactor operating on an a.c. supply,
≥ 250 ms for a contactor operating on a d.c. supply.
*Maximum impulse duration for the **LAD6K10●** mechanical latch block: 10 seconds.*
(2) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Volts 50/60 Hz, ⎓	24	32/36	42/48	60/72	100	110/127	220/240	256/277	380/415
Code	B	C	E	EN	K	F	M	U	Q

*(3) The DC, low consumption contactors (coil code ●L) are not compatible with the mechanical latch blocks **LAD6K10●**.*

Contactors

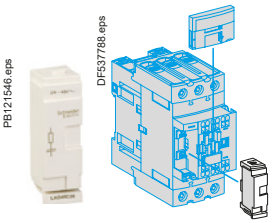


LAD4RCU LAD4●●

RC circuits (Resistor-Capacitor)

Effective protection for circuits highly sensitive to "high frequency" interference. For use only in cases where the voltage is virtually sinusoidal. i.e. less than 5 % total harmonic distortion. Voltage limited to 3 Uc max. and oscillating frequency limited to 400 Hz max. Slight increase in drop-out time (1.2 to 2 times the normal time).

Mounting	For use with contactor (1)			Reference
	Rating	Type		
		V ∿	V ⎓	
Clip-on side mounting (3) (5)	D09…D38 (3P) DT20…DT40	24…48	–	**LAD4RCE**
		50…127	–	**LAD4RCG**
		110…250	–	**LAD4RCU**
Clip-on front mounting (3) (5)	D40A…D65A (3P) DT60A…DT80A (4P)	24…48	–	**LAD4RC3E**
		50…127	–	**LAD4RC3G**
		110…240	–	**LAD4RC3U**
		380…415	–	**LAD4RC3N**
Screw fixing (4)	D80…D150 (3P) D40…D115 (4P)	24…48	–	**LA4DA2E**
		50…127	–	**LA4DA2G**
		110…240	–	**LA4DA2U**
		380…415	–	**LA4DA2N**

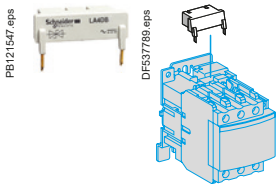


LAD4RC3●, LAD4V3●, LAD4D3U, LAD4T3●

Varistors (peak limiting)

Protection provided by limiting the transient voltage to 2 Uc max. Maximum reduction of transient voltage peaks. Slight increase in drop-out time (1.1 to 1.5 times the normal time).

Clip-on side mounting (3) (5)	D09…D38 (3P) DT20…DT40	24…48	–	**LAD4VE**
		50…127	–	**LAD4VG**
		110…250	–	**LAD4VU**
Clip-on front mounting (3) (5)	D40A…D65A (3P) DT60A…DT80A (4P)	24…48	24…48	**LAD4V3E**
		50…127	50…127	**LAD4V3G**
		110…250	110…250	**LAD4V3U**
Screw fixing (4)	D80…D115 (3P) D80…D115 (4P)	24…48	–	**LA4DE2E**
		50…127	–	**LA4DE2G**
		110…250	–	**LA4DE2U**
	D80…D95 (3P) D80 (4P)	–	24…48	**LA4DE3E**
		–	50…127	**LA4DE3G**
		–	110…250	**LA4DE3U**



LA4D●●

Flywheel diodes

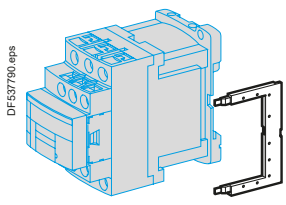
No overvoltage or oscillating frequency. Increase in drop-out time (6 to 10 times the normal time). Polarised component.

Clip-on side mounting (5)	D09…D38 (3P), DT20…DT40	–	5...600	**LAD4DDL**
Clip-on front mounting (5)	D40A…D65A (3P), DT60A…DT80A (4P)	–	24…250	**LAD4D3U**
Screw fixing (4)	D80 and D95 (3P), D40…D80 (4P)	–	24…250	**LA4DC3U**

Bidirectional peak limiting diodes

Protection provided by limiting the transient voltage to 2 Uc max.
Maximum reduction of transient voltage peaks.

Clip-on side mounting (3)	D09…D38 (3P) DT20…DT40 (4P) (2)	24	–	**LAD4TB**
		–	24	**LAD4TBDL**
		72	–	**LAD4TS**
		–	72	**LAD4TSDL**
		–	125	**LAD4TGDL**
		–	250	**LAD4TUDL**
		–	600	**LAD4TXDL**
Clip-on front mounting (3)	D40A…D65A (3P) DT60A…DT80A (4P) (2)	12…24	12…24	**LAD4T3B**
		25…72	25…72	**LAD4T3S**
		73…125	73…125	**LAD4T3G**
		126…250	126…250	**LAD4T3U**
		251…440	251…440	**LAD4T3R**
Screw fixing (4)	D80…D95 (3P) D40…D80 (4P)	12…24	–	**LA4DB2B**
		25…72	–	**LA4DB2S**
		–	24	**LA4DB3B**
		–	72	**LA4DB3S**



LAD4DDL or LAD4T●DL



LAD4DDL

(1) For satisfactory protection, a suppressor module must be fitted across the coil of each contactor except for TeSys D Green *(●●E coil), as surge protection is already embedded.*

*(2) From **D09** to **D65A** and from **LC1DT20** to **DT80A**, d.c, low consumption are fitted with a built-in bidirectional peak limiting diode suppressor as standard. This bidirectional peak limiting diode is removable and can therefore be replaced by the user. (See reference above). If a d.c. or low consumption contactor is used without suppression, the standard suppressor should be replaced with a blanking plug (reference **LAD9DL** for **LC1D09** to **D38** and **LC1DT20** to **DT40**; reference **LAD9DL3** for **LC1D40A** to **D65A** and **LC1DT60A** to **DT80A**).*

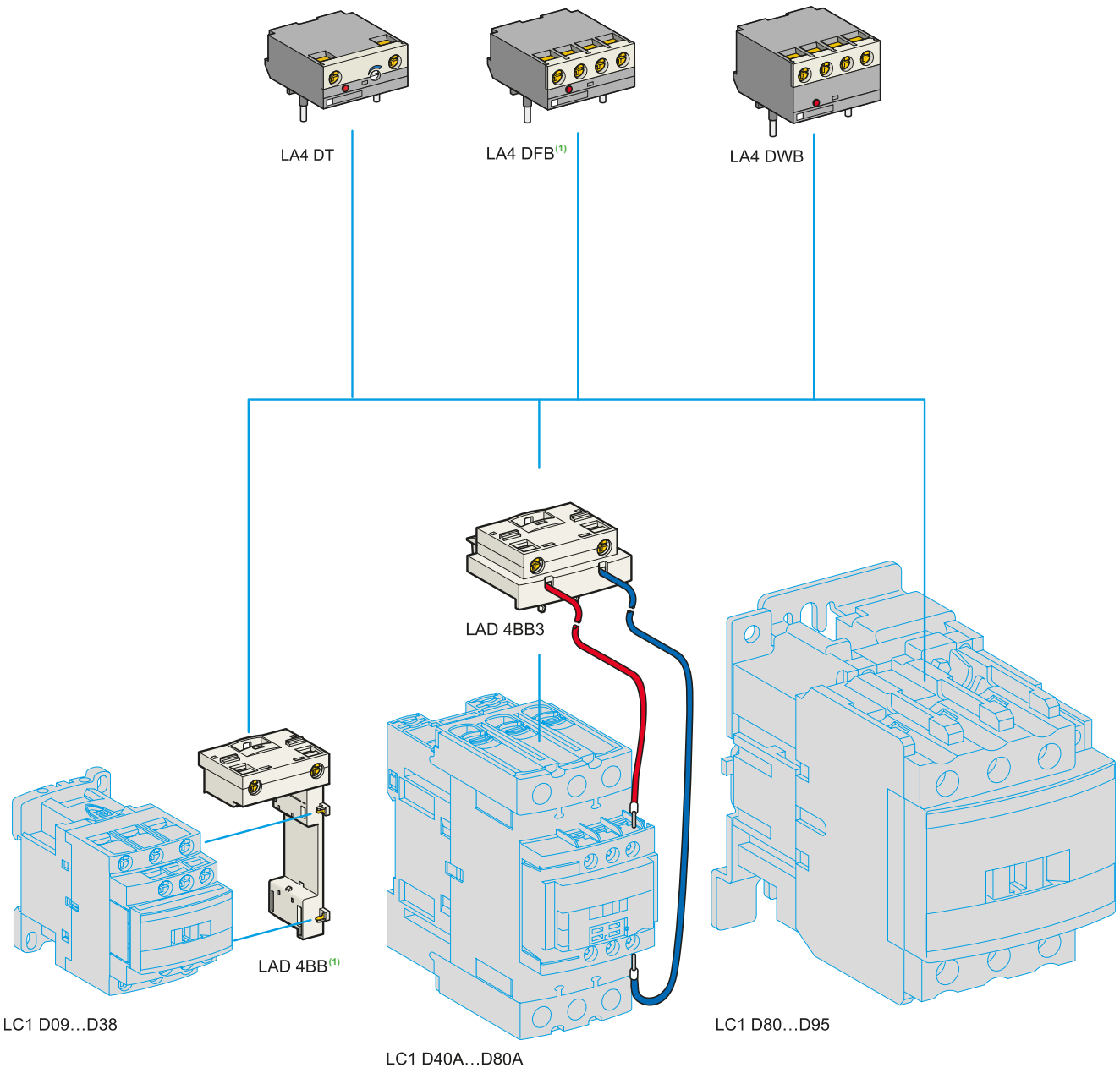
(3) Clipping-on makes the electrical connection. The overall size of the contactor remains unchanged.

(4) Mounting at the top of the contactor on coil terminals A1 and A2.

(5) In order to install these accessories, the existing suppression device must first be removed.

Characteristics:
page B8/69

DB425486.eps



See page opposite for mounting possibilities according to the contactor type.

(1) For TeSys D *with AC coil only.*

Product references

PB121548.eps



LA4DT●●

PB121549.eps



LA4DFB

PB121550.eps



LA4DBL

PB121402.eps



LAD4BBVU

Electronic serial timer modules (1)

■ 3-pole contactors LC1D09 to D38: mounted using adapter LAD4BB, to be ordered separately, see below.
■ 3-pole contactors LC1D40A to D65A: mounted using adapter LAD4BB3, to be ordered separately, see below.
■ 3-pole contactors LC1D80 to D150 and 4-pole contactors LC1D40 to D115: mounted directly across terminals A1 and A2 of the contactor.

On-delay type

Operational voltage ∿		Time delay	Reference
24…250 V	**100…250 V**		
LC1D09…D80A (3P)	LC1D80…D150 (3P)	0.1…2 s	**LA4DT0U**
		1.5…30 s	**LA4DT2U**
		25…500 s	**LA4DT4U**

Interface modules

■ 3-pole contactors LC1D09 to D38: mounted using adapter LAD4BB, to be ordered separately, see below.
■ 3-pole contactors LC1D40A to D80A: mounted using adapter LAD4BB3, to be ordered separately, see below.

Relay interface

Operational voltage ∿	Supply voltage E1-E2 (⎓)	Reference
24…250 V		
LC1D09…D150 (3P)	24 V	**LA4DFB**

Static relay interface

Operational voltage ∿		Supply voltage E1-E2 (⎓)	Reference
24…250 V	**100…250 V**		
LC1D09…D80A (3P)	LC1D80…D115 (3P)	24 V	**LA4DWB**

Adapter kit for low control signal

For use on contactors	Composition	Reference
LC1D40A…D80A (3P) (2)	■ 1 LAD4BB3 coil wiring adapter ■ 1 LA4DFB relay interface module	**LA4DBL**

Wiring adapters for coil retrofit of 3 pole contactors

For adapting existing wiring to a new product

For use on contactors			Reference
LC1D09…D38	Without coil suppression		**LAD4BB** (3)
	With coil suppression	∿ 24…48 V	**LAD4BBVE**
		∿ 50…127 V	**LAD4BBVG**
		∿ 110…250 V	**LAD4BBVU**
LC1D40A…80A	Without coil suppression		**LAD4BB3**

(1) For 24 V operation, the contactor must be fitted with a 21 V coil (code Z). See pages B8/31 to B8/34.
(2) The kit is compatible with a coil voltage of ∿ 24 V to ∿ 250 V (B7 to U7) and ⎓ 24 V to ⎓ 250 V (BD to UD).
*(3) **LAD4BB** can not be used with 4 poles contactors.*

Contactors

Characteristics: page B8/70
Dimensions: page B8/72
Schemes: page B8/80

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Product references

PB121360.eps



LA9D3260

PB121361.eps



LA9D11550●

PB121362.eps



LAD96570

PB121363.eps



LA9D11560●

PB121364.eps



LA9D11570●

PB121365.eps



LA9D80962

PB121366.eps



LA9D11567

Accessories for main pole and control connections

Description		For use with contactors LC1 ~	For use with contactors LC1 ⎓	Sold in lots of	Unit reference
Connectors for cable, size (1 connector)	4-pole 10 mm²	DT20, DT25	DT20, DT25	1	**LAD92560**
	3-pole 25 mm²	D09…D38	D09…D38	1	**LA9D3260**
EverLink® terminal block	3-pole	D40A…D80A	D40A…D80A	1	**LAD96560**
Connectors for cables (2 connectors)	3-pole 120 mm²	D115, D150	D115, D150	1	**LA9D115603**
	4-pole 120 mm²	D115	D115	1	**LA9D115604**
Connectors for lug type terminals (2 connectors)	3-pole	D1156, D1506	D1156, D1506	1	**LA9D115503**
	4-pole	D1156	D1156	1	**LA9D115504**
Protective covers for connectors for lug type terminals	3-pole	D40A6…D80A6	D40A6…D80A6	1	**LAD96570**
		D1156, D1506	D1156, D1506	1	**LA9D115703** (1)
	4-pole	D60A6…D80A6	D60A6…D80A6	1	**LAD96580**
		D1156, D1506	D1156, D1506	1	**LA9D115704**
IP 20 covers for lug type terminals (for mounting with circuit breakers GV3 P●●6 and GV3 L●●6)	3 poles	D40A6…D80A6	D40A6…D80A6	1	**LAD96575**
Links for parallel connection of	2 poles	D09…D38	D09…D38	10	**LA9D2561**
		DT20, DT25 (4P)	DT20, DT25 (4P)	10	**LA9D1261**
		DT32, DT40 (4P)	DT32, DT40 (4P)	10	**LAD96061**
		D40A…D80A	D40A…D80A	1	**LAD9P32**
		D80, D95	D80, D95	2	**LA9D80961**
	3 poles	D09…D38	D09…D38	10	**LAD9P3** (2)
		D40A…D80A	D40A…D80A	1	**LAD9P33**
		D80, D95	D80, D95	1	**LA9D80962**
	4 poles	DT20, DT25	DT20, DT25	2	**LA9D1263**
		D80	D80	2	**LA9D80963**
Staggered coil connection		–	D80	10	**LA9D09966**
Control circuit take-off from main pole		D80, D95	D80, D95	10	**LA9D8067**
		D115, D150	D115, D150	10	**LA9D11567**
Spreaders for increasing the pole pitch to 45 mm		D115, D150	D115, D150	3	**GV7AC03**

(1) For 3-pole contactors: 1 set of 6 covers, for 4-pole contactors: 1 set of 8 covers.
(2) Separate connecting bar for connecting 2 poles in parallel.



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Sets of contacts and arc chambers

Description	For contactor		Reference
Sets of contacts	3-pole	LC1D115	**LA5D1158031**
		LC1D150	**LA5D150803**
	4-pole	LC1D115004	**LA5D115804**
Arc chambers	3-pole	LC1D115	**LA5D11550**
		LC1D150	**LA5D15050**
	4-pole	LC1D115004	**LA5D115450**

Power connection accessories

Terminal block	For supply to one or more GV2G busbar sets	**GV1G09**
Set of 63 A busbars for parallelling of contactors	2 contactors LC1D09…D18 or D25…D38	**GV2G245**
	4 contactors LC1D09…D18 or D25…D38	**GV2G445**
Set of 115 A busbars for parallelling of contactors	2 contactors LC1D40A…D80A	**GV3G264**
	3 contactors LC1D40A…D80A	**GV3G364** (1)
Set of S-shape busbars	For circuit breakers GV3P●● and GV3L●● (3) and contactors LC1D40A…D73A	**GV3S**

PB121367.eps
GV2G245

PB121368.eps
GV1G09

PB121369.eps
GV3S

Protection accessories

Description	Use	Sold in lots of	Reference
Miniature control circuit fuse holder	5 x 20 with 4 A-250 V fuse	1	**LA9D941**
Sealing cover	For LADT, LADR	1	**LA9D901**
Safety cover preventing access to the moving contact carrier	LC1D09…D80A and DT20…DT80A	1	**LAD9ET1**
	Red cover (for safety chain indication)	1	**LAD9ET1S**
	LC1D80 and D95	1	**LAD9ET3**
	Red cover (for safety chain indication)	1	**LAD9ET3S**
	LC1D115 and D150	1	**LAD9ET4**
	Red cover (for safety chain indication)	1	**LAD9ET4S**

PB121370.eps
LA9D941

PB121371.eps
LAD9ET1

PB113824.eps
LAD9ET1S

Marking accessories

Description	Use	Sold in lots of	Unit reference
Sheet of 64 blank legends, self-adhesive, 8 x 33 mm (2)	Contactors (except 4P) LC1D80…D115, LADN (4 contacts), LA6DK	10	**LAD21**
Sheet of 112 blank legends, self-adhesive, 8 x 12 mm (2)	LADN (2 contacts), LADT, LADR, LRD	10	**LAD22**
Sheet of 64 blank legends for marking using plotter or 8 x 33 mm engraver	Contactors (except 4P) LC1D80…D115, LAD (4 contacts), LA6DK	10	**LAD23**
Sheet of 440 blank legends for marking using plotter or 8 x 12 mm engraver	All products	35	**LAD24**
Marker holder snap-in, 8 x 22 mm	4-pole contactors, LC1D80...D115, LA6DK	100	**LA9D92**
Marker holder snap-in, 8 x 18 mm	LC1D09...D65A, LC1DT20...DT80A, LADN (4 contacts), LADT, LADR	100	**LAD90**
Bag of 300 blank legends self-adhesive, 7 x 21 mm	On holder LA9D92	1	**LA9D93**

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LAD21...24

PB121373.eps
LAD90

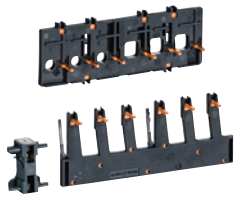
Mounting accessories

Retrofit plate for screw fixing	For replacement of LC1D40 to D80 with LC1D40A to D80A	1	**LAD7X3**
Mounting plate	For replacement of LC1F115 or F150 with LC1D115 or D150	1	**LA9D730**
Size 4 Allen key, insulated, 1000 V	For use on contactors LC1D40A to LC1D150	5	**LADALLEN4**

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LAD7X3

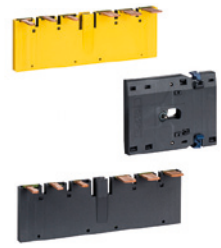
*(1) With this set of busbars, any one contactor can be supplied directly by its EverLink® double cage power terminal block. The other two contactors are supplied by the busbar set. The 115 A limitation is therefore applied to these two contactors. Example: 1 **LC1D65A** supplied directly + 1 contactor **LC1D65A** and 1 contactor **LC1D50A** supplied via the busbar set = 115 A. This combination is compatible with busbar set **GV3G364**.*
(2) These legends are for sticking onto the safety cover of the contactors or add-on block, if fitted.
*(3) With 73 A current limit for **GV3L73**, **GV3P73**.*

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LAD9R1

PB121376.eps



LAD9R3

PB121377.eps



LA9D8069

For 3-pole reversing contactors for motor control

Contactors with screw clamp terminals or connectors. Horizontally mounted, assembled by customer.

Description	For contactors [1] (2 identical contactors)	Reference
Kits for assembly of reversing contactors		
Kit comprising: ■ a mechanical interlock **LAD9V2** with electrical interlocking **LAD9V1** ■ a set of power connections **LAD9V5** (parallel) and **LAD9V6** (reversing).	LC1D09 to D38	**LAD9R1V**
Kit comprising: ■ a mechanical interlock **LAD9V2** without electrical interlocking ■ a set of power connections **LAD9V5** (parallel) and **LAD9V6** (reversing).	LC1D09 to D38	**LAD9R1**
Kit comprising: ■ a mechanical interlock **LAD4CM** ■ a set of power connections **LA9D65A69**.	LC1D40A to D80A	**LAD9R3**
Mechanical interlocks		
Mechanical interlock with integral electrical interlocking	LC1D80 and D95 (~)	**LA9D4002**
	LC1D80 and D95 (⎓)	**LA9D8002**
	LC1D115 and D150	**LA9D11502**
Mechanical interlock without integral electrical interlocking	LC1D09 to D38	**LAD9V2**
	LC1D40A to D80A	**LAD4CM**
	LC1D80 and D95 (~)	**LA9D50978**
	LC1D80 and D95 (⎓)	**LA9D80978**
Sets of power connections		
Comprising: ■ a set of parallel bars ■ a set of reverser bars.	LC1D09 to D38 with screw clamp terminals or connectors	**LAD9V5** + **LAD9V6**
	LC1D09…D32 with spring terminal connections	**LAD9V12** + **LAD9V13** [2]
	LC1D40A to D80A	**LA9D65A69**
	LC1D80 and D95 (~)	**LA9D8069**
	LC1D80 and D95 (⎓)	**LA9D8069**
	LC1D115 and D150	**LA9D11569**

For low-speed/high-speed starter

Description	For LC1D09... D38 contactors with connection type	Reference
Connection kit enabling reversing of low and high speed directions using a reversing contactor and a 2N/O + 2N/C main pole contactor	Screw clamps or connectors	**LAD9PVGV**
	Spring terminals	**LAD3PVGV**

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LAD91217

PB121378.eps



LAD91218

For star-delta starter

Description	For contactors	Reference	Without timer LADS2
Mounting kit comprising: ■ 1 time delay contact block **LADS2** (**LC1D09…D80**), ■ power circuit connections (**LC1D09…D80**), ■ hardware required for fixing the contactors onto the mounting plate (**LC1D80**).	LC1D09 to D38 [3]	**LAD91217**	**LAD91218**
	LC1D09 to D38 [4]	**LAD93217**	**LAD93218**
	LC1D40A to D65A	**LAD9SD3**	–
	LC1D80	**LA9D8017**	–
Equipment mounting plates	LC1D09 to D38	**LA9D12974**	
	LC1D40A and D50A	–	
	LC1D80	**LA9D80973**	

(1) To order the 2 contactors: see pages B8/9 and B8/15.
(2) To assemble a reversing contactor with spring terminal connections, the following components must be ordered:
*- 1 mechanical interlock **LAD9V2**,*
- 1 upstream power connection kit and 1 downstream power connection kit.
*Upstream power connection kit **LAD9V10**: installed in the Quickfit system with power connection module **LAD34**.*
*(If module **LAD34** is not used, replace **LAD9V10** with **LAD9V12**).*
*Downstream power connection kit **LAD9V11**: installed in the Quickfit system with outgoing terminal block **LAD331**.*
*(If **LAD331** is not used, replace **LAD9V11** with **LAD9V13**).*
(3) For assembly of 3 contactors of the same physical size (depth).
(4) For assembly of 3 contactors with star contactor physically smaller (depth).



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Dimensions:
pages B8/81 and B8/82

Schemes:
pages B8/83 and B8/84

PB121379.eps



LADT9R1V

For 4-pole changeover contactor pairs (3-phase distribution + neutral)

Contactors with screw clamp terminals or connectors. Horizontally mounted, assembled by customer.

Description	For contactors [1] (2 identical contactors)	Reference
Kits for assembly of changeover contactor pairs		
Kit comprising: ■ a mechanical interlock LAD9V2 with electrical interlocking LAD9V1, ■ a set of power connections (changeover) LAD9V7.	LC1DT20 to DT40 with screw clamps or connectors	**LADT9R1V**
Kit comprising: ■ a mechanical interlock LAD9V2 without electrical interlocking, ■ a set of power connections (changeover) LAD9V7.	LC1DT20 to DT40 with screw clamps or connectors	**LADT9R1**
Mechanical interlocks		
With integral electrical interlocking	LC1D80004	**LA9D4002**
	LP1D80004	**LA9D8002**
	LC1D115004	**LA9D11502**
Without integral electrical interlocking	LC1DT20 to DT40 with screw clamps or connectors	**LAD9V2** [2]
	LC1DT203 to DT403 with spring terminals	**LAD9V2** [2]
	LC1DT60A and DT80A	**LAD4CM**
	LC1D80004	**LA9D50978**
	LP1D80004	**LA9D80978**
Sets of power connections		
Comprising a set of parallel bars	LC1D80004	**LA9D8070**
	LP1D80004	**LA9D8070**
	LC1D115004	**LA9D11570**
	LC1DT203 to DT403 with spring terminals	**LAD9V9**
	LC1D80004	**LA9D8070** [2]
	LP1D80004	**LA9D8070** [2]

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LA9D50978

PB121380.eps



LA9D8070

For 3-pole changeover contactor pairs

Contactors with screw clamp terminals or connectors. Horizontally mounted, assembled by customer.

Description	For contactors [1] (2 identical contactors)	Reference
Kits for assembly of changeover contactor pairs		
Kit comprising: ■ a mechanical interlock LAD4CM ■ a set of parallel bars LA9D65A6	LC1D40A…D80A	**LAD9R3S**
Mechanical interlocks		
Without integral electrical interlocking	LC1D40A…D80A	**LAD4CM**
With integral electrical interlocking	LC1D115 and D150	**LA9D11502**
Sets of power connections		
Comprising a set of parallel bars	LC1D40A…D80A	**LA9D65A6**
	LC1D115 and D150	**LA9D11571**

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LAD9R3S

(1) To order the 2 contactors: see pages B8/9 and B8/15.
*(2) Order 2 contact blocks **LADN●1** to build the electrical interlock, see page B8/22.*



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Dimensions:
pages B8/81 and B8/82

Schemes:
pages B8/83 and B8/84

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LXD1●●

a.c coils for ∿ contactors LC1D09...D38 and LC1DT20…DT40

Specifications

Average consumption at 20 °C:
- inrush (cos ϕ = 0.75) 70 VA,
- sealed (cos ϕ = 0.3) 50 Hz: 7 VA, 60 Hz: 7.5 VA.

Operating range (θ ≤ 60 °C): 50 Hz: 0.8…1.1 Uc, 60 Hz: 0.85…1.1 Uc.

Control circuit voltage Uc	Average resistance at 20 °C ±10 %	Inductance of closed circuit	Reference (1)
V	Ω	H	
			50/60 Hz
12	1.33	0.05	**LXD1J7**
21 (2)	4.17	0.17	**LXD1Z7**
24	5.37	0.22	**LXD1B7**
32	10.1	0.39	**LXD1C7**
36	12.8	0.49	**LXD1CC7**
42	17	0.67	**LXD1D7**
48	21.7	0.87	**LXD1E7**
60	34.6	1.4	**LXD1EE7**
100	100.4	3.8	**LXD1K7**
110	124.1	4.6	**LXD1F7**
115	129.8	5	**LXD1FE7**
120	150.6	5.4	**LXD1G7** (3)
127	158.5	6.1	**LXD1FC7**
200	410.7	15	**LXD1L7**
208	430.4	16	**LXD1LE7** (3)
220	515.4	18	**LXD1M7** (4)
230	538.6	20	**LXD1P7**
240	562.3	22	**LXD1U7**
277	800.7	29	**LXD1W7** (3)
380	1551	55	**LXD1Q7** (5)
400	1633	60	**LXD1V7**
415	1694	65	**LXD1N7**
440	1993	73	**LXD1R7**
480	2398	87	**LXD1T7** (3)
500	2499	95	**LXD1S7**
575	3294	125	**LXD1SC7**
600	3810	136	**LXD1X7**
660	4656	165	**LXD1YC7**
690	5020	180	**LXD1Y7**

(1) The last 2 digits in the reference represent the voltage code.
(2) Voltage for special coils fitted in contactors with serial timer modules, with 24 V supply.
(3) Coil for use only on 60 Hz.
*(4) Suitable for use on **230 V** / 50 Hz. In this case, apply a coefficient of 0.6 to the mechanical durability of the contactor (see page B8/60 and B8/62).*
*(5) Suitable for use on **400 V** / 50 Hz. In this case, apply a coefficient of 0.6 to the mechanical durability of the contactor (see page B8/60 and B8/62).*

PB121384.eps



LXD3●●

a.c coils for ∿ contactors LC1D40A…D80A, LC1DT60A and LC1DT80A

Specifications

Average consumption at 20 °C:
- inrush (cos ϕ = 0.75) 160 VA,
- sealed (cos ϕ = 0.3) 50 Hz: 15 VA, 60 Hz: 15 VA.

Operating range (θ ≤ 60 °C): 50 Hz: 0.8…1.1 Uc, 60 Hz: 0.85…1.1 Uc.

Control circuit voltage Uc	Average resistance at 20 °C ±10%	Inductance of closed circuit	Reference (1)
V	Ω	H	
			50/60 Hz
12	0.49	0.03	**LXD3J5** (2)
24	1.98	0.12	**LXD3B7**
32	3.76	0.22	**LXD3C7**
42	6.18	0.37	**LXD3D7**
48	7.97	0.48	**LXD3E7**
100	37.63	2.07	**LXD3K7**
110	42.28	2.50	**LXD3F7**
115	48.76	2.74	**LXD3FE7**
120	37.63	2.07	**LXD3G7** (5)
127	60.29	3.34	**LXD3FC7**
200	149	8.27	**LXD3L7**
208	105	6.22	**LXD3LE7** (5)
220	182	10	**LXD3M7** (3)
230	192	10.9	**LXD3P7**
240	202	11.9	**LXD3U7**
277	193	11	**LXD3W7** (5)
380	512	29.9	**LXD3Q7** (4)
400	607	33.1	**LXD3V7**
415	635	35.6	**LXD3N7**
440	682	40.1	**LXD3R7**
480	607	33.1	**LXD3T7** (5)
500	878	51.7	**LXD3S7**
575	1238	68.4	**LXD3SC7**
600	1304	74.5	**LXD3X7**
660	1593	90.1	**LXD3YC7**
690	1683	98.5	**LXD3Y7**

(1) The last 2 digits in the reference represent the voltage code.
(2) This coil can only be used on 50 Hz.
*(3) Suitable for use on **230 V** / 50 Hz. In this case, apply a coefficient of 0.6 to the mechanical durability of the contactor (see page B8/60 and B8/62).*
*(4) Suitable for use on **400 V** / 50 Hz. In this case, apply a coefficient of 0.6 to the mechanical durability of the contactor (see page B8/60 and B8/62).*
(5) This coil can only be used on 60 Hz.

PB121385.eps



LX1D6●●

a.c coils for 3 or 4-pole contactors LC1D40, D50, D65, D80, D95

Specifications

Average consumption at 20 °C:
- inrush (cos ϕ = 0.75) 50 Hz: 200 VA, 60 Hz: 220 VA
- sealed (cos ϕ = 0.3) 50 Hz: 20 VA, 60 Hz: 22 VA.

Operating range (θ ⩽ 55 °C): 0.85…1.1 Uc.

Control circuit voltage Uc	Average resistance at 20°C ±10 %	Inductance of closed circuit	Reference (1)	Average resistance at 20 °C ±10 %	Inductance of closed circuit	Reference (1)
V	Ω	H		Ω	H	
			50 Hz			60 Hz
24	1.4	0.09	**LX1D6B5**	1.05	0.06	**LX1D6B6**
32	2.6	0.16	**LX1D6C5**	–	–	–
42	4.4	0.27	**LX1D6D5**	–	–	–
48	5.5	0.35	**LX1D6E5**	4.2	0.23	**LX1D6E6**
110	31	1.9	**LX1D6F5**	22	1.2	**LX1D6F6**
115	31	1.9	**LX1D6FE5**	–	–	–
120	–	–	**–**	28	1.5	**LX1D6G6**
127	41	2.4	**LX1D6G5**	–	–	–
208	–	–	**–**	86	4.3	**LX1D6L6**
220	–	–	**–**	98	4.8	**LX1D6M6**
220/230	127	7.5	**LX1D6M5**	–	–	–
230	133	8.1	**LX1D6P5**	–	–	–
240	152	8.7	**LX1D6U5**	120	5.7	**LX1D6U6**
256	166	10	**LX1D6W5**	–	–	–
277	–	–	**–**	157	8	**LX1D6W6**
380	–	–	**–**	300	14	**LX1D6Q6**
380/400	381	22	**LX1D6Q5**	–	–	–
400	411	25	**LX1D6V5**	–	–	–
415	463	26	**LX1D6N5**	–	–	–
440	513	30	**LX1D6R5**	392	19	**LX1D6R6**
480	–	–	**–**	480	23	**LX1D6T6**
500	668	38	**LX1D6S5**	–	–	–
575	–	–	**–**	675	33	**LX1D6S6**
600	–	–	**–**	775	36	**LX1D6X6**
660	1220	67	**LX1D6Y5**	–	–	–

Specifications

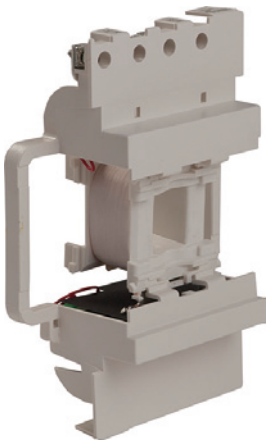
Average consumption at 20 °C:
- inrush (cos ϕ = 0.75) 50/60 Hz: 245 VA at 50 Hz
- sealed (cos ϕ= 0.3) 50/60 Hz: 26 VA at 50 Hz.

Operating range (θ ⩽ 55 °C): 0.85…1.1 Uc.

						50/60 Hz
24	–	–	–	1.22	0.08	**LX1D6B7**
42	–	–	–	3.5	0.25	**LX1D6D7**
48	–	–	–	5	0.32	**LX1D6E7**
110	–	–	–	26	1.7	**LX1D6F7**
115	–	–	–	–	–	**LX1D6FE7**
120	–	–	–	32	2	**LX1D6G7**
220/230 (2)	–	–	–	102	6.7	**LX1D6M7**
230	–	–	–	115	7.7	**LX1D6P7**
230/240 (3)	–	–	–	131	8.3	**LX1D6U7**
380/400 (4)	–	–	–	310	20	**LX1D6Q7**
400	–	–	–	349	23	**LX1D6V7**
415	–	–	–	390	24	**LX1D6N7**
440	–	–	–	410	27	**LX1D6R7**

(1) The last 2 digits in the reference represent the voltage code.
*(2) For use on **230 V** / 50 Hz, apply a coefficient of 0.6 to the mechanical durability of the contactor, see page B8/60 and B8/62. This coil can be used on 240 V at 60 Hz.*
(3) This coil can be used on 220/240 V at 50 Hz and on 240 V only at 60 Hz.
*(4) For use on **400 V** / 50 Hz, apply a coefficient of 0.6 to the mechanical durability of the contactor, see page B8/60 and B8/62.*

PB121386.eps



LX1D8●●

a.c coils for 3 or 4-pole contactors LC1D115

Specifications

Average consumption at 20 °C:
■ inrush (cos ϕ = 0.8) 50 or 60 Hz: 300 VA
■ sealed (cos ϕ = 0.3) 50 or 60 Hz: 22 VA.
Operating range (θ ≤ 55 °C): 0.85…1.1 Uc.

Control circuit voltage Uc	Average resistance at 20 °C ±10 %	Inductance of closed circuit	Reference (1)	Average resistance at 20 °C ±10 %	Inductance of closed circuit	Reference (1)
V	Ω	H		Ω	H	
			50 Hz			60 Hz
24	1.24	0.09	**LX1D8B5**	0.87	0.07	**LX1D8B6**
32	2.14	0.17	**LX1D8C5**	–	–	–
42	3.91	0.28	**LX1D8D5**	–	–	–
48	4.51	0.36	**LX1D8E5**	3.91	0.28	**LX1D8E6**
110	26.53	2.00	**LX1D8F5**	19.97	1.45	**LX1D8F6**
115	26.53	2.00	**LX1D8FE5**	–	–	–
120	–	–	–	24.02	1.70	**LX1D8G6**
127	32.75	2.44	**LX1D8FC5**	–	–	–
208	–	–	–	67.92	5.06	**LX1D8L6**
220	104.77	7.65	**LX1D8M5**	79.61	5.69	**LX1D8M6**
230	104.77	8.29	**LX1D8P5**	–	–	–
240	125.25	8.89	**LX1D8U5**	97.04	6.75	**LX1D8U6**
277	–	–	–	125.75	8.89	**LX1D8W6**
380	338.51	22.26	**LX1D8Q5**	243.07	17.04	**LX1D8Q6**
400	368.43	25.55	**LX1D8V5**	–	–	–
415	368.43	27.65	**LX1D8N5**	–	–	–
440	441.56	30.34	**LX1D8R5**	338.51	22.26	**LX1D8R6**
480	–	–	–	368.43	25.55	**LX1D8T6**
500	566.62	38.12	**LX1D8S5**	–	–	–

a.c coils for 3 or 4-pole contactors LC1D115, LC1D150

Specifications

Average consumption at 20 °C:
■ inrush: cos ϕ = 0.9 - 280 to 350 VA
■ sealed: cos ϕ = 0.9 - 2 to 18 VA.
Operating range (θ ≤ 55 °C): 0.8…1.15 Uc.
Coils with integral suppression device fitted as standard, class B.

Control circuit voltage Uc	Average resistance at 20 °C ±10 %	Inductance of closed circuit	Reference (1)	Average resistance at 20 °C ±10 %	Inductance of closed circuit	Reference (1)
V	Ω	H		Ω	H	
						50/60 Hz
24	–	–	–	147	3.03	**LX1D8B7**
32	–	–	–	301	8.28	**LX1D8C7**
42	–	–	–	498	13.32	**LX1D8D7**
48	–	–	–	1061	24.19	**LX1D8E7**
110	–	–	–	4377	109.69	**LX1D8F7**
115	–	–	–	4377	109.69	**LX1D8FE7**
120	–	–	–	4377	109.69	**LX1D8G7**
127	–	–	–	6586	152.65	**LX1D8FC7**
208	–	–	–	10 895	260.15	**LX1D8LE7**
220	–	–	–	9895	210.72	**LX1D8M7**
230	–	–	–	9895	210.72	**LX1D8P7**
240	–	–	–	9895	210.72	**LX1D8U7**
277	–	–	–	21 988	533.17	**LX1D8UE7**
380	–	–	–	21 011	482.42	**LX1D8Q7**
400	–	–	–	21 011	482.42	**LX1D8V7**
415	–	–	–	21 011	482.42	**LX1D8N7**
440	–	–	–	21 501	507.47	**LX1D8R7**
480	–	–	–	32 249	938.41	**LX1D8T7**
500	–	–	–	32 249	938.41	**LX1D8S7**

(1) The last 2 digits in the reference represent the voltage code.

PB121387.eps



LX4D7●D

d.c. coils for 3-pole contactors LC1D80 or 4-pole contactors LP1D80

Specifications

Average consumption: 22 W.
Operating range: 0.85…1.1 Uc.

Control circuit voltage Uc	Average resistance at 20 °C ± 10%	Inductance of closed circuit	Reference (1)	Weight
V	Ω	H		kg
12	6.6	0.46	**LX4D7JD**	0.680
24	27	1.89	**LX4D7BD**	0.680
36	57	4	**LX4D7CD**	0.680
48	107	7.5	**LX4D7ED**	0.680
60	170	11.9	**LX4D7ND**	0.680
72	230	16.1	**LX4D7SD**	0.680
110	564	39.5	**LX4D7FD**	0.680
125	718	50.3	**LX4D7GD**	0.680
220	2215	155	**LX4D7MD**	0.680
250	2850	200	**LX4D7UD**	0.680
440	9195	640	**LX4D7RD**	0.680

(1) The last 2 digits in the reference represent the voltage code.

d.c. coils for contactors LC1D115, D150

Specifications

Consumption: inrush 270 to 365 W, sealed 2.4 to 5.1 W.
Operating range: 0.75…1.2 Uc.
Coils with integral suppression device fitted as standard, class B.



LX4D8●D

Control circuit voltage Uc	Average resistance at 20 °C ± 10 %	Inductance of closed circuit	Reference (1)	Weight
V	Ω	H		kg
24	147	3.03	**LX4D8BD**	0.300
48	1061	24.19	**LX4D8ED**	0.300
60	1673	38.44	**LX4D8ND**	0.300
72	2500	56.27	**LX4D8SD**	0.300
110	4377	109.69	**LX4D8FD**	0.300
125	6586	152.65	**LX4D8GD**	0.300
220	9895	210.72	**LX4D8MD**	0.300
250	18 022	345.40	**LX4D8UD**	0.300
440	21 501	684.66	**LX4D8RD**	0.300

d.c. coils for 3-pole contactors LC1D80 or 4-pole contactors LP1D80

Specifications

Wide range coils for specific applications
Average consumption: 23 W.
Operating range: 0.75 to 1.2 Uc.
Coils with "TH" treatment as standard.

PB121390.eps



LX4D7●●

Control circuit voltage Uc	Average resistance at 20 °C ± 10 %	Inductance of closed circuit	Reference (1)	Weight
V	Ω	H		kg
12	6.2	0.49	**LX4D7JW**	0.680
24	23.5	1.75	**LX4D7BW**	0.680
36	51.9	4.18	**LX4D7CW**	0.680
48	94.2	7	**LX4D7EW**	0.680
72	204	15.7	**LX4D7SW**	0.680
110	483	36	**LX4D7FW**	0.680
220	1922	144	**LX4D7MW**	0.680

(1) The last 2 digits in the reference represent the voltage code.

Product references

PB111641.eps



LC1SK06

- Width of contactor 27 mm.
- Mounting on 35 mm ⎓ rail.
- Screw clamp terminals.

Mini-contactors for motor in category AC-3

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 [1]			Rated operational voltage in AC-3 up to 400 V	Number of poles	Instantaneous auxiliary contacts		Basic reference. Complete with code indicating control circuit voltage [2]
220 V 230 V	380 V 415 V	660 V 690 V					
kW	kW	kW	A				
1.1	2.2	2.2	6	2	–	–	**LC1SK0600●●**

Mini-contactors for motor in category AC-1

Non inductive loads maximum current (θ ≤ 55 °C) utilisation category AC-1	Control circuit supply	Number of poles	Instantaneous auxiliary contacts		Basic reference. Complete with code indicating control circuit voltage [2]
A					
12	a.c.	2	–	–	**LC1SK0600●●**
	d.c.	2	–	–	**LP1SK0600●●**

PB111639.eps



LA1SK10

Add-on block with 1 power pole (for 3-phase circuits)

For use on contactor	Number of poles	Instantaneous auxiliary contacts		Reference
LC1SK06 clip-on front mounting	1	1	–	**LA1SK10**
	1	–	1	**LA1SK01**

Note: *Auxiliary contact blocks and coil suppressor module, see next page.*

*(1) For use in AC-3 category and 3-phase circuits, an **LA1SK●●** auxiliary contact block should be ordered separately for mounting on the contactor.*

(2) Standard control circuit voltages (variable delivery times, please consult your Regional Sales Office):

Mini-contactors LC1SK									
Volts ∿ 50/60 Hz	**24**	**48**	**110**	**120**	**220**	**230**	**240**	**380**	**400**
Code	B7	E7	F7	G7	M7	P7	U7	Q7	V7
Mini-contactors LP1SK									
Volts ⎓	**12**	**24**	**36**	**48**	**72**				
Code	JD	BD	CD	ED	SD				

Contactors

Product references

PB111639.eps



LA1SK●●

PB111640.eps



LA4SK●1●

Instantaneous auxiliary contact blocks

Clip-on front mounting

For use on contactor	Maximum number of blocks per contactor	Composition		Reference
LC1SK06	1	2	–	**LA1SK20**
		–	2	**LA1SK02**
		1	1	**LA1SK11**

Coil suppressor modules

Clip-on fixing and electrical connection on right-hand side, without use of tools

For use on contactors	Type	For voltages	Sold in lots of	Unit reference
LC1SK06 and LP1SK06	Varistor (1)	∿ and ⎓ 24 V…48 V	10	**LA4SKE1E**
		∿ and ⎓ 110 V…250 V	10	**LA4SKE1U**
	Diode (2)	⎓ 24 V…250 V	10	**LA4SKC1U**

(1) Protection provided by limiting the transient voltage to 2 Uc max. Maximum reduction of transient voltage peaks. Slight increase in drop-out time (1.1 to 1.5 times the normal time).
(2) No overvoltage or oscillating frequency. Slight increase in drop-out time (1.1 to 1.5 times the normal time).

Characteristics: pages B8/86 to B8/89
Dimensions, schemes: page B8/90



LC1K0910●●



LC1K09103●●



LC1K09107●●



LC1K09105●●



LC7K0910●●

Mounting on 35 mm ⎓ rail or Ø4 screw fixing.
Screws in the open "ready-to-tighten" position.
Add-on auxiliary contact blocks and accessories, see pages B8/48 to B8/50.

3-pole contactors - Motor control 6 to 16 A in categories AC-3 AC-4 - a.c. coil

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3			Rated operational current in category AC-3 440 V up to	Instantaneous auxiliary contacts		Basic reference, to be completed by adding the voltage code (1)
220 V 230 V	380 V 415 V	440/500 V 660/690 V				
kW	kW	kW	A			
Screw clamp connections						
1.5	2.2	3	**6**	1	-	**LC1K0610●●**
				-	1	**LC1K0601●●**
2.2	4	4	**9**	1	-	**LC1K0910●●**
				-	1	**LC1K0901●●**
3	5.5	4 (> 440)	**12**	1	-	**LC1K1210●●**
		5.5 (440)		-	1	**LC1K1201●●**
4	7.5	4 (> 440)	**16**	1	-	**LC1K1610●●**
		5.5 (440)		-	1	**LC1K1601●●**

Spring terminal connections (2)

For 6 to 12 A ratings only, in the references selected above, insert a figure **3** before the voltage code.
Example: **LC1K0610●●** becomes **LC1K06103●●.**

Faston connectors, 1 x 6.35 or 2 x 2.8

For 6 to 16 A ratings, in the references selected above, insert a figure **7** before the voltage code.
Example: **LC1K0610●●** becomes **LC1K06107●●**.

Solder pins for printed circuit boards

For 6 to 16 A ratings, in the references selected above, insert a figure **5** before the voltage code.
Example: **LC1K0610●●** becomes **LC1K06105●●**.

3-pole silent contactors

Recommended for use in areas sensitive to noise, high interference mains supplies, etc.
Coil with rectifier incorporated, suppressor fitted as standard.

Screw clamp connections						
1.5	2.2	3	**6**	1	-	**LC7K0610●●**
				-	1	**LC7K0601●●**
2.2	4	4	**9**	1	-	**LC7K0910●●**
				-	1	**LC7K0901●●**
3	5.5	4 (> 440)	**12**	1	-	**LC7K1210●●**
		5.5 (440)		-	1	**LC7K1201●●**

Faston connectors, 1 x 6.35 or 2 x 2.8

In the references selected above, insert a figure **7** before the voltage code.
Example: **LC7K0610●●** becomes **LC7K06107●●**.

Solder pins for printed circuit boards

In the references selected above, insert a figure **5** before the voltage code.
Example: **LC7K0610●●** becomes **LC7K06105●●**.

Standard control circuit voltages (for other voltages, please consult your Regional Sales office)

Coil voltage codes - a.c. (3)

Contactors LC1K (0.8…1.15 Uc) *(0.85…1.1 Uc)*

Volts	**12**	**20**	**24** (1)	**36**	**42**	**48**	**110**	**115**	**120**	**127**	**200/208**		***220/230***	***230***	***230/240***
50 Hz (4)			B5		D5	E5								*P5*	
50/60 Hz	J7	Z7	B7	C7	D7	E7	F7	FE7	G7	FC7	L7		*M7*	*P7*	*U7*
Volts	**256**	**277**	***380/400***		**400**	***400/415***		**440**	**480**	**500**	**575**	**600**	**660/690**		
50/60 Hz	W7	UE7	*Q7*	–	V7	*N7*		R7	T7	S7	SC7	X7	*Y7*	–	–

Up to and including 240 V, coil with integral suppression device available: add **2** to the code required. Example: **J72**.

Contactors LC7K (0.85…1.1 Uc)

Volts	**24**	**42**	**48**	**110**	**115**	**220**	**230/240**
50/60 Hz	B7	D7	E7	F7	FE7	M7	U7

*(1) For mains supplies with a high level of interference (voltage surge > 800 V), use a suppressor module **LA4KE1FC** (50…129 V) or **LA4KE1UG** (130…250 V), see page B8/49.*
*(2) For **LC●K●●●●3 / LP●K●●●●3** with spring terminal, Ith max = 10 A.*
(3) (0.8…1.15 Uc) for single voltage coil; (0.85…1.1 Uc) for dual voltage coil, exemple 200/208 V AC.
(4) Only available for 'screw clamp terminals' versions.

Characteristics: pages B8/91 to B8/93
Dimensions: page B8/95
Schemes: page B8/96
Click HERE for access to online contactor selector


PB121392.eps

LP1K0910●●


PB121393.eps

LP1K09103●●


PB112197.eps

LP1K09107●●


PB112190.eps

LP1K09105●●


PB111997.eps

LP4K0910●●

Contactor selection according to utilisation category, see pages A6/34 to A6/39 and A6/42 to A6/45.
Mounting on 35 mm ⎓ rail or Ø4 screw fixing.
Screws in the open "ready-to-tighten" position.
Add-on auxiliary contact blocks and accessories, see pages B8/48 to B8/50.

3-pole contactors - Motor control 6 to 12 A in categories AC-3 AC-4 - d.c. coil

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3			Rated operational current in category AC-3 440 V up to	Instantaneous auxiliary contacts		Basic reference, to be completed by adding the voltage code (1)
220 V 230 V	380 V 415 V	440/500 V 660/690 V				
kW	kW	kW	A			
Screw clamp connections						
1.5	2.2	3	**6**	1	–	**LP1K0610●●**
				–	1	**LP1K0601●●**
2.2	4	4	**9**	1	–	**LP1K0910●●**
				–	1	**LP1K0901●●**
3	5.5	4 (> 440)	**12**	1	–	**LP1K1210●●**
		5.5 (440)		–	1	**LP1K1201●●**

Spring terminal connections (2)

In the references selected above, insert a figure **3** before the voltage code.
Example: **LP1K0610●●** becomes **LP1K06103●●**.

Faston connectors, 1 x 6.35 or 2 x 2.8

In the references selected above, insert a figure **7** before the voltage code.
Example: **LP1K0610●●** becomes **LP1K06107●●**.

Solder pins for printed circuit boards

In the references selected above, insert a figure **5** before the voltage code.
Example: **LP1K0610●●** becomes **LP1K06105●●**.

3-pole low consumption contactors

Compatible with programmable controller outputs.
Wide range coil (0.7…1.30 Uc), suppressor fitted as standard, consumption 1.8 W.

Screw clamp connections						
1.5	2.2	3	**6**	1	–	**LP4K0610●●**
				–	1	**LP4K0601●●**
2.2	4	4	**9**	1	–	**LP4K0910●●**
				–	1	**LP4K0901●●**
3	5.5	4 (> 440)	**12**	1	–	**LP4K1210●●**
		5.5 (440)		–	1	**LP4K1201●●**

Spring terminal connections

In the references selected above, insert a figure **3** before the voltage code.
Example: **LP4K0610●●** becomes **LP4K06103●●**.

Faston connectors, 1 x 6.35 or 2 x 2.8

In the references selected above, insert a figure **7** before the voltage code.
Example: **LP4K0610●●** becomes **LP4K06107●●**.

Solder pins for printed circuit boards

In the references selected above, insert a figure **5** before the voltage code.
Example: **LP4K0610●●** becomes **LP4K06105●●**.

Standard control circuit voltages (for other voltages, please consult your Regional Sales office)

d.c. supply (contactors LP1K: 0.8...1.15 Uc)

Volts	**12**	**20**	**24** (1)	**36**	**48**	**60**	**72**	**100**	**110**	**125**	**155**	**174**	**200**	**220**	**230**	**240**	**250**
Code	JD	ZD	BD	CD	ED	ND	SD	KD	FD	GD	PD	QD	LD	MD	MPD	MUD	UD

Coil with integral suppression device available: add **3** to the code required. Example: **JD3**

Low consumption (contactors LP4K: 0.7...1.3 Uc)

Volts	**12**	**20**	**24**	**48**	**72**	**110**	**120**
Code	JW3	ZW3	BW3	EW3	SW3	FW3	GW3

Coil with integral suppression device fitted as standard, by bi-directional peak limiting diode.

*(1) For **LP1K** only, when connecting an electronic sensor or timer in series with the contactor coil, select a 20 V coil (∼ control circuit voltage code Z7, ⎓ control circuit voltage code ZD) so as to compensate for the incurred voltage drop.*
*(2) For **LC●K●●●●3** / **LP●K●●●●3** with spring terminal), Ith max = 10 A.*

Characteristics: pages B8/91 to B8/93
Dimensions: page B8/95
Schemes: page B8/96
Click HERE for access to online contactor selector


PB121394.eps

LC1K09004●●


PB111988.eps

LC1K09103●●


PB112195.eps

LC1K09107●●


PB111994.eps

LC1K09004●●

Contactor selection according to utilisation category, see pages A6/40 and A6/41.
Mounting on 35 mm ⎓ rail or Ø4 screw fixing.
Screws in the open "ready-to-tighten" position.
Add-on auxiliary contact blocks and accessories, see pages B8/48 to B8/50.

3 or 4-pole contactors - Load control up to 20 A in category AC-1 - a.c. coil (1)

Non-inductive loads Category AC-1 Maximum current at θ ≤ 50 °C	Number of poles		Instantaneous auxiliary contacts		Basic reference, to be completed by adding the voltage code (2)
A					
Screw clamp connections					
20	3	–	1	–	**LC1K0910●●**
					or **LC1K1210●●**
	3	–	–	1	**LC1K0901●●**
					or **LC1K1201●●**
	4	–	–	–	**LC1K09004●●**
					or **LC1K12004●●**
	2	2	–	–	**LC1K09008●●**

Spring terminal connections (3)

In the references selected above, insert a figure **3** before the voltage code.
Example: **LC1K0910●●** becomes **LC1K09103●●**.

Faston connectors, 1 x 6.35 or 2 x 2.8

In the references selected above, insert a figure **7** before the voltage code.
Example: **LC1K0910●●** becomes **LC1K09107●●**.

Solder pins for printed circuit boards

In the references selected above, insert a figure **5** before the voltage code.
Example: **LC1K0910●●** becomes **LC1K09105●●**.

3 or 4-pole silent contactors (1)

Recommended for use in areas sensitive to noise, high interference mains supplies, etc.
Coil with rectifier incorporated, suppressor fitted as standard.

Screw clamp connections					
20	3	–	1	–	**LC7K0910●●**
					or **LC7K1210●●**
	3	–	–	1	**LC7K0901●●**
					or **LC7K1201●●**
	4	–	–	–	**LC7K09004●●**
					or **LC7K12004●●**
	2	2	–	–	**LC7K09008●●**

Faston connectors, 1 x 6.35 or 2 x 2.8

In the references selected above, insert a figure **7** before the voltage code.
Example: **LC7K0910●●** becomes **LC7K09107●●**.

Solder pins for printed circuit boards

In the references selected above, insert a figure **5** before the voltage code.
Example: **LC7K0910●●** becomes **LC7K09105●●**.

(1) Coordination tables between 9 and 12 A ratings according to number of operating cycles, see AC-1 curve on page A6/40.

Standard control circuit voltages (for other voltages, please consult your Regional Sales office)

Coil voltage codes - a.c. (4)

Contactors LC1K (0.8…1.15 Uc) *(0.85…1.1 Uc)*

Volts	**12**	**20**	**24** (2)	**36**	**42**	**48**	**110**	**115**	**120**	**127**	**200/208**		***220/230***	**230**	***230/240***
50 Hz (5)			B5		D5	E5								P5	
50/60 Hz	J7	Z7	B7	C7	D7	E7	F7	FE7	G7	FC7	L7		*M7*	P7	*U7*
Volts	**256**	**277**	***380/400***		**400**	***400/415***		**440**	**480**	**500**	**575**	**600**	***660/690***		
50/60 Hz	W7	UE7	*Q7*		V7	*N7*		R7	T7	S7	SC7	X7	*Y7*		

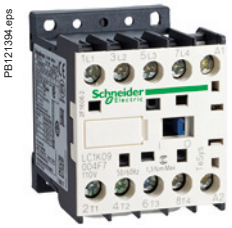
Up to and including 240 V, coil with integral suppression device available: add **2** to the code required. Example: **J72.**

Contactors LC7K (0.8…1.1 Uc)

Volts	**24**	**42**	**48**	**110**	**115**	**220**	**230/240**
50/60 Hz	B7	D7	E7	F7	FE7	M7	U7

*(2) For mains supplies with a high level of interference (voltage surge > 800 V), use a suppressor module **LA4KE1FC** (50…129 V) or **LA4KE1UG** (130…250 V), see page B8/49.*
*(3) For **LC●K●●●●3 / LP●K●●●●3** with spring terminal, Ith max = 10 A.*
(4) (0.8…1.15 Uc) for single voltage coil; (0.85…1.1 Uc) for dual voltage coil, exemple 200/208 V AC.
(5) Only available for 'screw clamp terminals' versions.

Characteristics: pages B8/91 to B8/93
Dimensions: page B8/95
Schemes: page B8/96
Click HERE for access to online contactor selector



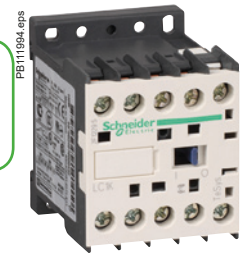
LC1K09004●●



LC1K09103●●



LC1K09105●●



LC1K09004●●

Contactor selection according to utilisation category, see pages A6/40 and A6/41.
Mounting on 35 mm ⎓ rail or Ø4 screw fixing.
Screws in the open "ready-to-tighten" position.
Add-on auxiliary contact blocks and accessories, see pages B8/48 to B8/50.

3 and 4-pole contactors - Load control - 20 A in category AC-1 - d.c. coil (1)

Non-inductive loads Category AC-1 Maximum current at θ ≤ 50 °C	Number of poles		Instantaneous auxiliary contacts		Basic reference, to be completed by adding the voltage code (2)
A					
Screw clamp connections					
20	3	–	1	–	**LP1K0910●●**
					or **LP1K1210●●**
	3	–	–	1	**LP1K0901●●**
					or **LP1K1201●●**
	4	–	–	–	**LP1K09004●●**
					or **LP1K12004●●**
	2	2	–	–	**LP1K09008●●**
Spring terminal connections (3)					
In the references selected above, insert a figure **3** before the voltage code. Example: **LP1K0910●●** becomes **LP1K09103●●**.					
Faston connectors, 1 x 6.35 or 2 x 2.8					
In the references selected above, insert a figure **7** before the voltage code. Example: **LP1K0910●●** becomes **LP1K09107●●**.					
Solder pins for printed circuit boards					
In the references selected above, insert a figure **5** before the voltage code. Example: **LP1K0910●●** becomes **LP1K09105●●**.					

3 or 4-pole 20 A / AC-1 - d.c. low consumption coil (1)

Compatible with programmable controller outputs.
Wide range coil (0.7…1.30 Uc), suppressor fitted as standard, consumption 1.8 W.

Screw clamp connections					
20	3	–	1	–	**LP4K0910●●●**
					or **LP4K1210●●●**
	3	–	–	1	**LP4K0901●●●**
					or **LP4K1201●●●**
	4	–	–	–	**LP4K09004●●●**
					or **LP4K12004●●●**
	2	2	–	–	**LP4K09008●●●**
Spring terminal connections					
In the references selected above, insert a figure **3** before the voltage code. Example: **LP4K0910●●** becomes **LP4K09103●●**.					
Faston connectors, 1 x 6.35 or 2 x 2.8					
In the references selected above, insert a figure **7** before the voltage code. Example: **LP4K0910●●** becomes **LP4K09107●●**.					
Solder pins for printed circuit boards					
In the references selected above, insert a figure **5** before the voltage code. Example: **LP4K0910●●** becomes **LP4K09105●●**.					

(1) Coordination tables between 9 and 12 A ratings according to number of operating cycles, see AC-1 curve on page A6/40.

Standard control circuit voltages (for other voltages, please consult your Regional Sales office)

Coil voltage codes - d.c. (contactors LP1K: 0.8...1.15 Uc)

Volts ⎓	12	20	24 (2)	36	48	60	72	100	110	125	155	174	200	220	230	240	250
Code	JD	ZD	BD	CD	ED	ND	SD	KD	FD	GD	PD	QD	LD	MD	MPD	MUD	UD

Coil with integral suppression device available: add **3** to the code required. Example: **JD3.**

Coil voltage codes - low consumption d.c. (contactors LP4K: 0.7...1.3 Uc)

Volts ⎓	12	20	24	48	72	110	120
Code	JW3	ZW3	BW3	EW3	SW3	FW3	GW3

Coil with integral suppression device fitted as standard, by bi-directional peak limiting diode.

*(2) For **LP1K** only, when connecting an electronic sensor or timer in series with the contactor coil, select a 20 V coil (∿ control circuit voltage code Z7, ⎓ control circuit voltage code ZD) so as to compensate for the incurred voltage drop.*

*(3) For **LC●K●●●●3 / LP●K●●●●3** with spring terminal, Ith max = 10 A.*

Characteristics: pages B8/91 to B8/93
Dimensions: page B8/95
Schemes: page B8/96
Click HERE for access to online contactor selector

Reversing contactor selection according to utilisation category, see pages A6/34 to A6/39 and A6/42 to A6/45.
Integral mechanical interlock.
It is essential to link the contacts of the electrical interlock.
Pre-wired power circuit connections as standard on screw clamp versions.
Mounting on 35 mm ⊔ rail or Ø4 screw fixing. Screws in the open "ready-to-tighten" position.
Add-on auxiliary contact blocks and accessories, see pages B8/48 to B8/50.

PB112199.eps



LC2K0910●●

PB112206.eps



LC2K09105●●

3-pole reversing contactors - Motor control 6 to 16 A in categories AC-3 AC-4 - a.c. coil

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3			Rated operational current in category AC-3 440 V up to	Instantaneous auxiliary contacts per contactor		Basic reference, to be completed by adding the voltage code (1)
220 V 230 V	380 V 415 V	440/500 V 660/690 V				
kW	kW	kW	A			
Screw clamp connections						
1.5	2.2	3	**6**	1	–	**LC2K0610●●**
				–	1	**LC2K0601●●**
2.2	4	4	**9**	1	–	**LC2K0910●●**
				–	1	**LC2K0901●●**
3	5.5	4 (> 440)	**12**	1	–	**LC2K1210●●**
		5.5 (440)		–	1	**LC2K1201●●**
4	7.5	4 (> 440)	**16**	1	–	**LC2K1610●●**
		5.5 (440)		–	1	**LC2K1601●●**

Spring terminal connections (2)

For 6 to 12 A ratings only, in the references selected above, insert a figure **3** before the voltage code.
Example: **LC2K0610●●** becomes **LC2K06103●●**.

Faston connectors, 1 x 6.35 or 2 x 2.8

For 6 to 16 A ratings, in the references selected above, insert a figure **7** before the voltage code.
Example: **LC2K0610●●** becomes **LC2K06107●●**.

Solder pins for printed circuit boards

For 6 to 16 A ratings, in the references selected above, insert a figure **5** before the voltage code.
Example: **LC2K0610●●** becomes **LC2K06105●●**.

3-pole silent reversing contactors - 6 to 16 A categories AC-3 AC-4 - a.c. coil

Recommended for use in areas sensitive to noise, high interference mains supplies, etc.
Coil with rectifier incorporated, suppressor fitted as standard.

Screw clamp connections						
1.5	2.2	3	**6**	1	–	**LC8K0610●●**
				–	1	**LC8K0601●●**
2.2	4	4	**9**	1	–	**LC8K0910●●**
				–	1	**LC8K0901●●**
3	5.5	4 (> 440)	**12**	1	–	**LC8K1210●●**
		5.5 (440)		–	1	**LC8K1201●●**

Faston connectors, 1 x 6.35 or 2 x 2.8

In the references selected above, insert a figure **7** before the voltage code.
Example: **LC8K0610●●** becomes **LC8K06107●●**.

Solder pins for printed circuit boards

In the references selected above, insert a figure **5** before the voltage code.
Example: **LC8K0610●●** becomes **LC8K06105●●**.

Standard control circuit voltages (for other voltages, please consult your Regional Sales office)

Coil voltage codes - a.c. (3)

Reversing contactors LC2K (0.8…1.15 Uc) *(0.85…1.1 Uc)*

Volts	**12**	**20**	**24** (1)	**36**	**42**	**48**	**110**	**115**	**120**	**127**	**200/208**		***220/230***	**230**	***230/240***
50/60 Hz	J7	Z7	B7	C7	D7	E7	F7	FE7	G7	FC7	L7		*M7*	P7	U7
Volts	**256**	**277**	***380/400***		**400**	***400/415***		**440**	**480**	**500**	**575**	**600**	***660/690***		
50/60 Hz	W7	UE7	*Q7*		V7	*N7*		R7	T7	S7	SC7	X7	*Y7*		

Up to and including 240 V, coil with integral suppression device available: add **2** to the code required. Example: **J72.**

Reversing contactors LC8K (0.8…1.1 Uc)

Volts	**24**	**42**	**48**	**110**	**115**	**220**	**230/240**
50/60 Hz	B7	D7	E7	F7	FE7	M7	U7

*(1) For mains supplies with a high level of interference (voltage surge > 800 V), use a suppressor module **LA4KE1FC** (50…129 V) or **LA4KE1UG** (130…250 V), see page B8/49.*
*(2) For **LC●K●●●●3 / LP●K●●●●3** with spring terminal, Ith max = 10 A.*
(3) (0.8…1.15 Uc) for single voltage coil; (0.85…1.1 Uc) for dual voltage coil, exemple 200/208 V AC.

Characteristics: pages B8/91 to B8/93
Dimensions: page B8/97
Schemes: page B8/98
Click HERE for access to online contactor selector

Reversing contactor selection according to utilisation category, see pages A6/34 to A6/39 and A6/42 to A6/45.
Integral mechanical interlock.
It is essential to link the contacts of the electrical interlock.
Pre-wired power circuit connections as standard on screw clamp versions.
Mounting on 35 mm ⎓ rail or Ø4 screw fixing.
Screws in the open “ready-to-tighten” position.
Add-on auxiliary contact blocks and accessories, see pages B8/48 to B8/50.

3-pole reversing contactors - Motor control 6 to 12 A in categories AC-3 AC-4 - d.c. coil

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3			Rated operational current in category AC-3 440 V up to	Instan-taneous auxiliary contacts per contactor		Basic reference, to be completed by adding the voltage code [1]
220 V 230 V	380 V 415 V	440/500 V 660/690 V				
kW	kW	kW	A			
Screw clamp connections						
1.5	2.2	3	6	1	–	**LP2K0610●●**
				–	1	**LP2K0601●●**
2.2	4	4	9	1	–	**LP2K0910●●**
				–	1	**LP2K0901●●**
3	5.5	4 (> 440)	12	1	–	**LP2K1210●●**
		5.5 (440)		–	1	**LP2K1201●●**
Spring terminal connections [2]						
In the references selected above, insert a figure **3** before the voltage code. Example: **LP2K0610●●** becomes **LP2K06103●●**.						
Faston connectors, 1 x 6.35 or 2 x 2.8						
In the references selected above, insert a figure **7** before the voltage code. Example: **LC2K0610●●** becomes **LC2K06107●●**.						
Solder pins for printed circuit boards						
For 6 to 16 A ratings, in the references selected above, insert a figure **5** before the voltage code. Example: **LC2K0610●●** becomes **LC2K06105●●**.						

3-pole low consumption reversing contactors

Compatible with programmable controller outputs.
Wide range coil (0.7…1.30 Uc), suppressor fitted as standard, consumption 1.8 W.

Screw clamp connections						
1.5	2.2	3	6	1	–	**LP5K0610●●**
				–	1	**LP5K0601●●**
2.2	4	4	9	1	–	**LP5K0910●●**
				–	1	**LP5K0901●●**
3	5.5	4 (> 440)	12	1	–	**LP5K1210●●**
		5.5 (440)		–	1	**LP5K1201●●**
Spring terminal connections						
In the references selected above, insert a figure **3** before the voltage code. Example: **LP5K0610●●** becomes **LP5K06103●●**.						
Faston connectors, 1 x 6.35 or 2 x 2.8						
In the references selected above, insert a figure **7** before the voltage code. Example: **LP5K0610●●** becomes **LP5K06107●●**.						
Solder pins for printed circuit boards						
In the references selected above, insert a figure **5** before the voltage code. Example: **LP5K0610●●** becomes **LP5K06105●●**.						

Standard control circuit voltages (for other voltages, please consult your Regional Sales office)

Coil voltage codes - d.c.

Reversing contactors LP2K (0.8…1.15 Uc)

Volts	12	20	24 [1]	36	48	60	72	100	110	125	155	174	200	220	230	240	250
Code	JD	ZD	BD	CD	ED	ND	SD	KD	FD	GD	PD	QD	LD	MD	MPD	MUD	UD

Coil with integral suppression device available: add **3** to the code required. Example: **JD3**.

Coil voltage codes - low consumption d.c.

Reversing contactors LP5K (0.7…1.3 Uc)

Volts	12	20	24	48	72	110	120
Code	JW3	ZW3	BW3	EW3	SW3	FW3	GW3

Coil with integral suppression device fitted as standard, by bi-directional peak limiting diode.

*(1) For **LP2K** only, when connecting an electronic sensor or timer in series with the contactor coil, select a 20 V coil (∼ control circuit voltage code Z7, ⎓ control circuit voltage code ZD) so as to compensate for the incurred voltage drop.*

*(2) For **LC●K●●●●3 / LP●K●●●●3** with spring terminal, Ith max = 10 A.*

Characteristics: pages B8/91 to B8/94
Dimensions: page B8/97
Schemes: page B8/98
Click HERE for access to online contactor selector

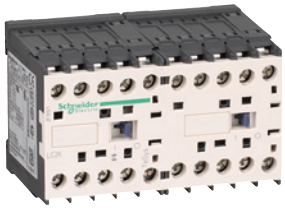

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LC2K0910●●

Warning: reversing contactors LC2K0910●● and LC2K0901●● are pre-wired for reverse motor operation as standard.
Reversing contactor selection according to utilisation category, see pages A6/40 and A6/41.
Integral mechanical interlock.
It is essential to link the contacts of the electrical interlock.
Mounting on 35 mm ⎓ rail or Ø4 screw fixing.
Screws in the open “ready-to-tighten” position.
Add-on auxiliary contact blocks and accessories, see pages B8/48 to B8/50.

3 or 4-pole reversing contactors - Load control - 20 A in category AC-1 - a.c. coil (1)

Non-inductive loads Category AC-1 Maximum current at θ ≤ 50 °C	Number of poles		Instantaneous auxiliary contacts per contactor			Basic reference, to be completed by adding the voltage code (2)
						
A						
Screw clamp connections						
20	3	–	1	–		**LC2K0910●●**
					or	**LC2K1210●●**
	3	–	–	1		**LC2K0901●●**
					or	**LC2K1201●●**
	4	–	–	–		**LC2K09004●●**
					or	**LC2K12004●●**


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LC2K09105●●

Spring terminal connections (3)
In the references selected above, insert a figure **3** before the voltage code.
Example: **LC2K0910●●** becomes **LC2K09103●●**.

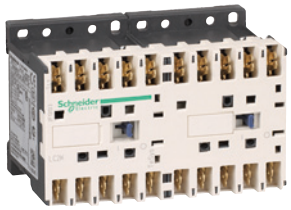
Faston connectors, 1 x 6.35 or 2 x 2.8
In the references selected above, insert a figure **7** before the voltage code.
Example: **LC2K0910●●** becomes **LC2K09107●●**.

Solder pins for printed circuit boards
In the references selected above, insert a figure **5** before the voltage code.
Example: **LC2K0910●●** becomes **LC2K09105●●**.

3 or 4-pole silent reversing contactors - 20 A / AC-1 - a.c. coil (1)

Recommended for use in areas sensitive to noise, high interference mains supplies, etc.
Coil with rectifier incorporated, suppressor fitted as standard.

Screw clamp connections						
20	3	–	1	–		**LC8K0910●●**
					or	**LC8K1210●●**
	3	–	–	1		**LC8K0901●●**
					or	**LC8K1201●●**
	4	–	–	–		**LC8K09004●●**
					or	**LC8K12004●●**


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LC2K09107●●

Faston connectors, 1 x 6.35 or 2 x 2.8
In the references selected above, insert a figure **7** before the voltage code.
Example: **LC8K0910●●** becomes **LC8K09107●●**.

Solder pins for printed circuit boards
In the references selected above, insert a figure **5** before the voltage code.
Example: **LC8K0910●●** becomes **LC8K09105●●**.

(1) Coordination tables between 9 and 12 A ratings according to number of operating cycles, see AC-1 curve on page A6/40.

Standard control circuit voltages (for other voltages, please consult your Regional Sales office)

Coil voltage codes - a.c. (4)

Reversing contactors LC2K (0.8…1.15 Uc) *(0.85…1.1 Uc)*

Volts	**12**	**20**	**24** (2)	**36**	**42**	**48**	**110**	**115**	**120**	**127**	**200/208**		***220/230***	***230***	***230/240***
50/60 Hz	J7	Z7	B7	C7	D7	E7	F7	FE7	G7	FC7	L7		*M7*	*P7*	*U7*
Volts	**256**	**277**	***380/400***		**400**	***400/415***		**440**	**480**	**500**	**575**	**600**	***660/690***		
50/60 Hz	W7	UE7	*Q7*		V7	*N7*		R7	T7	S7	SC7	X7	*Y7*		

Up to and including 240 V, coil with integral suppression device available: add **2** to the code required. Example: **J72**.

Reversing contactors LC8K (0.8…1.1 Uc)

Volts	**24**	**42**	**48**	**110**	**115**	**220**	**230/240**
50/60 Hz	B7	D7	E7	F7	FE7	M7	U7

*(2) For mains supplies with a high level of interference (voltage surge > 800 V), use a suppressor module **LA4KE1FC** (50…129 V) or **LA4KE1UG** (130…250 V), see page B8/49.*
*(3) For **LC●K●●●●3 / LP●K●●●●3** with spring terminal, Ith max = 10 A.*
(4) (0.8…1.15 Uc) for single voltage coil; (0.85…1.1 Uc) for dual voltage coil, exemple 200/208 V AC.

Characteristics: pages B8/91 to B8/94
Dimensions: page B8/97
Schemes: page B8/98
Click **HERE** for access to online contactor selector

Warning: reversing contactors LP2K0910●● and LP2K0901●● are pre-wired for reverse motor operation as standard.
Reversing contactor selection according to utilisation category, see pages A6/40 and A6/41.
Integral mechanical interlock.
It is essential to link the contacts of the electrical interlock.
Mounting on 35 mm ⎓ rail or Ø4 screw fixing.
Screws in the open "ready-to-tighten" position.
Add-on auxiliary contact blocks and accessories, see pages B8/48 to B8/50.

3 or 4-pole reversing contactors - Load control - 20 A in category AC-1 - d.c. coil (1)

Non-inductive loads Category AC-1 Maximum current at θ ≤ 50 °C	Number of poles		Instantaneous auxiliary contacts per contactor			Basic reference, to be completed by adding the voltage code (2)
A						
Screw clamp connections						
20	3	–	1	–		**LP2K0910●●**
					or	**LP2K1210●●**
	3	–	–	1		**LP2K0901●●**
					or	**LP2K1201●●**
	4	–	–	–		**LP2K09004●●**
					or	**LP2K12004●●**

Spring terminal connections (3)
In the references selected above, insert a figure **3** before the voltage code.
Example: **LP2K0910●●** becomes **LP2K09103●●**.

Faston connectors, 1 x 6.35 or 2 x 2.8
In the references selected above, insert a figure **7** before the voltage code.
Example: **LP2K0910●●** becomes **LP2K09107●●**.

Solder pins for printed circuit boards
In the references selected above, insert a figure **5** before the voltage code.
Example: **LP2K0910●●** becomes **LP2K09105●●**.

3 or 4-pole reversing contactors - 20 A / AC-1 - d.c. low consumption coil (1)

Compatible with programmable controller outputs.
Wide range coil (0.7…1.30 Uc), suppressor fitted as standard, consumption 1.8 W.

Screw clamp connections						
20	3	–	1	–		**LP5K0910●●●**
					or	**LP5K1210●●●**
	3	–	–	1		**LP5K0901●●●**
					or	**LP5K1201●●●**
	4	–	–	–		**LP5K09004●●●**
					or	**LP5K12004●●●**

Spring terminal connections
In the references selected above, insert a figure **3** before the voltage code.
Example: **LP5K0910●●** becomes **LP5K09103●●**.

Faston connectors, 1 x 6.35 or 2 x 2.8
In the references selected above, insert a figure **7** before the voltage code.
Example: **LP5K0910●●** becomes **LP5K09107●●**.

Solder pins for printed circuit boards
In the references selected above, insert a figure **5** before the voltage code.
Example: **LP5K0910●●** becomes **LP5K09105●●**.

(1) Coordination tables between 9 and 12 A ratings according to number of operating cycles, see AC-1 curve on page A6/40.

Standard control circuit voltages (for other voltages, please consult your Regional Sales office)

Coil voltage codes - d.c. (reversing contactors LP2K: 0.8…1.15 Uc)

Volts ⎓	12	20	24 (2)	36	48	60	72	100	110	125	155	174	200	220	230	240	250
Code	JD	ZD	BD	CD	ED	ND	SD	KD	FD	GD	PD	QD	LD	MD	MPD	MUD	UD

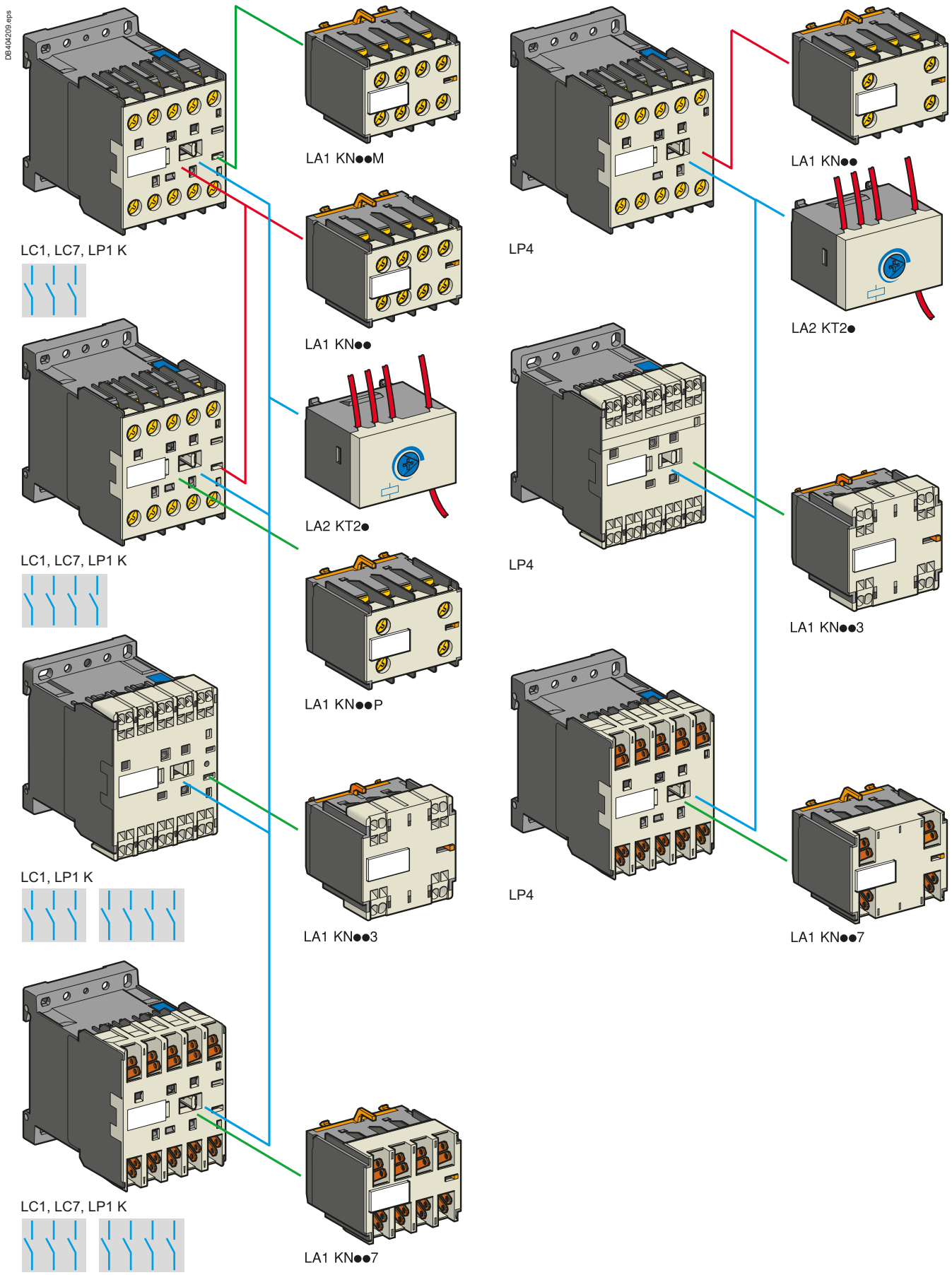
Coil with integral suppression device available: add **3** to the code required. Example: **JD3**.

Coil voltage codes - low consumption d.c. (reversing contactors LP5K: 0.7…1.3 Uc)

Volts ⎓	12	20	24	48	72	110	120
Code	JW3	ZW3	BW3	EW3	SW3	FW3	GW3

Coil with integral suppression device fitted as standard, by bi-directional peak limiting diode.
*(2) For **LP2K** only, when connecting an electronic sensor or timer in series with the contactor coil, select a 20 V coil (∼ control circuit voltage code Z7, ⎓ control circuit voltage code ZD) so as to compensate for the incurred voltage drop.*
*(3) For **LC●K●●●●3** / **LP●K●●●●3** with spring terminal, Ith max = 10 A.*

Characteristics: pages B8/91 to B8/94
Dimensions: page B8/97
Schemes: page B8/98
Click **HERE** for access to online contactor selector


DB404209.eps
LC1, LC7, LP1 K
LA1 KN●●M
LA1 KN●●
LA2 KT2●
LC1, LC7, LP1 K
LA2 KT2●
LA1 KN●●P
LA1 KN●●3
LC1, LP1 K
LA1 KN●●3
LP4
LA1 KN●●7
LC1, LC7, LP1 K
LA1 KN●●7
LP4
LA1 KN●●
LP4
LA1 KN●●3

Product references

PB121395.eps



LA1KN22

PB111987.eps



LA1KN223

PB111988.eps



LA1KN227

Instantaneous auxiliary contact blocks

Recommended for standard applications. Clip-on front mounting, 1 block per contactor

Connection	For use on contactors	Composition		Reference
		⌐	⌐	
Screw clamp terminals	All products with screw clamp terminals	2	–	**LA1KN20**
		–	2	**LA1KN02**
		1	1	**LA1KN11**
	All products with screw clamp terminals except low consumption	4	–	**LA1KN40**
		3	1	**LA1KN31**
		2	2	**LA1KN22**
		1	3	**LA1KN13**
		–	4	**LA1KN04**
Spring terminals	All products with spring terminals	2	–	**LA1KN203**
		–	2	**LA1KN023**
		1	1	**LA1KN113**
	All products with spring terminals except low consumption	4	–	**LA1KN403**
		3	1	**LA1KN313**
		2	2	**LA1KN223**
		1	3	**LA1KN133**
		–	4	**LA1KN043**
Faston connectors, 1 x 6.35 or 2 x 2.8	All products with Faston connectors	2	–	**LA1KN207**
		–	2	**LA1KN027**
		1	1	**LA1KN117**
	All products with Faston connectors except low consumption	4	–	**LA1KN407**
		3	1	**LA1KN317**
		2	2	**LA1KN227**
		1	3	**LA1KN137**
		–	4	**LA1KN047**

With terminal referencing to standard EN 50012. Clip-on front mounting, 1 block per contactor

Screw clamp terminals with referencing conforming to standard EN 50012	All 3-pole + N/O products with screw clamp terminals except LP4 and LP5K12	–	2	**LA1KN02M**
		1	1	**LA1KN11M**
	All 3-pole + N/O products with screw clamp terminals except LP4 or LP5K06, K09 and K12	3	1	**LA1KN31M**
		2	2	**LA1KN22M**
		1	3	**LA1KN13M**
	All 4-pole products with screw clamp terminals except LP4 or LP5K12	1	1	**LA1KN11P**
	All 4-pole products with screw clamp terminals except LP4 or LP5K09 and K12	2	2	**LA1KN22P**

Electronic time delay auxiliary contact blocks

Relay output with common point changeover contact, ∼ or ⎓ 240 V, 2 A maximum.
Control voltage 0.85…1.1 Uc.
Maximum switching capacity 250 VA or 150 W.
Operating temperature -10…+60 °C.
Reset time: 1.5 s during the time delay period, 0.5 s after the time delay period.

Clip-on front mounting, 1 block per contactor

Voltage	Type	Timing range	Composition	Reference
			⌐	
V		s		
∼ or ⎓ 24…48	On-delay	1…30	1	**LA2KT2E**
∼ 110…240	On-delay	1…30	1	**LA2KT2U**

Characteristics: page B8/94
Dimensions: pages B8/95 and B8/97
Schemes: pages B8/96 and B8/98

Product references

PB111989_R.eps



LA4K●●●

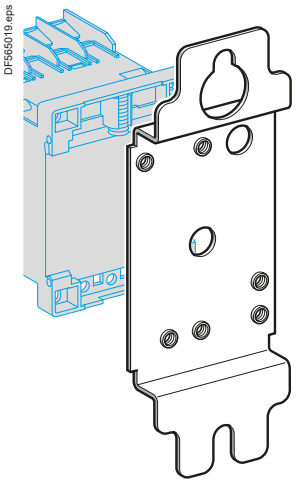
References

Mounting and connection	Type	For voltages	Sold in lots of	Unit reference
Clip-on fixing on the front of contactors LC1 and LP1, with locating device. No tools required.	Varistor (1)	∼ and ⎓ 12…24 V	5	**LA4KE1B**
		∼ and ⎓ 32…48 V	5	**LA4KE1E**
		∼ and ⎓ 50…129 V	5	**LA4KE1FC**
		∼ and ⎓ 130…250 V	5	**LA4KE1UG**
	Diode + Zener diode (2)	⎓ 12…24 V	5	**LA4KC1B**
		⎓ 32…48 V	5	**LA4KC1E**
	RC (3)	∼ 110…250 V	5	**LA4KA1U**

(1) Protection provided by limiting the transient voltage to 2 Uc max.
Maximum reduction of transient voltage peaks.
Slight increase in drop-out time (1.1 to 1.5 times the normal time).
(2) No overvoltage or oscillating frequency.
Polarised component.
Slight increase in drop-out time (1.1 to 1.5 times the normal time).
(3) Protection by limiting the transient voltage to 3 Uc max. and limitation of the oscillating frequency.
Slight increase in drop-out time (1.2 to 2 times the normal time).

Characteristics: page B8/94
Dimensions: pages B8/95 and B8/97
Schemes: pages B8/96 and B8/98

Product references



DX1AP25



LA9D973

Mounting and marking accessories

Description	Application		Sold in lots of	Unit reference
Mounting plates (1)	For fixing on 1 ⊔ rail	Clip-on	1	**LA9D973**
	For fixing on 2 ⊔ rails	110/120 mm fixing centres	10	**DX1AP25**
Marker holder	Clip-on	Onto front of contactor	100	**LA9D90**
Clip-in markers	4 maximum per contactor	Strips of 10 identical numbers 0…9	25	**AB1R●** (2)
		Strips of 10 identical letters A…Z	25	**AB1G●** (2)



LA9E01

Connection accessories

Description	Application		Sold in lots of	Unit preference
Paralleling links	For 2 poles	With screw clamps	4	**LA9E01**
	For 4 poles	With screw clamps	2	**LA9E02**
Set of 6 power connections	For 3-pole reversing contactors for motor control	For contactors with screw clamp terminals	100	**LA9K0969**

(1) Order 1 mounting plate for fixing a contactor and 2 mounting plates for fixing a reversing contactor.
(2) Complete the reference by replacing the dot with the required character.



Control Panel Technical Guide:
Mounting and wiring accessories for TeSys D, K, F - Star Delta, reverser, low-high speed control motor starters and changeover applications - Product references and details on all kits and wiring accessories.

> Ref. Document: CPTG011_EN

> Click on QR code to download

Dimensions:
pages B8/95 and B8/97

Product references

Mini-contactors 25 and 47 mm pitch for use in modular panels.
- Mounting on 35 mm ⊔ rail or fixing by four Ø4 screws, except for LC1SKGC200.
- Connection by connectors.
- Mini-contactor fitted with transparent, sealable protective cover to prevent front face access.

PB111643.eps



LC1SKGC200

Mini-contactors, width 27 mm

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3			Rated operational current in AC-3 up to 400 V	Non inductive loads category AC-1 maximum current θ ≤ 50 °C	No. of poles			Basic reference, to be completed by adding the voltage code (1)
220 V 230 V	380 V 415 V	660 V 690 V						
kW	kW	kW	A	A				
–	–	–	5	20	2	–	–	**LC1SKGC200●●**

PB111645_R.eps



LC1SKGC400

Mini-contactors, width 45 mm

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3			Rated operational current in AC-3 up to 400 V	Non inductive loads category AC-1 maximum current θ ≤ 50 °C	No. of poles			Basic reference, to be completed by adding the voltage code (1)
220 V 230 V	380 V 415 V	660 V 690 V						
kW	kW	kW	A	A				
1.1	4	4	9	20	3	1	–	**LC1SKGC310●●**
					3	–	1	**LC1SKGC301●●**
					4	–	–	**LC1SKGC400●●**

(1) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Volts ∼ 50/60 Hz	24	48	110	120	220	230	240	380	400
Code	B7	E7	F7	G7	M7	P7	U7	Q7	V7

Contactors

Product references

PB111640_R.eps



LA4SK●1●

Suppressor modules

Connection without need for tools by clipping onto right-hand side of contactor

For use on contactors	Type	For voltages	Sold in lots of	Unit reference
LC1SKGC	Varistor (1)	∿ and ⎓ 24…48 V	10	**LA4SKE1E**
		∿ and ⎓ 110…250 V	10	**LA4SKE1U**
	Diode (2)	⎓ 24…250 V	10	**LA4SKC1U**

(1) Protection provided by limiting the transient voltage to 2 Uc max.
Maximum reduction of transient voltage peaks.
Slight increase in drop-out time (1.1 to 1.5 times the normal time).
(2) No overvoltage or oscillating frequency.
Slight increase in drop-out time (1.1 to 1.5 times the normal time).

Characteristics:
pages B8/99 to B8/101

Dimensions, schemes:
page B8/103

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PB113075_12.eps

GC2520


PB113078_18.eps

GC4040


PB113079_24.eps

GC10020

TeSys GC Contactors - modular - 17.5 mm pitch for modular panels

No. of poles		Number of 17.5 mm modules	Commercial reference 50 Hz coil - different voltages					Sold in lots of
			12 V	24 V	48 V	110 V	220/240 V	
Maximum current rating category AC-7a - 16 A								
1	–	1	**GC1610J5**	**GC1610B5**	**GC1610E5**	**GC1610F5**	**GC1610M5** ★	12
1	1	1	**GC1611J5**	**GC1611B5**	**–**	**GC1611F5**	**GC1611M5** ★	12
2	–	1	**GC1620J5**	**GC1620B5**	**GC1620E5**	**GC1620F5** ★	**GC1620M5** ★	12
2	2	2	**–**	**GC1622B5**	**GC1622E5**	**GC1622F5** ★	**GC1622M5**	6
3	–	2	**–**	**–**	**–**	**–**	**GC1630B5** **GC1630M5** ★	6
4	–	2	**–**	**GC1640B5**	**–**	**GC1640F5**	**GC1640M5** ★	6
Maximum current rating category AC-7a - 25 A								
–	2	1	**–**	**GC2502B5**	**GC2502E5**	★	**GC2502M5** ★	12
–	4	2	**–**	**GC2504B5**	**GC2504E5**	★	**GC2504M5** ★	6
1	–	1	**–**	**GC2510B5**	**–**	**–**	**GC2510M5** ★	12
1	1	1	**–**	**GC2511B5**	**–**	**GC2511F5**	**GC2511M5** ★	12
2	–	1	**GC2520J5**	**GC2520B5**	**GC2520E5**	**GC2520F5** ★	**GC2520M5** ★	12
2	2	2	**–**	**GC2522B5**	**GC2522E5**	**GC2522F5**	**GC2522M5** ★	6
3	–	2	**–**	**GC2530B5**	**–**	**GC2530F5**	**GC2530M5** ★	6
3	1	2	**–**	**–**	**–**	**–**	**GC2531M5**	6
4	–	2	**GC2540J5**	**GC2540B5**	**GC2540E5**	**GC2540F5** ★	**GC2540M5** ★	6
Maximum current rating category AC-7a - 40 A								
–	2	2	**–**	**GC4002B5**	**–**	**–**	**GC4002M5** ★	6
–	4	3	**–**	**GC4004B5**	**–**	**GC4004F5** ★	**GC4004M5**	4
1	1	2	**–**	**GC4011B5**	**–**	**–**	**GC4011M5** ★	6
2	–	2	**–**	**GC4020B5**	**–**	**GC4020F5** ★	**GC4020M5** ★	6
2	2	3	**–**	**–**	**–**	**–**	**GC4022M5**	4
3	–	3	**–**	**GC4030B5**	**–**	**GC4030F5**	**GC4030M5** ★	4
4	–	3	**–**	**GC4040B5**	**GC4040E5**	**GC4040F5** ★	**GC4040M5** ★	4
Maximum current rating category AC-7a - 63 A								
–	2	2	**–**	**–**	**–**	**–**	**GC6302M5**	6
–	4	3	**–**	**GC6304B5**	**–**	**–**	**GC6304M5**	4
1	1	2	**–**	**–**	**–**	**–**	**GC6311M5**	6
2	–	2	**–**	**–**	**–**	**–**	**GC6320M5**	6
2	2	3	**–**	**–**	**–**	**GC6322F5**	**GC6322M5**	4
3	–	3	**–**	**GC6330B5**	**–**	**GC6330F5**	**GC6330M5** ★	4
4	–	3		**GC6340B5**	**GC6340E5**	**GC6340F5** ★	**GC6340M5** ★	4
Maximum current rating category AC-7a - 100 A								
2	–	3	**–**	**–**	**–**	**–**	**GC10020M5**	4
4	–	6	**–**	**GC10040B5**	**–**	**–**	**GC10040M5** ★	2

★ *for 60 Hz coil replace last figure 5 by 6.*

Characteristics:
pages B8/104 to B8/110

Dimensions, schemes:
pages B8/111 to B8/113

Product references

PB113083_13.eps



GY2520M5

PB113087_26.eps



GY6340M5

TeSys GY "dual tariff" contactors - modular - 17.5 mm pitch for modular panels

No. of poles		Number of 17.5 mm modules	Commercial reference 50 Hz coil - different voltages					Sold in lots of
			12 V	24 V	48 V	110 V	220/240 V	
Maximum current rating category AC-7a - 16 A								
2	–	1	–	**GY1620B5**		–	**GY1620M5**	12
4	–	2	–	–	–	–	**GY1640M5**	6
Maximum current rating category AC-7a - 25 A								
2	–	1	–	**GY2520B5**	–	–	**GY2520M5** ★	12
3	–	2	–	–	–	–	**GY2530M5**	6
4	–	2	–	**GY2540B5**	–	–	**GY2540M5**	6
Maximum current rating category AC-7a - 40 A								
2	–	2	–	–	–	–	**GY4020M5**	6
3	–	3	–	–	–	–	**GY4030M5**	4
4	–	3	–	**GY4040B5**	–	–	**GY4040M5**	4
Maximum current rating category AC-7a - 63 A								
2	–	2	–	–	–	–	**GY6320M5**	6
4	–	3	–	**GY6340B5**	–	–	**GY6340M5**	4

★ *for 60 Hz coil replace last figure 5 by 6.*

Characteristics: pages B8/114 to B8/116

Dimensions, schemes: pages B8/117 and B8/118

Schemes: page B8/118

Product references

PB121399.eps



GF1610M7

TeSys GF impulse relays - modular - 17.5 mm pitch for modular panels

Maximum current rating category AC-1	Composition		Coil voltages ~ 50/60 Hz	Coil voltages ⎓	Sold in lots of	Unit reference
A			V	V		
16	1	–	12	6	12	**GF1610J7**
			24	12	12	**GF1610B7**
			48	24	12	**GF1610E7**
			110	48	12	**GF1610F7**
			220	–	12	**GF1610M7**
			230/240	110	12	**GF1610U7**
	2	–	12	6	12	**GF1620J7**
			24	12	12	**GF1620B7**
			48	24	12	**GF1620E7**
			110	48	12	**GF1620F7**
			220	–	12	**GF1620M7**
			230/240	110	12	**GF1620U7**
	1	1	12	6	12	**GF1611J7**
			24	12	12	**GF1611B7**
			48	24	12	**GF1611E7**
			110	48	12	**GF1611F7**
			220	–	12	**GF1611M7**
			230/240	110	12	**GF1611U7**

Characteristics:
pages B8/119 to B8/122

Dimensions, schemes:
page B8/123

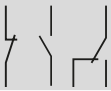
Product references

PB113093_13.eps



GAP23

Instantaneous auxiliary contact blocks

Number of contacts	Number of poles			Reference
				
2	1	1	–	**GAC0521**
	–	2	–	**GAC0531**
	–	–	1	**GAC0511**

PB104483-40.eps



GAC5

PB104486_34.eps



A9A15922

PB104487_49.eps



A9A15923

Accessories

Description	For use on contactor	Number of modules	Operational voltage in V	Sold in lots of	Unit reference
Coil suppression blocks comprising 2 RC circuits	–	1	12…48	1	**GAP21**
			110…240	1	**GAP23**
Ventilation 1/2 module clips onto ⊔ rail	–	1/2	–	10	**GAC5**
Set of screw shields (10 top parts + 10 bottom parts)	40 or 63 A 2 contacts	2	–	1	**A9A15922**
	40 or 63 A 3 or 4 contacts	3	–	1	**A9A15923**

Dimensions, schemes: page B8/112
Schemes: page B8/113

Life Is On Schneider Electric

TeSys D Green, D, SK, K, SKGC, GC, GY, GF

Technical Data for Designers

Contents

TeSys D Green, TeSys D:
> characteristics.....B8/59 to B8/71
> dimensions.....B8/72 to B8/85

TeSys SK:
> characteristics.....B8/86 to B8/89
> dimensions.....B8/90

TeSys K:
> characteristics.....B8/91 to B8/94
> dimensions.....B8/95 to B8/98

TeSys SKGC:
> characteristics.....B8/99 to B8/102
> dimensions.....B8/103

TeSys GC:
> characteristics.....B8/104 to B8/106
> dimensions.....B8/111 and B8/112

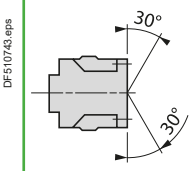
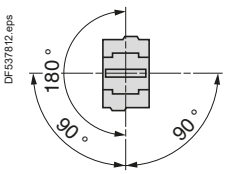
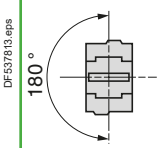
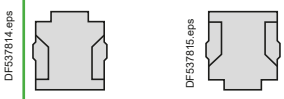
TeSys GY:
> characteristics.....B8/114 to B8/116
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TeSys GF:
> characteristics.....B8/119 to B8/121
> dimensions.....B8/123

Standard IEC tests - Contactors conforming to UL/CSA.....B8/124

Characteristics

Environment

Contactor type LC1			D09…D18 DT20 and DT25	D25…D38 DT32 and DT40	D40A…D80A DT60A and DT80A	D80…D95 (1)	D115 and D150
Rated insulation voltage (Ui)	Conforming to IEC 60947-4-1, overvoltage category III, degree of pollution: 3	V	690			1000	
	Conforming to UL, CSA	V	600				
Rated impulse withstand voltage (Uimp)	Conforming to IEC 60947	kV	6			8	
Conforming to standards			IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.4				
Product certifications (1)			UL, CSA, CCC, EAC, CB certification, EU-MR-RO by DNV-GL			UL, CSA, CCC, EAC, CB certification, DNV-GL, RINA, BV, LRoS	
Degree of protection (2) (front face)	Conforming to IEC 60529						
	Power circuit connections		Protection against direct finger contact IP20				
	Coil connection		Protection against direct finger contact IP20				
Climatic withstand			According to IACS E10 and IEC 60947-1 Annex Q category D			According to IACS E10	
Ambient air temperature around the device	Storage	°C	-60…+80				
	Operation (3)	°C	-40...+60				
	Allowed with derating (3) (4)	°C	+60…+70 at Uc to 1.●● x Uc				
Maximum operating altitude	Without derating	m	3000				
Operating positions (5)	Without derating in the following positions		AC and DC coils AC/DC and "BBE" coils 		AC coils AC/DC and "BBE" coils 		DC coils 
	Positions that are not allowed		For ⎓ contactors LC1D09 to LC1D150. 				
Flame resistance	Conforming to IEC 60695-2-11	°C	850				
Shock resistance (6) 1/2 sine wave = 11 ms	Contactor open		10 gn	8 gn	10 gn	8 gn	6 gn
	Contactor closed		15 gn	15 gn	15 gn	10 gn	15 gn
Vibration resistance (6) 5…300 Hz	Contactor open		2 gn				
	Contactor closed		4 gn	4 gn	4 gn	3 gn	4 gn

*(1) Contactor **LC1D95** with d.c. coil is not UL/CSA certified.*
(2) Protection provided for the cabling c.s.a.'s indicated on the next page and for connection by cable. For lug type: add a protective cover.
(3) As per IEC60947-4-1, operating time and drop out voltage given and tested for -5...+40 °C.
(4) Refer to operational current in AC1 (page A6/40).
(5) When mounting on a vertical rail, use a stop.
(6) Without modifying the power contact states, in the most unfavourable direction (coil energised at Ue). In case of vibration, it is recommended to mount the devices separately by screws on metal plate.

References: pages B8/4 to B8/14
Dimensions: pages B8/72 to B8/78
Schemes: pages B8/79 and B8/80

Characteristics

Pole characteristics TeSys D, TeSys D Green

Contactor type			LC1		D09 (3P)	DT20 D098	D12 (3P)	DT25 D128	D18 (3P)	DT32 D188	D25 (3P)	DT40 D258
Rated operational current (Ie) (Ue ≤ 440 V)	In AC-3, θ ≤ 60 °C			A	9		12		18		25	
	In AC-1, θ ≤ 60 °C			A	25 (1)	20	25 (1)	25	32 (1)	32	40 (1)	40
Rated operational voltage (Ue)	Up to			V	690		690		690		690	
Frequency limits	Of the operational current			Hz	25…400		25…400		25…400		25…400	
Conventional thermal current (Ith)	θ ≤ 60 °C			A	25 (1)	20	25 (1)	25	32 (1)	32	40 (1)	40
Rated making capacity (440 V)	Conforming to IEC 60947			A	250		250		300		450	
Rated breaking capacity (440 V)	Conforming to IEC 60947			A	250		250		300		450	
Permissible short time rating No current flowing for preceding 15 minutes with θ ≤ 40 °C	For 1 s			A	210		210		240		380	
	For 10 s			A	105		105		145		240	
	For 1 min			A	61		61		84		120	
	For 10 min			A	30		30		40		50	
Fuse protection against short-circuits (U ≤ 690 V)	Without thermal overload relay, gG fuse	type 1		A	25		40		50		63	
		type 2		A	20		25		35		40	
	With thermal overload relay			A	See pages B11/4 and B11/5, for aM or gG fuse ratings corresponding to the associated thermal overload relay							
Average impedance per pole	At Ith and 50 Hz			mΩ	2.5		2.5		2.5		2	
Power dissipation per pole for the above operational currents	AC-3			W	0.20		0.36		0.8		1.25	
	AC-1			W	1.56		1.56		2.5		3.2	

Control circuit characteristics, a.c. supply TeSys D

Rated control circuit voltage (Uc)			50/60 Hz	V	12…690
Control voltage limits					
	50 or 60 Hz coils	Operation			–
		Drop-out			–
	50/60 Hz coils	Operation			0.8…1.1 Uc on 50 Hz and 0.85…1.1 Uc on 60 Hz at 60 °C
		Drop-out			0.3…0.6 Uc at 60 °C
Average consumption at 20 °C and at Uc	∼ 50 Hz	Inrush	50 Hz coil	VA	–
			Cos φ		0.75
			50/60 Hz coil	VA	70
		Sealed	50 Hz coil	VA	–
			Cos φ		0.3
			50/60 Hz coil	VA	7
	∼ 60 Hz	Inrush	60 Hz coil	VA	–
			Cos φ		0.75
			50/60 Hz coil	VA	70
		Sealed	60 Hz coil	VA	–
			Cos φ		0.3
			50/60 Hz coil	VA	7.5
Heat dissipation	50/60 Hz			W	2…3
Operating time (2)		Closing "C"		ms	12…22
		Opening "O"		ms	4…19
Mechanical durability in millions of operating cycles		50 or 60 Hz coil			–
		50/60 Hz coil on 50 Hz			15
Maximum operating rate at ambient temperature ≤ 60 °C		In operating cycles per hour			3600

(1) Versions with spring terminal connections:
*16 A for **LC1D093** and **LC1D123** (20 A possible with 2 x 2.5 mm² in parallel),*
*25 A for **LC1D183** to **LC1D323** (32 A possible for **LC1D183** connected with 2 x 4 mm² cables in parallel; 40 A possible for **LC1D253** and **LC1D323** connected with 2 x 4 mm² in parallel).*

(2) The closing time "C" is measured from the moment the coil supply is switched on to closure of the main poles. The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separate.

References: pages B8/4 to B8/14
Dimensions: pages B8/72 to B8/78
Schemes: pages B8/79 and B8/80

D32	D38	D40A	DT60A	D50A	D65A	D80A	DT80A	D80	D95	D115	D150
32	38	40	–	50	65	66	–	80	95	115	150
50 (1)	50	60	60	80	80	80	80	125	125	200	200
690	690	690	690	690	690	690	690	1000	1000	1000	1000
25…400	25…400	25…400	25…400	25…400	25…400	25…400	25…400	25…400	25…400	25…400	25…400
50	50	60	60	80	80	80	80	125	125	200	200
550	550	800	800	900	1000	1000	1000	1100	1100	1260	1660
550	550	800	800	900	1000	1000	1000	1100	1100	1100	1400
430	430	720	720	810	900	900	900	990	1100	1100	1400
260	310	320	320	400	640	640	640	640	800	950	1200
138	150	165	165	208	260	260	260	320	400	550	580
60	60	72	72	84	110	110	110	135	135	250	250
63	63	80	80	100	125	125	125	200	200	250	315
63	63	80	80	100	125	125	125	160	160	200	250
See pages B11/4 and B11/5 for aM or gG fuse ratings corresponding to the associated thermal overload relay											
2	2	1.5	1.6	1.5	1.5	1.5	1.6	0.8	0.8	0.6	0.6
2	3	2.4	–	3.7	6.3	6.3	–	5.1	7.2	7.9	13.5
5	5	5.4	5.8	9.6	9.6	9.6	10.2	12.5	12.5	24	24

12…690	12…690									24…500	
–	–							0.85…1.1 Uc at 55 °C			
–	–							0.3…0.6 Uc at 55 °C		0.3…0.5 Uc at 55 °C	
0.8…1.1 Uc on 50 Hz and 0.85…1.1 Uc on 60 Hz at 60 °C	0.8…1.1 Uc on 50 Hz and 0.85…1.1 Uc on 60 Hz at 60 °C							0.8…1.1 Uc on 50 Hz and 0.85…1.1 Uc on 60 Hz at 55 °C		0.8…1.15 Uc on 50/60 Hz at 55 °C	
0.3…0.6 Uc at 60 °C	0.3…0.6 Uc at 60 °C							0.3…0.6 Uc at 55 °C		0.3…0.5 Uc at 55 °C	
–	–							200		300	–
0.75	0.75							0.75		0.8	0.9
70	160							245		280…350	280…350
–	–							20		22	–
0.3	0.3							0.3		0.3	0.9
7	15							26		2…18	2…18
–	–							220		300	–
0.75	0.75							0.75		0.8	0.9
70	140							245		280…350	280…350
–	–							22		22	–
0.3	0.3							0.3		0.3	0.9
7.5	13							26		2…18	2…18
2…3	4…5							6…10		3…8	3…4.5
12…22	12…26	12…26	12…26	12…26	12…26	12…26	20…35	20…35	20…50	20…35	
4…19	4…19	4…19	4…19	4…19	4…19	4…19	6…20	6…20	6…20	40…75	
–	–	–	–	–	–	–	10	10	8	–	
15	6	6	6	6	6	6	4	4	8	8	
3600	3600	3600	3600	3600	3600	3600	3600	3600	2400	1200	

d.c. control circuit characteristics TeSys D

Contactor type				LC1D09…D38 LC1DT20…DT40	LC1D40A…D80A LC1DT60A and DT80A	LC1 or LP1D80 LC1D95	LC1D115 and LC1D150
Rated control circuit voltage (Uc)	⎓		V	12…440	12…440		24…440
Rated insulation voltage	Conforming to IEC 60947-1		V	690			
	Conforming to UL, CSA		V	600			
Control voltage limits	Operation	Standard coil		0.7…1.25 Uc at 60 °C	0.75…1.25 Uc at 60 °C	0.85…1.1 Uc at 55 °C	0.75…1.2 Uc at 55 °C
		Wide range coil		–	–	0.75…1.2 Uc at 55 °C	–
	Drop-out			0.1…0.25 Uc at 60 °C	0.1…0.3 Uc at 60 °C	0.1…0.3 Uc at 55 °C	0.15…0.4 Uc at 55 °C
Average consumption at 20 °C and at Uc	⎓	Inrush	W	5.4	19	22	270…365
		Sealed	W	5.4	7.4	22	2.4…5.1
Operating time (1) average at Uc	Closing	"C"	ms	63 ±15 %	50 ±15%	95…130	20…35
	Opening	"O"	ms	20 ±20 %	20 ±20%	20…35	40…75
				Note: The arcing time depends on the circuit switched by the poles. For all normal 3-phase applications, the arcing time is less than 10 ms. The load is isolated from the supply after a time equal to the sum of the opening time and the arcing time.			
Time constant (L/R)			ms	28	34	75	25
Mechanical durability at Uc	In millions of operating cycles			30	10	10	8
Maximum operating rate at ambient temperature ⩽ 60 °C	In operating cycles per hour			3600	3600	3600	1200

Low consumption control circuit characteristics TeSys D

Rated insulation voltage	Conforming to IEC 60947-1		V	690	–
	Conforming to UL, CSA		V	600	–
Maximum voltage	Of the control circuit on ⎓		V	250	–
Average consumption d.c. at 20 °C and at Uc	Wide range coil (0.8…1.25 Uc)	Inrush	W	2.4	–
		Sealed	W	2.4	–
Operating time (1) at Uc and at 20 °C	Closing	"C"	ms	77 ±15 %	–
	Opening	"O"	ms	25 ±20 %	–
Voltage limits (θ ⩽ 60 °C) of the control circuit	Operation			0.8 to 1.25 Uc	–
	Drop-out			0.1…0.3 Uc	–
Time constant (L/R)			ms	40	–
Mechanical durability	In millions of operating cycles			30	–
Maximum operating rate at ambient temperature ⩽ 60 °C	In operating cycles per hour			3600	–

(1) The operating times depend on the type of contactor electromagnet and its control mode.
The closing time "C" is measured from the moment the coil supply is switched on to initial contact of the main poles.
The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separate.

Ref.
Contactors

Wide band TeSys D Green AC/DC coil circuit characteristics

Rated control circuit voltage (Uc)		**V**	AC/DC 24...250						
	Operation	**V**	0.85 Uc mini...1.1 Uc maxi at 60 °C in AC or DC (BNE coil: 0.8 Uc mini at 24 VDC, 0.85 Uc mini in AC).						
	Drop-out	**V**	0.1 Uc maxi (e.g. 100 to 250 V = 25 V at 60 °C)						
Contactor type			**LC1D09...D38**			**LC1D40A...D80A, LC1DT60A, LC1DT80A**			
Coil code			**BNE**	**EHE**	**KUE**	**BBE**	**BNE**	**EHE**	**KUE**
Rated control circuit voltage (Uc)			24-60	48-130	100-250	24 DC	24-60	48-130	100-250
AC supply at 20°C	Consumption inrush	**VA**	15	25	25	-	15	23	18
	Consumption sealed	**VA**	0.9	1.3	1.6	-	1	1.4	1.8
	Consumption sealed	**mA**	28	15	9	-	35	17	9.5
	Heat dissipation	**W**	0.6	0.8	1.1	-	0.8	0.9	1.3
DC supply at 20°C	Consumption inrush	**W**	14	24	18	11	16	19	14
	Consumption sealed	**mA**	23	13	7	20	30	15	7.7
	Heat dissipation	**W**	0.6	0.8	1.1	0.5	0.7	0.9	1.2
Max operating time (2)	Closing "C"	**ms**	50 ±5 ms			60 ±5 ms			
	Opening "O"	**ms**	20...90 ms			20...80 ms			
EMC immunity			Meets IEC 60947-4-1 standard, table 14						
EMC emission	IEC 60947-4-1 §9.4.3		Environment A (1)						
Maximum operating rate at ambient temperature ⩽ 60°C		**cycle/h**	3600						
Mechanical durability at Uc In millions of operating cycles			15			6			

(1) Use of this product in EMC environment B may require mitigation measures to avoid unwanted disturbance.
(2) The closing time "C" is measured from the moment the coil supply is switched on to closure of the main poles. The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separates.

Ref.
Contactors

Characteristics

Power circuit connections

Screw clamp terminal connections TeSys D, TeSys D Green

Contactor type		LC1	D09 and D12 DT20 and DT25	D18 (3P)	D25 (3P)	D32	D38	D18 and D25 (4P) DT32 and DT40	D40A to D80A DT60A and DT80A (1)	D80 and D95	D115 and D150
Tightening			Screw clamp terminals					Connector 2 inputs	Screw clamp terminals	Connector 1 input	Connector 2 inputs
Flexible cable without cable end	1 conductor	mm²	1…4	1.5…6	2.5…10			2.5…10	1…35	4…50	10…120
	2 conductors	mm²	1…4	1.5…6	2.5…10			2.5…10	1…25 and 1…35	4…25	10…120 + 10…50
Flexible cable with cable end	1 conductor	mm²	1…4	1…6	1…10			2.5…10	1…35	4…50	10…120
	2 conductors	mm²	1…2.5	1…4	1.5…6			2.5…10	1…25 and 1…35	4…16	10…120 + 10…50
Solid cable without cable end	1 conductor	mm²	1…4	1.5…6	1.5…10			2.5…16	1…35	4…50	10…120
	2 conductors	mm²	1…4	1.5…6	2.5…10			2.5…16	1…25 and 1…35	6…25	10…120 + 10…50
Screwdriver	Philips		N° 2	N° 2	N° 2			N° 2	–	–	–
	Flat screwdriver Ø		Ø6	Ø6	Ø6			Ø6	–	Ø6…Ø8	–
Hexagonal key			–	–	–			–	4	4	4
Tightening torque		N.m	1.7	1.7	2.5			1.8	5: ⩽ 25 mm² 8: 35 mm²	12	12

Spring terminal connections (2) TeSys D

Flexible cable without cable end	1 conductor	mm²	2.5 (4: DT25)	4	4	4	–	10	–	–	
	2 conductors	mm²	2.5 (except DT25)	4	4	4	–	–	–	–	

Connection by bars or lugs TeSys D

Bar c.s.a.			–	–	–	–		–	–	3 x 16	5 x 25
Lug external Ø		mm	8	8	10	10		8	16.5	17	25
Ø of screw		mm	M3.5	M3.5	M4	M4		M3.5	M6	M6	M8
Screwdriver	Pozidriv		N° 2	N° 2	N° 2	N° 2		N° 2	–	–	–
	Flat screwdriver Ø		Ø6	Ø6	Ø6	Ø6		Ø6	–	Ø8	–
Key for hexagonal headed screw			–	–	–	–		–	10	10	13
Tightening torque		N.m	1.7	1.7	2.5	2.5		1.8	6	9	12

Control circuit connections

Connection by cable (tightening via screw clamps) TeSys D, TeSys D Green

Flexible cable without cable end	1 conductor	mm²	1…4	1…4	1…4	1…4		1…4	1…4	1…4	1…2.5
	2 conductors	mm²	1…4	1…4	1…4	1…4		1…4	1…4	1…4	1…2.5
Flexible cable with cable end	1 conductor	mm²	1…4	1…4	1…4	1…4		1…4	1…4	1…2.5	1…2.5
	2 conductors	mm²	1…2.5	1…2.5	1…2.5	1…2.5		1…2.5	1…2.5	1…2.5	1…2.5
Solid cable without cable end	1 conductor	mm²	1…4	1…4	1…4	1…4		1…4	1…4	1…4	1…2.5
	2 conductors	mm²	1…4	1…4	1…4	1…4		1…4	1…4	1…4	1…2.5
Screwdriver	Philips		N° 2	N° 2	N° 2	N° 2		N° 2	N° 2	N° 2	N° 2
	Flat screwdriver Ø		Ø6	Ø6	Ø6	Ø6		Ø6	Ø6	Ø6	Ø6
Tightening torque		N.m	1.7	1.7	1.7	1.7		1.7	1.7	1.7	1.2

Spring terminal connections (2) TeSys D

Flexible cable without cable end	1 conductor	mm²	2.5	2.5	2.5	2.5	–	2.5	0.75…2.5	–	–
	2 conductors	mm²	2.5	2.5	2.5	2.5	–	2.5	0.75…2.5	–	–

Connection by bars or lugs TeSys D

Lug external Ø		mm	8	8	8	8		8	8	8	8
Ø of screw		mm	M3.5	M3.5	M3.5	M3.5		M3.5	M3.5	M3.5	M3.5
Screwdriver	Pozidriv (except for D80-95 / D115-150: Philips)		N° 2	N° 2	N° 2	N° 2		N° 2	N° 2	N° 2	N° 2
	Flat screwdriver Ø		Ø6	Ø6	Ø6	Ø6		Ø6	Ø6	Ø6	Ø6
Tightening torque		N.m	1.7	1.7	1.7	1.7		1.7	1.7	1.7	1.2

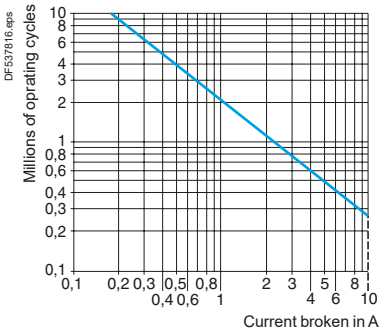
*(1) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LADALLEN4**, see page B8/28).*

(2) If cable ends are used, choose the next size down (example: for 2.5 mm², use 1.5 mm²) and square crimp the cable ends using a special tool.

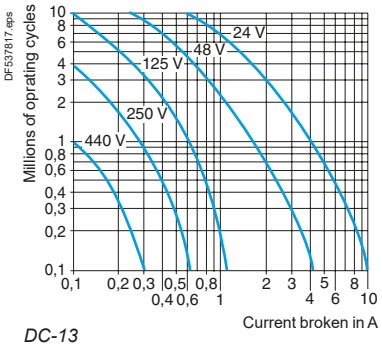
References: pages B8/4 to B8/14
Dimensions: pages B8/72 to B8/78
Schemes: pages B8/79 and B8/80

Characteristics of auxiliary contacts incorporated in the contactor

Mechanically linked contacts	Conforming to IEC 60947-5-1			Each contactor has 2 N/O and N/C contacts mechanically linked on the same movable contact holder
Mirror contact	Conforming to IEC 60947-4-1			The N/C contact on each contactor represents the state of the power contacts and can be connected to a PREVENTA safety module
Rated operational voltage (Ue)	Up to		**V**	690
Rated insulation voltage (Ui)	Conforming to IEC 60947-1		**V**	690
	Conforming to UL, CSA		**V**	600
Conventional thermal current (Ith)	For ambient temperature ≤ 60 °C		**A**	10
Frequency of the operational current			**Hz**	25…400
Minimum switching capacity λ = 10^{-8}	U min		**V**	17
	I min		**mA**	5
Short-circuit protection	Conforming to IEC 60947-5-1			gG fuse: 10 A
Rated making capacity	Conforming to IEC 60947-5-1, I rms		**A**	∼: 140, ⎓: 250
Short-time rating	Permissible for	1 s	**A**	100
		500 ms	**A**	120
		100 ms	**A**	140
Insulation resistance			**MΩ**	> 10
Non-overlap time	Guaranteed between N/C and N/O contacts		**ms**	1.5 (on energisation and on de-energisation)
Tightening torque	Pozidriv / Philips head n° 2 and Ø6		**N.m**	1.7



AC-15



DC-13

Operational power of contacts conforming to IEC 60947-5-1

a.c. supply, categories AC-14 and AC-15

Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current (cos φ 0.7) = 10 times the power broken (cos φ 0.4).

Operating cycles	V	24	48	115	230	400	440	600
1 million	**VA**	60	120	280	560	960	1050	1440
3 million	**VA**	16	32	80	160	280	300	420
10 million	**VA**	4	8	20	40	70	80	100

d.c. supply, category DC-13

Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.

Operating cycles	V	24	48	125	250	440
1 million	**W**	96	76	76	76	44
3 million	**W**	48	38	38	32	–
10 million	**W**	14	12	12	–	–

References:
pages B8/4 to B8/14
Dimensions:
pages B8/72 to B8/78
Schemes:
pages B8/79 and B8/80

Characteristics

Environment

Contact block type (not dust/damp protected)				LADN or LAD C	LADT and LADS	LADR	LAD8
Conforming to standards				IEC/EN 60947-5-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.5			
Product certifications				UL, CSA, CCC, EAC, CB certification			
Degree of protection	Conforming to IEC 60529			Protection against direct finger contact IP 2X			
Ambient air temperature around the device	Storage		°C	-60…+80			
	Operation		°C	-5…+60			
Maximum operating altitude	Without derating		m	3000			
Connection by cable	Phillips n° 2 and Ø6 mm Flexible or solid cable with or without cable end		mm²	Min: 1 x 1; max: 2 x 2.5			
Tightening torque			N.m	1.7			
Spring terminal connections	Flexible or solid cable without cable end		mm²	Max: 2 x 2.5			

Instantaneous and time delay contact characteristics

Number of contacts				1, 2 or 4	2	2	2
Rated operational voltage (Ue)	Up to		V	690			
Rated insulation voltage (Ui)	Conforming to IEC 60947-5-1		V	690			
	Conforming to UL, CSA		V	600			
Conventional thermal current (Ith)	For ambient temperature ≤ 60 °C		A	10			
Frequency of the operational current			Hz	25…400			
Minimum switching capacity		U min	V	17			
		I min	mA	5			
Short-circuit protection	Conforming to IEC 60947-5-1 gG fuse		A	10			
Rated making capacity	Conforming to IEC 60947-5-1	I rms	A	∼: 140; ⎓: 250			
Short-time rating	Permissible for	1 s	A	100			
		500 ms	A	120			
		100 ms	A	140			
Insulation resistance			MΩ	> 10			
Non-overlap time	Guaranteed between N/C and N/O contacts		ms	1.5 (on energisation and on de-energisation)			
Overlap time	Guaranteed between N/C and N/O contacts on LADC22		ms	1.5	–	–	–
Time delay (LADT, R and S contact blocks) Accuracy only valid for setting range indicated on the front face	Ambient air temperature for operation		°C	–	-40…+70	-40…+70	–
	Repeat accuracy			–	±2 %	±2 %	–
	Drift up to 0.5 million operating cycles			–	+15 %	+15 %	–
	Drift depending on ambient air temperature			–	0.25 % per °C	0.25 % per °C	–
Mechanical durability	In millions of operating cycles			30	5	5	30
Operational power of contacts				See page B8/68			

Ref.
Contactors

References: page B8/22
Dimensions: pages B8/72 and B8/73
Schemes: pages B8/79 and B8/80

Characteristics

Environment

Contact block type (dust/damp protected)			LA1DX	LA1DZ (4 contacts: 2 protected + 2 non protected)		LA1DY
			Protected	Protected	Non protected	Protected
Conforming to standards			IEC/EN 60947-5-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.5			
Product certifications			UL, CSA, CCC, EAC, CB certification			
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact IP 2X			
Ambient air temperature	Storage and operation	**°C**	-25…+70			
Cabling	Phillips n° 2 and Ø6 mm Flexible or solid conductor with or without cable end	**mm²**	Min: 1 x 1; max: 2 x 2.5			
Tightening torque		**N.m**	1.7			
Number of contacts			2	2	2	2

Contact characteristics

Rated operational voltage (Ue)	Up to		**Vac**	125	125	690	125
			Vdc	30	30		30
Rated insulation voltage (Ui)	Conforming to IEC 60947-5-1		**V**	250	250	690	250
	Conforming to UL, CSA		**V**	–	–	600	–
Conventional thermal current (Ith)	For ambient temperature ≤ 40 °C		**A**	–	–	10	–
Maximum operational current (Ie)			**mA**	100	100	–	100
Frequency of the operational current			**Hz**	–	–	25…400	–
Minimum switching capacity		U min	**V**	5	5	17	5
		I min	**mA**	1	1	5	1
Short-circuit protection	Conforming to IEC 609475-1 gG fuse		**A**	–	–	10	–
Rated making capacity	Conforming to IEC 609475-1	I rms	**A**	–	–	∿:140; ⎓: 250	–
Short-time rating	Permissible for	1 s	**A**	–	–	100	–
		500 ms	**A**	–	–	120	–
		100 ms	**A**	–	–	140	–
Insulation resistance			**MΩ**	> 10	> 10	> 10	> 10
Mechanical durability	In millions of operating cycles			5	5	30	5
Materials and technology used for dust and damp protected contacts				Gold alloy - Single break	Gold alloy - Single break	–	Gold alloy - Single break with crossed bars

Ref.
Contactors

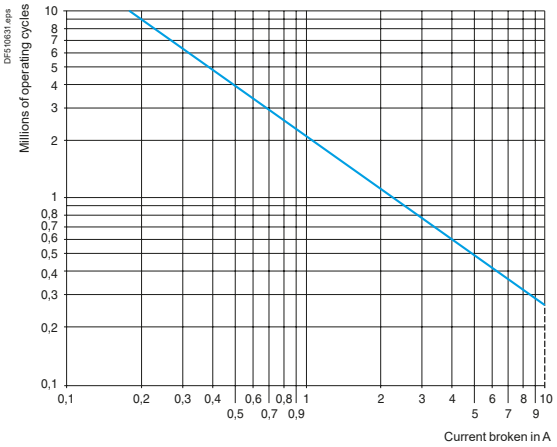
References: page B8/22
Dimensions: pages B8/72 and B8/73
Schemes: pages B8/79 and B8/80

Rated operational power of not dust/damp protected contacts (conforming to IEC 60947-5-1)

a.c. supply, categories AC-14 and AC-15

Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current (cos φ 0.7) = 10 times the power broken (cos φ 0.4).

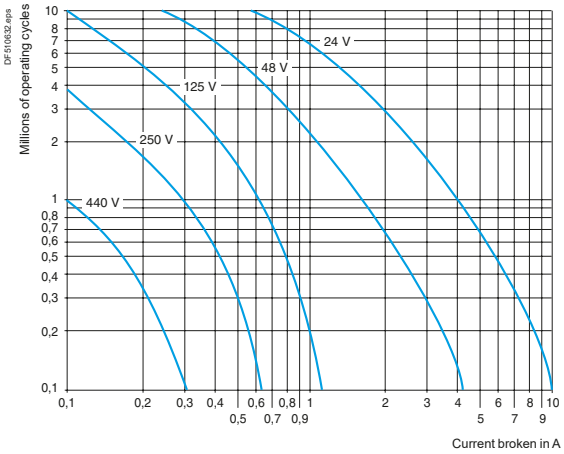
Operating cycles	V	24	48	115	230	400	440	600
1 million	**VA**	60	120	280	560	960	1050	1440
3 million	**VA**	16	32	80	160	280	300	420
10 million	**VA**	4	8	20	40	70	80	100



d.c. supply, category DC-13

Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.

Operating cycles	V	24	48	125	250	440
1 million	**W**	96	76	76	76	44
3 million	**W**	48	38	38	32	–
10 million	**W**	14	12	12	–	–



Ref.
Contactors

Characteristics

Environment

Conforming to standards			IEC/EN 60947-5-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.5
Product certifications			UL, CSA
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact IP 2X
Ambient air temperature around the device	Storage	°C	-40…+80
	Operation	°C	-25…+55
	Permissible for operation at Uc	°C	-25…+70

Suppressor modules TeSys D

Module type			LA4DA, LAD4RC, LAD4RC3	LA4DB, LAD4T, LAD4T3	LA4DC, LAD4D3	LA4DE, LAD4V, LAD4V3
Type of protection			RC circuit	Bidirectional peak limiting diode	Diode	Varistor
Rated control circuit voltage (Uc)		V	∿ 24…415	∿ or ⎓ 24…440	⎓ 12…250	∿ or ⎓ 24…250
Maximum peak voltage			3 Uc	2 Uc	Uc	2 Uc
Natural RC frequency	24/48 V	Hz	400	–	–	–
	50/127 V	Hz	200	–	–	–
	110/240 V	Hz	100	–	–	–
	380/415 V	Hz	150	–	–	–

Mechanical latch blocks (1) TeSys D, TeSys D Green

Mechanical latch block type				LAD6K10	LA6DK20
For use on contactor				**LC1D09…D80A DT20…DT80A**	**LC1D80…D150 LP1D80 and LC1D115**
Product certifications				UL, CSA	UL, CSA
Rated insulation voltage	Conforming to IEC 60947-5-1		V	690	690
Rated control circuit voltage	∿ 50/60 Hz and ⎓		V	24…415	24…415
Power required	For unlatching	∿	VA	25	25
		⎓	W	30	30
Maximum operating rate	In operating cycles/hour			1200	1200
On-load factor				10 %	10 %
Mechanical durability at Uc	In millions of operating cycles			0.5	0.5

(1) Unlatching can be manually operated or electrically controlled (pulsed).
*The **LA6DK** or **LAD6K** latch coil and the **LC1D** operating coil must not be energised simultaneously.*
*The duration of the **LA6DK** or **LAD6K** and **LC1D** control signals must be ≥ 100 ms.*

Ref.
Contactors

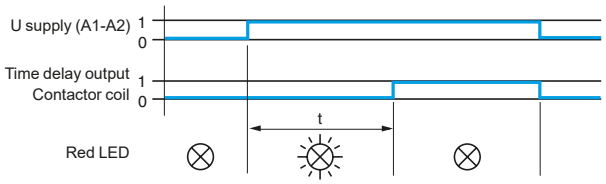
References:
pages B8/23 and B8/24
Dimensions:
pages B8/72 and B8/73
Schemes:
page B8/80

Characteristics

Environment TeSys D, TeSys D Green			
Module type			**LA4DT** (On-delay)
Conforming to standards			IEC 60255-5
Product certifications			UL, CSA
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact IP 2X
Ambient air temperature around the device	Storage	**°C**	-40…+80
	Operation	**°C**	-25…+55
	For operation at Uc	**°C**	-25…+70
Rated insulation voltage (Ui)	Conforming to IEC 60947-1	**V**	250
Cabling	Phillips n° 2 and Ø6 mm Flexible or solid conductor with or without cable end	**mm²**	Min: 1 x 1; max: 2 x 2.5
Tightening torque		**N.m**	1.7
Control circuit characteristics			
Built-in protection	Of the input		By varistor
	Contactor coil suppression		By varistor
Rated control circuit voltage (Uc)		**V**	∼ or ⎓: 24…250
Permissible variation			0.8…1.1 Uc
Type of control			By mechanical contact only
Timing characteristics			
Timing ranges		**s**	0.1…2; 1.5…30; 25…500
Repeat accuracy	0…40 °C		±3 % (10 ms minimum)
Reset time	During time delay period	**ms**	150
	After time delay period	**ms**	50
Immunity to microbreaks	During time delay period	**ms**	10
	After time delay period	**ms**	2
Minimum control pulse duration		**ms**	–
Time delay signalling	By LED		Illuminates during time delay period
Switching characteristics (solid state type)			
Maximum power dissipated		**W**	2
Leakage current		**mA**	< 5
Residual voltage		**V**	3.3
Overvoltage protection			3 kV; 0.5 joule
Electrical durability	In millions of operating cycles		30

Function diagram

Electronic on-delay timer LA4DT



References:
page B8/26
Dimensions:
pages B8/72 and B8/73
Schemes:
pages B8/79 and B8/80

Characteristics

Environment TeSys D, TeSys D Green

Conforming to standards				IEC 60255-5
Product certifications				UL, CSA
Degree of protection	Conforming to IEC 60529			Protection against direct finger contact IP 2X
Ambient air temperature around the device	Storage		°C	-40…+80
	Operation		°C	-25…+55
	Permissible for operation at Uc		°C	-25…+70

Other characteristics

Module type				LA4DFB for TeSys D With relay	LA4DWB for TeSys D, TeSys D Green Solid state
Conventional thermal current (Ith)	For ambient temperature ≤ 50 °C		A	8	
Rated insulation voltage	Conforming to IEC 60947-5-1		V	250	
Rated operational voltage	Conforming to IEC 60947-5-1		V	250	
Indication of input state				By integral LED which illuminates when the contactor coil is energised	
Input signals	Control voltage (E1-E2)		V	⎓ 24	⎓ 24
	Permissible variation		V	17…30	5…30
	Current consumption at 20 °C		mA	25	8.5 for 5 V 15 for 24 V
	State “0” guaranteed for	U	V	< 2.4	< 2.4
		I	mA	< 2	< 2
	State “1” guaranteed for	U	V	17	5
Built-in protection	Against reversed polarity			By diode	By diode
	Of the input			By diode	By diode
Electrical durability at 220 A/240 V	In millions of operating cycles			10	20
Maximum immunity to microbreaks			ms	4	1
Power dissipated	At 20 °C		W	0.6	0.4
Direct mounting on contactor	With coil	∿ 24…250 V		**LC1D80…D150**	–
		∿ 100…250 V		–	**LC1D80…D115**
		∿ 380…415 V		–	–
Mounting with cabling adapter LAD4BB	With coil	∿ 24…250 V		**LC1D09…D38, LC1DT20…DT40**	**LC1D09…D38, LC1DT20…DT40**
		∿ 380…415 V		–	–
Mounting with cabling adapter LAD4BB3	With coil	∿ 24…250 V		**LC1D40A…D80A**	**LC1D40A…D80A**
		∿ 380…415 V		**LC1D40A…D80A**	**LC1D40A…D80A**

Total operating time at Uc (of the contactor)

The operating times depend on the type of contactor electromagnet and its control mode. The closing time "C" is measured from the moment the coil supply is switched on to initial contact of the main poles. The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separate.

				LC1D09…D38, LC1DT20…DT40	**LC1D40A…D80A**	**LC1D80 and D95**	**LC1D115**	**LC1D150**
With **LA4DFB**	"C"		ms	20…30	28…34	28…43	28...58	28...43
	"O"		ms	16…24	20…24	18…32	18...32	52...87

Cabling	Phillips n° 2 and Ø6 mm Flexible or solid cable with or without cable end	mm^2	Min: 1 x 1; max: 2 x 2.5
Tightening torque		N.m	1.7

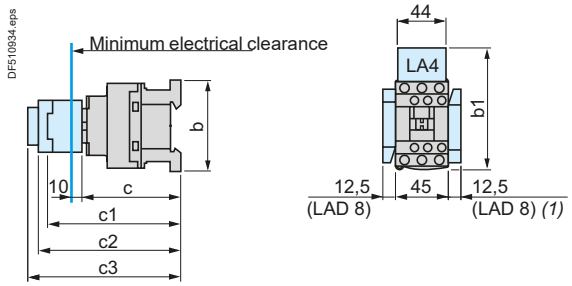
References:
page B8/26

Dimensions:
pages B8/72 and B8/73

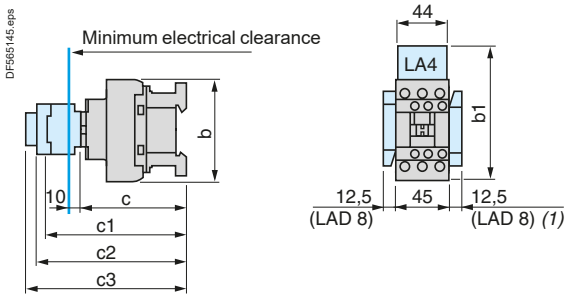
Schemes:
pages B8/79 and B8/80

Dimensions

LC1D09…D18 (3-pole)



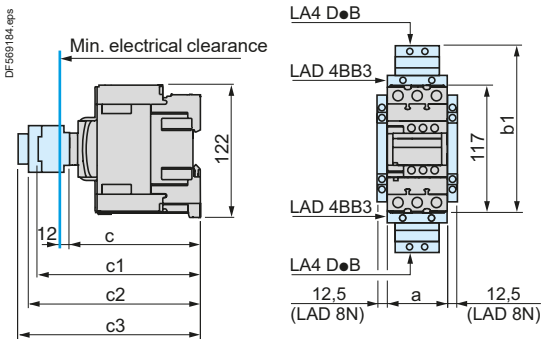
LC1D25…D38 (3-pole), **LC1DT20…DT40** (4-pole)



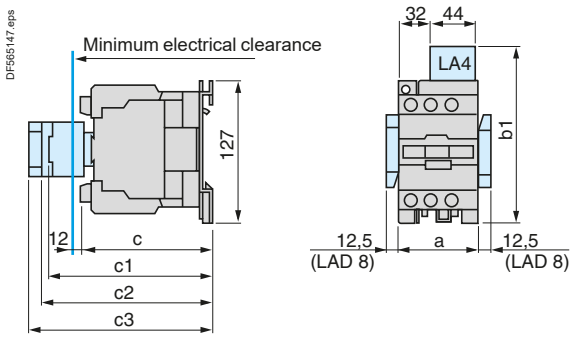
LC1		D09…D18	D093… D123	D099… D129	D25… D38	D183… D323	D098, D128, DT20 and DT25	DT203 and DT253	DT32 and DT40	D188, D258, DT323 and DT403
b	without add-on blocks	77	99	80	85	99	85	99	91	105
b1	with LAD4BB	94	107	95,5	98	107	98	–	–	–
	with LA4D●2	110 (1)	123 (1)	111.5 (1)	114 (1)	123 (1)	114	–	–	–
	with LA4DF, DT	119 (1)	132 (1)	120.5 (1)	123 (1)	132 (1)	129	–	–	–
	with LA4DW, DL	126 (1)	139 (1)	127.5 (1)	130 (1)	139 (1)	190	–	–	–
c	without cover or add-on blocks	84	84	84	90	90	90	90	97	97
	with cover, without add-on blocks	86	86	86	92	92	92	92	99	99
c1	with LADN or C (2 or 4 contacts)	117	117	117	123	123	123	123	131	131
c2	with LA6DK10, LAD6K10	129	129	129	135	135	135	135	143	143
c3	with LADT, R, S	137	137	137	143	143	143	143	151	151
	with LADT, R, S and sealing cover	141	141	141	147	147	147	147	155	155

*(1) Including **LAD4BB**.*

LC1D40A…D80A (3-pole), **LC1DT60A…DT80A** (4-pole)



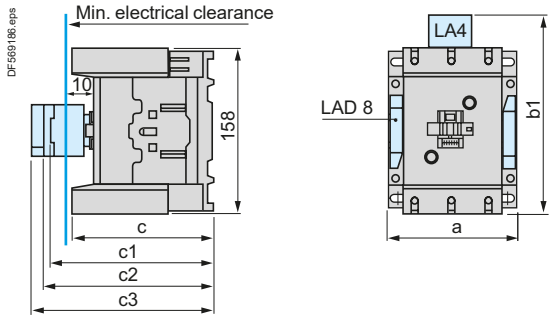
LC1D80 and **D95** (3-pole), **LC1D80004** and **D80008** (4-pole), **D40008** and **D65008** (4-pole)



LC1		D40A…D80A	DT60A…DT80A	D40008	D80	D95, D65008	D80004	D80008
a		55	70	85	85	85	96	96
b1	with LA4D●2	–	–	135	135	135	135	135
	with LA4DB3 or LAD4BB3	136	–	–	135	–	–	–
	with LA4DF, DT	157	–	142	142	142	142	142
	with LA4DM, DW, DL	166	–	150	150	150	150	150
c	without cover or add-on blocks	118	118	125	125	125	125	140
	with cover, without add-on blocks	120	120	–	130	130	–	–
c1	with LADN (1 contact)	–	–	139	150	150	150	150
	with LADN or C (2 or 4 contacts)	150	150	147	158	158	158	158
c2	with LAD6K10 or LA6DK	163	163	159	170	170	170	170
c3	with LADT, R, S	171	171	167	178	178	178	178
	with LADT, R, S and sealing cover	175	175	171	182	182	182	182

LC1D115 and **D150** (3-pole), **LC1D115004** (4-pole)

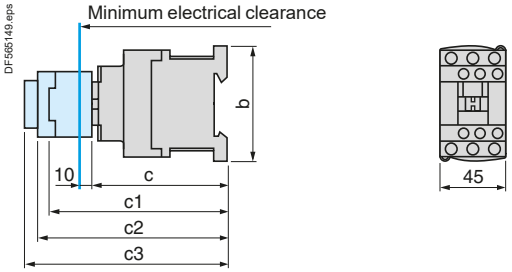
LC1		D115, D150	D115004	D1150046
a		120	150	155
b1	with LA4DA2	174	174	174
	with LA4DF, DT	185	185	185
	with LA4DM, DL	188	188	188
	with LA4DW	188	188	188
c	without cover or add-on blocks	132	132	115
	with cover, without add-on blocks	136	–	–
c1	with LADN or C (2 or 4 contacts)	150	150	150
c2	with LA6DK20	155	155	155
c3	with LADT, R, S	168	168	168
	with LADT, R, S and sealing cover	172	172	172



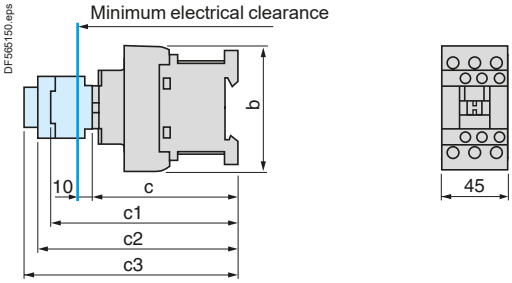
References:
pages B8/8 to B8/14
Characteristics:
pages B8/59 to B8/65
Schemes:
pages B8/79 and B8/80

Dimensions

LC1D09…D18 (3-pole)

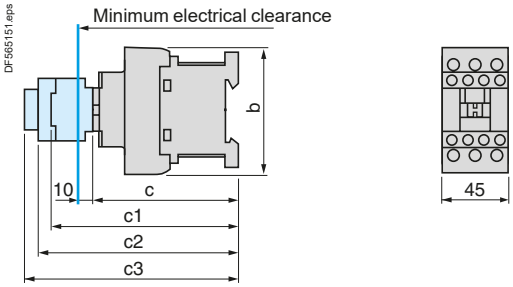


LC1D25…D38 (3-pole)



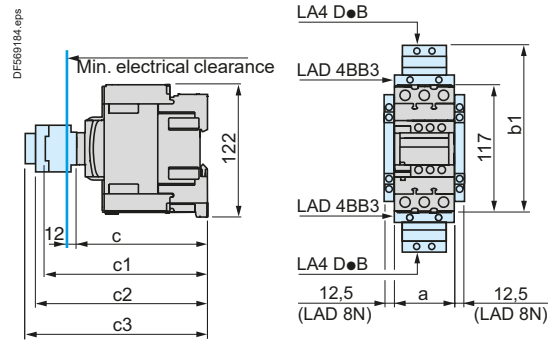
LC1		**D09…D18**	**D093…D123**	**D099…D129**	**D25…D38**	**D183…D323**
b		77	99	80	85	99
c	without cover or add-on blocks	93	93	93	99	99
	with cover, without add-on blocks	95	95	95	101	101
c1	with LADN or C (2 or 4 contacts)	126	126	126	132	132
c2	with LA6DK10	138	138	138	144	144
c3	with LADT, R, S	146	146	146	152	152
	with LADT, R, S and sealing cover	150	150	150	156	156

LC1DT20…DT40 (4-pole)

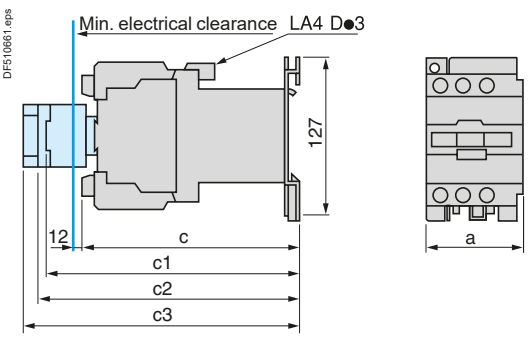


LC1		**DT20** and **DT25** **D098** and **D128**	**DT203** and **DT253** **D0983** and **D1283**	**DT32** and **DT40** **D188…D258**	**DT323** and **DT403** **D1883** and **D2583**
b		85	99	91	105
c	with cover	102	102	107	107
c1	with LADN or C (2 or 4 contacts)	123	123	131	131
c2	with LA6DK10	135	135	143	143
c3	with LADT, R, S	143	143	151	151
	with LADT, R, S and sealing cover	147	147	155	155

LC1D40A…D80A (3-pole), **LC1DT60A…DT80A** (4-pole)



LC1D80 and **D95** (3-pole), **LP1D80004, LP1D80008** (4-pole), **LP1D40008** and **D65008** (4-pole)



		LC1D40A … D80A	**LC1 DT60A…DT80A**	**LP1D40008** and **D65008**	**LC1 D80** and **D95**	**LP1D80004**	**LP1D80008**
a		55	72	85	85	96	96
b1	with LAD4BB3	136	136	–	–	–	–
	with LA4DF, DT	157	157	–	–	–	–
c	without cover or add-on blocks	118	118	182	181	181	196
	with cover, without add-on blocks	120	120	–	186	–	–
c1	with LADN (1 contact)	–	–	196	204	204	204
	with LADN or C (2 or 4 contacts)	150	150	202	210	210	210
c2	with LA6DK10	163	163	213	221	221	221
c3	with LADT, R, S	171	171	221	229	229	229
	with LADT, R, S and sealing cover	175	175	225	233	233	233

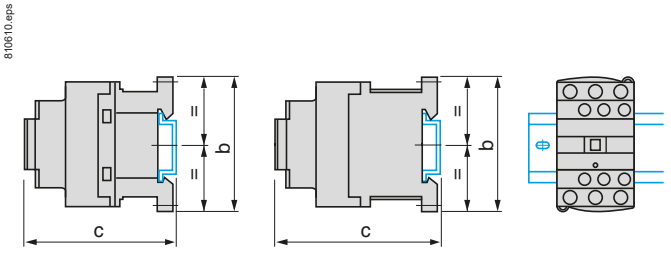
LC1D115●●● and **LC1D150●●●** with ⎓ coil: see page B8/72.

References:
pages B8/8 to B8/14
Characteristics:
pages B8/59 to B8/65
Schemes:
pages B8/79 and B8/80

Mounting

LC1D09…D38, DT20…DT40

On mounting rail NSYSDR200BD, NSYSDR200BD or NSYSDR200 (width 35 mm)



Control circuit: a.c.

LC1	D09… D18	D25… D38	DT20 and DT25	DT32 and DT40
b	77	85	85	100
c (NSYSDR200BD or NSYSDR200BD) (1)	88	94	94	109
c (NSYSDR200) (1)	96	102	102	117

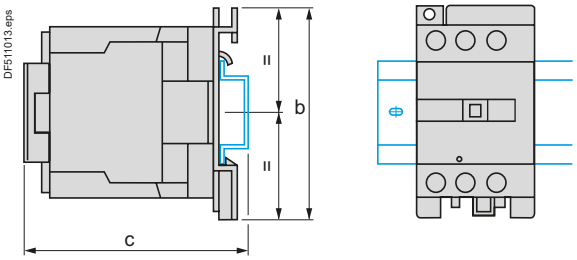
Control circuit: d.c.

LC1	D09… D18	D25… D38	DT20 and DT25	DT32 and DT40
b	77	85	94	109
c (NSYSDR200BD or NSYSDR200BD) (1)	97	103	103	118
c (NSYSDR200) (1)	105	110	111	126

(1) With safety cover.

LC1D40A…D80A, LC1DT60A and DT80A, LC1D80 and D95, LC1D40008 and D65008

On mounting rail AM1DL201 (width 75 mm) (2)
On mounting rail NSSDPR●● or NSYSDR200 (width 35 mm)



Control circuit: a.c.

LC1	D40A…D80A DT60A…DT80A	D80 and D95	D40008 and D65008
b	122	127	127
c	–	147	143
c (AM1DL201) (1)	–	137	133
c (NSSDPR●● or NSYSDR200 (1)	128	137	133

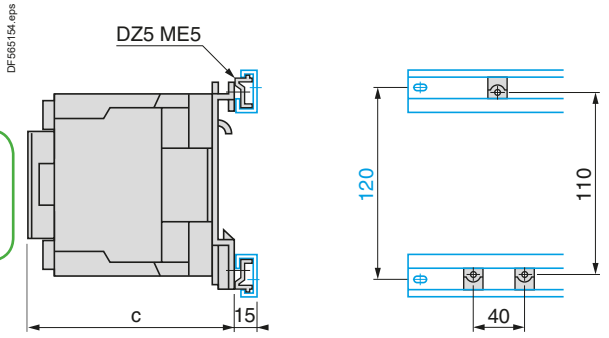
Control circuit: d.c.

LC1	D40A…D80A DT60A…DT80A	D80 and D95	D40008 and D65008
c	–	205	200
c (AM1DL201) (1)	–	195	190
c (NSSDPR●● or NSYSDR200) (1)	128	–	190

(1) With safety cover.
*(2) Except for **LC1D40A**…**D80A**, **LC1DT60A** and **DT80A**.*

LC1D80 and D95, LP1D80

On 2 mounting rails DZ5MB on 120 mm centres



Control circuit: a.c.

LC1	D80 and D95
c with cover	130

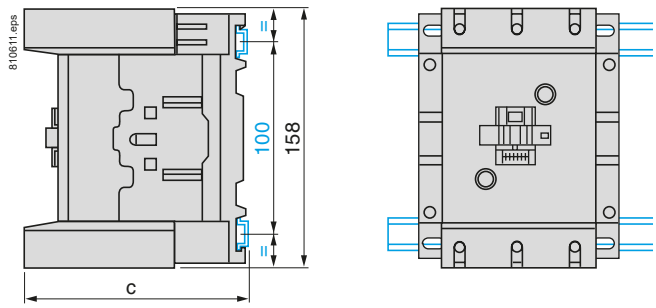
Control circuit: d.c.

LC1	D80 and D95
c with cover	186

LP1	D80
c	181

LC1D115, D150

On 2 mounting rails DZ5MB on 120 mm centres



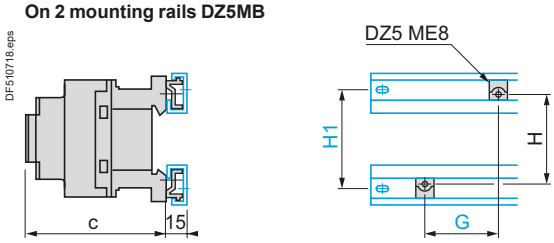
Control circuit: a.c. or d.c.

LC1	D115 and D150	D1156 and D1506
c (NSYSDR200BD or NSYSDR200BD)	134.5	117.5
c (NSYSDR200 or ED●●●)	142.5	125.5

References: pages B8/8 to B8/14
Characteristics: pages B8/59 to B8/65
Schemes: pages B8/79 and B8/80

LC1D09…D38 and LC1DT20…DT40

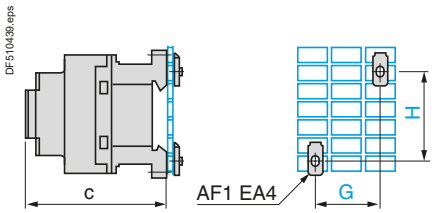
On 2 mounting rails DZ5MB



Control circuit:	a.c.		d.c.	
LC1	D09…D18	D25…D38	D09…D18	D25…D38
c with cover	86	92	95	101
G	35	35	35	35
H	60	60	70	70
H1	70	70	70	70
4-pole contactors				
LC1	DT20 and DT25	DT32 and DT40	DT20 and DT25	DT32 and DT40
c	92	100	101	109
G	35	35	35	35
H	60	60	70	70
H1	70	70	70	70

LC1D09…D38 and LC1DT20…DT40

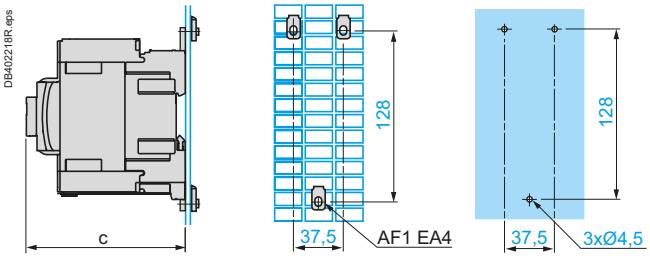
On pre-slotted mounting plate AM1 PA, PB, PC



Control circuit:	a.c		d.c	
LC1	D09…D18	D25…D38	D09…D18	D25…D38
c with cover	86	92	95	101
G	35	35	35	35
H	60/70	60/70	70	70
LC1	DT20 and DT25	DT32 and DT40	DT20 and DT25	DT32 and DT40
c with cover	80	93	118	132
G	35	35	35	35
H	60	60	70	70

LC1D40A…D80A, LC1DT60A…DT80A

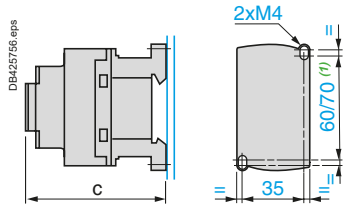
On pre-slotted mounting plate AM1 PA, PB, PC and panel mounted



Control circuit:	a.c	d.c.
LC1	D40A…D80A, DT60A…DT80A	D40A…65A, DT60A…DT80A
c with cover	120	120

LC1D09…D38, LC1DT20…DT40

Panel mounted

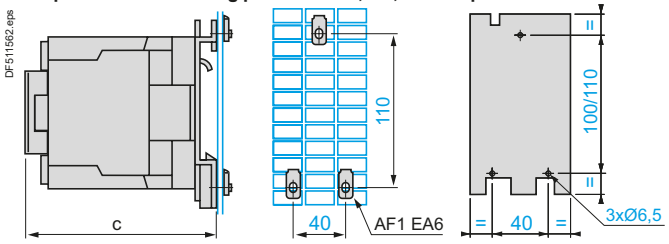


(1) for DC coil: 70 mm only.

Control circuit:	a.c		d.c	
LC1	D09…D18	D25…D38	D09…D18	D25…D38
c with cover	86	92	95	101
4-pole contactors				
LC1	DT20 and DT25	DT32 and DT40	DT20 and DT25	DT32 and DT40
c with cover	90	98	90	98

LC1D80 and D95, LC1D40008 and D65008, LP1D80

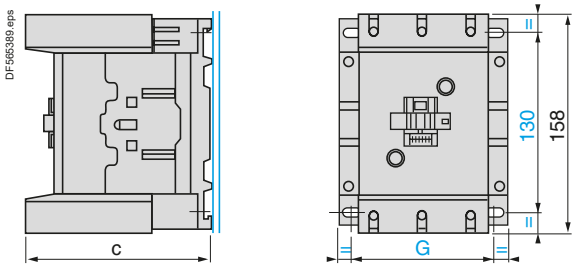
On pre-slotted mounting plate AM1 PA, PB, PC and panel mounted



Control circuit:	a.c	d.c.
LC1	D80 and D95, D40008 and D65008	D80 and D95 D40008 and D65008
c with cover	130	186
LP1	– –	D80
c without cover	– –	181

LC1D115, D150

Panel mounted



LC1	D115	D1156	D150	D1506
c	132	115	132	115
G (3-pole)	96/110	96/110	96/110	96/110
G (4-pole)	130/144	130/144	–	–

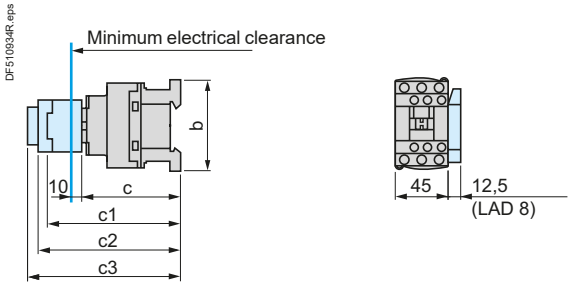
References:
pages B8/8 to B8/14

Characteristics:
pages B8/59 to B8/65

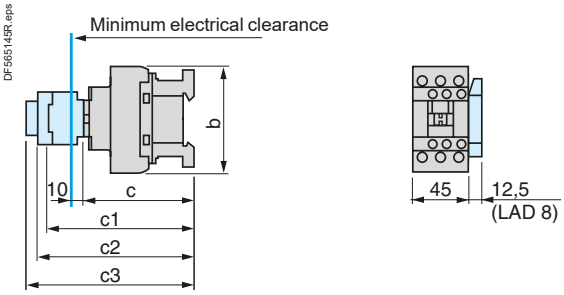
Schemes:
pages B8/79 and B8/80

Dimensions

LC1D09…D18 (3-pole), with AC/DC compatible coil

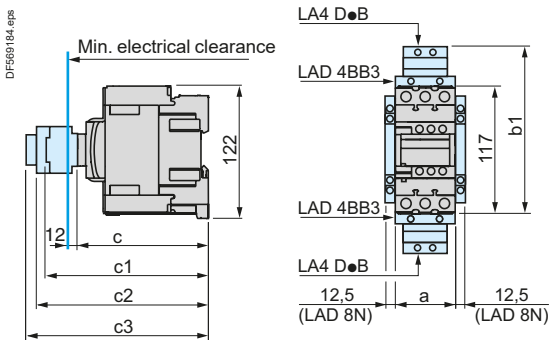


LC1D25…D38 (3-pole), with AC/DC compatible coil



LC1		D09…D18	D25…D38
b	without add-on blocks	77	85
c	without cover or add-on blocks	84	90
	with cover, without add-on blocks	86	92
c1	with LADN or C (2 or 4 contacts)	117	123
c2	with LA6DK10	129	135
c3	with LADT, R, S	137	143
	with LADT, R, S and sealing cover	141	147

LC1D40A…D80A (3-pole), LC1DT60A…DT80A (4-pole), with AC/DC compatible coil



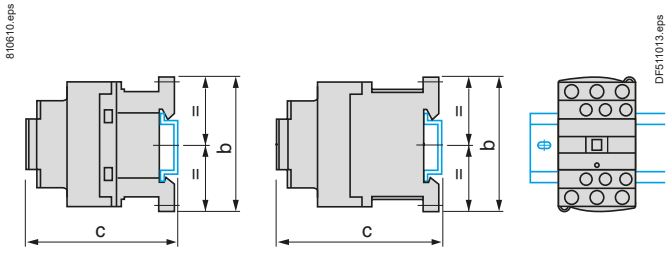
LC1		D40A…D80A	DT60A…DT80A
a		55	70
b1	LAD4BB3	136	–
	with LAD4DWB	166	–
c	without cover or add-on blocks	118	118
	with cover, without add-on blocks	120	120
c1	with LADN (1 contact)	–	–
	with LADN or C (2 or 4 contacts)	150	150
c2	with LAD6K10	163	163
c3	with LADT, R, S	171	171
	with LADT, R, S and sealing cover	175	175

Ref.
Contactors

Mounting

LC1D09…D38 (3-pole), with AC/DC compatible coil

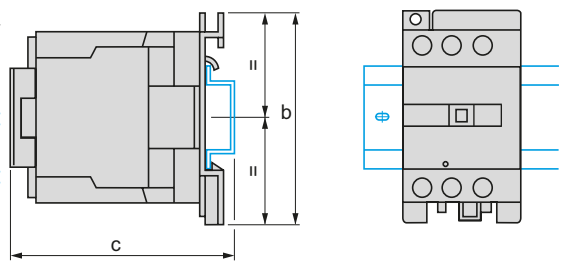
On mounting rail NSYSDR200BD, NSYSDR200BD or NSYSDR200 (width 35 mm)



LC1	D09…D18	D25…D38
b	77	85
c (NSYSDR200BD or NSYSDR200BD)	88	94
c (NSYSDR200)	96	102

LC1D40A…D80A (3-pole), **LC1DT60A** and **DT80A** (4-pole), with AC/DC compatible coil

On mounting rail AM1DL201 (width 75 mm) (2)
On mounting rail NSSDPR●● or NSYSDR200 (width 35 mm)

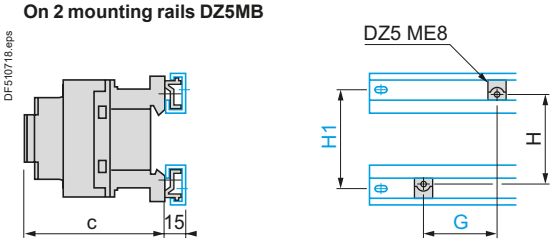


LC1	D40A…D80A DT60A…DT80A
b	122
c	–
c (AM1DL201)	–
c (NSSDPR●● or NSYSDR200)	128

Ref.
Contactors

LC1D09…D38 (3-pole), with AC/DC compatible coil

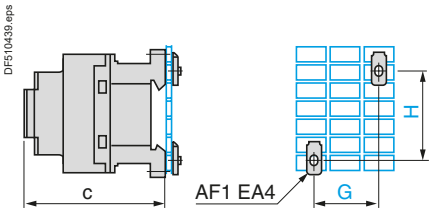
On 2 mounting rails DZ5MB



LC1	D09…D18	D25…D38
c with cover	86	92
G	**35**	**35**
H	60	60
H1	**70**	**70**

LC1D09…D38 (3-pole), with AC/DC compatible coil

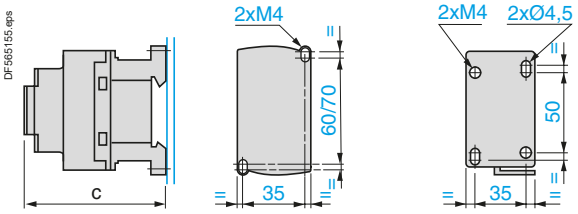
On pre-slotted mounting plate AM1PA, PB, PC



LC1	D09…D18	D25…D38
c with cover	86	92
G	**35**	**35**
H	60/70	60/70

LC1D09…D38 (3-pole), with AC/DC compatible coil

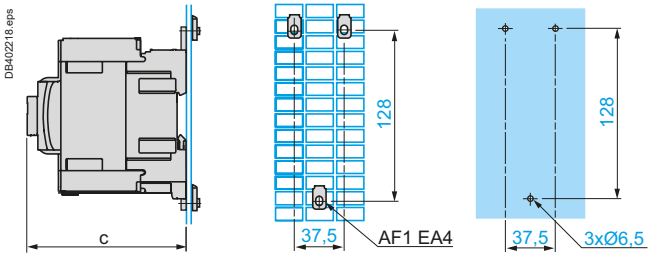
Panel mounted



LC1	D09…D18	D25…D38
c with cover	86	92

LC1D40A…D80A (3-pole), LC1DT60A…DT80A (4-pole), with AC/DC compatible coil

On pre-slotted mounting plate AM1PA, PB, PC and panel mounted



LC1	D40A…D80A , DT60A…DT80A
c with cover	120

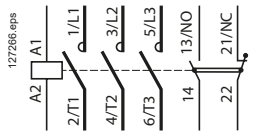
Ref.
Contactors

Schemes

Contactors

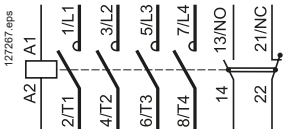
TeSys D, TeSys D Green 3-pole contactors (References: pages B8/8 to B8/11)

LC1D09 to D150

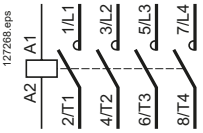


TeSys D 4-pole contactors (References: pages B8/12 and B8/13)

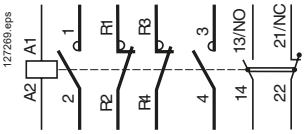
LC1DT20 to DT80A



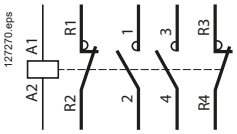
LC1D115004



LC1D098 to D258



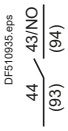
LC1 and LP1D40008 to D80008



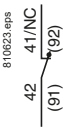
Front mounting add-on contact blocks

Instantaneous auxiliary contacts for TeSys D, TeSys D Green (References: page B8/22)

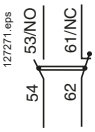
1 N/O LADN10 (1)



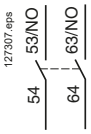
1 N/C LADN01 (1)



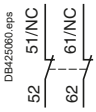
1 N/O + 1 N/C LADN11



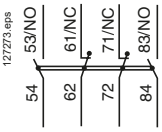
2 N/O LADN20



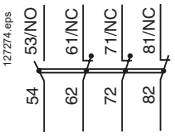
2 N/C LADN02



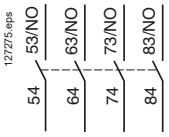
2 N/O + 2 N/C LADN22



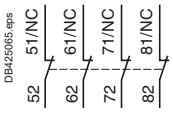
1 N/O + 3 N/C LADN13



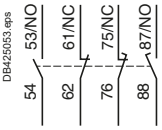
4 N/O LADN40



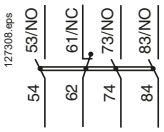
4 N/C LADN04



2 N/O + 2 N/C including 1 N/O + 1 N/C make before break LADC22

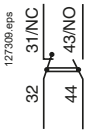


3 N/O + 1 N/C LADN31

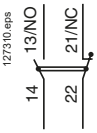


Instantaneous auxiliary contacts conforming to standard EN 50012 for TeSys D, TeSys D Green (References: page B8/22)

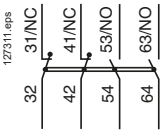
1 N/O + 1 N/C LADN11G



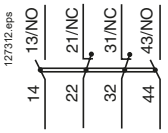
1 N/O + 1 N/C LADN11P



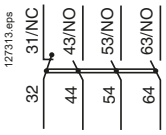
2 N/O + 2 N/C LADN22G



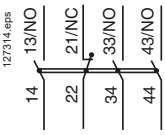
2 N/O + 2 N/C LADN22P



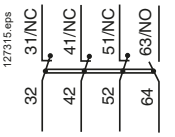
3 N/O + 1 N/C LADN31G



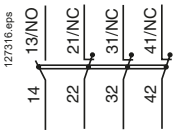
3 N/O + 1 N/C LADN31P



1 N/O + 3 N/C LADN13G



1 N/O + 3 N/C LADN13P



(1) Items in brackets refer to blocks mounted on right-hand side of contactor.

References:
pages B8/8 to B8/26

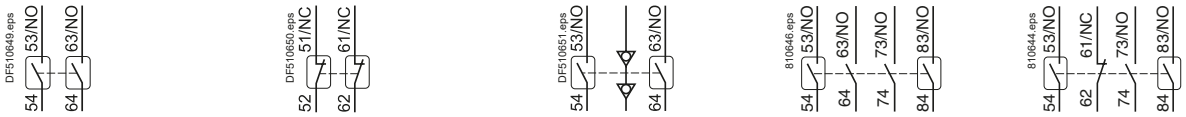
Characteristics:
pages B8/59 to B8/71

Dimensions:
pages B8/72 to B8/78

Front mounting add-on contact blocks for TeSys D, TeSys D Green

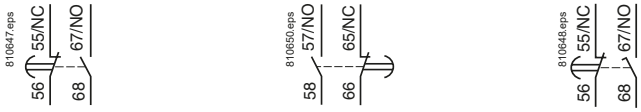
Dust and damp protected instantaneous auxiliary contacts (References: page B8/22)

2 N/O (24-50 V)	2 N/C (24-50 V)	2 N/O (5-24V) with 2 cable screen terminals	2 N/O protected (24-50 V) 2 N/O standard	2 N/O protected (24-50 V) + 1 N/O + 1 N/C standard
LA1DX20	LA1DX02	LA1DY20	LA1DZ40	LA1DZ31



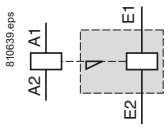
Time delay auxiliary contacts (References: page B8/23)

On-delay 1 N/O + 1 N/C	Off-delay 1 N/O + 1 N/C	On-delay 1 N/C + 1 N/O break before make
LADT	LADR	LADS



Mechanical latch blocks for TeSys D, TeSys D Green (References: page B8/23)

LAD6K10 and LA6DK20

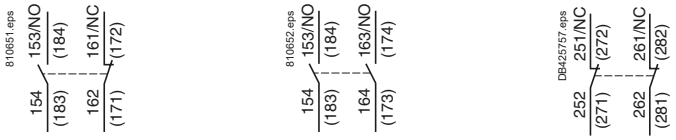


Ref.

Side mounting add-on contact blocks for TeSys D, TeSys D Green

Instantaneous auxiliary contacts (References: page B8/22)

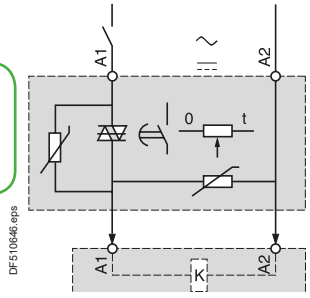
1 N/O + 1 N/C LAD8N11 (1)	2 N/O LAD8N20 (1)	2 N/C LAD8N02 (1)



(1) Items in brackets refer to blocks mounted on right-hand side of contactor.

Electronic serial timer modules for TeSys D, TeSys D Green

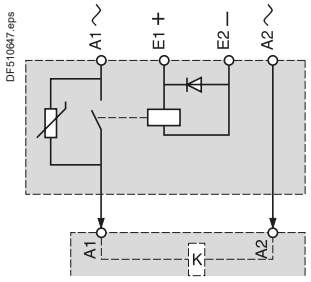
On-delay LA4DT●U



Interface modules

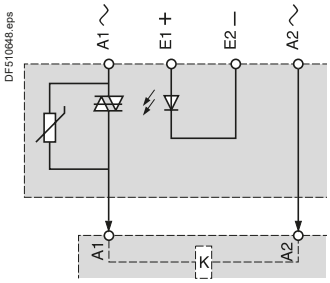
Relay output for TeSys D

LA4DFB



Solid state for TeSys D, TeSys D Green

LA4DWB



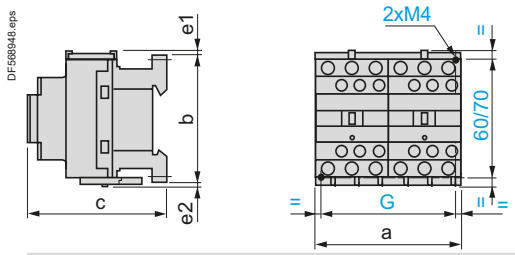
References: page B8/85.

References: pages B8/22 to B8/26
Characteristics: pages B8/66 to B8/70
Dimensions: pages B8/72 and B8/73, B8/76

Dimensions

LC2D09 to D38 TeSys D, TeSys D Green

2 x **LC1D09 to D38**



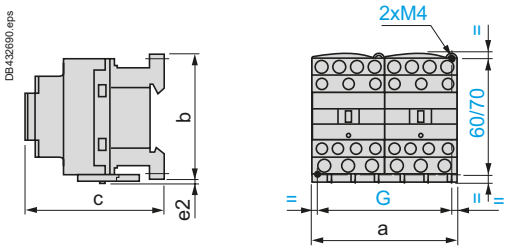
LC2 or 2 x LC1	a	b	c (1)	e1	e2	G
D09 to D18 AC, AC/DC	90	77	86	4	1.5	80
D093 to D123 AC	90	99	86	–	–	80
D09 to D18 DC	90	77	95	4	1.5	80
D093 to D123 DC	90	99	95	–	–	80
D25 to D38 AC, AC/DC	90	85	92	9	5	80
D183 to D383 AC	90	99	92	–	–	80
D25 to D32 DC	90	85	101	9	5	80
D183 to D383 DC	90	99	101	–	–	80

e1 and e2: including cabling.

(1) With safety cover, without add-on block.

LC2DT20 to DT40 TeSys D

2 x **LC1DT20 to DT40**

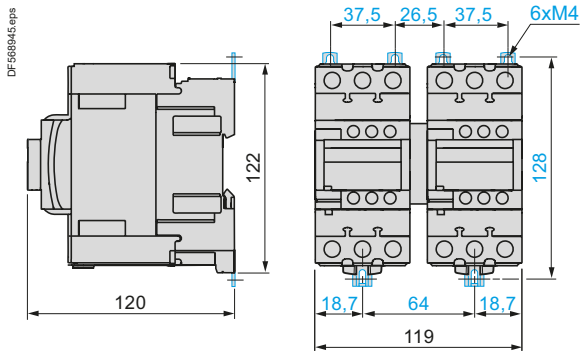


LC2 or 2 x LC1	a	b	c	G	e2
DT20 and DT25 AC	90	85	92	80	20
DT32 and DT40 AC	90	91	99	80	22
DT20 and DT25 DC	90	85	102	80	20
DT32 and DT40 DC	90	91	109	80	22

c, e: including cabling.

LC2D40A to D80A for TeSys D, TeSys D Green

2 x **LC1D40A to D80A**

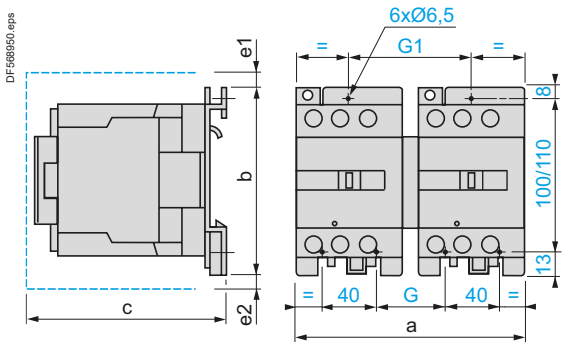


Ref.
Contactors

Dimensions

LC2D80 and D95

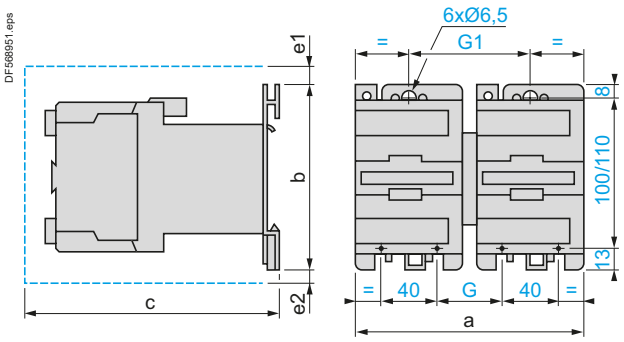
2 x **LC1D80 and D95** ∿



LC2 or 2 x **LC1**	**a**	**b**	**c**	**e1**	**e2**	**G**	**G1**
D80 and D95 ∿	182	127	158	13	–	**57**	**96**
D80004 ∿	207	127	158	–	20	**71**	**111**

c, e1 and e2: including cabling.

2 x **LC1D80 and D95** ⎓

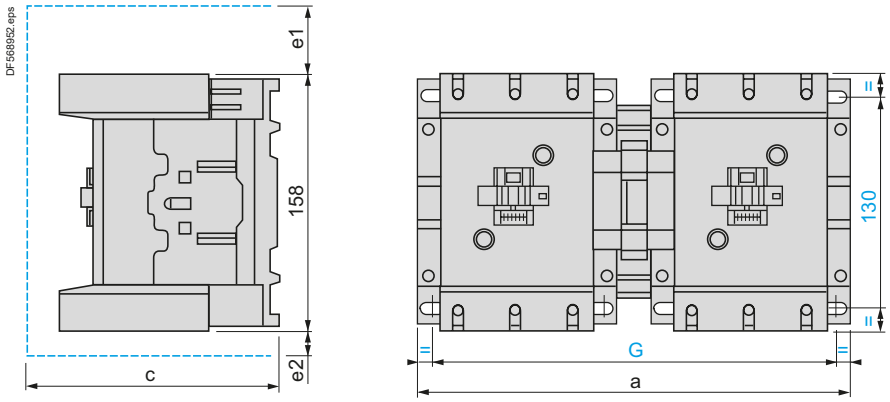


2 x **LC1**	**a**	**b**	**c**	**e1**	**e2**	**G**	**G1**
D80 and D95	207	127	215	13	20	**96**	**111**

c, e1 and e2: including cabling.

LC2D115 and D150

2 x **LC1D115 and D150**



LC2 or 2 x **LC1**	**a**	**c**	**e1**	**e2**	**G**
D115 and D150	266	148	56	18	**242/256**
D115004	334	148	–	60	**310/324**

c, e1 and e2: including cabling.

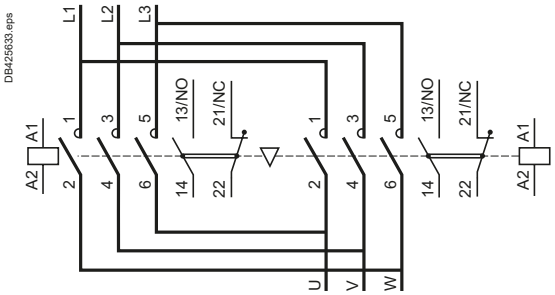
Ref.
Contactors

Schemes

Reversing contactors for motor control

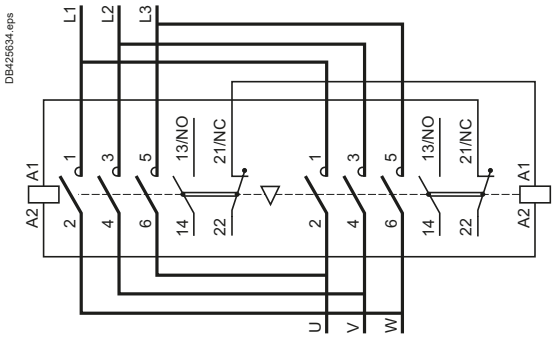
LC2D09...D80A TeSys D , TeSys D Green LC2D80...D150 TeSys D

Horizontally mounted



LAD9R1V TeSys D, TeSys D Green

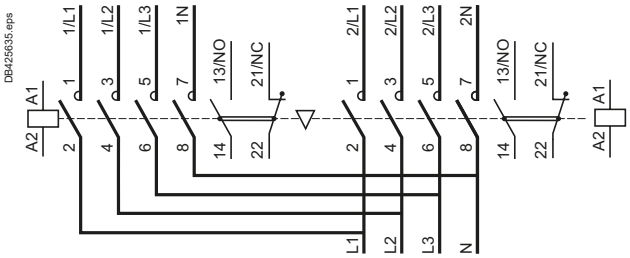
With integral electrical interlocking



Changeover contactor pairs TeSys D

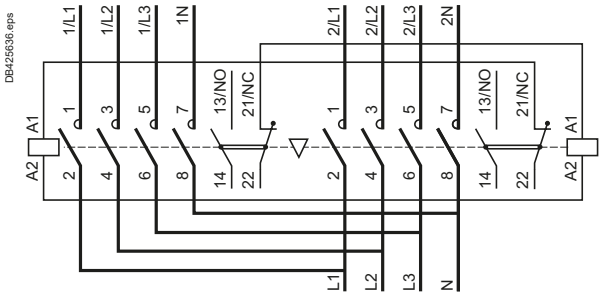
LC2DT20…DT40

Horizontally mounted



LADT9R1V

With integral electrical interlocking

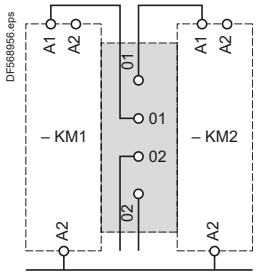


Ref.
Contactors

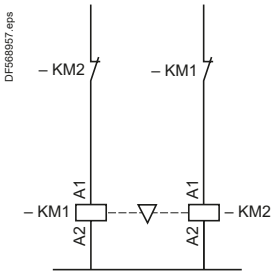
Schemes

Electrical interlocking of TeSys D, TeSys D Green reversing contactors fitted with:

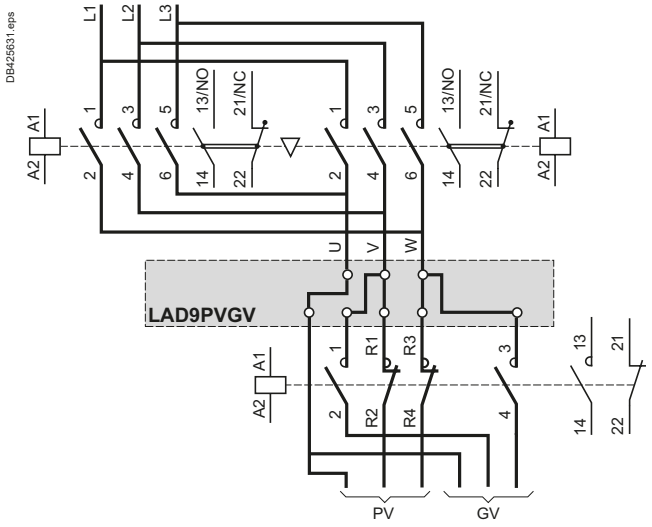
Mechanical interlock with integral electrical contacts
LA9D4002, LA9D8002 and LA9D11502



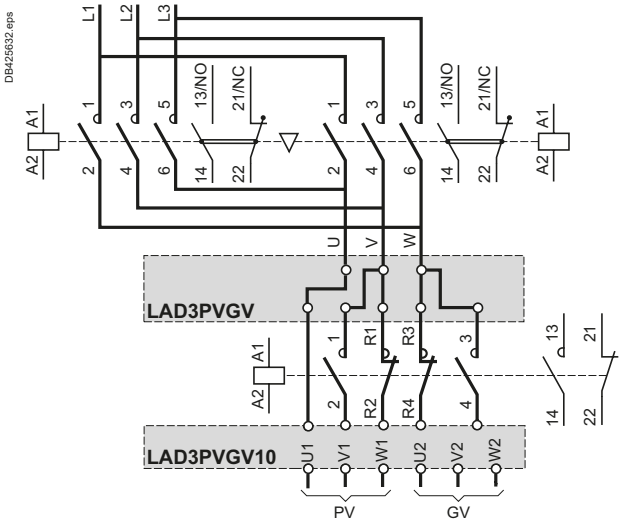
Mechanical interlock without integral electrical contacts
LAD9V2, LAD4CM, LA9D50978 and LA9D80978



Low speed - High speed cabling kit, screw clamp terminals for LC1D09... D38 contactors (TeSys D, TeSys D Green)



Low speed - High speed cabling kit, spring terminals for LC1D09... D38 contactors (TeSys D)

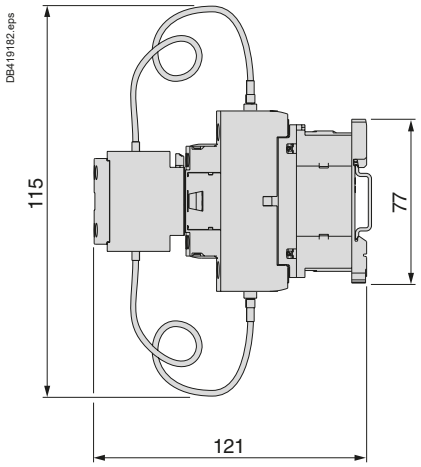


Ref.
Contactors

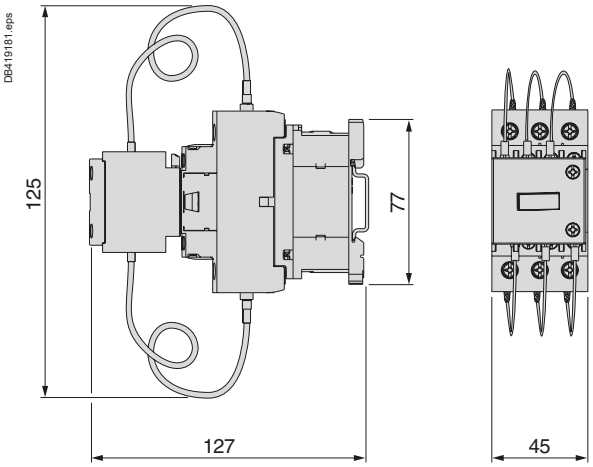
Dimensions and scheme

Dimensions

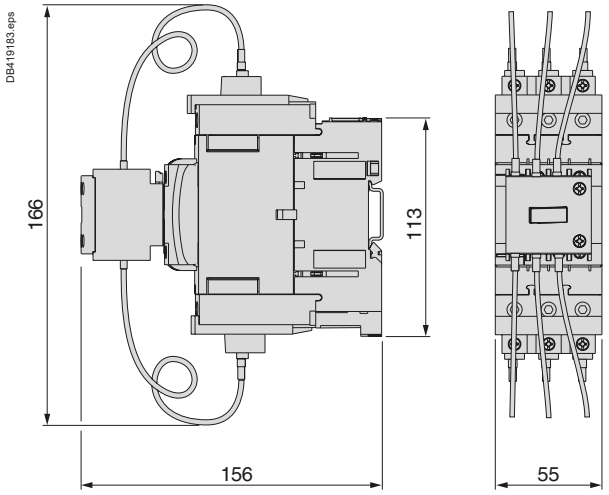
LC1DFK



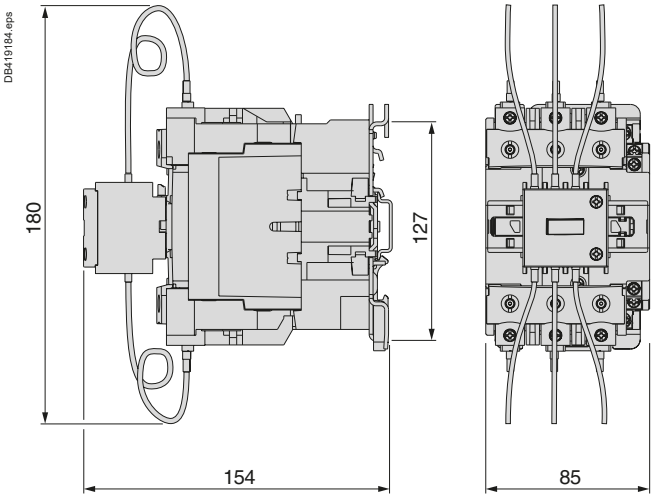
LC1DGK, DLK, DMK



LC1DPK, DTK

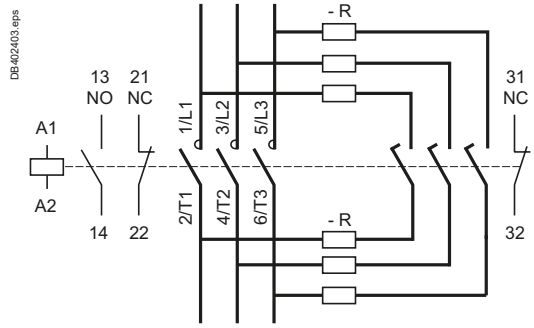


LC1DWK



Scheme

LC1D●K

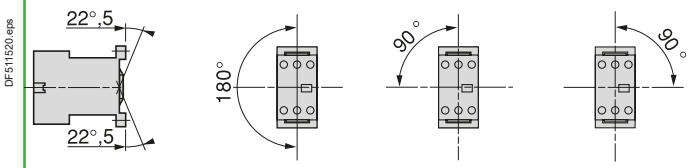


R = Pre-wired resistor connections.

References:
page B8/20

Characteristics

Environment

Rated insulation voltage (Ui)	Conforming to 60947	**V**	690
Conforming to standards			IEC/EN 60947-4-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1
Approvals			cULus, CCC, EAC, CB certification
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact IP2x
Ambient air temperature around the device	Storage	**°C**	-50…+70
	Operation	**°C**	-20…+50
Maximum operating altitude	Without derating	**m**	2000
Operating position			**Vertical axis** **Horizontal axis**  Without derating Without derating

Cabling, screw clamp terminals			Min	Max
	Solid conductor	**mm²**	1 x 1.5 or 2 x 1.5	1 x 6 or 2 x 4
	Flexible cable without cable end	**mm²**	1 x 0.5 or 2 x 0.35	1 x 6 or 2 x 2.5
	Flexible cable with cable end	**mm²**	1 x 0.35 or 2 x 0.35	1 x 6 or 2 x 1.5
Tightening torque	Pozidriv n° 1 head	**N.m**	0.8	
Terminal referencing			Conforming to standards En 50005	

Ref.
Contactors

Characteristics

Pole characteristics

Conventional thermal current (Ith)	For ambient temperature ≤ 55 °C	**A**	12
Rated operational frequency		**Hz**	50/60
Frequency limits of the operational current		**Hz**	Up to 400
Rated operational voltage (Ue)		**V**	690
Rated making capacity	I rms conforming to IEC 60947-1	**A**	66
Rated breaking capacity (for Ue ≤ 400 V)	Conforming to IEC 60947-1	**A**	52
Short time rating	In free air for a time "t" from cold state (θ ≤ 55 °C)	**A**	50
Short-circuit protection	gl fuse U ≤ 440 V	**A**	16
Average impedance per pole	At Ith and 50 Hz	**mΩ**	4
Maximum rated operational current			
For a temperature ≤ 55 °C	AC-3 (1) (Ue ≤ 400 V)	**A**	6
	AC-1	**A**	12
Utilisation in category AC-1 resistive circuits, heating, lighting (Ue ≤ 440 V)	Increase in operational current by paralleling of poles	**A**	20

Auxiliary contact characteristics of add-on blocks

Rated operational voltage (Ue)	Up to	**V**	690
Rated insulation voltage (Ui)	Conforming to IEC 60947, IEC 60947-1	**V**	690
Conventional thermal current (Ith)	For ambiant temperature ≤ 55 °C	**A**	10
Frequency of operational current		**Hz**	Up to 400
Short-circuit protection	Conforming to IEC 60947 and IEC 60947-1, gl fuse	**A**	10

Operational power of contacts conforming to IEC 60947

a.c. supply, category AC-15

Electrical durability (valid up to 3600 operating cycles per hour) on an inductive load such as the coil of an electromagnet: making current (cos φ 0.7) = 10 times the breaking current (cos φ 0.4).

	V	24	48	110/127	220/230	380/400	440
1 million operating cycles	**VA**	48	96	240	440	800	880
3 million operating cycles	**VA**	17	34	86	158	288	317
10 million operating cycles	**VA**	7	14	36	66	120	132
Occasional making capacity	**VA**	1000	2050	5000	10000	14000	13000

d.c. supply, category DC-13

Electrical durability (valid up to 1200 operating cycles per hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.

	V	24	48	110	220	440	440
1 million operating cycles	**W**	120	80	60	52	51	880
3 million operating cycles	**W**	55	38	30	28	26	317
10 million operating cycles	**W**	15	11	9	8	7	132
Occasional making capacity	**W**	720	600	400	300	230	13000

(1) For LC1 contactors.

References: pages B8/37 and B8/38
Curves: page B8/89
Dimensions: page B8/90
Schemes: page B8/90

Characteristics

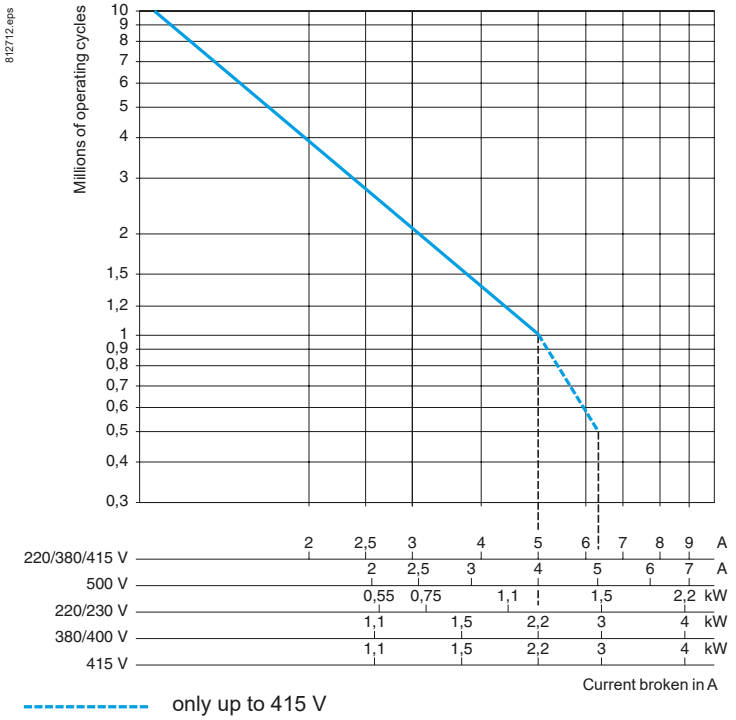
Control circuit characteristics

Type			LC1SK06	LP1SK06
Rated control circuit voltage (Uc)		**V**	∼ 24…400	⎓ 12…72
Control voltage limits (q ≤ 50 °C)	For operation		0.85…1.1 Uc	0.85…1.1 Uc
	For drop-out		≥ 0.20 Uc	≥ 0.10 Uc
Average coil consumption at 20 °C and at Uc	Inrush		16 VA	2.2 W
	Sealed		4.2 VA	2.2 W
Heat dissipation		**W**	1.4	2.2
Operating time at 20 °C and at Uc				
Between coil energisation and	opening of the N/C contacts	**ms**	8…16	10…18
	closing of the N/O contacts	**ms**	7…14	8…12
Between coil de-energisation and	opening of the N/O contacts	**ms**	6…8	4…6
	closing of the N/C contacts	**ms**	8…10	6…8
Maximum operating rate	In operating cycles per hour		1200	1200
Mechanical durability at Uc In millions of operating cycles	50/60 Hz coil		10	–
	⎓ coil		–	10

Ref.
Contactors

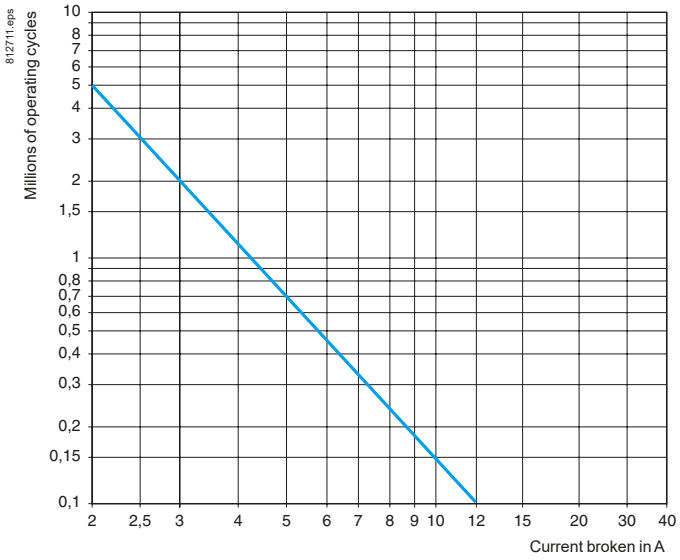
Use in category AC-3 (Ue ⩽ 440 V)

Control of 3-phase asynchronous squirrel cage motors with breaking whilst running.
The current broken (Ic) in category AC-3 is equal to the rated operational current (Ie) of the motor.



Use in category AC-1 (Ue ⩽ 440 V)

Control of resistive circuits (cos φ ⩾ 0.95).
The current broken (Ic) in category AC-1 is equal to the current (Ie) normally drawn by the load.

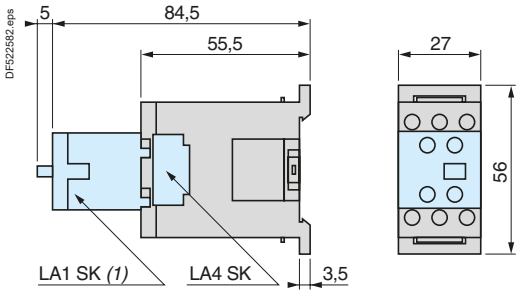


Ref.
Contactors

Dimensions

Mini-contactors

LC1 and LP1SK06



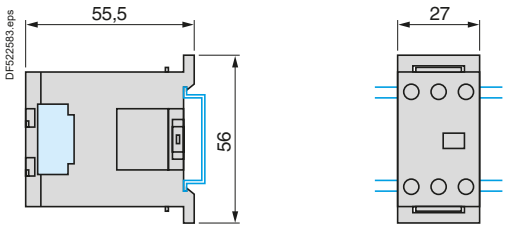
*(1) Only on **LC1SK06**.*

Mounting

Mini-contactors

LC1 and LP1SK06

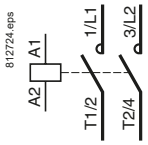
On mounting rail NSYSDR200BD or NSYSDR200 (ـــ 35 mm)



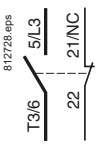
Schemes

2-pole mini-contactors

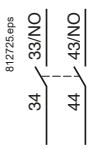
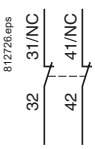
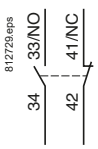
LC1 and LP1SK06



Add-on power pole block

1 pole + 1 “N/O” aux.	1 pole + 1 “N/C” aux.
LA1SK10	**LA1SK01**
	

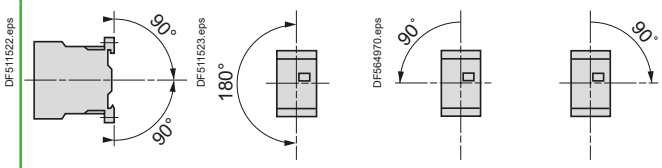
Instantaneous auxiliary contacts

2 “N/O”	2 “N/C”	1 “N/O” + 1 “N/C”
LA1SK20	**LA1SK02**	**LA1SK11**
		

Ref.
Contactors

Characteristics

Environment characteristics

Conforming to standards			IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.4
Product certifications	LC● and LP●K06 to K12		UL, CSA, CCC, EAC, CB certification
	LC● and LP●K16		CB certification, CCC, EA
Operating positions			Vertical axis / Horizontal axis  *Without derating* — *Without derating* — *Possible positions for* **LC●K** *only. Contactor pull-in voltage: 0.85 Uc*

Connection			**Min.**	**Max.**	**Max. to IEC 60947**
Screw clamp terminals	Solid conductor	**mm²**	1 x 1.5	2 x 4	1 x 4 + 1 x 2.5
	Flexible conductor without cable end	**mm²**	1 x 0.75	2 x 4	2 x 2.5
	Flexible conductor with cable end	**mm²**	1 x 0.34	1 x 1.5 + 1 x 2.5	1 x 1.5 + 1 x 2.5
Spring terminals	Solid conductor	**mm²**	1 x 0.75	1 x 1.5	2 x 1.5
	Flexible conductor without cable end	**mm²**	1 x 0.75	1 x 1.5	2 x 1.5
Faston connectors	Clip	**mm**	2 x 2.8 or 1 x 6.35		
Solder pins for printed circuit board			With locating device between power and control circuits pins length 5 mm Recommended minimum width and thickness layer for power printed circuit board track : 4mm x 35 microns		
Tightening torque	of screw-clamp terminals only Philips head n° 2 and Ø6	**N.m**	0.8		
Terminal referencing	Conforming to standards EN 50005 and EN 50012		Up to 5 contacts, depending on model		
Rated insulation voltage (Ui)	Conforming to IEC 60947-4-1	**V**	690		
	Conforming to CSA 22-2 n° 60947-4-1, UL 60947-4-1	**V**	600		
Rated impulse withstand voltage (Uimp)		**kV**	8		
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact IP2x		
Ambient air temperature around the device	Storage	**°C**	-50…+80		
	Operation	**°C**	-25…+50 in AC3, -25…+60 in AC1		
Maximum operating altitude	Without derating	**m**	2000		
Vibration resistance 5 ... 300 Hz	Contactor open		2 gn		
	Contactor closed		4 gn		
Flame resistance	according to IEC 60695-2-10	**°C**	850		
Shock resistance (1/2 sine wave, 11 ms)	Contactor open		On X axis: 6 gn On Y and Z axes: 10 gn		
	Contactor closed		On X axis: 10 gn On Y and Z axes: 15 gn		

References:
pages B8/39 to B8/46

Dimensions:
pages B8/95 and B8/97

Schemes:
pages B8/96 and B8/98

Characteristics

Pole characteristics

Type				K06	K09	K12	K16
Conventional thermal current (Ith)	For ambient temperature ≤ 60 °C		A	20 (1)			
Rated operational frequency			Hz	50/60			
Frequency limits of the operational current			Hz	Up to 400			
Rated operational voltage (Ue)			V	690			
Rated making capacity	I rms conforming to IEC 60947		A	110	110	144	160
Rated breaking capacity	I rms conforming to IEC 60947	220/230 V	A	110	110	–	–
		380/400 V	A	110	110	–	–
		415 V	A	110	110	–	–
		440 V	A	110	110	110	110
		500 V	A	80	80	80	80
		660/690 V	A	70	70	70	70
Permissible short time rating	In free air for a time "t" from cold state (θ ≤ 50 °C)	1 s	A	90	90	115	115
		5 s	A	85	85	105	105
		10 s	A	80	80	100	100
		30 s	A	60	60	75	75
		1 min	A	45	45	55	55
		3 min	A	40	40	50	50
		≥ 15 min	A	20	20	25	25
Short-circuit protection	gG fuse U ≤ 440 V (aM fuse, see page 22009/2)		A	25			
Average impedance per pole	At Ith and 50 Hz		mΩ	3			
Use in category AC-1 resistive circuits, heating, lighting (Ue ≤ 440 V)	Maximum rated operational current for a temperature ≤ 50 °C		A	20			
	Maximum rated operational current for a temperature ≤ 70 °C		A	16 for Ue only			
	Rated operational current limits in relation to the on-load factor and operating frequency			On-load factor		90 %	60 % 30 %
			A	300 operating cycles/hour		13	15 18
			A	120 operating cycles/hour		15	18 19
			A	30 operating cycles/hour		19	20 20
	Increase in rated operational current by paralleling of poles			Apply the following coefficients to the above currents; these coefficients take into account an often unbalanced distribution of current between the poles			
				2 poles in parallel: K = 1.60			
				3 poles in parallel: K = 2.25			
				4 poles in parallel: K = 2.80			
Use in category AC-3 squirrel cage motors	Operational power according to the voltage. Voltage 50 or 60 Hz	115 V single-ph.	kW	0.37	0.55	–	–
		220 V single-ph.	kW	0.75	1.1	–	–
		220/230 V 3-ph.	kW	1.5	2.2	3	4
		380/415 V 3-ph.	kW	2.2	4	5.5	7.5
		440/480 V 3-ph.	kW	3	4	5.5/4 (480)	5.5/4 (480)
		500/600 V 3-ph.	kW	3	4	4	4
		660/690 V 3-ph.	kW	3	4	4	4
	Maximum operating rate (in operating cycles/hour in relation to % of rated power)			Op. cycles/h		600	900 1200
				Power		100 %	75 % 50 %

*(1) For **LC●K●●●●3 / LP●K●●●●3** with spring terminal, Ith max = 10 A.*

References: pages B8/39 to B8/46
Dimensions: pages B8/95 and B8/97
Schemes: pages B8/96 and B8/98

Control circuit characteristics

Type			LC1	LC2	LC7	LC8	LP1	LP2	LP4	LP5
Rated control circuit voltage (Uc)		**V**	∼ 12…690 (1)		∼ 24…240 (1)		⎓ 12…250 (1)		⎓ 12…120	
Control voltage limits (≤ 50 °C) single voltage coil	Operation		0.8…1.15 Uc (2)		0.85…1.1 Uc		0.8…1.15 Uc		0.7…1.30 Uc	
	Drop-out		≥ 0.20 Uc		≥ 0.10 Uc		≥ 0.10 Uc		≥ 0.10 Uc	
Average consumption at 20 °C and at Uc	Inrush		30 VA		3 VA		3 W		1.8 W	
	Sealed		4.5 VA		3 VA		3 W		1.8 W	
Heat dissipation		**W**	1.3		3		3		1.8	
Operating time at 20 °C and at Uc										
Between coil energisation and:	- opening of the N/C contacts	**ms**	5…15		25…35		25…35		25…35	
	- closing of the N/O contacts	**ms**	10…20		30…40		30…40		30…40	
Between coil de-energisation and:	- opening of the N/O contacts	**ms**	10…20		30		10		10…20	
	- closing of the N/C contacts	**ms**	15…25		40		15		15…25	
Maximum immunity to microbreaks		**ms**	2		2		2		2	
Maximum operating rate	In operating cycles per hour		3600		3600		3600		3600	
Mechanical durability at Uc In millions of operating cycles	50/60 Hz coil		10	5	10	5	–	–	–	–
	⎓ coil		–	–	–	–	10	5	–	–
	Wide range coil, Low consumption		–	–	–	–	–	–	30	5

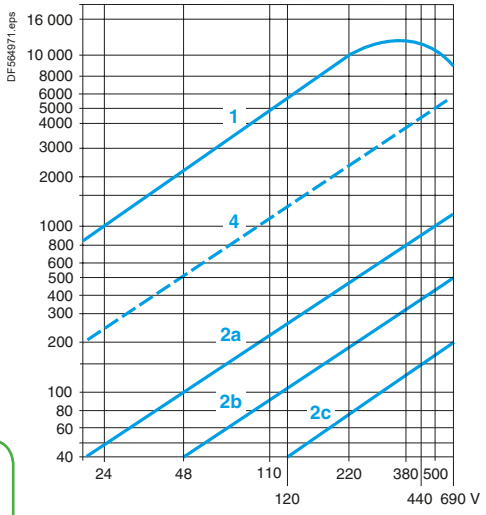
*(1) For mains supplies with a high level of interference (voltage surge > 800 V), use a suppressor module **LA4KE1FC** (50…129 V) or **LA4KE1UG** (130…250 V), see page B8/49.*
*(2) **LC1K12, LC1K16...** : 0.85…1.15 Uc.*

Ref.
Contactors

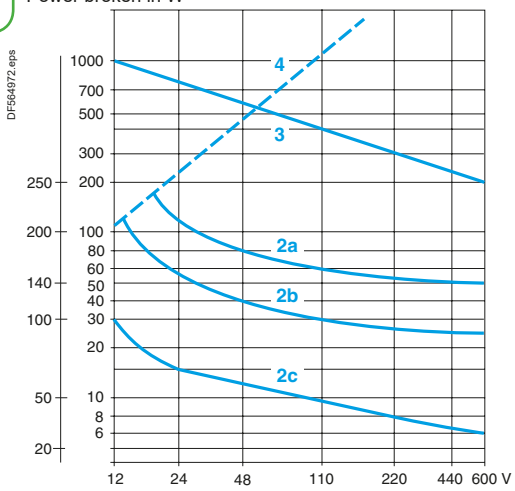
Auxiliary contact characteristics of contactors and instantaneous contact blocks

Number of auxiliary contacts	On LC●K or LP●K 3-pole			1
	On LA1K			2 or 4
Rated operational voltage (Ue)	Up to		**V**	690
Rated insulation voltage (Ui)	Conforming to IEC 60947		**V**	690
	Conforming to UL 60947-5-1, CSA C22.2 n° 60947-5-1		**V**	600
Conventional thermal current (Ith)	For ambient temperature ≤ 50 °C		**A**	10
Frequency of the operational current			**Hz**	Up to 400
Minimum switching capacity	U min		**V**	17
	I min		**mA**	5
Short-circuit protection	Conforming to IEC 60947, gG fuse		**A**	10
Rated making capacity	Conforming to IEC 60947	I rms	**A**	110
Short-time rating	Permissible for	1 s	**A**	80
		500 ms	**A**	90
		100 ms	**A**	110
Insulation resistance			**MΩ**	> 10
Non-overlap distance	LA1K: linked contacts conforming to INRS, BIA and CNA specifications		**mm**	0.5 (see schemes pages B8/96 and B8/98)

Power broken in VA



Power broken in W



Operational power of contacts conforming to IEC 60947

a.c. supply, category AC-15

Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current (cos φ 0.7) = 10 times the power broken (cos φ 0.4).

Operating cycles	V	24	48	110/ 127	220/ 230	380/ 400	440	600/ 690
1 million operating cycles	**VA**	48	96	240	440	800	880	1200
3 million operating cycles	**VA**	17	34	86	158	288	317	500
10 million operating cycles	**VA**	7	14	36	66	120	132	200
Occasional making capacity	**VA**	1000	2050	5000	10000	14000	13000	9000

d.c. supply, category DC-13

Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.

Operating cycles	V	24	48	110	220	440	600
1 million operating cycles	**W**	120	80	60	52	51	50
3 million operating cycles	**W**	55	38	30	28	26	25
10 million operating cycles	**W**	15	11	9	8	7	6
Occasional making capacity	**W**	720	600	400	300	230	200

1. Breaking limit of contacts valid for:
   - maximum of 50 operating cycles at 10 s intervals (power broken = making current x cos φ 0.7).
2. Electrical durability of contacts for:
   - 1 million operating cycles (2a)
   - 3 million operating cycles (2b)
   - 10 million operating cycles (2c).
3. Breaking limit of contacts valid for:
   - maximum of 20 operating cycles at 10 s intervals with current passing for 0.5 s per operating cycle.
4. Thermal limit.

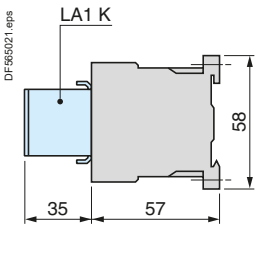
References:
pages B8/39 to B8/46
Dimensions:
pages B8/95 and B8/97
Schemes:
pages B8/96 and B8/98

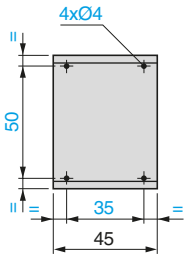
Dimensions and mounting

Contactors

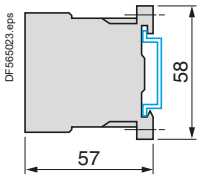
LC1K, LC7K, LP1K, LP4K

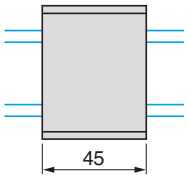
On panel





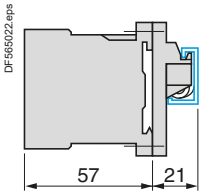
On mounting rail NSYSDR200BD or NSYSDR200 (⎓ 35 mm)

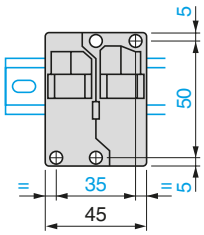




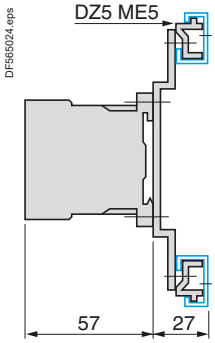
LA9D973

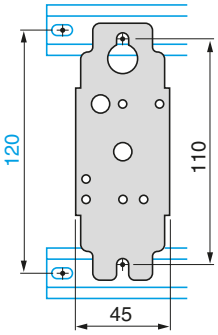
On one asymmetrical rail DZ5MB with clip-on mounting plates



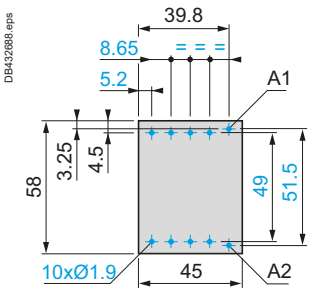


DX1AP25





On printed circuit board

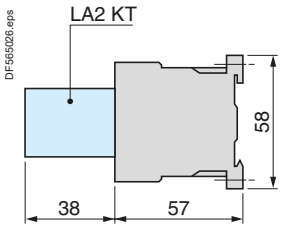


Electronic time delay contact blocks

LA2KT

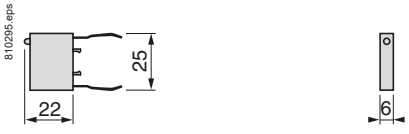


On contactor

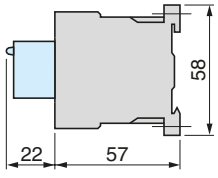


Suppressor modules

LA4K●



On contactor LC1K or LP1K



References:
pages B8/39 to B8/42

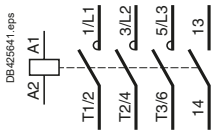
Characteristics:
pages B8/91 to B8/94

Schemes:
page B8/96

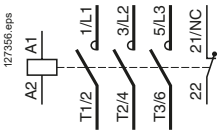
Schemes

3-pole contactors

3 P + N/O

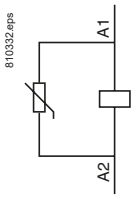


3 P + N/C

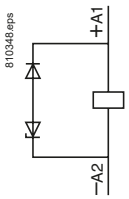


With integral suppression device

LC7K

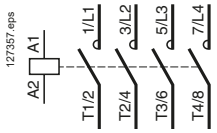


LP4K

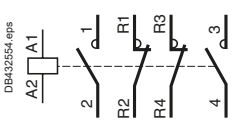


4-pole contactors

4 P

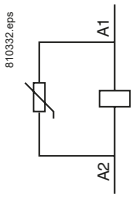


2 P N/O + 2 P N/C

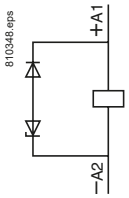


With integral suppression device

LC7K



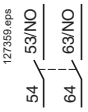
LP4K



Instantaneous auxiliary contacts LA1K

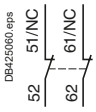
LA1KN20, KN207, KN203

2 N/O



LA1KN02, KN027, KN023

2 N/C



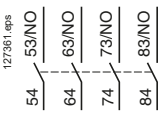
LA1KN11, KN117, KN113

1 N/O + 1 N/C



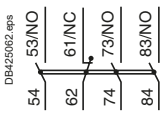
LA1KN40, KN407, KN403

4 N/O



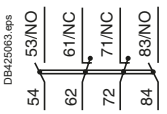
LA1KN31, KN317, KN313

3 N/O + 1 N/C



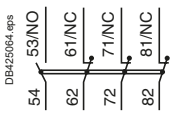
LA1KN22, KN227, KN223

2 N/O + 2 N/C



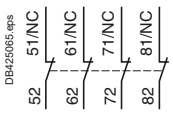
LA1KN13, KN137, KN133

1 N/O + 3 N/C



LA1KN04, KN047, KN043

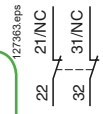
4 N/C



Terminal referencing conforming to standard EN 50012

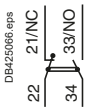
LA1KN02M

2 N/C



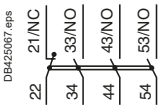
LA1KN11M

1 N/O + 1 N/C



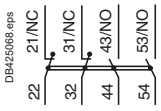
LA1KN31M

3 N/O + 1 N/C



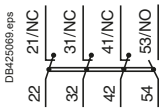
LA1KN22M

2 N/O + 2 N/C



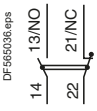
LA1KN13M

1 N/O + 3 N/C



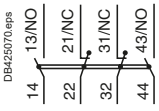
LA1KN11P

1 N/O + 1 N/C



LA1KN22P

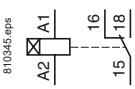
2 N/O + 2 N/C



Electronic time delay contact blocks

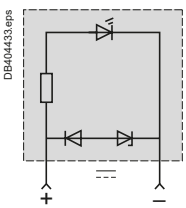
LA2KT

1 C/O

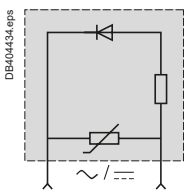


Suppressor modules

LA4KC



LA4KE



References:
pages B8/39 to B8/42

Characteristics:
pages B8/91 to B8/94

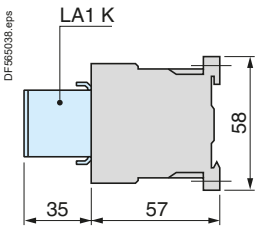
Dimensions:
page B8/95

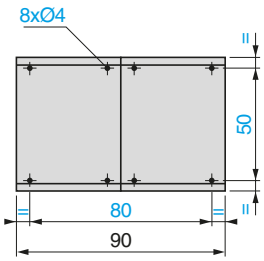
Dimensions and mounting

Reversing contactors

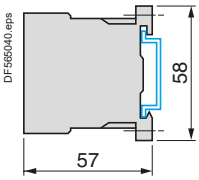
LC2K, LC8K, LP2K, LP5K

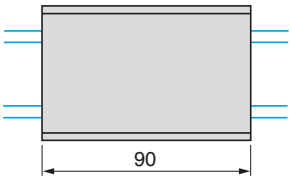
On panel





On mounting rail NSYSDR200BD or NSYSDR200 (⎓ 35 mm)

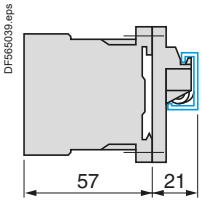


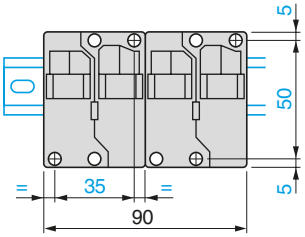


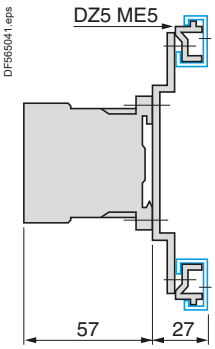
2 x LA9D973

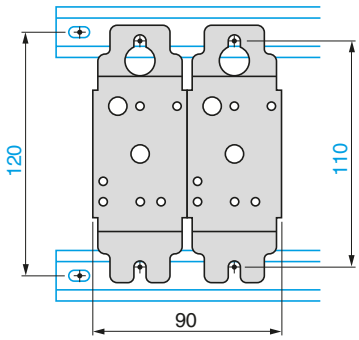
2 x DX1AP25

On one asymmetrical mounting rail DZ5MB with 2 clip-on mounting plates LA9D973 or on 2 mounting plates DX1AP25.

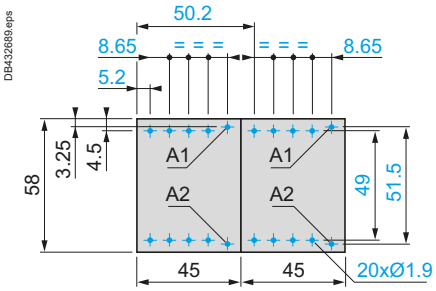








On printed circuit board for reversing contactors or 2 contactors mounted side by side.

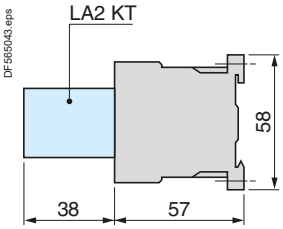


Electronic time delay contact blocks

LA2KT

On reversing contactors

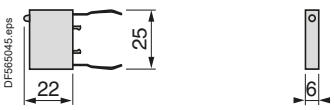


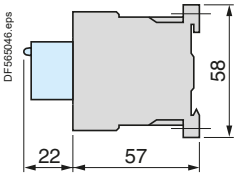


Suppressor modules

LA4K●

On reversing contactors LC2K or LP2 K





References:
pages B8/43 to B8/46

Characteristics:
pages B8/91 to B8/94

Schemes:
page B8/98

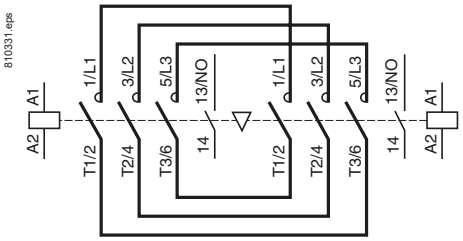
Schemes

3-pole reversing contactors

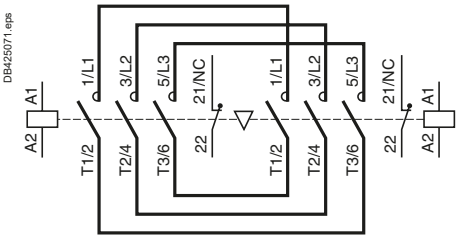
With integral suppression device

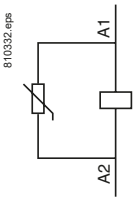
With screw clamp connections — **LC8K** — **LP5K**

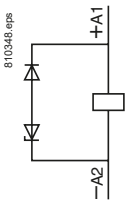
3 P + N/O



3 P + N/C

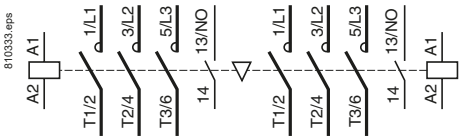




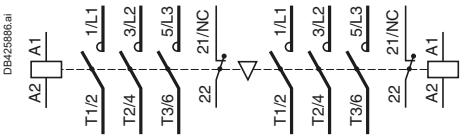


With Faston connectors or solder pins (printed circuit board)

3 P + N/O



3 P + N/C

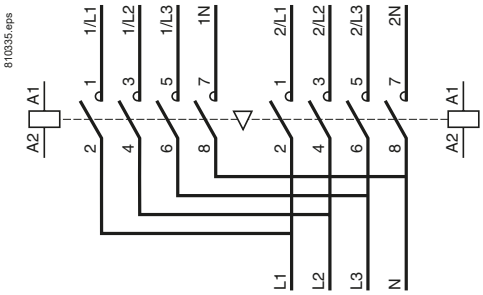


4-pole reversing contactors

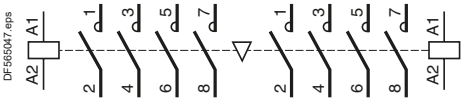
Integral suppression device

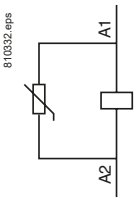
With screw clamp connections — **With Faston connectors or solder pins (printed circuit board)** — **LC8K** — **LP5K**

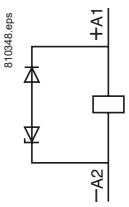
4 P



4 P





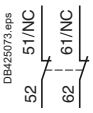


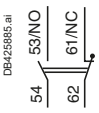
Instantaneous auxiliary contacts LA1K

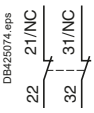
Terminal referencing conforming to standard EN 50012

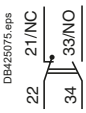
LA1KN20, KN207, KN203	LA1KN02, KN027, KN023	LA1KN11, KN117, KN113	LAKN02M	LA1KN11M	LA1KN11P
2 N/O	2 N/C	1 N/O + 1 N/C	2 N/C	1 N/O + 1 N/C	1 N/O + 1 N/C

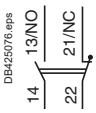






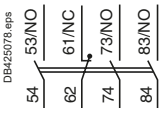


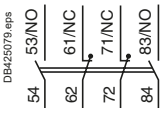


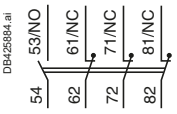


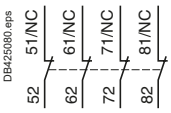
LA1KN40, KN407, KN403	LA1KN31, KN317, KN313	LA1KN22, KN227, KN223	LAKN13, KN137, KN133	LA1KN04, KN047, KN043
4 N/O	3 N/O + 1 N/C	2 N/O + 2 N/C	1 N/O + 3 N/C	4 N/C







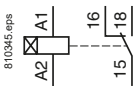




Electronic time delay contact blocks

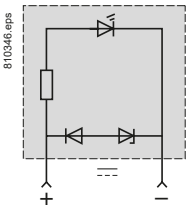
LA2KT

1 C/O

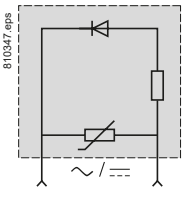


Suppressor modules

LA4KC



LA4KE



References:
pages B8/43 to B8/46

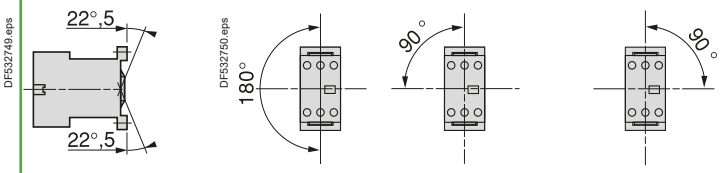
Characteristics:
pages B8/91 to B8/94

Dimensions:
page B8/97

Characteristics

Environment

Rated insulation voltage (Ui)	Conforming to IEC 60947	**V**	690
Conforming to standards			IEC 60947, UL 60947-4-1, CSA C22.2 n° 60947-4-1
Approvals			cULus
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact
Ambient air temperature around the device			
	Storage	**°C**	-50…+70
	Operation	**°C**	-20…+50
Maximum operating altitude	Without derating	**m**	2000
Operating position			**Vertical axis** **Horizontal axis**



Without derating Without derating

Cabling, connectors			Min.	Max.
	Solid conductor	**mm²**	1 x 1.5 or 2 x 1.5	1 x 6 or 2 x 4
	Flexible cable without cable end	**mm²**	1 x 0.5 or 2 x 0.35	1 x 6 or 2 x 2.5
	Flexible cable with cable end	**mm²**	1 x 0.35 or 2 x 0.35	1 x 6 or 2 x 1.5
Tightening torque	Pozidriv n° 1 head	**N.m**	0.8	
Terminal referencing			Conforming to standards EN 50005	

Ref.
Contactors

References:
pages B8/51 and B8/52
Dimensions, schemes:
page B8/103

Characteristics

Pole characteristics

Mini-contactor type				LC1SKGC2	LC1SKGC3 and LC1SKGC4
Conventional thermal current (Ith)	For ambient temperature ≤ 55 °C		**A**	20	20
Rated operational frequency			**Hz**	50/60	
Frequency limit of the operational current			**Hz**	up to 400	
Rated operational voltage (Ue)			**V**	690	
Rated making capacity	I rms conforming to IEC 60947		**A**	50	85
Rated breaking capacity (for Ue ≤ 400 V)	Conforming to IEC 60947 (I rms)		**A**	40	68
Permissible short time rating	In free air for a time "t" from cold state (θ ≤ 55 °C)		**A**	40	60
Short-circuit protection	gl fuse U ≤ 440 V		**A**	20	20
Average impedance per pole	At Ith and 50 Hz		**mΩ**	4	4
Maximum rated operational current	For temperature ≤ 55 °C	AC-3 (Ue ≤ 400 V)	**A**	5	9
		AC-1	**A**	20	20
Use in category AC-1 resistive circuits, heating, lighting (Ue ≤ 440 V)	Increase in rated operational current by paralleling of 2 poles		**A**	32	32

Auxiliary contact characteristics of mini-contactors

Rated operational voltage (Ue)	Up to	**V**	690
Rated insulation voltage (Ui)	Conforming to IEC 60947	**V**	690
Conventional thermal current (Ith)	For ambient temperature ≤ 55 °C	**A**	10
Frequency of the operational current		**Hz**	Up to 400
Short-circuit protection	Conforming to IEC 60947, gl fuse	**A**	10

Operational power of contacts conforming to IEC 60947

a.c. supply, category AC-15

Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current (cos φ 0.7) = 10 times the power broken (cos φ 0.4).

	V	24	48	110/127	220/230	380/400	440
1 million operating cycles	**VA**	48	96	240	440	800	880
3 million operating cycles	**VA**	17	34	86	158	288	317
10 million operating cycles	**VA**	7	14	36	66	120	132
Occasional making capacity	**VA**	1000	2050	5000	10000	14000	13000

d.c. supply, category DC-13

Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.

	V	24	48	110	220	440	440
1 million operating cycles	**W**	120	80	60	52	51	880
3 million operating cycles	**W**	55	38	30	28	26	317
10 million operating cycles	**W**	15	11	9	8	7	132
Occasional making capacity	**W**	720	600	400	300	230	13000

Ref.
Contactors

References:
pages B8/51 and B8/52
Dimensions, schemes:
page B8/103

Characteristics

Control circuit characteristics

Mini-contactor type			LC1SKGC2	LC1SKGC3 and LC1SKGC4
Rated control circuit voltage (Uc)		**V**	∿ 24…400	
Control voltage limits (θ ≤ 55 °C)	Operation		0.85…1.1 Uc	
	For drop-out		≥ 0.20 Uc	
Average coil consumption at 20 °C and at Uc				
	Inrush	**VA**	16	23
	Sealed	**VA**	4.2	4.9
Heat dissipation		**W**	1.4	1.5
Operating time at 20 °C and at Uc				
Between coil energisation and	opening of the N/C contacts	**ms**	8…16	
	closing of the N/O contacts	**ms**	7…14	
Between coil de-energisation and	opening of the N/O contacts	**ms**	6…8	
	closing of the N/C contacts	**ms**	8…10	
Maximum operating rate	In operating cycles per hour		1200	
Mechanical durability at Uc in millions of operating cycles	50/60 Hz coil		10	

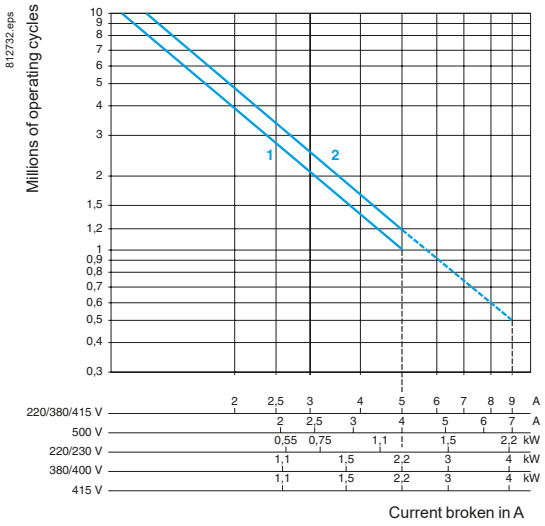
Ref.
Contactors

References:
pages B8/51 and B8/52
Dimensions, schemes:
page B8/103

Durability curves

Use in category AC-3 (Ue ⩽ 440 V)

Control of 3-phase asynchronous squirrel cage motors with breaking whilst running.
The current broken (Ic) in category AC-3 is equal to the rated operational current of the motor.

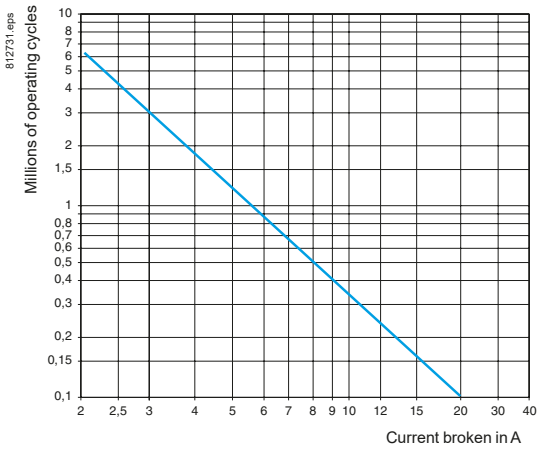


1. LC1SKGC2
2. LC1SKGC3 and SKGC4

- - - - - only up to 415 V

Use in category AC-1 (Ue ⩽ 440 V)

Control of resistive circuits (cos φ ⩾ 0.95).
The current broken (Ic) in category AC-1 is equal to the current (Ie) normally drawn by the load.

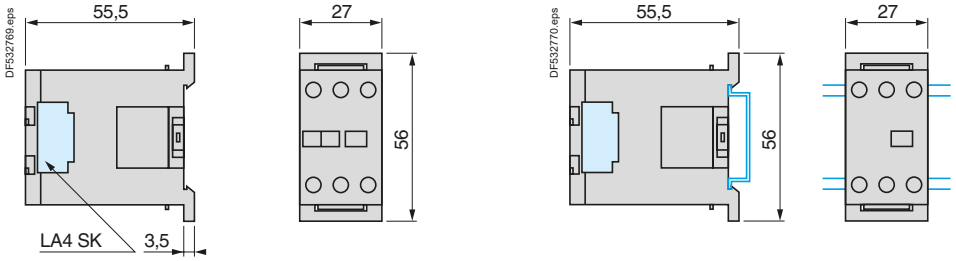


Ref.
Contactors

Dimensions, mounting and schemes

Dimensions — Mini-contactors LC1SKGC2

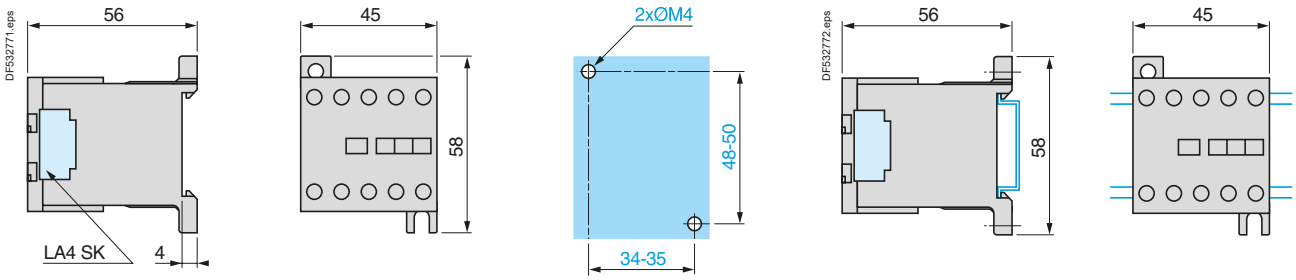
Mounting — On mounting rail NSYSDR200BD or NSYSDR200 (⎓ 35 mm)



Dimensions — Mini-contactors LC1SKGC3 and SKGC4

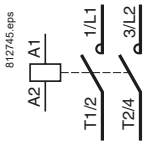
Mounting — On panel

Mounting — On mounting rail NSYSDR200BD or NSYSDR200 (⎓ 35 mm)



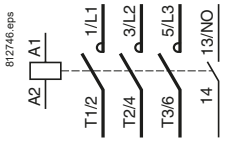
2-pole mini-contactors

LC1SKGC2

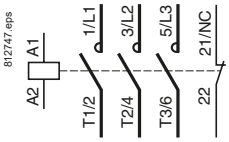


3-pole mini-contactors

LC1SKGC310

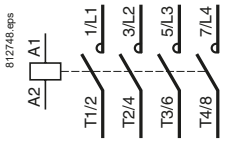


LC1SKGC301



4-pole mini-contactors

LC1SKGC400



References:
pages B8/51 and B8/52
Characteristics:
pages B8/99 to B8/101
Curves:
page B8/102



GC25

TeSys GC contactors are designed for use in modular panels and enclosures.
These contactors feature:

■ **Easy installation:**
□ quick clip-on fixing and locking onto 35 mm omega rail
□ easy connection by means of ready-to-tighten, captive, pozidrive screw terminals.
■ **Compact size:**
All units have a common depth of 60 mm and width in modules of 17.5 mm (width of one module: 17.5 mm).

■ **User safety:**
□ use of materials conforming to strictest fire safety standards
□ live parts protected against direct finger contact
□ completely safe operation
□ state indication on front panel.

Standards

This range of modular contactors has been designed taking into account the requirements of international standard IEC 61095.
This standard is specific to “Electromagnetic contactors for domestic and similar use”.
It has very strict requirements, meeting the expectations of users, with regard to the safety of equipment and persons in “premises and areas accessible to the public”.
Conformity with this standard makes it possible to obtain the following quality labels without the need for additional tests: NF-USE, VDE, CEBEC, etc.

Applications

TeSys GC modular contactors are designed for switching all single-phase, 3-phase or 4-phase loads up to 100 A.

Power switching

These contactors have multiple applications in industrial, agricultural and commercial premises, hospitals and the home, i.e. wherever switching of a specific supply is required:
■ lighting
■ heating
■ ventilation
■ motorised shutters or gates.

Characteristics

Environment

Contactor type			GC16	GC25	GC40	GC63	GC100
Rated insulation voltage (Ui)	Conforming to IEC 61095	V	500				
	Conforming to VDE 0110	V	500				
Rated impulse withstand voltage (Uimp)		kV	4 in enclosure				
Conforming to standards			IEC 61095 and IEC 60947-5-1 for auxiliary contacts				
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact (IP 20 open, IP 40 in enclosure)				
Ambient air temperature around the device	Storage	°C	-40…+70				
	Operation	°C	-5…+50 (0.85…1.1 Uc)				
Maximum operating altitude	Without derating	m	3000				
Operating positions	Without derating		±30° in relation to normal vertical mounting plane				
Shock resistance 1/2 sine wave = 10 ms	Contactor open		10 gn				
	Contactor closed		15 gn				
Vibration resistance 5…300 Hz	Contactor open		2 gn				
	Contactor closed		3 gn				
Flame resistance			Conforming to IEC 61095				

Pole characteristics

Number of poles			2, 3 or 4				
Rated operational current (Ie) (Ue ≤ 440 V)	In AC-7a (heating)	A	16	25	40	63	100
	In AC-7b (motor control)	A	5	8.5	15	25	–
Contactor rating	40 °C	A	16	25	40	63	100
	50 °C	A	14	22	36	57	87
	60 °C (1)	A	13	20	32	50	80
Rated operational voltage (Ue)	Up to	V	250 two-pole contactors, 415 three and four-pole contactors				
Frequency limits	Of the operating current	Hz	400				
Conventional thermal current (Ith)	θ ≤ 50 °C	A	16	25	40	63	100
Rated breaking and making capacity	Conforming to IEC 61095 (AC-7b) I rms 400 V 3-phase	A	40	68	120	200	–
Permissible short time rating no current flowing for preceding 15 minutes with q ≤ 40 °C	For 10 s	A	128	200	320	504	800
	For 30 s	A	40	62	100	157	250
Short-circuit protection by fuse or circuit breaker U ≤ 440 V	gl fuse	A	16	25	40	63	100
	Circuit breaker I^2t (at 3 kA rms prospective) 230 V	A^2s	5000	10000	16000	18000	–
	400 V	A^2s	9000	14000	17500	20000	–
Electrical durability in operating cycles	AC-7a, AC-7b		100000	100000	100000	100000	30000
Average impedance per pole	At Ith and 50 Hz	mΩ	2.5	2.5	2	2	1
Power dissipated per pole	For the above operational currents	W	0.65	1.6	3.2	8	10
Maximum cabling c.s.a. Flexible cable without cable end	1 conductor	mm^2	6	6	25	25	35
	2 conductors	mm^2	4	4	16	16	–
Flexible cable with cable end	1 conductor	mm^2	6	6	16	16	35
	2 conductors	mm^2	1.5	1.5	4	4	–
Solid cable without cable end	1 conductor	mm^2	6	6	25	25	35
	2 conductors	mm^2	4	4	6	6	10
Tightening torque	Power circuit connections	N.m	0.8	0.8	3.5	3.5	3.5

(1) Ventilation 1/2 module must be fitted.

References: page B8/53
Dimensions, schemes: pages B8/111 to B8/113

Characteristics

Control circuit characteristics

Contactor type				GC16, GC25 single or 2-pole	GC16, GC25 3 or 4-pole **GC40, GC63** 2-pole	GC40, GC63 3 or 4-pole **GC100** 2-pole	GC100 4-pole
Rated control circuit voltage (Uc)		50 or 60 Hz	**V**	12…240 V, for other voltages, please consult your Regional Sales Office			
Control voltage limits (θ ≤ 50 °C)	50 Hz coils	Operational		0.85…1.1 Uc			
		Drop-out		0.2…0.75 Uc			
Average coil consumption at 20 °C and at Uc	∼ 50 Hz	Inrush	**VA**	15	34	53	106
		Sealed	**VA**	3.8	4.6	6.5	13
Maximum heat dissipation		50/60 Hz	**W**	1.3	1.6	2.1	4.2
Operating time		Closing "C"	**ms**	10…30			
		Opening "O"	**ms**	10…25			
Mechanical durability		In operating cycles		10^6			
Maximum operating rate at ambient temperature ≤ 50 °C		In operating cycles per hour		300			
Maximum cabling c.s.a.	Flexible cable without cable end	1 or 2 conductors	**mm²**	2.5			
	Flexible cable with cable end	1 conductor	**mm²**	2.5			
		2 conductors	**mm²**	1.5			
	Solid cable without cable end	1 or 2 conductors	**mm²**	1.5			
Tightening torque			**N.m**	0.8			

Instantaneous auxiliary contact characteristics

Rated operational voltage (Ue)	Up to	**V**	250
Rated insulation voltage (Ui)	Conforming to IEC 60947-5	**V**	500
	Conforming to VDE 0110	**V**	500
Conventional thermal current (Ith)	For ambient θ ≤ 50 °C	**A**	5
Mechanical durability	Operating cycles		10^6
Maximum cabling c.s.a.	Flexible or solid conductor	**mm²**	2.5
Tightening torque		**N.m**	0.8

Ref.
Contactors

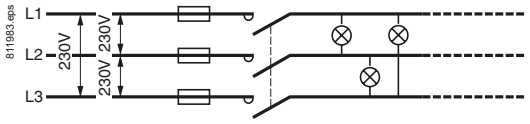
References: page B8/53
Dimensions, schemes: pages B8/111 to B8/113

Lighting (Maximum number of lamps depending on the power of each unit) Introduction of installations according to type of supply

■ Single-phase circuit, 230 V

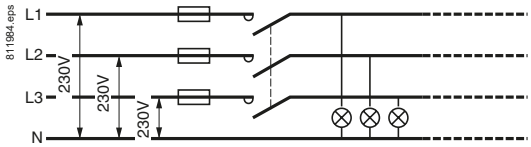


■ 3-phase circuit, 230 V



The maximum number of lamps which can be operated per phase is equal to the number of lamps in the "single phase 230 V" table divided by $\sqrt{3}$.

■ 3-phase circuit, 400 V (with neutral)



The maximum number of lamps which can be operated per phase is equal to the total number of lamps in the "single-phase 230 V" table.

Contactor rating for a single-phase 230 V circuit (single-pole)

Fluorescent lamps with starter

Single fitting	Non corrected					With parallel correction					Contactor rating
P (W)	20	40	50	80	110	20	40	58	80	110	–
I_B (A)	0.39	0.43	0.70	0.80	1.2	0.19	0.29	0.46	0.57	0.79	–
C (µF)	–	–	–	–	–	5	5	7	7	16	–
Maximum number of lamps	22	20	13	10	7	15	15	10	10	5	**16 A**
	30	28	17	15	10	20	20	15	15	7	**25 A**
	70	60	35	30	20	40	40	30	30	14	**40 A**
	100	90	56	48	32	60	60	43	43	20	**63 A**
Twin fitting	**Non corrected**					**With series correction**					**Contactor rating**
P (W)	2 x 18	2 x 36	2 x 58	2 x 80	2 x 140	2 x 18	2 x 36	2 x 58	2 x 80	2 x 140	–
I_B (A)	0.44	0.82	1.34	1.64	2.2	0.26	0.48	0.78	0.96	1.3	–
C (µF)	–	–	–	–	–	3.5	4.5	7	9	18	–
Maximum number of lamps	20	11	7	5	4	30	17	10	9	6	**16 A**
	30	16	10	8	6	46	25	16	13	10	**25 A**
	50	26	16	13	10	80	43	27	22	16	**40 A**
	75	42	25	21	16	123	67	42	34	25	**63 A**

High pressure mercury vapour lamps

	Non corrected						With parallel correction							Contactor rating
P (W)	50	80	125	250	400	700	50	80	125	250	400	700	1000	–
I_B (A)	0.6	0.8	1.15	2.15	3.25	5.4	0.35	0.50	0.7	1.5	2.4	4	5.7	–
C (µF)	–	–	–	–	–	–	7	8	10	18	25	40	60	–
Maximum number of lamps	15	10	8	4	2	1	10	9	9	4	3	2	–	**16 A**
	20	15	10	6	4	2	15	13	10	6	4	2	1	**25 A**
	34	27	20	10	6	4	28	25	20	11	8	5	3	**40 A**
	53	40	28	15	10	6	43	38	30	17	12	7	5	**63 A**

I_B: value of current drawn by each lamp at its rated voltage.
***C**: unit capacitance for each lamp.*
*I_B and **C** correspond to values normally quoted by lamp manufacturers*

References: page B8/53
Dimensions, schemes: pages B8/111 to B8/113

Contactor rating for a single-phase 230 V circuit (single-pole) (continued)

Low pressure sodium vapour lamps

	Non corrected						With parallel correction						Contactor rating
P (W)	18	35	55	90	135	180	18	35	55	90	135	180	–
I_B (A)	0.35	1.4	1.4	2.1	3.1	3.1	0.35	0.6	0.6	0.9	0.9	0.9	–
C (µF)	–	–	–	–	–	–	5	20	20	26	45	40	–
Maximum number of lamps	18	4	5	3	2	2	14	3	3	2	1	1	**16 A**
	34	9	9	6	4	4	21	5	5	4	2	2	**25 A**
	57	14	14	9	6	6	40	10	10	8	4	5	**40 A**
	91	24	24	19	10	10	60	15	15	11	6	7	**63 A**

High pressure sodium vapour lamps

	Non corrected					With parallel correction					Contactor rating
P (W)	70	150	250	400	1000	70	150	250	400	1000	–
I_B (A)	1	1.8	3	4.4	10.3	0.6	0.7	1.5	2.5	6	–
C (µF)	–	–	–	–	–	12	20	32	45	100	–
Maximum number of lamps	8	4	2	1	–	6	6	2	2	1	**16 A**
	12	7	4	3	1	9	9	3	4	2	**25 A**
	20	13	8	5	2	18	18	6	8	4	**40 A**
	32	18	11	8	3	25	25	9	12	6	**63 A**

Metal iodine or halogen vapour lamps

	Non corrected						With parallel correction							Contactor rating
P (W)	35	70	150	250	400	1000	39	70	150	250	400	1000	2000	–
I_B (A)	0.3	0.5	1	1.5	2.5	6	0.3	0.5	1	1.5	2.5	6	5.5	–
C (µF)	–	–	–	–	–	–	6	12	20	32	45	85	60	–
Maximum number of lamps	27	16	8	5	3	1	12	6	4	3	2	–	1	**16 A**
	40	24	12	8	5	2	18	9	6	4	3	1	2	**25 A**
	68	42	20	14	8	4	31	16	10	7	5	3	3	**40 A**
	106	64	32	21	13	5	50	25	15	10	7	4	5	**63 A**

Incandescent and halogen lamps

									Contactor rating
P (W)	60	75	100	150	200	300	500	1000	–
I_B (A)	0.26	0.32	0.44	0.65	0.87	1.3	2.17	4.4	–
Maximum number of lamps	30	25	19	12	10	7	4	2	**16 A**
	45	38	28	18	14	10	6	3	**25 A**
	85	70	50	35	26	18	10	6	**40 A**
	125	100	73	50	37	25	15	8	**63 A**

Halogen lamps used with transformer

					Contactor rating
P (W)	60	80	105	150	–
I_B (A)	0.26	0.35	0.45	0.65	–
Maximum of lamps	9	8	6	4	**16 A**
	14	12	9	6	**25 A**
	27	23	18	13	**40 A**
	40	35	27	19	**63 A**

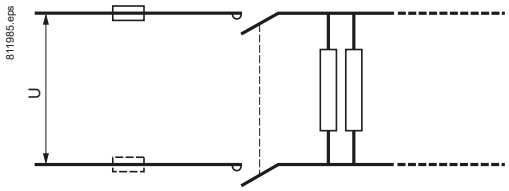
I_B *value of current drawn by each lamp at its rated voltage.*
C*: unit capacitance for each lamp.*
I_B *and* ***C*** *correspond to values normally quoted by lamp manufacturers*

Ref.
Contactors

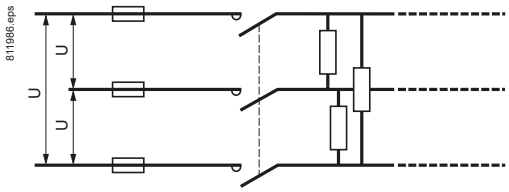
Characteristics in heating applications

Heating (AC-7a)

Single-phase, 2-pole switching



3-phase switching



Heating by resistive elements or by infra-red radiators, convectors or radiators, heating ducts, industrial furnaces. The current peak between the hot and cold states must not exceed 2 to 3 In at the moment of switch-on.

Contactor selection according to power and required electrical life

Electrical durability (in operating cycles)	Maximum power (kW)					Contactor rating
	100 x 10^3	150 x 10^3	200 x 10^3	500 x 10^3	10^6	
Single-phase switching 230 V (2-pole)	3.5	3	2.2	1	0.8	**16 A**
	5.4	4.6	3.5	1.6	1.2	**25 A**
	8.6	7.4	5.6	2.6	1.9	**40 A**
	13.6	11.6	8.8	4	3	**63 A**
	21.6	18.4	14	6.4	4.8	**100 A**
3-phase switching 400 V (3-pole)	10	9	6.5	3.2	2.2	**16 A**
	16	14	10	5	3.5	**25 A**
	26	22	17	7.5	6	**40 A**
	41	35	26.5	12	9	**63 A**
	64.8	55.2	42	19.2	14.4	**100 A**

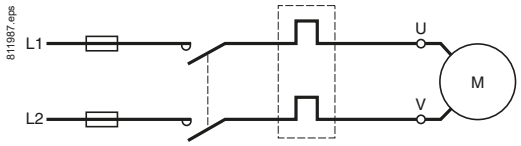
References:
page B8/53

Dimensions, schemes:
pages B8/111 to B8/113

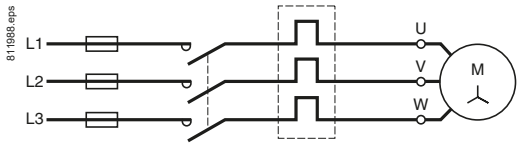
Characteristics in motor control applications

Motor control (AC-7b)

Single-phase circuit, 230 V



3-phase circuit, 400 V



Contactor selection according to maximum power in kW

230 V single-phase capacitor motor (2-pole)	**400 V 3-phase motor**	**Contactor rating** (Ith)
0.55	2.2	**16 A**
1.1	4	**25 A**
2.2	7.5	**40 A**
4	11	**63 A**

Ref.

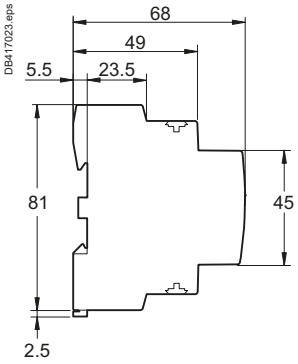
Contactors

Dimensions

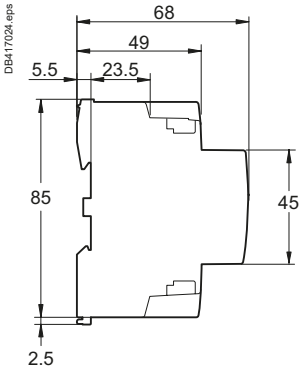
Dimensions

Contactors

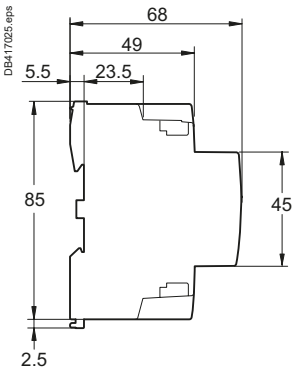
Common side view	GC1610, 1611, 1620 GC2502, 2510, 2511, 2520	GC1622, 1640 GC2504, 2522, 2530, 2540
	1 module	2 modules



Common side view	GC4002, 4011, 4020 GC6302, 6311, 6320	GC4004, 4022, 4030, 4040 GC6304, 6322, 6330, 6340
	2 modules	3 modules



Common side view	GC10020	GC10040
	3 modules	6 modules

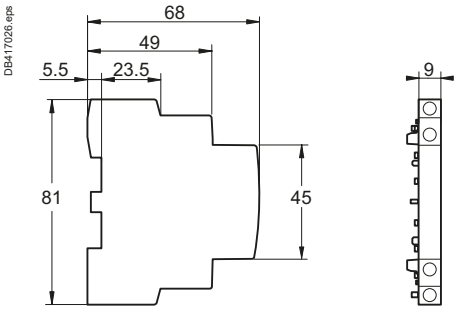


Ref.
Contactors

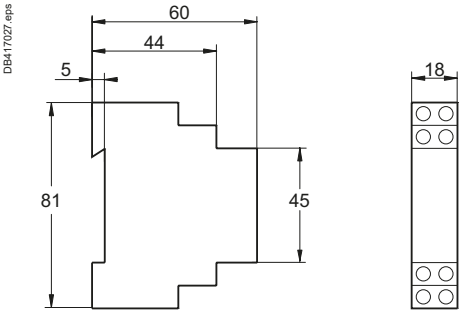
References:
page B8/53
Characteristics:
pages B8/104 to B8/110
Schemes:
page B8/113

Dimensions

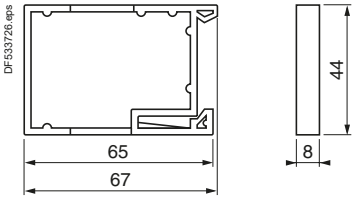
Auxiliary contacts
GAC0511, 0531 and 0521



Coil suppression blocks
GAP21 and 23



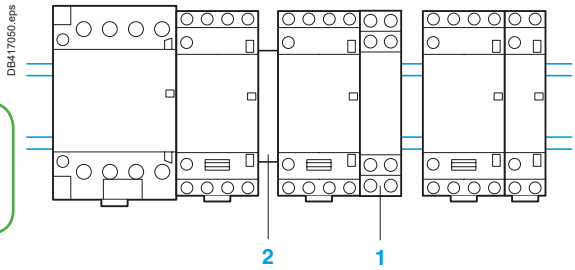
Clip-on ventilation 1/2 module
GAC5



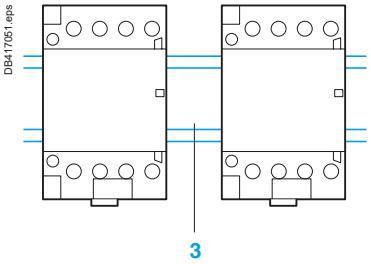
Mounting

Setting-up precautions

The contactor controls must be bounce free. If not, connect a coil suppression block **1** (GAP21 or 23) across the coil terminals y 250 V. When several contactors which operate at the same time are mounted side by side, a GAC 5 ventilation 1/2 module **2** must be fitted every 2 contactors.



It is advisable to mount electronic units at the bottom of the modular panel and to separate them from electromechanical units by a space **3** equal to one module, or by 2 ventilation 1/2 modules (GAC 5).



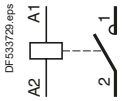
Ref.
Contactors

Schemes

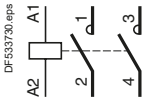
Schemes

Contactors

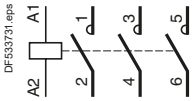
GC●●10



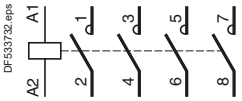
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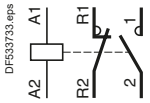
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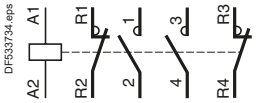
GC●●40



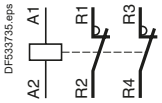
GC●●11



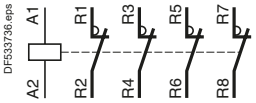
GC●●22



GC●●02

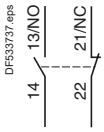


GC●●04

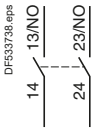


Auxiliary contacts

GAC0521



GAC0531



GAC0511



Ref.
Contactors

Characteristics

PB113083_13.eps



GY25

TeSys GY "dual tariff" contactors are designed for use in modular panels and enclosures.
These contactors feature:
■ **Easy installation:**
□ quick clip-on fixing and locking onto 35 mm omega rail
□ easy connection by means of ready-to-tighten captive, pozidrive screw terminals.
■ **Compact size**
All units have a common depth of 60 mm and width in modules of 17.5 mm (width of one module: 17.5 mm).
■ **User safety:**
□ use of materials conforming to strictest fire safety standards
□ live parts protected against direct finger contact
□ completely safe operation
□ state indication on front panel.
"Dual tariff" contactors are designed for use with Electricity Supply Authority dual tariffs.
They have a 4-position selector switch on the front panel:

"Stop" (O)	For switching off the load, e.g. for prolonged periods of absence.
"Off peak" Automatic start (A)	The contactor switches automatically during "off peak" hours as set by the Supply Authority remote control and thus supplies the load, (washing machine, dishwasher, convector heater, water heater) during this period, at an economy rate to the user.
"Peak time" Manual start (I)	In this position, the contactor supplies the load to cater for additional requirements for hot water, heating, etc., but at the standard rate. The contactor returns automatically to the "off-peak" position at the start of the "off-peak" period.
"Peak time" Manual override with lock	Facility for setting the contactor to continuous manual operation, ignoring the automation system and the Supply Authority control; setting and locking is achieved by means of a tool, with manual return to the "AUTO" position.

Standards

This range of modular contactors has been designed taking into account the requirements of international standard IEC 61095.
This standard is specific to "Electromagnetic contactors for domestic and similar use".
It has very strict requirements, meeting the expectations of users, with regard to the safety of equipment and persons in "premises and areas accessible to the public".
Conformity with this standard makes it possible to obtain the following quality labels without the need for additional tests: NF-USE, VDE, CEBEC, etc.

"Dual tariff" modular contactors are designed for switching all single-phase, 3-phase or 4-phase loads up to 63 A.

TeSys GY contactors have multiple applications in industrial, agricultural and commercial premises, hospitals and the home, i.e. wherever switching of a specific supply is required:
■ lighting,
■ heating, ventilation,
■ motorised shutters or gates.

References:
page B8/54
Dimensions and schemes:
pages B8/117 and B8/118

Characteristics

Environment

Type			GY16	GY25	GY40	GY63
Rated insulation voltage (Ui)	Conforming to IEC 61095	V	500			
	Conforming to VDE 0110	V	500			
Rated impulse withstand voltage (Uimp)		kV	4 in enclosure			
Conforming to standards			IEC 61095 and IEC 60947-5-1 for auxiliary contacts			
Product certifications			NF-USE, VDE, CEBEC, ÖVE			
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact IP 20 open, IP 40 in enclosure			
Ambient air temperature around the device	Storage	°C	-40…+70			
	Operation	°C	-5…+50 (0.85…1.1 Uc)			
Maximum operating altitude	Without derating	m	3000			
Operating positions	Without derating		±30° in relation to normal vertical mounting plane			
Shock resistance 1/2 sine wave = 11 ms	Contactor open		10 gn			
	Contactor closed		15 gn			
Vibration resistance 5…300 Hz	Contactor open		2 gn			
	Contactor closed		3 gn			
Flame resistance			Conforming to IEC 61095			

Pole characteristics

Number of poles			2, 3 or 4			
Rated operational current (Ie) (Ue ≤ 440 V)	In AC-7a (heating)	A	16	25	40	63
	In AC-7b (motor control)	A	5	8.5	15	25
Contactor rating	40 °C		16	25	40	63
	50 °C		14	22	36	57
	60 °C (1)		13	20	32	50
Rated operational voltage (Ue)	Up to	V	250 - 2-pole contactors, 415 - 3 and 4-pole contactors			
Frequency limits	Of the operating current	Hz	400			
Conventional thermal current (Ith)	θ ≤ 50 °C	A	16	25	40	63
Rated breaking and making capacity	Conforming to IEC 61095 (AC-7b) I rms 400 V 3-phase	A	40	68	120	200
Short time rating with no current flow for the previous previous 15 minutes with θ ≤ 40 °C	For 10 s	A	128	200	320	504
	For 30 s	A	40	62	100	157
Short-circuit protection by fuse or circuit breaker U ≤ 440 V						
gI fuse		A	16	25	40	63
Circuit breaker I²t (at 3 kA rms prospective)	230V	A²s	5000	10000	16000	18000
	400V	A²s	9000	14000	17500	20000
Electrical durability in operating cycles	AC-7a, AC-7b		100000	100000	100000	100000
Average impedance per pole	At Ith and 50 Hz	mΩ	2.5	2.5	2	2
Power dissipated per pole	For the above operational currents	W	0.65	1.6	3.2	8
Maximum cabling c.s.a.						
Flexible cable without cable end	1 conductor	mm²	6	6	25	25
	2 conductors	mm²	4	4	16	16
Flexible cable with cable end	1 conductor	mm²	6	6	16	16
	2 conductors	mm²	1.5	1.5	4	4
Solid cable without cable end	1 conductor	mm²	6	6	25	25
	2 conductors	mm²	4	4	6	6
Tightening torque	Power circuit connections	N.m	0.8	0.8	3.5	3.5

(1) Ventilation 1/2 module must be fitted.

References: page B8/54
Dimensions and schemes: pages B8/117 and B8/118

Characteristics

Control circuit characteristics

Type				GY16, GY25 single or 2-pole	GY16, GY25 3 or 4-pole / GY40, GY63 2-pole	GY40, GY63 3 or 4-pole
Rated control circuit voltage (Uc)	50 or 60 Hz		V	12…240 V, for other voltages, please consult your Regional Sales Office		
Control voltage limits (θ ≤ 50 °C)						
50 Hz coils	Operational			0.85…1.1 Uc		
	Drop-out			0.2…0.75 Uc		
Average consumption at 20 °C and at Uc						
∼ 50 Hz	Inrush		VA	15	34	53
	Sealed		VA	3.8	4.6	6.5
Heat dissipation	50/60 Hz		W	1.3	1.6	2.1
Operating time	Closing "C"		ms	10 ... 30		
	Opening "O"		ms	10 ... 25		
Mechanical durability	In operating cycles			10^6		
Maximum operating rate at ambient temperature ≤ 50 °C	In operating cycles per hour			300		
Maximum cabling c.s.a.						
Flexible cable without cable end	1 or 2 conductors		mm^2	2.5		
Flexible cable with cable end	1 conductor		mm^2	2.5		
	2 conductors		mm^2	1.5		
Solid cable without cable end	1 or 2 conductors		mm^2	1.5		
Tightening torque			N.m	0.8		

Instantaneous auxiliary contact characteristics

Rated operational voltage (Ue)	Up to	V	250
Rated insulation voltage (Ui)	Conforming to IEC 60947-5	V	500
	Conforming to VDE 0110	V	500
Conventional thermal current (Ith)	For ambient θ ≤ 50 °C	A	5
Mechanical durability	In operating cycles		10^6
Maximum cabling c.s.a.	Flexible or solid conductor	mm^2	2.5
Tightening torque		N.m	0.8

Ref.
Contactors

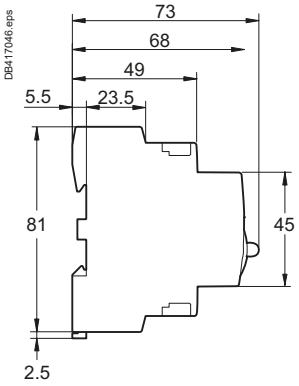
References: page B8/54
Dimensions and schemes: pages B8/117 and B8/118

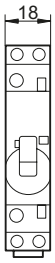
Dimensions

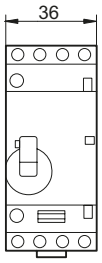
Dimensions

"Dual tariff" contactors

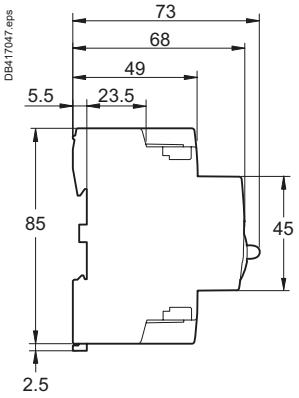
Common side view	GY1620 GY2520	GY2530, 2540
	1 module	2 modules

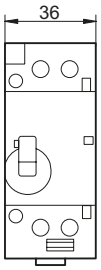


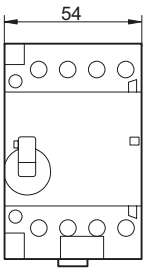




Common side view	GY4020 GY6320	GY4030, 4040 GY6330, 6340
	2 modules	3 modules

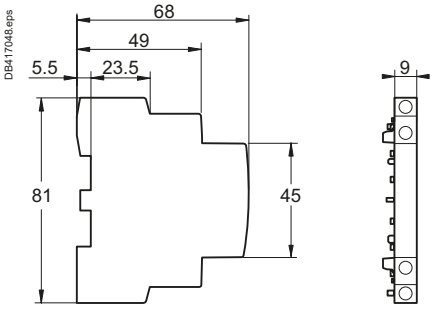






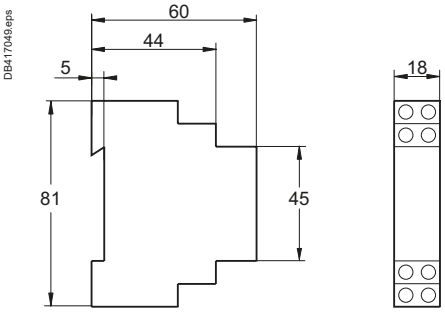
Auxiliary contacts

GAC0511, 0531 and 0521



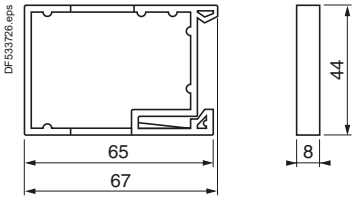
Coil suppression block

GAP21 and 23



Clip-on ventilation 1/2 module

GAC5



References:
page B8/54

Characteristics:
pages B8/114 to B8/116

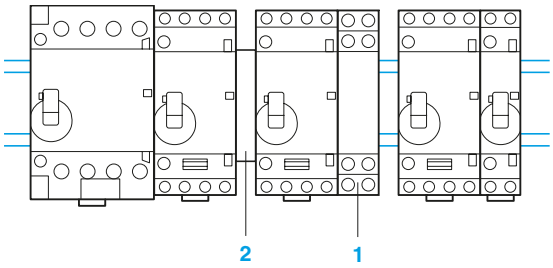
Mounting and schemes

Mounting

Setting-up precautions

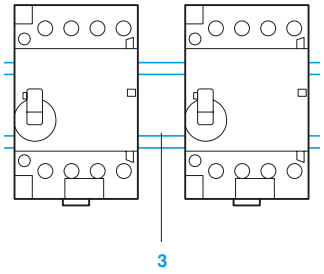
The contactor controls must be bounce free. If not, connect a coil suppression block 1 (GAP 21 or 23) across the coil terminals ⩽ 250 V.
When several contactors which operate at the same time are mounted side by side, a GAC5 ventilation 1/2 module 2 must be fitted every 2 contactors.

DB417052.eps



It is advisable to mount electronic units at the bottom of the modular panel and to separate them from electromechanical units by a space equal to one module 3 or by 2 ventilation 1/2 modules GAC5.

DB417053.eps

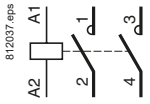


Schemes

Contactors

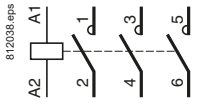
GY●●20

812037.eps



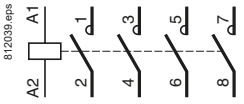
GY●●30

812038.eps



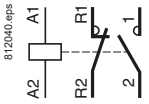
GY●●40

812039.eps



GY●●11

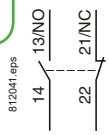
812040.eps



Auxiliary contacts

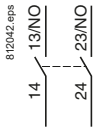
GAC0521

812041.eps



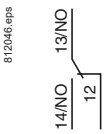
GAC0531

812042.eps



GAC0511

812046.eps



Ref.
Contactors

Characteristics

PF526284R.eps



GF1611M7

TeSys GF impulse relays are designed for use in modular enclosures.
They feature:
■ **Easy installation:**
□ quick clip-on fixing and locking onto 35 mm omega rail
□ easy connection by means of ready-to-tighten captive, pozidrive screw terminals.
■ **Compact size**
Units have a common depth of 60 mm and width of 18 mm.
■ **User safety:**
□ live parts protected against direct finger contact
□ completely safe operation
□ state indication on front panel.

Standards

This range of modular impulse relays has been designed taking into account the requirements of international standard IEC 60669-2.
This standard is specific to “Impulse relays”.
Conformity with this standard makes it possible to obtain the following quality labels without the need for additional tests: NF-USE, VDE, CEBEC, etc.

Functions

Modular impulse relays are designed for opening and closing of circuits which are remotely controlled by impulses. The position is mechanically maintained.
These impulse relays are used in lighting circuits when there are more than two switching points.

Power switching

TeSys GF impulse relays have multiple applications in industrial, agricultural and commercial premises, hospitals and the home, i.e. wherever switching of a specific lighting supply is required.

References:
page B8/55
Dimensions, schemes:
page B8/123

Characteristics

Environment

Rated insulation voltage (Ui)	Conforming to IEC 60947-1-5	**V**	400
	Conforming to VDE 0110	**V**	400
Rated impulse withstand voltage (Uimp)		**kV**	4 in enclosure
Conforming to standards			IEC 60669-1 and 60669-2
Product certifications			NF-USE, CEBEC, ASE, KEMA, N, S, D, FI, VDE
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact IP 20 open, IP 40 in enclosure
Ambient air temperature around the device	Storage	**°C**	-40…+80
	Operation	**°C**	-20…+50
Maximum operating altitude	Without derating	**m**	2000
Operating positions	Without derating		±90° in relation to normal vertical mounting plane
Shock resistance 1/2 sine wave = 10 ms	Impulse relay open		Please consult your Regional Sales Office
	Impulse relay closed		Please consult your Regional Sales Office
Vibration resistance 5…300 Hz	Impulse relay open		4 gn
	Impulse relay closed		4 gn

Pole characteristics

Number of poles				1 or 2	
Rated operational current (Ie) (Ue ⩽ 250 V)	In AC-7a (heating)		**A**	16	
Rated operational voltage			**V**	250	
Conventional thermal current (Ith)	θ ⩽ 50 °C		**A**	16	
Permissible short time rating no current flowing for preceding 15 minutes with θ ⩽ 40 °C	For 1 s		**A**	320	
	For 10 s		**A**	96	
	For 30 s		**A**	48	
Short-circuit protection by fuse or circuit breaker	gI fuse		**A**	16	
	Circuit breaker I^2t (at 3 kA rms prospective)		**A^2s**	5000	
Average impedance per pole	At Ith and 50 Hz		**mΩ**	4	
Power dissipated per pole			**W**	1	
Maximum cabling c.s.a.				**Min.**	**Max.**
	Flexible cable without cable end	1 conductor	**mm^2**	0.5	6
		2 conductors	**mm^2**	0.5	4
	Flexible cable with cable end	1 conductor	**mm^2**	0.5	6
		2 conductors	**mm^2**	0.5	4
	Solid cable without cable end	1 conductor	**mm^2**	0.5	6
		2 conductors	**mm^2**	0.5	4
Tightening torque	Power circuit connections		**N.m**	0.8	

References: page B8/55
Dimensions, schemes: page B8/123

Characteristics

Control circuit characteristics

Rated control circuit voltage (Uc)			**V**	12…240 V, for other voltages, please consult your Regional Sales Office
Control voltage limits (θ < 50 °C)		Operating threshold, dual frequency 50/60 Hz	**V**	0.85…1.1 Uc
Average consumption at 20 °C and at Uc		Inrush at 50 Hz	**VA**	19
Operating time		Closing “C”	**ms**	70
		Opening “O”	**ms**	70
Minimum impulse time			**ms**	70
Mechanical durability				10^6 operating cycles
Electrical durability				
		AC-21		200000 operating cycles
		AC-22		100000 operating cycles
Maximum operating rate		Operating cycles per hour		900
Maximum cabling c.s.a.				
	Flexible cable without cable end	1 or 2 conductors	**mm²**	2.5
	Flexible cable with cable end	1 conductor	**mm²**	2.5
		2 conductors	**mm²**	1.5
	Solid cable without cable end	1 or 2 conductors	**mm²**	1.5
Tightening torque			**N.m**	0.8

Ref.
Contactors

References:
page B8/55

Dimensions, schemes:
page B8/123

Characteristics in lighting and heating applications

Lighting circuits

Fluorescent lamps with starter

Single fitting	Non corrected			With parallel correction		
Power in W	18	36	58	18	36	58
Number of lamps	70	35	21	50	25	16

Twin fitting	With series correction		
Power in W	2 x 18	2 x 36	2 x 58
Number of lamps	56	28	17

Incandescent lamps: filament lamps

Power in W	40	60	75	100	200
Number of lamps	40	25	20	16	8

Incandescent lamps: halogen lamps

Power in W	300	500	1000	1500
Number of lamps	5	3	1	1

Incandescent lamps: very low voltage halogen lamps

Power in W	20	50	75	100
Number of lamps	70	28	19	4

Low pressure sodium vapour lamps

	Non corrected			
Power in W	55	90	135	180
Number of lamps	24	15	10	7

High pressure sodium vapour lamps

	Non corrected		
Power in W	250	400	1000
Number of lamps	5	3	1

Heating circuits

Single-phase 230 V, 2-pole

Power in kW	3.6

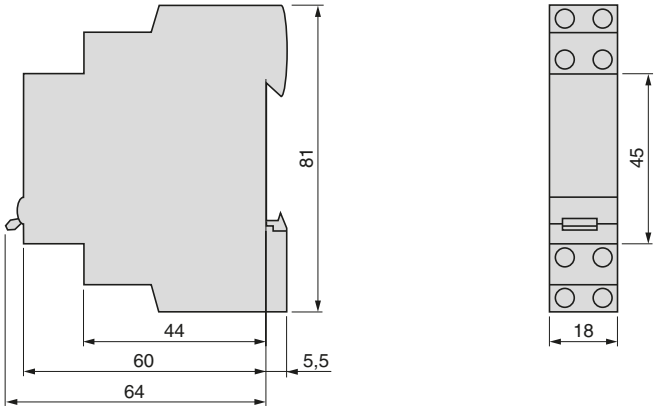
References:
page B8/55
Dimensions, schemes:
page B8/123

Dimensions and schemes

Dimensions

GF1610, GF1611, GF1620

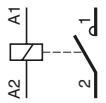
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Schemes

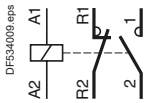
GF1610

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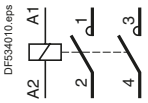
GF1611

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GF1620

DF534010.eps



Ref.
Contactors

References:
page B8/55

Characteristics:
pages B8/119 to B8/122

Test conditions according to IEC utilization categories

Contactor characteristics are established following tests and utilization categories whose are conforming IEC 60947-4-1 and 5-1 standards.

Contactors

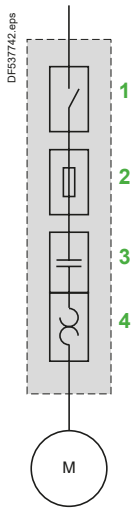
		Electrical durability: making and breaking conditions						Occasional duty: making and breaking conditions					
a.c. supply													
Typical applications	**Utilisation category**	**Making**			**Breaking**			**Making**			**Breaking**		
		I	**U**	**cos φ**	**I**	**U**	**cos φ**	**I**	**U**	**cos φ**	**I**	**U**	**cos φ**
Resistors, non inductive or slightly inductive loads	**AC-1**	Ie	Ue	0.95	Ie	Ue	0.95	1.5 Ie	1.05 Ue	0.8	1.5 Ie	1.05 Ue	0.8
Motors													
Slip ring motors: starting, breaking.	**AC-2**	2.5 Ie	Ue	0.65	2.5 Ie	Ue	0.65	4 Ie	1.05 Ue	0.65	4 Ie	1.05 Ue	0.65
Squirrel cage motors: starting, breaking whilst motor running.	**AC-3**												
	Ie ≤ (1)	6 Ie	Ue	0.65	1 Ie	0.17 Ue	0.65	10 Ie	1.05 Ue	0.45	8 Ie	1.05 Ue	0.45
	Ie > (2)	6 Ie	Ue	0.35	1 Ie	0.17 Ue	0.35	10 Ie	1.05 Ue	0.35	8 Ie	1.05 Ue	0.35
Squirrel cage motors: starting, reversing, inching	**AC-4**												
	Ie ≤ (1)	6 Ie	Ue	0.65	6 Ie	Ue	0.65	12 Ie	1.05 Ue	0.45	10 Ie	1.05 Ue	0.45
	Ie > (2)	6 Ie	Ue	0.35	6 Ie	Ue	0.35	12 Ie	1.05 Ue	0.35	10 Ie	1.05 Ue	0.35
d.c. supply													
Typical applications	**Utilisation category**	**Making**			**Breaking**			**Making**			**Breaking**		
		I	**U**	**L/R** (ms)	**I**	**U**	**L/R** (ms)	**I**	**U**	**L/R** (ms)	**I**	**U**	**L/R** (ms)
Resistors, non inductive or slightly inductive loads	**DC-1**	Ie	Ue	1	Ie	Ue	1	1.5 Ie	1.05 Ue	1	1.5 Ie	1.05 Ue	1
Shunt wound motors: starting, reversing, inching	**DC-3**	2.5 Ie	Ue	2	2.5 Ie	Ue	2	4 Ie	1.05 Ue	2.5	4 Ie	1.05 Ue	2.5
Series wound motors: starting, reversing, inching	**DC-5**	2.5 Ie	Ue	7.5	2.5 Ie	Ue	7.5	4 Ie	1.05 Ue	15	4 Ie	1.05 Ue	15

Control relays and auxiliary contacts

		Electrical durability: making and breaking conditions						Occasional duty: making and breaking conditions					
a.c. supply													
Typical applications	**Utilisation category**	**Making**			**Breaking**			**Making**			**Breaking**		
		I	**U**	**cos φ**	**I**	**U**	**cos φ**	**I**	**U**	**cos φ**	**I**	**U**	**cos φ**
Electromagnets													
≤ 72 VA	**AC-14**	-	-	-	-	-	-	6 Ie	1.1 Ue	0.7	6 Ie	1.1 Ue	0.7
> 72 VA	**AC-15**	10 Ie	Ue	0.7	Ie	Ue	0.4	10 Ie	1.1 Ue	0.3	10 Ie	1.1 Ue	0.3
d.c. supply													
Typical applications	**Utilisation category**	**Making**			**Breaking**			**Making**			**Breaking**		
		I	**U**	**L/R** (ms)	**I**	**U**	**L/R** (ms)	**I**	**U**	**L/R** (ms)	**I**	**U**	**L/R** (ms)
Electromagnets	**DC-13**	Ie	Ue	6 P (3)	Ie	Ue	6 P (3)	1.1 Ie	1.1 Ue	6 P (3)	1.1 Ie	1.1 Ue	6 P (3)

(1) Ie ≤ 17 A for electrical durability, Ie ≤ 100 A for occasional duty.
(2) Ie > 17 A for electrical durability, Ie > 100 A for occasional duty.
(3) The value 6 P (in watts) is based on practical observations and is considered to represent the majority of d.c. magnetic loads up to the maximum limit of P = 50 W i.e. 6 P = 300 ms = L/R.
Above this, the loads are made up of smaller loads in parallel. The value 300 ms is therefore a maximum limit whatever the value of current drawn.

North American market - UL CSA classification of motor starter applications



1 Motor Disconnect (Disconnect switch)
2 Motor Branch Circuit Protection (Short-circuit protection)
3 Motor Controller (Contactor)
4 Motor Overload Protection (Thermal overload relay)

Starters for the North American market

In recent years, the North American market has started to harmonise UL, CSA and ANCE standards, as well as the industrial installation codes provided by national regulations (NEC for the United States, CEC for Canada and MEC for Mexico). (1)
Major improvements, carried out by the Canena (2) are aimed at harmonising product requirements based on IEC (3) standards.
However, the North American codes use specific terminology for defining the functions of a starter.
These functions can be fulfilled by standard IEC products, accompanied by appropriate certifications.

Combination Starters

Combination Starters are the most common type of packaged motor starter. They are called "Combination" because of their structure and their combined functions. The figure opposite shows the four combined functions that constitute a complete motor starter circuit, defined as a “Motor branch circuit” by the NEC (US National Electric Code) in article 430. Standard UL508 currently gives different types of combination starter that meet the requirements of a "Motor branch circuit".

Type E, called “**self-protected combination starter**”, covers all these functions and can be controlled manually (thermal-magnetic circuit breaker) or remotely (starter-controller). Type E starters withstand faults within their declared nominal rating without sustaining damage, after which they can be put back into service. In addition, they can withstand more severe short-circuit and durability performance tests without welding or excessive wear of the contact tips.

Type F, called “**Combination motor starter**”, consists of a type E manual starter (thermal-magnetic circuit breaker) combined with a contactor.
These starters are evaluated by means of basic short-circuit tests, but are not considered as “self-protected”.

For this combination, the type E starter must be marked “Combination Motor Controller when used with ...”, followed by the reference of the load side contactor.

(1) ***UL****: Underwriters Laboratories,* ***CSA****: Canadian Standards Association,* ***ACNE****: Association of Standardization and Certification,* ***NEC****: National Electric Code,* ***CEC****: Canadian Electrical Code,* ***MEC****: Mexican Electrical Code.*
(2) ***Canena****: Council for Harmonization of Electrotechnical Standardization of North America.*
(3) ***IEC****: International Electrotechnical Commission.*

Control panels

To help users properly coordinate their motor control equipment with their distribution system in the event of a fault, article 409 of the 2005 NEC requires panel builders to list the short-circuit withstand rating of their motor control panels.
According to standard UL508A, manufacturers must use the short-circuit withstand value of the lowest rated device as the nominal withstand rating of the panel, unless the devices have been tested together for a higher coordinated rating.
The minimum "**short-circuit current rating**" (SCCR), on motor control components for horsepower ratings of 50 hp or below is 5000 A.

Using a **type E** or **type F** combination starter eliminates the coordination problems of using individual components for the "motor branch circuit protection", "motor controller" and "motor overload protection" functions.
The panel builder uses the declared short-circuit current rating for the combination starter. This value is generally higher than 5000 A.
This makes it easier to list the short-circuit current ratings and to check the compatibility of a UL508A motor control panel within a given distribution system.

Group protection

Article 430.53 of the NEC allows a single short-circuit protection device to be used for more than one motor circuit if the components used are marked and listed for such use.
Components suitable for use in group protection, known as "**motor group installations**", can be marked in one of the following two ways:

Case n° 1

The contactor and the motor overload relay are both listed as suitable for group installation.
An inverse time circuit breaker can be used as the short-circuit protection device if it is also listed as suitable for group installation.
The panel builder must therefore make sure that the short-circuit protection device selected (fuses or inverse time circuit breaker) does not exceed the value allowed by article 430.40 for the smallest overload relay used in the circuit.
Once these conditions have been met, the panel builder can reduce the size of the conductor connecting the short-circuit protection device to the individual motor contactor/overload relay, to one third of the size of the upstream circuit conductor supplying the protection device.
The panel builder must limit the length of the motor starter conductor (connecting the short-circuit protection device to the motor contactor/overload relay) to a maximum of 7.6 m (25 feet).

Case n° 2

The motor contactor and overload relay are listed as suitable for "**tap conductor protection**" in group installations.
This category allows the panel designer to reduce the size of the conductor connecting the short-circuit protection device to the individual motor contactor/overload relay, to one tenth of the size of the upstream circuit conductor supplying the protection device.
The designer must limit the length of this conductor to a maximum of 3.05 m (10 feet).
In both cases, the supply circuits must not be less than 125 % of the connected motor FLA (Full Load Amps) rating.
For panel builders, using **type F** combination starters in group installations simplifies group motor considerations.
Each starter is a fully coordinated motor branch circuit.
The panel builder follows the same NEC requirements for sizing the supply conductors as those required for single motor branch circuits.
The size of the supply conductors can be reduced in accordance with the specifications of article 430.28.
This allows the same flexibility in conductor sizing as that offered in article 430.53 (D), without a requirement to check the short-circuit protection rating marked on the components and the overload relay limit.
A UL508A panel does not need a short-circuit protection device when each motor starter installed is a **type F**.
The upstream short-circuit protection device supplying the starter protects the panel. The panel builder only has to consider the panel/enclosure disconnect requirements specified by the NEC or local codes.

TeSys F
High power contactors

TeSys F, V, FG, CR1F Contactors

Type of product	Range		Pages
Contactors for AC-3 applications TeSys F	From 115 to 1000 A		B9/2
Contactors for AC-1 applications TeSys F	From 200 to 2600 A		B9/3
Vacuum contactors – 1500 V TeSys V	From 160 to 610 A - AC-3 From 160 to 630 A - AC-1		B9/4
Shockproof contactors TeSys FG	From 150 to 630 A - AC-3		B9/6
Magnetic latching contactors TeSys CR1F	From 150 to 630 A - AC-3		B9/7
Reversing pre-assembled contactors for AC-3 applications TeSys F	From 115 to 265 A - AC-3		B9/8
Changeover pre-assembled contactor pairs for AC-1 applications TeSys F	From 200 to 350 A - AC-1		B9/9
Auxiliary contact blocks Accessories – spare parts - delayed opening devices TeSys F			B9/10
Coils TeSys F			B9/17
Accessories, coils for shockproof and magnetic latching contactors TeSys FG, TeSys CR1F			B9/27
Accessories for reversing and changeover contactor assemblies TeSys LA9F			B9/34

Technical Data for Designers B9/43

Product references

PB111858.eps



LC1F115...500

PB111860.eps



LC1F630 ..800

PB112306.eps



LC1F780

PB121451.eps



LC1F1000

3-pole contactors - Motors 115 to 1000 A / 440 V
Category AC-3 - a.c. or d.c. coils

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3							Rated operational current in AC-3	Basic reference, to be completed by adding the voltage code (2)	Weight
220 V 230 V kW	380 V 400 V kW	415 V kW	440 V kW	500 V kW	660 V 690 V kW	1000 V kW	440 V up to A	Screw fixing, cabling (1)	kg
30	55	59	59	75	80	–	115	**LC1F115●●**	3.430
40	75	80	80	90	100	–	150	**LC1F150●●**	3.430
55	90	100	100	110	110	–	185	**LC1F185●●**	4.650
63	110	110	110	129	129	–	225	**LC1F225●●**	4.750
75	132	140	140	160	160	–	265	**LC1F265●●**	7.440
100	160	180	200	200	220	160	330	**LC1F330●●**	8.600
110	200	220	250	257	280	185	400	**LC1F400●●**	9.100
147	250	280	295	355	335	–	500	**LC1F500●●**	11.350
200	335	375	400	400	450	450	630	**LC1F630●●**	18.600
220	400	425	425	450	475	450	780	**LC1F780●●**	39.500
250	450	450	450	450	475	450	800	**LC1F800●●**	18.750
315	560	630	670	_	_	_	1000	**LC1F1000●●**	31.000

Note: *auxiliary contact blocks, modules and accessories: see pages B9/10 to B9/27.*

*(1) Power terminals can be protected against direct finger contact by the addition of shrouds, to be ordered separately, except on contactors **LC1F780** (see page B9/14).*
(2) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office).

Volts ∿	24	48	110	115	120	208	220	230	240	380	400	415	440
LC1F115…F225													
40…400 Hz (coil LX9)	–	E7	F7	FE7	G7	L7	M7	P7	U7	Q7	V7	N7	R7
LC1F265…F330													
40…400 Hz (coil LX1)	B7	E7	F7	FE7	G7	L7	M7	P7	U7	Q7	V7	N7	R7
LC1F400…F630, F1250													
40…400 Hz (coil LX1)	–	E7	F7	FE7	G7 (3)	L7	M7	P7	U7	Q7	V7	N7	R7
LC1F780													
40…400 Hz (coil LX1)	–	–	F7	FE7	F7	L7	M7	P7	U7	Q7	V7	N7	R7
LC1F800													
40…400 Hz (coil LX4) (4)	–	–	FW	FW	FW	–	MW	MW	MW	QW	QW	QW	–
LC1F1000, F1400, F1700, F2100, F2600													
40...400 Hz (coil LX1F)	–	–	F7	–	G7	–	M7	P7	U7	Q7	V7	N7	R7

Volts ⎓	24	48	110	125	220	230	250	400	440
LC1F115…F330									
(coil LX4F)	BD	ED	FD	GD	MD	MD	UD	–	RD
LC1F400…F630, F1250									
(coil LX4F)	–	ED	FD	GD	MD	–	UD	–	RD
LC1F780, LC1F1000, F1400, F1700, F2100, F2600									
(coil LX4F)	–	–	FD	GD	MD	–	UD	–	RD
LC1F800									
(coil LX4F)	–	–	FW	FW	MW	MW	–	QW	–

*(3) F7 for **LC1F630**.*
*(4) Coil **LX4F8●●** + rectifier **DR5TE●●**.*

Coordination tables: pages A6/36 to A6/56
Characteristics: pages B9/44 to B9/53
Dimensions: pages B9/54 to B9/57
Schemes: pages B9/61 and B9/62

Product references

PB111861.eps



LC1F1854...3304

PB111862.eps



LC1F4004...5004

PB111863.eps



LC1F6304

PB107573.eps



LC1F1250

PB107575.eps



LC1F1700...2100

PB114811.eps



LC1F2600

2, 3 or 4-pole contactors - Loads 200 to 2600 A / 440 V
Category AC-1 - a.c. or d.c. coils

Maximum current in AC-1 (θ ≤ 40 °C)	Number of poles	Basic reference, to be completed by adding the voltage code (2) / Screw fixing, cabling (1)	Weight
A			kg
200	3	**LC1F115●●**	3.430
	4	**LC1F1154●●**	3.830
250	3	**LC1F150●●**	3.430
	4	**LC1F1504●●**	3.830
275	3	**LC1F185●●**	4.390
	4	**LC1F1854●●**	5.450
315	3	**LC1F225●●**	4.750
	4	**LC1F2254●●**	5.550
350	3	**LC1F265●●**	7.440
	4	**LC1F2654●●**	8.540
400	3	**LC1F330●●**	8.600
	4	**LC1F3304●●**	9.500
500	2	**LC1F4002●●**	8.000
	3	**LC1F400●●**	9.100
	4	**LC1F4004●●**	10.200
700	2	**LC1F5002●●**	9.750
	3	**LC1F500●●**	11.350
	4	**LC1F5004●●**	12.950
1000	2	**LC1F6302●●**	15.500
	3	**LC1F630●●**	18.600
	4	**LC1F6304●●**	21.500
1200	3	**LC1SF1200KUE**	13.400
1260	3	**LC1F1250●●**	19.000
1400	3	**LC1F1400●●**	29.000
1600	3	**LC1F780●●**	39.500
	4	**LC1F7804●●**	48.000
1700	3	**LC1F1700●●**	30.000
2100 (3)	3	**LC1F2100●●**	31.000
2600 (4)	3	**LC1F2600●●**	36.000

Note: *auxiliary contact blocks, modules and accessories: see pages B9/10 to B9/27.*
*(1) Power terminals can be protected against direct finger contact by the addition of shrouds, to be ordered separately (except **LC1F780, LC1F1250, LC1F1400, LC1F1700 and LC1F2100**), see page "TeSys contactors", page B9/14.*
(2) Standard control circuit voltages, see previous page.
*(3) With set of right-angled connectors **LA9F2100** (see page B9/13).*
*(4) With set of right-angled connectors **LA9F2600** (see page B9/13).*

Coordination tables: pages A6/36 to A6/56
Characteristics: pages B9/44 to B9/53
Dimensions: pages B9/54 to B9/57
Schemes: pages B9/61 and B9/62

Product references

PB121411.eps



LC1V320

Vacuum contactors - Motors 160 to 610 A / 400 V - a.c. coils

Standard power ratings 50/60 Hz in category AC-3					Rated operational current Ie		Instantaneous auxiliary contacts		Control circuit voltage (50/60 Hz)	Basic reference (1)	Weight
230 V	400 V	525 V	690 V	1000 V	AC-3 400 V up to	AC-1					
kW	kW	kW	kW	kW	A	A					kg
45	75	110	150	200	160	160	2	1	(1)	**LC1V160●●**	3.800
90	160	220	280	400	320	320	1	1	(1)	**LC1V320●●**	10.500
160	300	400	560	800	610	630	1	1	(1)	**LC1V610●●**	13.000

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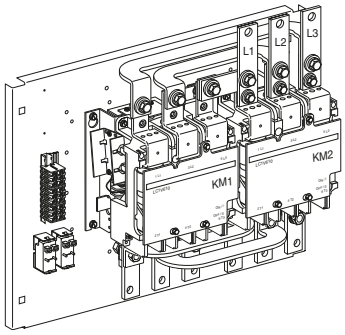
LA9V974

Reversing vacuum contactors

The reversing contactor range comprises :

- for 160 A rating, a kit with set of power connections allowing assembly of the starter
- for 320 and 610 A ratings, a complete starter, ready for use.

510227.eps



LC2V610

Standard power ratings 50/60 Hz in category AC-3					Rated operational current Ie		Instantaneous auxiliary contacts		Control circuit voltage (50/60 Hz)	Basic reference (1)	Weight
230 V	400 V	525 V	690 V	1000 V	AC-3 400 V up to	AC-1					
kW	kW	kW	kW	kW	A	A					kg
45	75	110	150	200	160	160	2	1	–	**LA9V974** (2)	1.200
90	160	220	280	400	320	320	1	1	110-120 V	**LC2V320FE7**	30
									220-240 V	**LC2V320P7**	30
									380-415 V	**LC2V320V7**	30
160	300	400	560	800	610	630	1	1	110-120 V	**LC2V610FE7**	36
									220-240 V	**LC2V610P7**	36

(1) Basic reference; add code indicating control circuit voltage.
Standard control circuit voltages:

Volts 50/60 Hz	110…120	220…240	380…415	440…480	550…600
Item	FE7	P7	V7	R7	X7

(2) Kit containing a mechanical interlock, a set of power connections and a fixing plate.
*To build a complete reversing contactor, order contactors **LC1V160●●** separately.*

Product references

PB121408.eps



LA1VN11

Instantaneous auxiliary contact blocks (1)

Number of contacts	Maximum number of blocks per contactor	Auxiliary contacts		Reference
2	4	1	1	**LA1VN11**
		–	2	**LA1VN02**
		2	–	**LA1VN20**
		1	1	**LA1VN11X** (2)

PB121409.eps



LX1V320●●

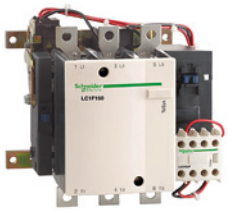
50/60 Hz coils

Rated voltage	Voltage code	Reference
V		
For contactors LC1V160		
110…120	FE7	**LX1V160FE7**
220…240	P7	**LX1V160P7**
380…415	V7	**LX1V160V7**
440…480	R7	**LX1V160R7**
550…600	X7	**LX1V160X7**
For contactors LC1V320		
110…120	FE7	**LX1V320FE7**
220…240	P7	**LX1V320P7**
380…415	V7	**LX1V320V7**
440…480	R7	**LX1V320R7**
550…600	X7	**LX1V320X7**
For contactors LC1V610		
110…120	FE7	**LX1V610FE7**
220…240	P7	**LX1V610P7**
380…415	V7	**LX1V610V7**
440…480	R7	**LX1V610R7**
550…600	X7	**LX1V610X7**

*(1) **LC1V160**: auxiliary contact blocks mounted at the top of the contactor, with no change to the overall dimensions.*
***LC1V320** or **LC1V610**: 2 auxiliary contact blocks mounted on the RH and LH side of the contactor, with no change to the overall dimensions.*
*(2) For **LC1V160**: 1 N/C contact for the coil + 1 N/O contact.*

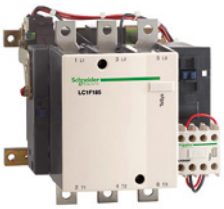
Product references

PB121407.eps



LC1FG150

PB121406.eps



LC1FG185

PB121405.eps



LC1FG265

Important notice: LC1FG range is planned for discontinuation without replacement.
Before ordering, please consult your regional sales office for availability.

3-pole shockproof contactors - Motors 150 to 630 A / 440 V AC-3, loads 250 to 1000 A / 440 V / AC-1 - a.c. coil

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3							Rated operational current in cat. AC-3, 440 V/AC-1 up to	Basic reference, to be completed by adding the voltage code [1]	Weight
220 V 230 V	380 V 400 V	415 V	440 V	500 V	660 V 690 V	1000 V		Screw fixing, cabling [2]	
kW	kW	kW	kW	kW	kW	kW	A		kg
40	75	80	80	90	100	65	150/250	**LC1FG150●●**	3.430
55	90	100	100	110	110	100	185/275	**LC1FG185●●**	4.650
75	132	140	140	160	160	147	265/350	**LC1FG265●●**	7.440
110	200	220	250	257	280	185	400/500	**LC1FG400●●**	9.100
147	250	280	295	355	335	335	500/700	**LC1FG500●●**	11.350
200	335	375	400	400	450	450	630/1000	**LC1FG630●●**	18.600

Note: *these contactors have instantaneous auxiliary contact blocks with 2 N/O contacts, 1 N/C contact and one coil maintaining contact.*

(1) Power terminals can, if required, be protected against direct finger contact by the addition of shrouds, to be ordered separately. See page B9/14.
(2) Please consult your Regional Sales Office to get the details on available coil voltages.

Characteristics: pages B9/70 to B9/83
Dimensions, schemes: pages B9/86 and B9/87

Product references

PB108372.eps



CR1F1854

PB108370.eps



CR1F500

3, 4 pole - Motors 150 to 630 A / 440 V / AC-3, loads 250 to 1000 A / 440 V AC-1 - a.c. or d.c. coils

Maximum thermal current in category AC-1 40 °C	Rated operational current in category AC-3 (440 V max)	Number of poles	Instantaneous auxiliary contacts		Basic reference, to be completed by adding the voltage code (1)	Weight
A	A					kg
250	150	3	–	–	**CR1F150●●**	3.500
		4	–	–	**CR1F1504●●**	3.800
275	185	3	–	–	**CR1F185●●**	4.600
		4	–	–	**CR1F1854●●**	5.400
350	265	3	–	–	**CR1F265●●**	7.400
		4	–	–	**CR1F2654●●**	8.500
500	400	3	–	–	**CR1F400●●**	9.100
		4	–	–	**CR1F4004●●**	10.200
700	500	3	–	–	**CR1F500●●**	11.300
		4	–	–	**CR1F5004●●**	12.900
1000	630	3	–	–	**CR1F630●●**	18.600
		4	–	–	**CR1F6304●●**	21.500

Note: *accessories, replacement parts and spare coils, see pages B9/31 to B9/33.*

(1) *Standard control circuit voltages: see page B9/32.*

Characteristics:
pages B9/88 to B9/97

Dimensions:
pages B9/98 to B9/101

PB112345.eps



LC2F115

3-pole reversing contactors - Motors 115 to 265 A / 440 V / AC-3 - a.c. or d.c. coils

Pre-wired power connections (horizontally mounted) (1)

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3						Operational current in AC-3	Maximum operational voltage	Contactors supplied without coil (2) Complete reference	Weight
220 V 230 V	380 V 400 V	415 V	440 V	500 V	660 V 690 V	440 V up to		Fixing, cabling (3)	
kW	kW	kW	kW	kW	kW	A	V		kg
30	55	59	59	75	80	115	690	**LC2F115**	7.560
40	75	80	80	90	100	150	690	**LC2F150**	7.560
55	90	100	100	110	110	185	690	**LC2F185**	10.100
63	110	110	110	129	129	225	690	**LC2F225**	14.200
75	132	140	140	160	160	265	690	**LC2F265**	16.480

PB111592.eps



LA9F701...703

Accessories (to be ordered separately)

Description	For reversing contactors	Quantity required	Reference
Power terminal protection shrouds	LC2F115	2	**LA9F701**
	LC2F150, F185	2	**LA9F702**
	LC2F225, F265	2	**LA9F703**
Auxiliary contact blocks and add-on modules	–	–	See pages B9/10 to B9/14

*(1) Fitted with a mechanical interlock without electrical interlocking. Order separately 2 auxiliary contact blocks **LADN●1** to obtain electrical interlocking between the 2 contactors, see page B9/11. For accessories, see pages B9/12 to B9/14.*
(2) Coils to be ordered separately:
- a.c. supply, see pages B9/2, B9/17 and B9/18,
- d.c. supply, see pages B9/2 and B9/23.
(3) Screw fixing.
Power terminals can be protected against direct finger contact by the addition of shrouds, to be ordered separately, see above.



Control Panel Technical Guide:
Description and product reference of all mounting kits and wiring accessories for TeSys D, K, F - Star Delta, reverser, low-high speed control motor starters and changeover applications.

> Ref. Document: CPTG011_EN

> Click on QR code to download

Coordination tables: pages A6/36 to A6/56
Dimensions: pages B9/102 to B9/104
Schemes: page B9/106

Product references

PB112346.eps



LC2F1854

4-pole changeover contactor pairs - Loads 200 to 350 A AC-1 - a.c. or d.c. coils

Pre-wired power connections (horizontally mounted) (1)

Utilisation category AC-1 Non inductive loads Maximum operational current θ < 40 °C	Maximum operational voltage	Contactors supplied without coil (2) Complete reference Fixing, cabling (3)	Weight
A	V		kg
200	690	**LC2F1154**	8.860
250	690	**LC2F1504**	8.860
275	690	**LC2F1854**	12.100
315	690	**LC2F2254**	15.200
350	1000	**LC2F2654**	19.480

PB111592.eps



LA9F706...708

Accessories (to be ordered separately)

Description	For changeover pairs	Quantity required	Reference
Power terminal protection shrouds	LC2F1154	2	**LA9F706**
	LC2F1504, F1854	2	**LA9F707**
	LC2F2254, F2654	2	**LA9F708**
Auxiliary contact blocks and add-on modules	–	–	See pages B9/10 to B9/14

*(1) Fitted with a mechanical interlock without electrical interlocking. Order separately 2 auxiliary contact blocks **LADN●1** to obtain electrical interlocking between the 2 contactors, see page B9/11. For accessories, see pages B9/12 to B9/14.*
(2) Coils to be ordered separately:
- a.c. supply, B9/2, B9/17 and B9/18,
- d.c. supply, see pages B9/2 and B9/23.
(3) Screw fixing.
Power terminals can be protected against direct finger contact by the addition of shrouds, to be ordered separately, see above.



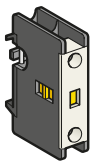
Control Panel Technical Guide:
Description and product reference of all mounting kits and wiring accessories for TeSys D, K, F - Star Delta, reverser, low-high speed control motor starters and changeover applications.

> Ref. Document: CPTG011_EN

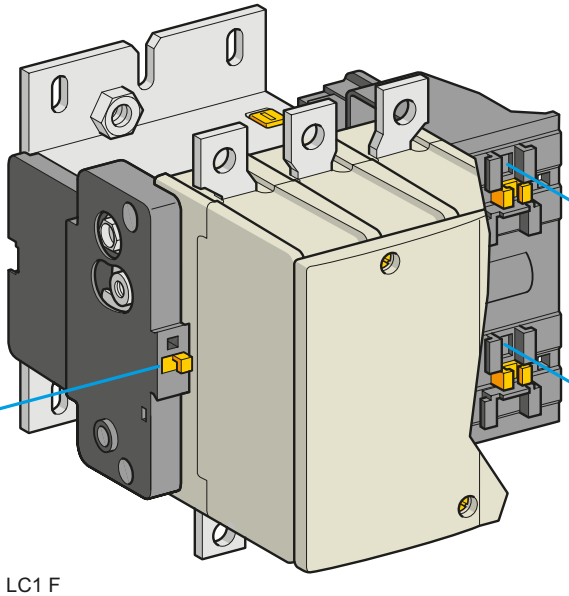
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Coordination tables: pages A6/36 to A6/56
Dimensions: pages B9/102 to B9/104
Schemes: page B9/106

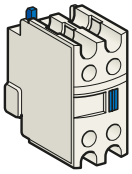
DB425903.eps



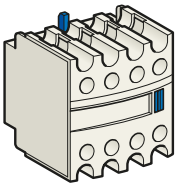
LAD N10, N01



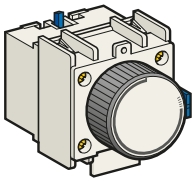
LC1 F



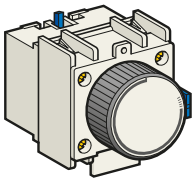
LAD N



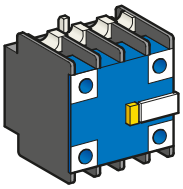
LAD N, LAD C



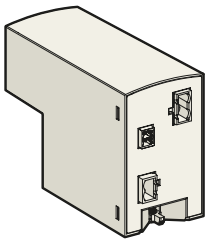
LAD T, LAD S



LAD R



LA1 DX, DY, DZ



LA4 EM250●●

Instantaneous auxiliary contact blocks

For use in normal operating environments

Number of contacts	Maximum number of blocks per contactor Clip-on mounting	Composition				Reference
1	1	–	–	1	–	**LADN10**
		–	–	–	1	**LADN01**
2	2	–	–	1	1	**LADN11**
		–	–	2	–	**LADN20**
		–	–	–	2	**LADN02**
4	2	–	–	2	2	**LADN22**
		–	–	1	3	**LADN13**
		–	–	4	–	**LADN40**
		–	–	–	4	**LADN04**
		–	–	3	1	**LADN31**
		–	–	2	2 (1)	**LADC22**

With terminal referencing conforming to EN 50012

2	2	–	–	1	1	**LADN11P**
		–	–	1	1	**LADN11G**
4	2	–	–	2	2	**LADN22P**
		–	–	2	2	**LADN22G**

Instantaneous auxiliary contact blocks for connection by lugs

This type of connection is not possible for blocks with 1 contact or blocks with dust and damp protected contacts. For all other instantaneous auxiliary contact blocks, add the figure **6** to the end of the references selected above. Example: **LADN11** becomes **LADN116**.

Instantaneous auxiliary contact blocks with dust and damp protected contacts

Recommended for use in particularly harsh industrial environments

Number of contacts	Maximum number of blocks per contactor Clip-on mounting	Composition				Reference
2	2	2	–	–	–	**LA1DX20**
		2	2 (2)	–	–	**LA1DY20**
4	2	2	–	2	–	**LA1DZ40**
		2	–	1	1	**LA1DZ31**

Time delay auxiliary contact blocks

Number of contacts	Maximum number of blocks per contactor Clip-on mounting	Time delay Type	Range s	Reference
1 N/O + 1 N/C	2	On-delay	0…3 (3)	**LADT0**
			1…30	**LADT2**
			10…180	**LADT4**
			1…30 (4)	**LADS2**
		Off-delay	0…3 (3)	**LADR0**
			1…30	**LADR2**
			10…180	**LADR4**

(1) Including 1 N/O + 1 N/C make before break.
(2) Device fitted with 4 earth screen continuity terminals.
(3) With extended scale from 0.1 to 0.6 s.
(4) With switching time of 40 ms ±15 ms between opening of the N/C contact and closing of the N/O contact.

High power contactors

PB111612.eps



LA9D09981

PB111603.eps



LA4F●●●

Suppressor blocks (1)

RC circuits (resistor-capacitor)

■ Effective protection for circuits highly sensitive to "high frequency" interference. For use only in cases where the voltage is virtually sinusoidal, i.e. less than 5 % total harmonic distortion.
■ Voltage limited to 3 Uc max. and oscillating frequency limited to 400 Hz max.
■ Slight increase in drop-out time (1.1 to 1.3 times the normal time).

Mounting	Uc		Reference
Clip-on mounting on all ratings and all a.c. coils.	∿	24…48 V	**LA4FRCE**
		50…110 V	**LA4FRCF**
		127…240 V	**LA4FRCP**
		265…415 V	**LA4FRCV**
Suppressor block bracket			**LA9D09981**

Varistors (peak limiting)

■ Protection provided by limiting the transient voltage to 2 Uc max.
■ Maximum reduction of transient voltage peaks.

Clip-on mounting on all ratings and all coils.	∿ or ⎓	24…48 V	**LA4FVE**
		50…110 V	**LA4FVF**
		127…240 V	**LA4FVP**
		265…415 V	**LA4FVV**

Diodes

■ No overvoltage or oscillating frequencies.
■ Increase in drop-out time (3 to 4 times the normal time).
■ Polarised component.

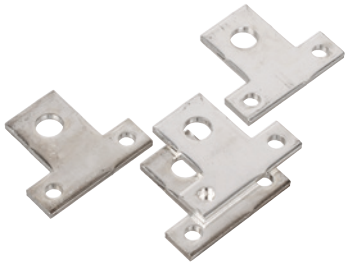
Clip-on mounting on all ratings and all d.c. coils.	⎓	24…48 V	**LA4FDE**
		55…110 V	**LA4FDF**
		125…250 V	**LA4FDP**
		280…440 V	**LA4FDV**

Bidirectional peak limiting diodes (transil)

■ Protection provided by limiting the transient voltage to between 2 and 2.5 times Uc max.
■ Maximum reduction of transient voltage peaks.

Clip-on mounting on all ratings and all coils.	∿ or ⎓	24…48 V	**LA4FTE**
		50…110 V	**LA4FTF**
		127…240 V	**LA4FTP**
		265…415 V	**LA4FTV**

PB111627.eps



LA9F●602

Connection accessories

For use on 4-pole contactors	Set of 4 links Set reference	Weight kg
Links for parallel connection of poles (in pairs)		
LC1F1154	**LA9FF602**	0.200
LC1F1504, F1854	**LA9FG602**	0.350
LC1F2254, F2654, F3304, F4004	**LA9FH602**	1.000
LC1F5004	**LA9FK602**	1.750
LC1F6304	**LA9FL602**	3.000
Links for "star" connection of 3 poles		
LC1F115	**LA9FF601**	0.035
LC1F150, F185	**LA9FG601**	0.050
LC1F225, F265, F330, F400	**LA9FH601**	0.120
LC1F500	**LA9FK601**	0.180
LC1F630, F800	**LA9FL601**	0.550

PB111628.eps



LA9F●601

High power contactors

PB112313.eps



DZ3FA3

Control circuit voltage take-off from power terminals

For use with contactors	Mounted on bolt size	Sold in lots of	Unit reference
LC1F115	M6	10	**DZ3FA3**
LC1F150, F185	M8	10	**DZ3GA3**
LC1F225…F500	M10	10	**DZ3HA3**
LC1F630, F800	M12	10	**DZ3JA3**

*(1) Order 2 x **LA4F●●●** for **F780**, **F1000**, **F1400**, **F1700**, **F2100** & **F2600** contactors and connect one suppressor block accross each coil.*
*For example, for a **LC1F1400M7** (220 V coil) contactor, use 2 x **LA4FRCF** (110 V) as RC type surge suppressors.*

Dimensions:
pages B9/58 and B9/59

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LA9F●981 (set of 3)

PB111626.eps



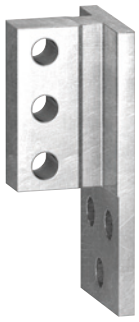
LA9F●979 (set of 3)

PB111624.eps



LA9FL980 (set of 3)

PB107577.eps



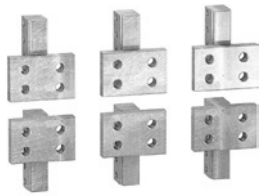
LA9F1250 (set of 6)

PB107578.eps



LA9F2100 (set of 6)

PB114813.eps



LA9F2600 (set of 6)

PB111593.eps



LA7F404 (set of 3)

Right-angled connectors

For contactors or thermal overload relays

For use with		With connector plates		Set of 3 connectors	
Contactors	Thermal overload relays (1)	Width	Type	Set reference	Weight kg
LC1F115	LR9F5●67, LR9F67	15 mm	Rear	**LA9FF981**	0.060
			Side	**LA9FF979**	0.240
			Large surface area	**LA9FF980**	0.150
LC1F150, F185	LR9F5●69, F5●71, LR9F69, F71	20 mm	Rear	**LA9FG981**	0.080
			Side	**LA9FG979**	0.350
			Large surface area	**LA9FG980**	0.200
LC1F225, F265, F330, F400	LR9F7●75,LR9F75	25 mm	Rear	**LA9FJ981**	0.430
			Side	**LA9FJ979**	0.750
			Large surface area	**LA9FJ980**	0.490
LC1F500	LR9F7●79, F7●81, LR9F79, F81	30 mm	Rear	**LA9FK981**	0.480
			Side	**LA9FK979**	0.920
			Large surface area	**LA9FK980**	0.800
LC1F630, F800	LR9F7●81,LR9F81	40 mm	Rear	**LA9FL981**	1.210
			Side	**LA9FL979**	2.570
			Large surface area	**LA9FL980**	3.190

For use with	With connector plates		Set of 6 connectors	
Contactors	Width	Type	Set reference	Weight kg
LC1F1250	60 mm	Rear	**LA9F1250**	5.480
LC1F1000, F1400, F1700, F2100	60 mm	Rear	**LA9F2100**	9.550
LC1F2600	100 mm	Rear	**LA9F2600**	4.380

Connection accessories

For reversing contactors or "star-delta" contactors combined with a thermal overload relay

For use with		Width of connector plates	Set of 3 busbars
Contactors	Thermal overload relays (1)		Set reference
LC1F115	LR9F5●57, F5●63 LR9F5●67, F5●69 LR9F69, F71	15 mm	**LA7F401**
LC1F150 and F185	LR9F5●57, F5●63	20 mm	**LA7F402**
LC1F185	LR9F5●71, LR9F71	25 mm	**LA7F407**
LC1F225 and F265	LR9F5●71, LR9F71	25 mm	**LA7F403**
	LR9F7●75, F7●79 LR9F75, F79	25 mm	**LA7F404**
LC1F330 and F400	LR9F7●75, F7●79 LR9F75, F79	25 mm	**LA7F404**
LC1F400	LR9F7●81,LR9F81	25 mm	**LA7F404**
LC1F500	LR9F7●75, F7●79 LR9F7●81 LR9F75, F79, F81	30 mm	**LA7F405**
LC1F630, F800	LR9F7●81, LR9F81	40 mm	**LA7F406**

(1) For protection relays class 10, replace the ● with a 3 and for class 20, replace the ● with a 5.

Dimensions:
pages B9/58 and B9/59

PB111617.eps



LA9F103

Insulated terminal blocks

For use on 3-pole contactors	Connection	Tightening tool	Set of 2 blocks Set reference
LC1F115, F150, F185	1 x 16…150 mm² or 2 x 16…95 mm²	4 mm hexagonal socket key	**LA9F103**

PB111592.eps



LA9F701

Power terminal protection shrouds

For use on 2, 3 and 4-pole contactors	Number of shrouds per set	Set reference
LC1F115	6	**LA9F701**
LC1F150, F185	6	**LA9F702**
LC1F225, F265, F330, F400 and F4002 F500 and F5002	6	**LA9F703**
LC1F630, F6302 and F800	6	**LA9F704**
LC1F1154	8	**LA9F706**
LC1F1504 and F1854	8	**LA9F707**
LC1F2254, F2654, F3304, F4004, F5004	8	**LA9F708**
LC1F6304	8	**LA9F709**

PB121430.eps





LA9F801

Phase separators

For use on 3-pole contactors	No. of barriers per set	Set reference
LC1F1400, F1700 F2100 and F2600	4	**LA9F801**

PB121429.eps



LA4EM250FK

Electronic Control Module (ECM) (1)

For use on 2, 3 and 4-pole contactors	With coil reference	ECM reference
LC1F115, F150	**LXEFF250**	**LA4EM250FF**
LC1F185, F225	**LXEFG250**	**LA4EM250FG**
LC1F265, F330	**LXEFH250**	**LA4EM250FH**
LC1F400	**LXEFJ250**	**LA4EM250FJ**
LC1F500	**LXEFK250**	**LA4EM250FK** (2)
LC1F630	**LXEFL250**	**LA4EM250FL** (2)
LC1F800	**LXEFW250**	**LA4EM250FW**
LC1SF1200	**LXEFK250**	**LA4EM250FK**
LC1F1250	**LXEFL250**	**LA4EM250FL** (2)

(1) ECM enables wider coil operating voltage for the TeSys F *range of contactors.*
(2) These ECM references + LXE coils will be available for ordering by end of june 2020.

Note: *Refer to page numbers B9/52, B9/53 for detailed technical information.*



Control Panel Technical Guide:
Description and product reference of all mounting kits and wiring accessories for TeSys D, K, F - Star Delta, reverser, low-high speed control motor starters and changeover applications.

> Ref. Document: CPTG011_EN

> Click on QR code to download

Product references

PB121428.eps



LA5FG431

PB111605.eps



LA5F11550

PB111606.eps



LA5F63050

Sets of contacts

Per pole: 2 fixed contacts, 1 moving contact , 2 deflectors, 1 back-plate, clamping screws and washers.

For contactor	Type	Replacement for	Reference	Weight kg
2-pole	LC1F4002	2 poles	**LA5F400802**	1.350
	LC1F5002	2 poles	**LA5F500802**	1.950
	LC1F6302	2 poles	**LA5F630802**	4.700
3-pole	LC1F115. F150	3 poles	**LA5FF431**	0.270
	LC1F185. F225	3 poles	**LA5FG431**	0.350
	LC1F265	3 poles	**LA5FH431**	0.660
	LC1F330. F400	3 poles	**LA5F400803**	2.000
	LC1F500	3 poles	**LA5F500803**	2.950
	LC1F630	3 poles	**LA5F630803**	6.100
	LC1F780	1 pole	**LA5F780801** (1)	4.700
		3 poles	**LA5F780803**	13.200
	LC1F800	3 poles	**LA5F800803**	6.100
4-pole	LC1F1504. F1154	4 poles	**LA5FF441**	0.360
	LC1F1854. F2254	4 poles	**LA5FG441**	0.465
	LC1F2654	4 poles	**LA5FH441**	0.880
	LC1F3304. F4004	4 poles	**LA5F400804**	2.700
	LC1F5004	4 poles	**LA5F500804**	3.900
	LC1F6304	4 poles	**LA5F630804**	8.150
	LC1F7804	1 pole	**LA5F780801** (1)	4.700
		4 poles	**LA5F780804**	17.300

Arc chambers

For contactor	Type	Replacement for	Reference	Weight kg
2-pole	LC1F4002	2 poles	**LA5F400250**	0.870
	LC1F5002	2 poles	**LA5F500250**	1.250
	LC1F6302	2 poles	**LA5F630250**	2.100
3-pole	LC1F115	3 poles	**LA5F11550**	0.490
	LC1F150	3 poles	**LA5F15050**	0.490
	LC1F185	3 poles	**LA5F18550**	0.670
	LC1F225	3 poles	**LA5F22550**	0.670
	LC1F265	3 poles	**LA5F26550**	0.920
	LC1F330	3 poles	**LA5F33050**	1.300
	LC1F400	3 poles	**LA5F40050**	1.300
	LC1F500	3 poles	**LA5F50050**	1.850
	LC1F630	3 poles	**LA5F63050**	3.150
	LC1F780	1 pole	**LA5F780150** (1)	2.100
	LC1F800	3 poles	**LA5F80050**	3.150
4-pole	LC1F1154	4 poles	**LA5F115450**	0.660
	LC1F1504	4 poles	**LA5F150450**	0.660
	LC1F1854	4 poles	**LA5F185450**	0.910
	LC1F2254	4 poles	**LA5F225450**	1.000
	LC1F2654	4 poles	**LA5F265450**	1.220
	LC1F3304	4 poles	**LA5F330450**	1.740
	LC1F4004	4 poles	**LA5F400450** (2)	1.740
	LC1F5004	4 poles	**LA5F500450** (2)	2.500
	LC1F6304	4 poles	**LA5F630450** 3)	4.200
	LC1F7804	1 pole	**LA5F780150** (1)	2.100

(1) Comprising 2 identical items per pole.
(2) Comprising two 2-pole arc chambers.
(3) Comprising single-pole arc chambers.

PB112314.eps



LAZR90F

Capacitive delayed opening device

These devices prevent inadvertent opening of a contactor in the event of a brief volt drop or momentary supply failure.

For contactors with d.c. coil supply				
For use with contactor		Corresponding delayed opening device		
Type	With coil	Supply voltage 50/60 Hz	Non-adjustable delay time (Tr)	Reference
		V	s	
LC1F115 or LC1F150	LX4FF110	110	2…5	**LAZR90F**
	LX4FF125	127	2…5	**LAZR90F**
	LX4FF220	220	2…5	**LAZR90M**
	LX4FF250	240	2…5	**LAZR90M**
	LX4FF375	380…415	2…5	**LAZR90Q**
	LX4FF440	440	2…5	**LAZR90Q**
LC1F185 or LC1F225	LX4FG110	110	2…5	**LAZR90F**
	LX4FG125	127	2…5	**LAZR90F**
	LX4FG220	220	2…5	**LAZR90M**
	LX4FG250	240	2…5	**LAZR90M**
	LX4FG375	380…415	2…5	**LAZR90Q**
	LX4FG440	440	2…5	**LAZR90Q**
LC1F265 or LC1F330	LX4FH110	110	2…5	**LAZR90F**
	LX4FH125	127	2…5	**LAZR90F**
	LX4FH220	220	2…5	**LAZR90M**
	LX4FH250	240	2…5	**LAZR90M**
	LX4FH375	380…415	2…5	**LAZR90Q**
	LX4FH440	440	2…5	**LAZR90Q**
LC1F400	LX4FJ110	110	1…2	**LAZR90F**
	LX4FJ125	127	1…2	**LAZR90F**
	LX4FJ220	220	1…2	**LAZR90M**
	LX4FJ250	240	1…2	**LAZR90M**
	LX4FJ375	380	1…2	**LAZR90Q**
	LX4FJ400	415	1…2	**LAZR90Q**
	LX4FJ440	440	1…2	**LAZR90Q**
LC1F500	LX4FK110	110	1…2	**LAZR90F**
	LX4FK125	127	1…2	**LAZR90F**
	LX4FK220	220	1…2	**LAZR90M**
	LX4FK250	240	1…2	**LAZR90M**
	LX4FK375	380	1…2	**LAZR90Q**
	LX4FK400	415	1…2	**LAZR90Q**
	LX4FK440	440	1…2	**LAZR90Q**
LC1F630	LX4FL110	110	1…2	**LAZR90F**
	LX4FL125	127	1…2	**LAZR90F**
	LX4FL220	220	1…2	**LAZR90M**
	LX4FL250	240	1…2	**LAZR90M**
	LX4FL375	380	1…2	**LAZR90Q**
	LX4FL400	415	1…2	**LAZR90Q**
	LX4FL440	440	1…2	**LAZR90Q**

Add-on blocks for delayed opening devices				
Application	For use with delayed opening device	Operational voltage	Non-adjustable delay time	Reference
		V	s	
To double the delay time	LAZR90F	110…127	Tr x 2	**LAZR91F**
	LAZR90M	220…240	Tr x 2	**LAZR91M**
	LAZR90Q	380…440	Tr x 2	**LAZR91Q**

Other versions

Delayed opening devices for use with other types of contactor. Please consult your Regional Sales Office.

Dimensions: pages B9/59
Schemes: page B9/62

PB112332.eps



LX9FF●●●

PB121427.eps



LX9FG●●●

PB121426.eps



LXEFK250

Specifications
Average consumption at 20 °C; 50 Hz/ 60 Hz;
cos ϕ = 0.5:
- inrush: 550 VA
- sealed: 8 VA.

Heat dissipation: 5 W.
Operating time at Uc: closing = 40...80 ms,
opening = 10…40 ms.
Operating cycles/hour (θ <= 55 °C): 1200.
Embedded PLC input according IEC 61131-2 type 2:
- Off state: 0...5 V DC
- On state: 11...30 V DC.

Coils for a.c., 40...400 Hz control voltage

Low sealed consumption.
High tolerance to inrush voltage drops.
Immune to micro-breaks (mains supply or contact chain).
Operate on networks with harmonic numbers ≤ 7.

Control circuit voltage Uc	Average resistance at 20 °C ±10 %		Inductance of closed circuit	Voltage code	Reference
	Inrush	Sealed			
V	Ω	Ω	H		
For contactors LC1F115 and LC1F150					
24	0.97	26.3	0.15	B7	**LX9FF024**
42	2.51	64.5	0.3	D7	**LX9FF042**
48	3.03	80.2	0.3	E7	**LX9FF048**
110	14.8	579	2.08	F7	**LX9FF110**
115	14.8	579	2.08	FE7	**LX9FF110**
120/127	19	746	2.65	G7	**LX9FF127**
220	59.4	2190	7.7	M7	**LX9FF220**
230	59.4	2190	7.7	P7	**LX9FF220**
240	73.5	2750	9.68	U7	**LX9FF240**
380	173	6540	23	Q7	**LX9FF380**
400	173	6540	23	V7	**LX9FF380**
415	218	8460	30	N7	**LX9FF415**
440	218	8460	30	R7	**LX9FF415**
500	262	10300	36	S7	**LX9FF500**
600	501	29674	43.58	X7	**LX9FF600**

Specifications
Average consumption at 20 °C: inrush: 690…855 VA, sealed: 6.6…8.1 VA.
Heat dissipation: 5.9…7.2 W.
Operating cycles/hour (θ ≤ 55 °C): < 2400.
Operating time at Uc: closing = 35 ms, opening = 130 ms.

For contactors LC1F185 and LC1F225					
24	0.56	34	0.13	B7	**LX9FG024**
42	1.8	46	0.25	D7	**LX9FG042**
48	2.2	60	0.23	E7	**LX9FG048**
110	10.4	411	1.46	F7	**LX9FG110**
115	10.4	411	1.46	FE7	**LX9FG110**
120/127	13	520	1.85	G7	**LX9FG127**
220	42.1	1680	5.84	M7	**LX9FG220**
230	42.1	1680	5.84	P7	**LX9FG220**
240	50.6	2060	7.22	U7	**LX9FG240**
380	128	4730	16.4	Q7	**LX9FG380**
400	128	4730	16.4	V7	**LX9FG380**
415	157	5930	20.6	N7	**LX9FG415**
440	157	5930	20.6	R7	**LX9FG415**
500	194	7550	26.3	S7	**LX9FG500**
600	406	19550	36.1	X7	**LX9FG600**

Specifications
Average consumption at 20 °C: inrush: 950…1180 VA, sealed: 8.9…10.9 VA.
Heat dissipation: 8…9.8 W.
Operating cycles/hour (θ ≤ 55 °C): < 2400.
Operating time at Uc: closing = 35 ms, opening = 130 ms.

For contactor LC1SF1200					
100...250	100...250	9.16	0.16	KUE	**LXEFK250**

PB121425.eps



LX1FH●●●2

Coils for a.c., 40...400 Hz control voltage

Low sealed consumption.
Operate on networks with harmonic numbers ≤ 7.

Control circuit voltage Uc	Average resistance at 20 °C ±10 %		Inductance of closed circuit	Voltage code	Reference
	Inrush	Sealed			
V	Ω	Ω	H		
For contactors LC1F265 and LC1F330					
24	0.8	20	(1)	B7	**LX1FH0242**
48	2.96	67	(1)	E7	**LX1FH0482**
110	18.7	440	(1)	F7	**LX1FH1102**
115	18.7	440	(1)	FE7	**LX1FH1102**
120/127	22.9	536	(1)	G7	**LX1FH1272**
200/208	58.4	1366	(1)	L7	**LX1FH2002**
220	70.6	1578	(1)	M7	**LX1FH2202**
230	70.6	1578	(1)	P7	**LX1FH2202**
240	87.94	1968	(1)	U7	**LX1FH2402**
277	113	2444	(1)	W7	**LX1FH2772**
380	217	4631	(1)	Q7	**LX1FH3802**
400	217	4631	(1)	V7	**LX1FH3802**
415	217	4631	(1)	N7	**LX1FH3802**
440	265	6731	(1)	R7	**LX1FH4402**
480/500	329	8543	(1)	S7	**LX1FH5002**
600/660	296	10245	(1)	X7	**LX1FH6002**
1000	696	25880	(1)	–	**LX1FH10002**

Specifications
Average consumption at 20 °C for 50 or 60 Hz and cos φ = 0.9:
■ inrush: 600…700 VA
■ sealed: 8…10 VA.
Heat dissipation: 8 W.
Operating time at Uc: closing = 40…65 ms, opening = 100…170 ms.
Operating cycles/hour (θ ≤ 55 °C): ≤ 2400.

PB121482.eps



LX1FJ●●●

For contactor LC1F400					
48	1.6	29.5	0.18	E7	**LX1FJ048**
110/120	9.8	230	1.35	F7	**LX1FJ110**
115	9.8	230	1.35	FE7	**LX1FJ110**
120/127	12.8	280	1.75	G7	**LX1FJ127**
200/208	30	815	4.1	L7	**LX1FJ200**
220	37	1030	5.1	M7	**LX1FJ220**
230	37	1030	5.1	P7	**LX1FJ220**
240	47.5	1320	6.4	U7	**LX1FJ240**
265/277	61	1700	8.1	W7	**LX1FJ280**
380	120	3310	15.8	Q7	**LX1FJ380**
400	120	3310	15.8	V7	**LX1FJ380**
415	145	4070	19.4	N7	**LX1FJ415**
440	145	4070	19.4	R7	**LX1FJ415**
500	190	4980	25.5	S7	**LX1FJ500**
550/600	243	6310	27.4	X7	**LX1FJ600**
1000	720	19420	84.6	–	**LX1FJ1000**

Specifications
Average consumption at 20 °C for 50 or 60 Hz and cos φ = 0.9:
■ inrush: 1000…1150 VA
■ sealed: 12…18 VA.
Heat dissipation: 14 W.
Operating time at Uc: closing = 40…75 ms, opening = 100…170 ms.
Operating cycles/hour (θ ≤ 55 °C): ≤ 2400.
(1) Please consult your Regional Sales Office.

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PB121423.eps



LX1FK●●●

Coils for a.c., 40...400 Hz control voltage

Low sealed consumption.
Operate on networks with harmonic numbers ⩽ 7.

Control circuit voltage Uc	Average resistance at 20 °C ±10 %		Inductance of closed circuit	Voltage code	Reference	Weight
	Inrush	Sealed				
V	Ω	Ω	H			kg
For contactor LC1F500						
48	1.9	33.5	0.19	E7	**LX1FK048**	1.150
110/120	9.55	260	1.25	F7	**LX1FK110**	1.150
115	9.55	260	1.25	FE7	**LX1FK110**	1.150
120/127	11.5	315	1.5	G7	**LX1FK127**	1.150
200/208	29	735	3.75	L7	**LX1FK200**	1.150
220	35.5	915	4.55	M7	**LX1FK220**	1.150
230	35.5	915	4.55	P7	**LX1FK220**	1.150
240	44.5	1160	5.75	U7	**LX1FK240**	1.150
265/277	56.5	1490	7.3	W7	**LX1FK280**	1.150
380	112	2980	14.7	Q7	**LX1FK380**	1.150
400	112	2980	14.7	V7	**LX1FK380**	1.150
415	143	3730	18.4	N7	**LX1FK415**	1.150
440	143	3730	18.4	R7	**LX1FK415**	1.150
500	172	4590	22.8	S7	**LX1FK500**	1.150
550/600	232	5660	23.9	X7	**LX1FK600**	1.150
1000	679	16960	72	–	**LX1FK1000**	1.150

Specifications
Average consumption at 20 °C for 50 or 60 Hz, cos φ = 0.9:
- inrush: 1050…1150 VA,
- sealed: 16…20 VA.

Operating cycles/hour (θ ⩽ 55 °C): ⩽ 2400.
Heat dissipation: 18 W.
Operating time at Uc: closing = 40…75 ms, opening = 100…170 ms.

PB121424.eps



LX1FL●●●

For contactors LC1F630 and LC1F1250						
48	1.1	17.1	0.09	E7	**LX1FL048** (1)	1.500
110/120	6.45	165	1.85	F7	**LX1FL110**	1.500
115	6.45	165	1.85	FE7	**LX1FL110**	1.500
127	8.1	205	1.05	G7	**LX1FL127**	1.500
200/208	20.5	605	2.65	L7	**LX1FL200**	1.500
220	25.5	730	3.35	M7	**LX1FL220**	1.500
230	25.5	730	3.35	P7	**LX1FL220**	1.500
240	25.5	730	3.35	U7	**LX1FL220**	1.500
265/277	31	900	4.1	W7	**LX1FL260**	1.500
380	78	2360	10.5	Q7	**LX1FL380**	1.500
400	78	2360	10.5	V7	**LX1FL380**	1.500
415	96	2960	13	N7	**LX1FL415**	1.500
440	96	2960	13	R7	**LX1FL415**	1.500
500	120	3660	16.5	S7	**LX1FL500**	1.500
550/600	155	4560	19.5	X7	**LX1FL600**	1.500
1000	474	12880	56.2	–	**LX1FL1000** (1)	1.500

(1) Incompatible with LC1F1250.

Specifications
Average consumption at 20 °C for 50 or 60 Hz, cos φ = 0.9:
- inrush: 1500…1730 VA,
- sealed: 20…25 VA.

Operating cycles/hour (θ ⩽ 55 °C): 1200.
Heat dissipation: 20 W.
Operating time at Uc: closing = 40…80 ms, opening = 100…200 ms.

Coils for a.c., 40...400 Hz control voltage

Low sealed consumption.
Operate on networks with harmonic numbers ≤ 7.

Control circuit voltage Uc	Average resistance at 20 °C ±10 %		Inductance of closed circuit	Voltage code	Reference	Weight
	Inrush	Sealed				
V	Ω	Ω	H			kg
For contactor LC1F780						
110/120	4.95 (2)	230 (2)	0.21	F7	**LX1FX110** (1)	3.000
115	4.95 (2)	230 (2)	0.21	FE7	**LX1FX110** (1)	3.000
127	6.1 (2)	280 (2)	0.26	G7	**LX1FX127** (1)	3.000
200/208	15.5 (2)	750 (2)	0.66	L7	**LX1FX200** (1)	3.000
220	19.5 (2)	920 (2)	0.82	M7	**LX1FX220** (1)	3.000
230	19.5 (2)	920 (2)	0.82	P7	**LX1FX220** (1)	3.000
240	19.5 (2)	920 (2)	0.82	U7	**LX1FX220** (1)	3.000
265/277	29.8 (2)	1330 (2)	1.25	W7	**LX1FX280** (1)	3.000
380	60.9 (2)	2780 (2)	2.3	Q7	**LX1FX380** (1)	3.000
400	60.9 (2)	2780 (2)	2.3	V7	**LX1FX380** (1)	3.000
415/480	74.3 (2)	3340 (2)	2.8	N7	**LX1FX415** (1)	3.000
440	74.3 (2)	3340 (2)	2.8	R7	**LX1FX415** (1)	3.000
500	92 (2)	4180 (2)	3.5	S7	**LX1FX500** (1)	3.000

Control circuit voltage Uc	Voltage code	Rectifier Reference	Coil Reference	Weight
V				kg
For contactor LC1F800				
110/127	FW	**DR5TE4U**	**LX4F8FW**	1.650
220/240	MW	**DR5TE4U**	**LX4F8MW**	1.650
380/400	QW	**DR5TE4S**	**LX4F8QW**	1.650

Control circuit voltage Uc	Average resistance at 20 °C ±10 %		Inductance of closed circuit	Voltage code	Reference	Weight
	Inrush	Sealed				
V	Ω	Ω	H			kg
For contactor LC1F1000						
110	4.718	98.4	0.63	F7	**LX1FK055** (3)	1.150
120	5.92	106	0.72	G7	**LX1FK065** (3)	1.150
For contactors LC1F1400, LC1F1700 and LC1F2100						
110	5.92	106	0.72	F7	**LX1FK065** (3)	1.150
120	5.92	106	0.72	G7	**LX1FK070** (3)	1.150
For contactors LC1F1000, LC1F1400, LC1F1700 and LC1F2100						
220	9.55	260	1.25	M7	**LX1FK110** (3)	1.150
230	9.55	260	1.25	P7	**LX1FK110** (3)	1.150
240	11.5	315	1.50	U7	**LX1FK127** (3)	1.150
277	16.5	420	2.25	W7	**LX1FK140** (3)	1.150
380	29	735	3.75	Q7	**LX1FK200** (3)	1.150
400	29	735	3.75	V7	**LX1FK200** (3)	1.150
415	35.5	915	4.55	N7	**LX1FK220** (3)	1.150
440	35.5	915	4.55	R7	**LX1FK220** (3)	1.150
500	44.5	1160	5.75	S7	**LX1FK240** (3)	1.150

Control circuit voltage Uc	Average resistance at 20 °C ±10 %		Inductance of closed circuit	Voltage code	Reference	Weight
	Inrush	Sealed				
V	Ω	Ω	H			kg
For contactors LC1F2600						
110	2.05	41	0.18	F7	**LX1FL065** (3)	1.150
120	2.05	41	0.18	G7	**LX1FL065** (3)	1.150
220	6.45	165	0.76	M7	**LX1FL110** (3)	1.150
230	6.45	165	0.76	P7	**LX1FL110** (3)	1.150
240	8.1	205	1.05	U7	**LX1FL127** (3)	1.150
277	10.2	317	1.45	W7	**LX1FL140** (3)	1.150
380	20.5	605	2.65	Q7	**LX1FL200** (3)	1.150
400	20.5	605	2.65	V7	**LX1FL200** (3)	1.150
415	25.5	730	3.35	N7	**LX1FL220** (3)	1.150
440	25.5	730	3.35	R7	**LX1FL220** (3)	1.150
500	30.8	901	4.13	S7	**LX1FL260** (3)	1.150

Specifications
Average consumption at 20 °C for 50 or 60 Hz, cos φ = 0.9:
■ inrush: 1900…2300 VA, sealed: 44…55 VA.
Operating cycles/hour (θ ≤ 55 °C): 600.
Heat dissipation: 2 x 22 W.
Operating time at Uc: closing = 40…80 ms, opening = 130…230 ms.

PB112321.eps



LX1FX●●●

Specifications
Operating cycles/hour (θ ≤ 55 °C): 600.
Average consumption at 20 °C for 50 or 60 Hz, cos φ = 0.8:
■ inrush: 1700 VA, sealed: 12 VA.
Operating time at Uc: closing = 60…80 ms, opening = 160…180 ms.

Specifications
Average consumption at 20 °C for 50 or 60 Hz, cos φ = 0.9:
■ inrush: 1600…2400 VA, sealed: 29…37 VA.
Operating cycles/hour (θ ≤ 55 °C): 600.
Heat dissipation: 2 x 18 W.
Operating time at Uc: closing = 40…75 ms, opening = 100…170 ms.

PB121422.eps



LX1FK●●●

Specifications
Average consumption at 20 °C for 50 or 60 Hz, cos φ = 0.9:
■ inrush: 2200…2700 VA, sealed: 37.4…50.6 VA.
Operating cycles/hour (θ ≤ 55 °C): 600.
Heat dissipation: 2 x 25 W.
Operating time at Uc: closing = 40…80 ms, opening = 100…200 ms.

PB121421.eps



LX1FL●●●

(1) Reference of set of 2 identical coils, to be connected in series.
(2) Value for the 2 coils in series.
(3) Order 2 coils and connect them in series.

Coils for specific applications (1)
a.c., 40...400 Hz control voltage

Low sealed consumption.
High tolerance to inrush voltage drops.
Immune to micro-breaks (mains supply or contact chain).
Operate on networks with harmonic numbers ⩽ 7.

Control circuit voltage Uc	Average resistance at 20 °C ±10 %		Inductance of closed circuit	Voltage code	Reference
	Inrush	Sealed			
V	Ω	Ω	H		
For contactors LC1F265 and LC1F330					
48	2.96	72	(2)	–	**LX9FH0482**
110/115	18.7	415	(2)	–	**LX9FH1102**
120/127	22.9	156	(2)	–	**LX9FH1272**
220/230	71.6	1621	(2)	–	**LX9FH2202**
240	88	1968	(2)	–	**LX9FH2402**
380/415	222	5075	(2)	–	**LX9FH3802**
500	345	7990	(2)	–	**LX9FH5002**

Specifications
Average consumption at 20 °C: inrush: 560…660 VA, sealed: 8…10 VA.
Heat dissipation: 8.4…10.4 W.
Operating cycles/hour (θ ⩽ 55 °C): < 3600.
Operating time at Uc: closing = 45 ms, opening = 25 ms.

(1) Application examples: hoisting (inching, high operating rates), Main-Standby (unstable mains supplies). These coils are particularly suited for use at higher operating temperatures (mounting in non-ventilated compartments, enclosures, etc.).
(2) Please consult your Regional Sales Office.

High power contactors

Schemes:
page B9/61

Coils for specific applications
a.c., 40...400 Hz control voltage

These coils are particularly suited for use at higher operating temperatures (mounting in non-ventilated compartments, enclosures, etc).
Application examples: hoisting (inching, high operating rates), Main-Standby (unstable mains supplies).
Coils with short operating times (at Uc):
- Closing: 60 ms
- Opening: 50 ms (~ side); 20 ms (⎓ side).

Coils with high operating rates (θ ≤ 70 °C):
- 3600 operating cycles/hour
- 1800 for LC1F630.

Coils with low inrush consumption.



LX9FJ●●●

Control circuit voltage Uc	Average resistance at 20 °C ±10 %		Inductance of closed circuit	Rectifier Reference (1)	Coil Reference	Weight
	Inrush	Sealed				
V	Ω	Ω	H			kg
For contactor LC1F400						
48	4.03	43	0.22	**DR5TF4V**	**LX9FJ917**	0.970
110	25.7	246	1.3	**DR5TE4U**	**LX9FJ925**	0.970
127	32.3	302	1.7	**DR5TE4U**	**LX9FJ926**	0.970
220/230	99.5	919	5	**DR5TE4U**	**LX9FJ931**	0.970
380/415	311	3011	15	**DR5TE4S**	**LX9FJ936**	0.970
440	386	3690	19	**DR5TE4S**	**LX9FJ937**	0.970
500	478	4380	23	**DR5TE4S**	**LX9FJ938**	0.970

Specifications
Average consumption:
- inrush: 500 VA
- sealed: 23 VA.

Heat dissipation: 11.4…13.9 W.



LX9FK●●●

For contactor LC1F500						
48	3.73	30.7	0.18	**DR5TF4V**	**LX9FK917**	1.080
110	24	204	1.1	**DR5TE4U**	**LX9FK925**	1.080
127	29.8	250	1.4	**DR5TE4U**	**LX9FK926**	1.080
220/230	89.9	770	4	**DR5TE4U**	**LX9FK931**	1.080
380/415	274	2075	12	**DR5TE4S**	**LX9FK936**	1.080
440	361	3060	16	**DR5TE4S**	**LX9FK937**	1.080
500	448	3750	19	**DR5TE4S**	**LX9FK938**	1.080

Specifications
Average consumption:
- inrush: 550 VA
- sealed: 31 VA.

Heat dissipation: 15…18.3 W.



LX9FL●●●

For contactor LC1F630						
48	2.81	20.8	0.17	**DR5TF4V**	**LX9FL917**	1.450
110	13.5	114	0.77	**DR5TE4U**	**LX9FL924**	1.450
127	20.8	167	1.2	**DR5TE4U**	**LX9FL926**	1.450
220	52	425	2.9	**DR5TE4U**	**LX9FL930**	1.450
220/240	64.5	518	3.6	**DR5TE4U**	**LX9FL931**	1.450
380/400	163	1360	8.8	**DR5TE4S**	**LX9FL935**	1.450
415/440	204	1670	11	**DR5TE4S**	**LX9FL936**	1.450
500	312	2510	17	**DR5TE4S**	**LX9FL938**	1.450

Specifications
Average consumption:
- inrush: 830 VA
- sealed: 47 VA.

Heat dissipation: 22.8…27.8 W.

(1) Rectifier to be ordered separately: 0.100 kg.

Schemes:
page B9/61

PB112324.eps



LX4FF●●●

Coils for d.c. control voltage

Low sealed consumption.

Control circuit voltage Uc	Average resistance at 20 °C ±10 %		Inductance of closed circuit	Voltage code	Reference
	Inrush	Sealed			
V	Ω	Ω	H		
For contactors LC1F115 and LC1F150					
24	1.12	177	11	**BD**	**LX4FF024**
48	4.52	715	42.7	**ED**	**LX4FF048**
110	21.7	2940	179	**FD**	**LX4FF110**
125	26.8	3560	223	**GD**	**LX4FF125**
220/230	84	11100	704	**MD**	**LX4FF220**
250	105	13000	868	**UD**	**LX4FF250**
440/460	301	48200	4000	**RD**	**LX4FF440**

Specifications
Average consumption:
- inrush: 543…665 W,
- sealed: 3.94…4.83 W.

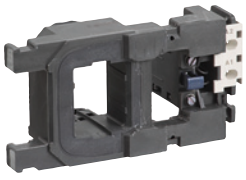
Operating time at Uc: closing = 30…40 ms, opening = 30…50 ms.
Operating cycles/hour (θ ≤ 55 °C): ≤ 2400.

For contactors LC1F185 and LC1F225					
24	0.79	169	14.9	**BD**	**LX4FG024**
48	3.2	662	55.3	**ED**	**LX4FG048**
110	14.9	2810	241	**FD**	**LX4FG110**
125	19	3320	289	**GD**	**LX4FG125**
220/230	57.7	10200	890	**MD**	**LX4FG220**
250	76	12400	1140	**UD**	**LX4FG250**
440/460	223	39700	4210	**RD**	**LX4FG440**

Specifications
Average consumption:
- inrush: 737…902 W,
- sealed: 4.13…5.07 W.

Operating time at Uc: closing = 30…40 ms, opening = 30…50 ms.
Operating cycles/hour (θ ≤ 55 °C): ≤ 2400.

PB112326.eps



LX4FH●●●

For contactors LC1F265 and LC1F330					
24	0.9	192	26.3	**BD**	**LX4FH024**
48	3.49	707	92.9	**ED**	**LX4FH048**
110	16.8	3180	424	**FD**	**LX4FH110**
125	20.8	3840	530	**GD**	**LX4FH125**
220/230	65.7	11500	1590	**MD**	**LX4FH220**
250	84	13900	1910	**UD**	**LX4FH250**
440/460	255	44000	7570	**RD**	**LX4FH440**

Specifications
Average consumption:
- inrush: 655…803 W,
- sealed: 3.68…4.53 W.

Operating time at Uc: closing = 40…50 ms, opening = 40…65 ms.
Operating cycles/hour (θ ≤ 55 °C): ≤ 2400.

For contactor LC1F400					
48	2.5	558	56	**ED**	**LX4FJ048**
110	12.7	2660	270	**FD**	**LX4FJ110**
125	15.8	3130	330	**GD**	**LX4FJ125**
220	47	8820	910	**MD**	**LX4FJ220**
250	61	10500	1200	**UD**	**LX4FJ250**
440	236	33750	4435	**RD**	**LX4FJ440**

Specifications
Average consumption:
- inrush: 920…1140 W,
- sealed: 4…7.5 W.

Operating time at Uc: closing = 50…60 ms, opening = 45…60 ms.
Operating cycles/hour (θ ≤ 55 °C): ≤ 2400.

PB112328_40.eps



LX4FK●●●

LX4FK specifications
Average consumption:
- inrush: 990…1220 W,
- sealed: 4.54…8 W.

Operating cycles/hour (θ ≤ 55 °C): 2400.
Operating time at Uc: closing = 50…60 ms, opening = 45…60 ms.

LXE specifications
Average consumption:
- inrush 50/60 Hz: 280...730 VA rms
  DC: 270...680 W,
- sealed: 50/60 Hz: 4.5...10 VA rms
  DC: 2.5..5.5 W.

Heat Dissipation: 2.5..5.5 W
Operating cycles/hour (θ ≤ 55 °C): < 2400.
Operating time at Uc: closing = 40…80 ms, opening = 6…54 ms.
Embedded PLC input according IEC 61131-2 type 2:
- Off state: 0...5 V DC
- On state: 11...30 V DC.

LX4FL specifications
Average consumption:
- inrush: 1420…1920 W,
- sealed: 6.5…12.5 W.

Operating cycles/hour (θ ≤ 55 °C): 1200.
Operating time at Uc: closing = 60…70 ms, opening = 40…50 ms.

LX4FX specifications
Average consumption:
- inrush: 1960…2420 W
- sealed: 42…52 W.

Operating cycles/hour (θ ≤ 55 °C): 600.
Operating time at Uc: closing = 70…80 ms, opening = 100…130 ms.

LX4F8 specifications
Heat dissipation: 25 W.
Operating time at Uc: closing = 60…80 ms, opening = 40…50 ms.

LX4FK specifications with LC1F1000,1400,1700, 2100
Average consumption:
- inrush: 2000…2200 W,
- sealed: 8…10 W.

Operating cycles/hour (θ ≤ 55 °C): 600.
Operating time at Uc: closing = 50…60 ms, opening = 45…60 ms.

LX4FL specifications with LC1F2600
Average consumption:
- inrush: 2130…2880 W
- sealed: 13…25 W.

Operating cycles/hour (θ ≤ 55 °C): 600.
Operating time at Uc: closing = 60…70 ms, opening = 40…50 ms.

Coils for d.c. control voltage

Low sealed consumption.

Control circuit voltage Uc	Average resistance at 20 °C ±10 % Inrush	Sealed	Inductance of closed circuit	Voltage code	Reference	Weight
V	Ω	Ω	H			kg
For contactor LC1F500						
48	2.35	515	67	ED	**LX4FK048**	1.080
110	11.5	2450	280	FD	**LX4FK110**	1.080
125	15	2930	400	GD	**LX4FK125**	1.080
220	44	8150	1080	MD	**LX4FK220**	1.080
250	56	9650	1350	UD	**LX4FK250**	1.080
440	225	31300	5270	RD	**LX4FK440**	1.080
For contactors LC1F500 to LC1F1250 (1)						
For contactors LC1F115 and LC1F150						
100...250 ∿ 100...380 ⎓	8.66	–	–	KUE	**LXEFF250**	1.100
For contactors LC1F185 and LC1F225						
100...250 ∿ 100...380 ⎓	9.06	–	–	KUE	**LXEFG250**	1.100
For contactors LC1F265 and LC1F330						
100...250 ∿ 100...380 ⎓	7.62	–	–	KUE	**LXEFH250**	1.100
For contactor LC1F400						
100...250 ∿ 100...380 ⎓	7.8	–	–	KUE	**LXEFJ250**	1.100
For contactors LC1F500 and LC1SF1200						
100...250 ∿ 100...380 ⎓	8	–	–	KUE	**LXEFK250**	1.100
For contactors LC1F630 and LC1F1250						
100...250 ∿ 100...380 ⎓	4.78	–	–	KUE	**LXEFL250**	1.100
For contactor LC1F800						
100...250 ∿	4.78	–	–	KUE	**LXEFW250**	1.100
For contactors LC1F630 and LC1F1250						
48	1.7	353	40.5	ED	**LX4FL048**	1.450
110	8.1	1680	180	FD	**LX4FL110**	1.450
125	10	2110	230	GD	**LX4FL125** (2)	1.450
220	31	5160	650	MD	**LX4FL220**	1.450
250	38	6080	815	UD	**LX4FL250**	1.450
440	152	23120	2910	RD	**LX4FL440** (2)	1.450
For contactor LC1F780						
110	6.1 (4)	280 (4)	0.26	FD	**LX4FX110** (3)	3.000
125	7.7 (4)	410 (4)	0.33	GD	**LX4FX125** (3)	3.000
220	24.6 (4)	1100 (4)	1	MD	**LX4FX220** (3)	3.000
250	29.8 (4)	1330 (4)	1.25	UD	**LX4FX250** (3)	3.000
440	92 (4)	4180 (4)	3.5	RD	**LX4FX440** (3)	3.000
For contactor LC1F800						
110/120	–	–	–	FW	**LX4F8FW**	1.650
220/240	–	–	–	MW	**LX4F8MW**	1.650
380/400	–	–	–	QW	**LX4F8QW**	1.650
For contactors LC1F1000, LC1F1400, LC1F1700 and LC1F2100						
110	2.94	734	98	FD	**LX4FK055** (5)	1.080
125	3.73	916	122	GD	**LX4FK065** (5)	1.080
220	11.5	2450	280	MD	**LX4FK110** (5)	1.080
250	15	2930	400	UD	**LX4FK125** (5)	1.080
440	44	8150	1080	RD	**LX4FK220** (5)	1.080
For contactor LC1F2600						
110	2.05	481	64	FD	**LX4FL055** (5)	1.080
125	2.53	603	80	GD	**LX4FL065** (5)	1.080
220	11.5	2450	280	MD	**LX4FL110** (5)	1.080
250	15	2930	400	UD	**LX4FL125** (5)	1.080
440	44	8150	1080	RD	**LX4FL220** (5)	1.080

*(1) LXE coil to be used along with suitable Electronic Control Module (ECM) Ref. **LA4EM●●●●●**. For details, please refer to page B9/14.*
*(2) Incompatible with **LC1F1250**.*
(3) Reference of set of 2 identical coils, to be connected in series.
(4) Value for the 2 coils in series.
(5) Order 2 coils and connect them in series.

PB112335.eps



LX9FJ●●●

PB112336.eps



LX9FK●●●

PB112337.eps



LX9FL●●●

Coils for d.c. control voltage

Coils with short operating times (at Uc):
- Opening: 60 ms
- Closing: 20 ms.

Coils with high operating rates (θ ≤ 70 °C):
- 3600 operating cycles/hour
- 1800 for LC1F630.

Coils with low inrush consumption.

Control circuit voltage Uc	Average resistance at 20 °C ±10 %		Induc-tance of closed circuit	Resistor (1)		Coil	
	Inrush	Sealed		Qty required	Reference	Reference	Weight
V	Ω	Ω	H				kg
For contactor LC1F400							
48	5.11	99	0.27	1	**DR2SC0047**	**LX9FJ918**	0.970
110	32.3	632	1.7	1	**DR2SC0330**	**LX9FJ926**	0.970
125	39.4	760	2	1	**DR2SC0390**	**LX9FJ927**	0.970
220	123	2320	6.1	1	**DR2SC1200**	**LX9FJ932**	0.970
440/460	478	9080	23	1	**DR2SC4700**	**LX9FJ938**	0.970

Specifications
Average consumption:
- inrush: 430 W
- sealed: 22 W.

For contactor LC1F500							
48	4.67	76.7	0.22	1	**DR2SC0039**	**LX9FK918**	1.080
110	29.8	470	1.4	1	**DR2SC0220**	**LX9FK926**	1.080
125	37.4	637	1.7	1	**DR2SC0330**	**LX9FK927**	1.080
220	115	1935	5.1	1	**DR2SC1000**	**LX9FK932**	1.080
440/460	448	7050	19	1	**DR2SC3300**	**LX9FK938**	1.080

Specifications
Average consumption:
- inrush: 470 W
- sealed: 29 W.

For contactor LC1F630							
48	3.43	52.9	0.20	2	**DR2SC0047**	**LX9FL918**	1.450
110	17.2	272	0.98	2	**DR2SC0270**	**LX9FL925**	1.450
125	20.8	333	1.2	2	**DR2SC0330**	**LX9FL926**	1.450
220	64.5	1018	3.6	2	**DR2SC1000**	**LX9FL931**	1.450
440/460	260	4010	14	2	**DR2SC3900**	**LX9FL937**	1.450

Specifications
Average consumption:
- inrush: 733 W
- sealed: 48 W.

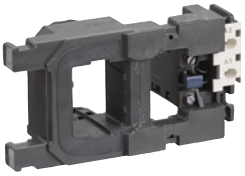
(1) Resistor to be ordered separately, weight of resistor: 0.030 kg.

PB112324.eps



LX4FF●●●

PB112326.eps



LX4FH●●●

Coils for wide range d.c. control voltage

Wide range coils: 0.7…1.25 Uc.
Operating cycles/hour: ⩽ 60 (1).
Ambient temperature (operation): -55 to + 70 °C.

Control circuit voltage Uc	Average resistance at 20 °C ±10 %		Inductance of closed circuit	Reference
	Inrush	Sealed		
V	Ω	Ω	H	
For contactors LC1F115 and LC1F150				
24	0.71	120	7.4	**LX4FF020**
48	2.86	392	27	**LX4FF040**
72	7.05	1055	66	**LX4FF060**
110	13.2	1970	121	**LX4FF090**
125	16.9	2340	149	**LX4FF100**

Specifications
Average consumption:
- inrush: 415…1300 W
- sealed: 3…9 W.

For contactors LC1F185 and LC1F225				
24	0.52	112	9.3	**LX4FG020**
48	2	359	34.4	**LX4FG040**
72	5.07	984	85	**LX4FG060**
110	9.66	1840	157	**LX4FG090**
125	12	2230	196	**LX4FG100**

Specifications
Average consumption:
- inrush: 580…1820 W
- sealed: 3.1…9.5 W.

For contactors LC1F265 and LC1F330				
24	0.58	129	17.3	**LX4FH020**
48	2.19	400	59.5	**LX4FH040**
72	5.58	1110	149	**LX4FH060**
110	11	2120	287	**LX4FH090**
125	13.8	2520	353	**LX4FH100**

Specifications
Average consumption:
- inrush: 515…1600 W
- sealed: 2.7…8.5 W.

Operational voltage	Average resistance at 20 °C ±10 %	Inductance of closed circuit	Coil	Economy resistor Resistors in //			Reference of the assembly (2)
			Reference	No.	Ω	Reference	
V	Ω	H					
For contactor LC1F400							
24	1.05	0.049	**LX2FJW11**	3	56	**DR2SC0056**	**LX5FJW11**
48	4.8	0.22	**LX2FJW18**	3	220	**DR2SC0220**	**LX5FJW18**
72	9.6	0.44	**LX2FJW21**	3	470	**DR2SC0470**	**LX5FJW21**

Specifications
Average consumption:
- inrush: 290…860 W
- sealed: 16…47 W.

(1) The mechanical durability of the contactor is limited to 1 million operating cycles.
*(2) The set comprises: 1 coil **LX2FJ** and 3 resistors **DR2SC**.*

Auxiliary contact blocks for TeSys LC1FG 3-pole shockproof contacts

PB121452.eps



LADN●●

Instantaneous auxiliary contact blocks

For use in normal operating environments

Number of contacts	Max. number of blocks per contactor Clip-on mounting	Composition				Reference	
1	1	–	–	1	–	**LADN10**	(1)
		–	–	–	1	**LADN01**	(1)
4	1	–	–	2	2	**LADN22**	(1)
		–	–	4	–	**LADN40**	(1)
		–	–	–	4	**LADN04**	(1)
		–	–	3	1	**LADN31**	(1)

PB121420.eps



LADT●

Time delay auxiliary contact blocks

Number of contacts	Max. number of blocks per contactor Clip-on mounting	Time delay Type	Range	Reference	
			s		
1 N/O + 1 N/C	1	On-delay	0…3 (2)	**LADT0**	
			1…30	**LADT2**	(1)
			10…180	**LADT4**	
			1…30 (3)	**LADS2**	
		Off-delay	0…3 (2)	**LADR0**	
			1…30	**LADR2**	(1)
			10…180	**LADR4**	

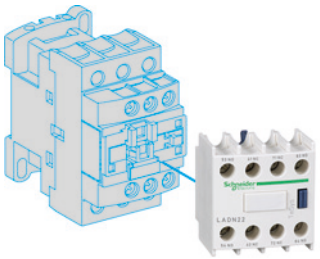
(1) Device approved by the DCN (French naval shipyard department) and authorised for on-board use.
(2) With extended scale from 0.1 to 0.6 s.
(3) With switching time of 40 ms ±15 ms between opening of the N/C contact and closing of the N/O contact.

High power contactors

Characteristics: pages B9/84 and B9/85
Schemes: page B9/87

Product references

PB121453.eps



LADN

PB111617.eps



LA9F103

PB111592.eps



LA9F70●

PB121415.eps



EZ2LB0601

Accessories for contactors CR1F

Description	Number of contacts or shrouds	For use on	Reference
Instantaneous auxiliary contacts	(1)	CR1F	**LADN●●, LADX●●, LADY●●, LADZ●●** (1)
Time delay auxiliary contacts	(1)	CR1F	**LADT●, LADS●, LADR●** (1)
Contact blocks with protected terminals for 3-pole contactors (for mounting on contactors with closed arc chamber)	Set of 2 blocks	CR1F150 and CR1F185	**LA9F103**
Power terminal protection shrouds	Set of 6 shrouds for 3-pole contactors	CR1F150 and CR1F185	**LA9F702**
		CR1F265 to CR1F500	**LA9F703**
		CR1F630	**LA9F704**
	Set of 8 shrouds for 4-pole contactors	CR1F1504 and CR1F1854	**LA9F707**
		CR1F2654 to CR1F5004	**LA9F708**
		CR1F6304	**LA9F709**

Description	Application	Reference
Mechanical interlock and power connections	For assembly of reversing contactors and changeover contactor pairs	See pages B9/29 and B9/30

Accessories for contactors CR1B

Description	Application	Reference	Weight kg
Mechanical interlock with mounting accessories (2)	For vertical assembly of reversing contactors and changeover contactor pairs	**EZ2LB0601**	1.560
Kit containing 2 bar mounting brackets	For mounting on 120 or 150 mm centres	**LA9B103**	1.620

(1) For maximum number per contactor and complete reference, see page B9/11.
(2) Positive mechanical interlocking between 2 vertically mounted contactors of identical or different ratings. Connecting rods and cranks assembled on right-hand sides, crank pins on the pole side.
Vertical fixing centre distance between the two contactors: 600 mm.



Control Panel Technical Guide:
Description and product reference of all mounting kits and wiring accessories for TeSys D, K, F - Star Delta, reverser, low-high speed control motor starters and changeover applications.

> Ref. Document: CPTG011_EN

> Click on QR code to download

Dimensions:
pages B9/98 to B9/101

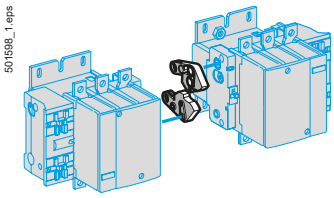
Reversing and changeover assemblies with CR1F magnetic latching contactors

Horizontally mounted

Mechanical interlocks

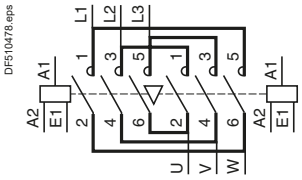
Reversers assembled using 2 contactors of identical rating, type:
CR1F150
CR1F185
CR1F265
CR1F400
CR1F500
CR1F630

LA9F●970 (1)



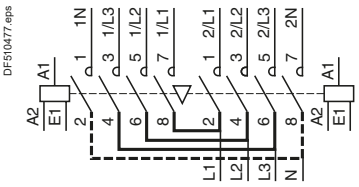
Sets of power connections

Reversing contactors
LA9F●976 (1)





3 or 4-pole changeover contactor pairs
LA9F●977 (1) or LA9F●982 (1)



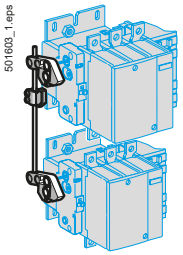


Vertically mounted

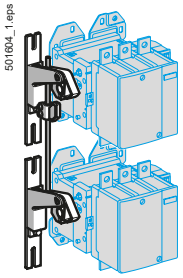
Mechanical interlocks

Reversers assembled using 2 contactors of identical rating, type:
CR1F150
CR1F185
CR1F265
CR1F400
CR1F500
CR1F630

LA9FF4F
LA9FG4G
Assembly A

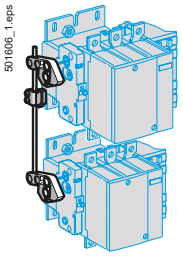


LA9FH4H
LA9FJ4J
LA9FK4K
LA9FL4L
Assembly C

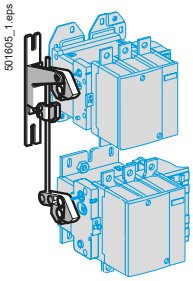


Reversers assembled using 2 contactors of different ratings, type:
CR1F150
CR1F185
CR1F265
CR1F400
CR1F500
CR1F630

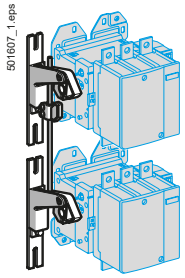
LA9FG4F
Assembly A



LA9FH4F
LA9FJ4F
LA9FK4F
LA9FL4F
LA9FH4G
LA9FJ4G
LA9FK4G
LA9FL4G
Assembly B

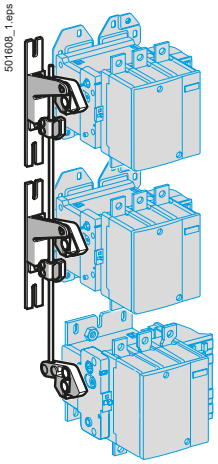


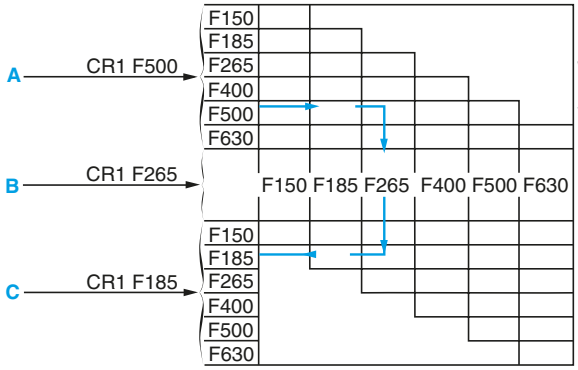
LA9FJ4H
LA9FK4H
LA9FL4H
LA9FK4J
LA9FL4J
LA9FK4K
Assembly C



Reversers assembled using 3 contactors of identical or different ratings

LA9F●4●4● (2)





Warning: the contactor ratings must be in decreasing size from top to bottom.

(1) Complete references: see page B9/35.
(2) Complete references: see pages B9/38 and B9/39.

Product references

Reversing and changeover assemblies with CR1F magnetic latching contactors.

Reversers assembled using 2 contactors of identical rating

Contactor type	Set of power connections			Mechanical interlock	
	3-pole Reference	4-pole Reference	Weight kg	Kit reference	Weight kg
For assembly of 3-pole reversing contactors for motor control (1)					
Horizontally mounted					
CR1F150	**LA9FF976**	–	0.600	**LA9FF970**	0.060
CR1F185	**LA9FG976**	–	0.780	**LA9FG970**	0.060
CR1F265	**LA9FH976**	–	1.500	**LA9FJ970**	0.140
CR1F400	**LA9FJ976**	–	2.100	**LA9FJ970**	0.140
CR1F500	**LA9FK976**	–	2.350	**LA9FJ970**	0.140
CR1F630	**LA9FL976**	–	3.800	**LA9FL970**	0.150
Vertically mounted					
CR1F150	(2)	–	–	**LA9FF4F**	0.345
CR1F185	(2)	–	–	**LA9FG4G**	0.350
CR1F265	(2)	–	–	**LA9FH4H**	1.060
CR1F400	(2)	–	–	**LA9FJ4J**	1.200
CR1F500	(2)	–	–	**LA9FK4K**	1.200
CR1F630	(2)	–	–	**LA9FL4L**	1.220
For assembly of 4-pole changeover contactor pairs					
Horizontally mounted					
CR1F1504	**LA9FF982**	**LA9FF977**	0.460	**LA9FF970**	0.060
CR1F1854	**LA9FG982**	**LA9FG977**	0.610	**LA9FG970**	0.060
CR1F2654	**LA9FH982**	**LA9FH977**	1.200	**LA9FJ970**	0.140
CR1F4004	**LA9FJ982**	**LA9FJ977**	1.800	**LA9FJ970**	0.140
CR1F5004	**LA9FK982**	**LA9FK977**	2.300	**LA9FJ970**	0.140
CR1F6304	**LA9FL982**	**LA9FL977**	3.400	**LA9FL970**	0.150
Vertically mounted					
CR1F1504	(2)	–	–	**LA9FF4F**	0.345
CR1F1854	(2)	–	–	**LA9FG4G**	0.350
CR1F2654	(2)	–	–	**LA9FH4H**	1.060
CR1F4004	(2)	–	–	**LA9FJ4J**	1.200
CR1F5004	(2)	–	–	**LA9FK4K**	1.200
CR1F6304	(2)	–	–	**LA9FL4L**	1.220

Reversers assembled using 2 contactors of different ratings

Contactor type		Mechanical interlock	
At bottom	At top	Kit reference	Weight kg
For assembly of 3 or 4-pole changeover contactor pairs			
Vertically mounted (3)			
CR1F150 or F1504	CR1F185 or F1854	**LA9FG4F**	0.350
	CR1F265 or F2654	**LA9FH4F**	0.870
	CR1F400 or F4004	**LA9FJ4F**	0.930
	CR1F500 or F5004	**LA9FK4F**	0.940
	CR1F630 or F6304	**LA9FL4F**	0.940
CR1F185 or F1854	CR1F265 or F2654	**LA9FH4G**	0.860
	CR1F400 or F4004	**LA9FJ4G**	0.940
	CR1F500 or F5004	**LA9FK4G**	0.940
	CR1F630 or F6304	**LA9FL4G**	0.950
CR1F265 or F2654	CR1F400 or F4004	**LA9FJ4H**	1.130
	CR1F500 or F5004	**LA9FK4H**	1.130
	CR1F630 or F6304	**LA9FL4H**	1.140
CR1F400 or F4004	CR1F500 or F5004	**LA9FK4J**	1.200
	CR1F630 or F6304	**LA9FL4J**	1.210
CR1F500 or F5004	CR1F630 or F6304	**LA9FL4K**	1.210

For assembly of 3 or 4-pole reversing contactors (4)

Using 3 contactors (vertically mounted) of identical or different ratings	Mechanical interlock Kit reference (5)
The contactor ratings must be in decreasing size from top to bottom.	**LA9F●4●4●**

Contactors	CR1F150	CR1F185	CR1F265	CR1F400	CR1F500	CR1F630
Code	F	G	H	J	K	L

Example: mechanical interlock for reversing contactor made up of 3 different contactors: CR1F500 top, CR1F265 middle and CR1F185 bottom: **LA9FK4H4G**.

(1) A 3-pole reversing contactor for motor control can be converted into a 3-pole changeover contactor pair by removing the upper connecting links.
(2) All power connections are to be made by the customer.
(3) With identical or different number of poles. Power connections to be made by the customer.
(4) Closing of one of the 3 contactors prevents closing of the other 2 contactors.
(5) Complete the reference by replacing the first dot with the code for the upper contactor, the second dot with the code for the middle contactor and the third dot with the code for the bottom contactor.

Illustrations: page B9/29
Dimensions: pages B9/98 to B9/101

Product references

PB121414.eps



LA5FG431

PB111605.eps



LA5F11550

References

Description	For contactor		Reference	Weight kg
Complete sets of contacts for 3 or 4 poles (1)	3-pole	CR1F150	**LA5FF431**	0.270
		CR1F185	**LA5FG431**	0.350
		CR1F265	**LA5FH431**	0.660
		CR1F400	**LA5F400803**	0.660
		CR1F500	**LA5F500803**	0.660
		CR1F630	**LA5F630803**	0.660
	4-pole	CR1F1504	**LA5FF441**	0.360
		CR1F1854	**LA5FG441**	0.465
		CR1F2654	**LA5FH441**	0.880
		CR1F4004	**LA5F400804**	0.465
		CR1F5004	**LA5F500804**	0.465
		CR1F6304	**LA5F630804**	0.465
Arc chambers	3-pole	CR1F150	**LA5F15050**	0.490
		CR1F185	**LA5F18550**	0.670
		CR1F265	**LA5F26550**	0.920
		CR1F400	**LA5F40050**	1.300
		CR1F500	**LA5F50050**	1.850
		CR1F630	**LA5F63050**	3.150
	4-pole	CR1F1504	**LA5F150450**	0.660
		CR1F1854	**LA5F185450**	0.910
		CR1F2654	**LA5F265450**	1.220
		CR1F4004	**LA5F400450**	1.740
		CR1F5004	**LA5F500450**	2.500
		CR1F6304	**LA5F630450**	4.200

(1) Set containing the following (per pole): 2 fixed contacts, 1 moving contact , 2 deflectors, 1 back-plate, clamping screws and washers.

Product references

PB121413.eps



LX0FG007

PB121412.eps



LX0FK006

Standard coils for a.c. or d.c. control voltage						
Usual voltages		Resistance of winding at θ = 20 °C		Reference	Voltage code	Weight
50…400 Hz or ⎓	50 Hz, 60 Hz	Latching	Unlatching			
V	V	Ω	Ω			kg
For contactors CR1F150						
48	–	1.98	230.8	**LX0FF005**	E7	0.440
110	–	9.35	1453	**LX0FF006**	F7	0.440
127	–	11.61	1788	**LX0FF007**	G7	0.440
208	–	23.50	4098	**LX0FF020**	L7	0.440
220/230	–	37.55	5139	**LX0FF008**	M7	0.440
–	240	45.16	6544	**LX0FF009**	U7	0.440
–	380/400	114.10	12 447	**LX0FF010**	Q7	0.440
–	415	139.50	16 717	**LX0FF011**	N7	0.440
For contactors CR1F185						
48	–	1.42	220	**LX0FG005**	E7	0.560
110	–	6.92	1339	**LX0FG006**	F7	0.560
127	–	8.45	1676	**LX0FG007**	G7	0.560
208	–	21.30	3169	**LX0FG020**	L7	0.560
220/230	–	26.27	4729	**LX0FG008**	M7	0.560
–	240	32.95	4729	**LX0FG009**	U7	0.560
–	380/400	82.29	11 885	**LX0FG010**	Q7	0.560
–	415	102.30	14 305	**LX0FG011**	N7	0.560
For contactors CR1F265						
48	–	1.34	183.4	**LX0FH005**	E7	0.780
110	–	6.90	1031	**LX0FH006**	F7	0.780
127	–	8.56	1325	**LX0FH007**	G7	0.780
208	–	20.20	2654	**LX0FH020**	L7	0.780
220/230	–	25.77	4090	**LX0FH008**	M7	0.780
–	240	33.03	5002	**LX0FH009**	U7	0.780
–	380/400	78.39	11 803	**LX0FH010**	Q7	0.780
–	415	102.9	15 006	**LX0FH011**	N7	0.780
For contactors CR1F400						
48	–	1.32	90.5	**LX0FJ005**	E7	1.120
110	–	8.09	813	**LX0FJ006**	F7	1.120
127	–	9.79	1027	**LX0FJ007**	G7	1.120
208	–	24.40	2643	**LX0FJ020**	L7	1.120
220/230	–	30.14	3309	**LX0FJ008**	M7	1.120
–	240	37.02	4074	**LX0FJ009**	U7	1.120
–	380/400	94.80	9380	**LX0FJ010**	Q7	1.120
–	415	121.10	11 763	**LX0FJ011**	N7	1.120
For contactors CR1F500						
48	–	1.57	166	**LX0FK005**	E7	1.220
110	–	7.53	916	**LX0FK006**	F7	1.220
127	–	9.56	1159	**LX0FK007**	G7	1.220
208	–	23.60	2981	**LX0FK020**	L7	1.220
220/230	–	28.81	3733	**LX0FK008**	M7	1.220
–	240	35.67	4595	**LX0FK009**	U7	1.220
–	380/400	89.56	10 570	**LX0FK010**	Q7	1.220
–	415	112.06	13 256	**LX0FK011**	N7	1.220
For contactors CR1F630						
48	–	0.87	204	**LX0FL005**	E7	1.460
110	–	5.20	1423	**LX0FL006**	F7	1.460
127	–	6.45	1830	**LX0FL007**	G7	1.460
208	–	20.20	2961	**LX0FL020**	L7	1.460
220/230	–	25.36	4603	**LX0FL008**	M7	1.460
–	240	25.36	5658	**LX0FL009**	U7	1.460
–	380/400	60.95	10 676	**LX0FL010**	Q7	1.460
–	415	77.97	13 003	**LX0FL011**	N7	1.460

Product references

PB121483.eps



LX0FG●●●

Special coils for a.c. or d.c. control voltage

Coils with two windings with common point, allowing the use of two separate power sources for latching and unlatching.

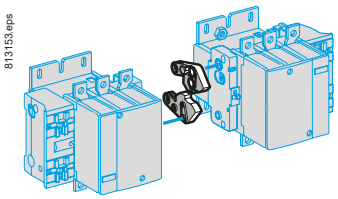
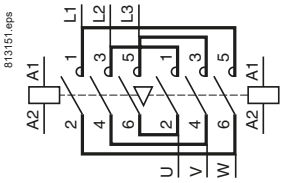
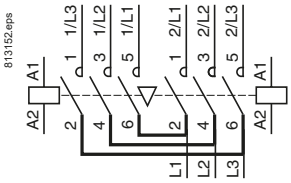
Coil voltages at 50 Hz, 60 Hz, 400 Hz or ⎓		Resistance of winding at θ = 20 °C		Reference	Voltage code	Weight
Latching	Unlatching	Latching	Unlatching			
V	V	Ω	Ω			kg
For contactors CR1F150						
220	24	29.5	39.5	**LX0FF224**	MB7	0.440
For contactors CR1F185						
220	24	26.5	19	**LX0FG224**	MB7	0.560
For contactors CR1F265						
220	24	26	29.5	**LX0FH224**	MB7	0.780
For contactors CR1F400						
220	24	30	23	**LX0FJ224**	MB7	1.120
For contactors CR1F500						
220	24	29	26	**LX0FK224**	MB7	1.220
For contactors CR1F630						
220	24	26	41	**LX0FL224**	MB7	1.460

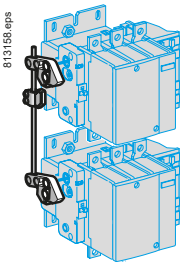
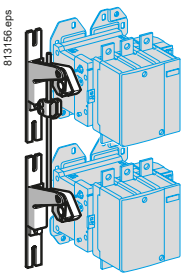
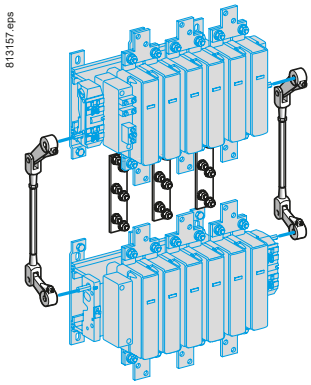
Coils with low inrush consumption for d.c. control voltage

Usual voltages ⎓	Resistance of winding at θ = 20 °C		Reference	Voltage code	Weight
	Latching	Unlatching			
V	Ω	Ω			kg
For contactors CR1F150					
48	4.56	140.56	**LX0FF055**	EZ7	0.440
110	22.37	706.44	**LX0FF056**	FZ7	0.440
127	35.54	1086.36	**LX0FF057**	GZ7	0.440
220	89.85	3342.51	**LX0FF058**	MZ7	0.440
For contactors CR1F185					
48	5.19	106.54	**LX0FG055**	EZ7	0.570
110	25.50	536.26	**LX0FG056**	FZ7	0.570
127	32.75	732.64	**LX0FG057**	GZ7	0.570
220	102.44	2378.62	**LX0FG058**	MZ7	0.570
For contactors CR1F265					
48	5.19	74.26	**LX0FH055**	EZ7	0.800
110	25	364.61	**LX0FH056**	FZ7	0.800
127	30.98	458.45	**LX0FH057**	GZ7	0.800
220	97.89	1344.46	**LX0FH058**	MZ7	0.800
For contactors CR1F400					
48	5.05	36.36	**LX0FJ055**	EZ7	1.150
110	25.39	171.49	**LX0FJ056**	FZ7	1.150
127	31.86	221.20	**LX0FJ057**	GZ7	1.150
220	98.19	648.79	**LX0FJ058**	MZ7	1.150
For contactors CR1F500					
48	4.42	41	**LX0FK055**	EZ7	1.270
110	22.74	193.36	**LX0FK056**	FZ7	1.270
127	28.25	313.60	**LX0FK057**	GZ7	1.270
220	85.12	918.68	**LX0FK058**	MZ7	1.270
For contactors CR1F630					
48	3.94	59.17	**LX0FL055**	EZ7	1.500
110	19.36	365.33	**LX0FL056**	FZ7	1.500
127	25.39	452.27	**LX0FL057**	GZ7	1.500
220	74.44	1071.43	**LX0FL058**	MZ7	1.500

Product references

Components for reversing and changeover assemblies of LC1F contactors - 3-pole

Horizontally mounted	Mechanical interlocks	Sets of power connections	
		Reversing contactors	3-pole changeover contactor pairs (1)
Reversers assembled using 2 contactors of identical rating, type :	LA9F●970 (2)	LA9F●●76 (2)	LA9F●●82 (2)
LC1F115 **LC1F150** **LC1F185** **LC1F225** **LC1F265** **LC1F330** **LC1F400** **LC1F500** **LC1F630** **LC1F800**			
			

Vertically mounted	Mechanical interlocks	
Reversers assembled using 2 contactors of identical rating, type :	LA9FF4F LA9FG4G	LA9FH4H LA9FJ4J LA9FK4K LA9FL4L
LC1F115 **LC1F150** **LC1F185** **LC1F225** **LC1F265** **LC1F330** **LC1F400** **LC1F500** **LC1F630** **LC1F800**		
Reversers assembled using 2 contactors of different ratings, see page B9/36		
LC1F780	**LA9FX970**	
		

(1) For 4-pole changeover contactor pairs, see pages B9/36 and B9/37.
(2) Complete references: see page B9/35.



Control Panel Technical Guide:
Description and product reference of all mounting kits and wiring accessories for TeSys D, K, F - Star Delta, reverser, low-high speed control motor starters and changeover applications.

> Ref. Document: CPTG011_EN

> Click on QR code to download

References:
pages B9/8 and B9/9

Product references

Components for reversing and changeover assemblies of LC1F contactors - 3-pole

Reversers assembled using 2 contactors of identical rating

Contactor type [1]	Set of power connections		Mechanical interlock	
	Reference	Weight kg	Kit reference	Weight kg
For assembly of 3-pole reversing contactors for motor control				
Horizontally mounted				
LC1F115	**LA9FF976**	0.600	**LA9FF970**	0.060
LC1F150	**LA9F15076**	0.600	**LA9FF970**	0.060
LC1F185	**LA9FG976**	0.780	**LA9FG970**	0.060
LC1F225	**LA9F22576**	1.500	**LA9FG970**	0.060
LC1F265	**LA9FH976**	1.500	**LA9FJ970**	0.140
LC1F330	**LA9FJ976**	2.100	**LA9FJ970**	0.140
LC1F400	**LA9FJ976**	2.100	**LA9FJ970**	0.140
LC1F500	**LA9FK976**	2.350	**LA9FJ970**	0.140
LC1F630 or F800	**LA9FL976**	3.800	**LA9FL970**	0.150
Vertically mounted				
LC1F115 or F150	[2]	–	**LA9FF4F**	0.345
LC1F185	[2]	–	**LA9FG4G**	0.350
LC1F225	[2]	–	**LA9FG4G**	0.350
LC1F265 or F330	[2]	–	**LA9FH4H**	1.060
LC1F400	[2]	–	**LA9FJ4J**	1.200
LC1F500	[2]	–	**LA9FK4K**	1.200
LC1F630 or F800	[2]	–	**LA9FL4L**	1.220
LC1F780	[3]	–	**LA9FX970** [3]	6.100
For assembly of 3-pole changeover contactor pairs [4]				
Horizontally mounted				
LC1F115	**LA9FF982**	0.460	**LA9FF970**	0.060
LC1F150	**LA9F15082**	0.460	**LA9FF970**	0.060
LC1F185	**LA9FG982**	0.610	**LA9FG970**	0.060
LC1F225	**LA9F22582**	1.200	**LA9FG970**	0.060
LC1F265	**LA9FH982**	1.200	**LA9FJ970**	0.140
LC1F330	**LA9FJ982**	1.800	**LA9FJ970**	0.140
LC1F400	**LA9FJ982**	1.800	**LA9FJ970**	0.140
LC1F500	**LA9FK982**	2.300	**LA9FJ970**	0.140
LC1F630 or F800	**LA9FL982**	3.400	**LA9FL970**	0.150
Vertically mounted				
LC1F115 or F150	[2]	–	**LA9FF4F**	0.345
LC1F185	[2]	–	**LA9FG4G**	0.350
LC1F225	[2]	–	**LA9FG4G**	0.350
LC1F265 or F330	[2]	–	**LA9FH4H**	1.060
LC1F400	[2]	–	**LA9FJ4J**	1.200
LC1F500	[2]	–	**LA9FK4K**	1.200
LC1F630 or F800	[2]	–	**LA9FL4L**	1.220
LC1F780	[3]	–	**LA9FX970** [3]	7.800

*(1) To order the 2 contactors: see pages B9/2 and B9/3. For the 2 auxiliary contact blocks **LADN●1** required to obtain electrical interlocking between the 2 contactors, see page B9/11. For accessories, see pages B9/12 to B9/14.*
(2) All power connections are to be made by the customer.
(3) Double mechanical interlock mechanism with 2 interlock connecting rods and 3 power connecting links.
(4) For assembly of 4-pole changeover contactor pairs, see pages B9/36 and B9/37.

High power contactors

Dimensions:
pages B9/102 to B9/104

Schemes:
page B9/106

Product references

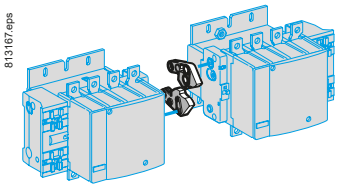
Components for reversing and changeover assemblies of LC1F contactors - 3-pole, 4-pole

Horizontally mounted

Contactor pairs assembled using 2 contactors of identical rating, type :
LC1F1154
LC1F1504
LC1F1854
LC1F2254
LC1F2654
LC1F3304
LC1F4004
LC1F5004
LC1F6304

Mechanical interlocks

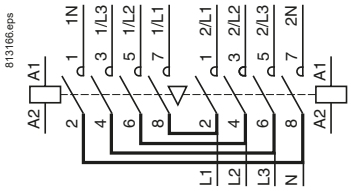
LA9F•970 (2)



Sets of power connections

4-pole changeover contactor pairs (1)
LA9F•••77 (2)





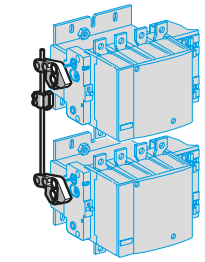
Vertically mounted

Contactor pairs assembled using 2 contactors of identical rating, type :
LC1F1154
LC1F1504
LC1F1854
LC1F2254
LC1F2654
LC1F3304
LC1F4004
LC1F5004
LC1F6304

Mechanical interlocks

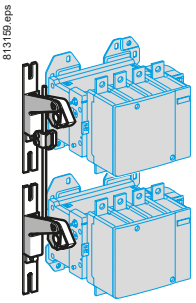
Assembly A

LA9FF4F
LA9FG4G



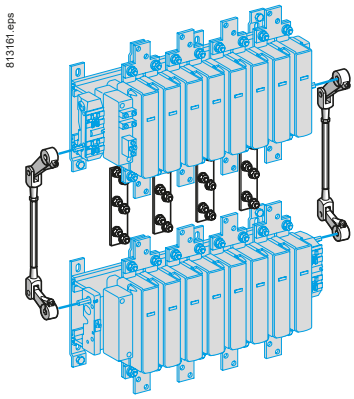
Assembly B

LA9FH4H
LA9FJ4J
LA9FK4K
LA9FL4L



Assembly C

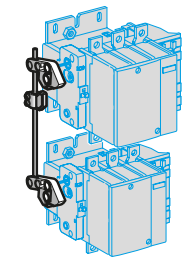
LA9FX971



Contactor pairs assembled using 2 contactors of different ratings, type :
LC1F115 or **F1154**
LC1F150 or **F1504**
LC1F185 or **F1854**
LC1F225 or **F2254**
LC1F265 or **F2654**
LC1F330 or **F3304**
LC1F400 or **F4004**
LC1F500 or **F5004**
LC1F630 or **F6304**
LC1F800

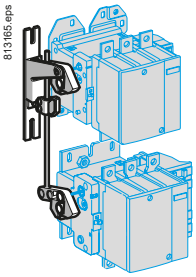
Assembly A

LA9FG4F



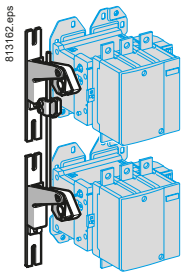
Assembly B

LA9FH4F, LA9FH4G
LA9FJ4F, LA9FJ4G
LA9FK4F, LA9FK4G
LA9FL4F, LA9FL4G



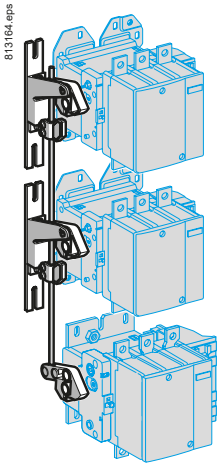
Assembly C

LA9FJ4H
LA9FK4H, LA9FK4J
LA9FL4H, LA9FL4J and LA9FL4K



Contactor pairs assembled using 3 contactors of identical or different ratings, type :
LC1F115 or **F1154**
LC1F150 or **F1504**
LC1F185 or **F1854**
LC1F225 or **F2254**
LC1F265 or **F2654**
LC1F330 or **F3304**
LC1F400 or **F4004**
LC1F500 or **F5004**
LC1F630 or **F6304**
LC1F800

LA9F•4•4• : see pages B9/38 and B9/39.





Control Panel Technical Guide:
Description and product reference of all mounting kits and wiring accessories for TeSys D, K, F - Star Delta, reverser, low-high speed control motor starters and changeover applications.

> Ref. Document: CPTG011_EN

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Important: the contactor ratings must be in decreasing size from top to bottom.

(1) For 3-pole changeover contactor pairs, see pages B9/34 and B9/35.
(2) Complete references: see page B9/37.

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Product references

Components for reversing and changeover assemblies of LC1F contactors 3-pole, 4-pole.

Contactor pairs assembled using 2 contactors of identical rating

For assembly of 4-pole changeover contactor pairs (1)

Contactor type (2)	Set of power connections		Mechanical interlock	
	Reference	Weight kg	Kit reference	Weight kg
Horizontally mounted				
LC1F1154	**LA9FF977**	0.460	**LA9FF970**	0.060
LC1F1504	**LA9F15077**	0.460	**LA9FF970**	0.060
LC1F1854	**LA9FG977**	0.610	**LA9FG970**	0.060
LC1F2254	**LA9F22577**	1.200	**LA9FG970**	0.060
LC1F2654	**LA9FH977**	1.200	**LA9FJ970**	0.140
LC1F3304	**LA9FJ977**	1.800	**LA9FJ970**	0.140
LC1F4004	**LA9FJ977**	1.800	**LA9FJ970**	0.140
LC1F5004	**LA9FK977**	2.300	**LA9FJ970**	0.140
LC1F6304	**LA9FL977**	3.400	**LA9FL970**	0.150
Vertically mounted				
LC1F1154 or F1504	(3)	–	**LA9FF4F**	0.345
LC1F1854	(3)	–	**LA9FG4G**	0.350
LC1F2254	(3)	–	**LA9FG4G**	0.350
LC1F2654 or F3304	(3)	–	**LA9FH4H**	1.060
LC1F4004	(3)	–	**LA9FJ4J**	1.200
LC1F5004	(3)	–	**LA9FK4K**	1.200
LC1F6304	(3)	–	**LA9FL4L**	1.220
LC1F7804	(4)	–	**LA9FX971** (4)	7.800

Contactor pairs assembled using 2 contactors of different ratings

For assembly of 3 or 4-pole changeover contactor pairs

Contactor type (1)		Mechanical interlock	
At bottom	At top	Kit reference	Weight kg
Vertically mounted			
LC1F115 or F1154 or LC1F150 or F1504	LC1F185 or F1854	**LA9FG4F**	0.350
	LC1F225 or F2254	**LA9FG4F**	0.350
	LC1F265 or F2654	**LA9FH4F**	0.870
	LC1F330 or F3304	**LA9FH4F**	0.870
	LC1F400 or F4004	**LA9FJ4F**	0.930
	LC1F500 or F5004	**LA9FK4F**	0.940
	LC1F630, F6304 or F800	**LA9FL4F**	0.940
LC1F185 or F1854 or LC1F225 or F2254	LC1F265 or F2654	**LA9FH4G**	0.860
	LC1F330 or F3304	**LA9FH4G**	0.860
	LC1F400 or F4004	**LA9FJ4G**	0.940
	LC1F500 or F5004	**LA9FK4G**	0.940
	LC1F630, F6304 or F800	**LA9FL4G**	0.950
LC1F265 or F2654 or LC1F330 or F3304	LC1F400 or F4004	**LA9FJ4H**	1.130
	LC1F500 or F5004	**LA9FK4H**	1.130
	LC1F630, F6304 or F800	**LA9FL4H**	1.140
LC1F400 or F4004	LC1F500 or F5004	**LA9FK4J**	1.200
	LC1F630 or F6304 or F800	**LA9FL4J**	1.210
LC1F500 or F5004	LC1F630 or F6304 or F800	**LA9FL4K**	1.210

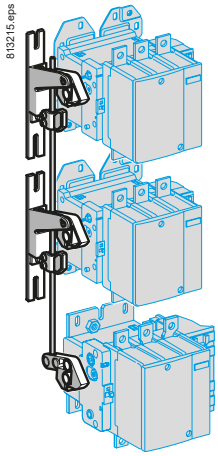
For assembly of reversers using 3 contactors, vertically mounted
See pages B9/38 and B9/39.

(1) For assembly of 3-pole changeover contactor pairs, see pages B9/34 and B9/35.
(2) To order the 2 contactors: see pages B9/2 and B9/3. For the 2 auxiliary contact blocks ***LADN•1*** *required to obtain electrical interlocking between the 2 contactors, see page B9/11. For accessories, see pages B9/12 to B9/14.*
(3) All power connections are to be made by the customer.
(4) Double mechanical interlock mechanism with 2 interlock connecting rods and 4 power connecting links.

Dimensions:
pages B9/102 to B9/104

Schemes:
page B9/106

Product references



Example of assembly using LA9FH4H4G kit (2 right-angled mounting brackets included)



LA9FF4●4● to LA9FG4●4●

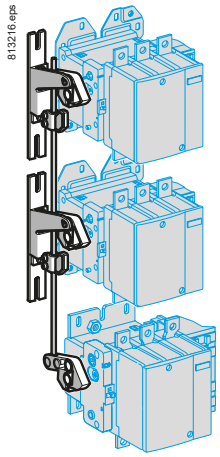
Components for reversing and changeover assemblies of 3 LC1F contactors - 3-pole, 4-pole.
Closing of one of the 3 contactors prevents closing of the other 2.

Mechanical interlock kits

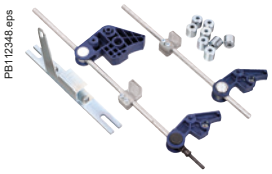
Vertically mounted

Contactor type (1)			Mechanical interlock (2)	
Top	Middle	Bottom	Kit reference (3)	Weight kg
LC1F115, F150, F1154 or F1504	LC1F115, F150, F1154 or F1504	LC1F115, F150, F1154 or F1504	**LA9FF4F4F**	0.554
LC1F185, F225, F1854 or F2254	LC1F115, F150, F1154 or F1504	LC1F115, F150, F1154 or F1504	**LA9FG4F4F**	0.559
	LC1F185, F225, F1854 or F2254	LC1F115, F150, F1154 or F1504	**LA9FG4G4F**	0.559
		LC1F185, F225, F1854 or F2254	**LA9FG4G4G**	0.562
LC1F265, F330, F2654 or F3304	LC1F115, F150, F1154 or F1504	LC1F115, F150, F1154 or F1504	**LA9FH4F4F**	1.350
	LC1F185, F225, F1854 or F2254	LC1F115, F150, F1154 or F1504	**LA9FH4G4F**	1.375
		LC1F185, F225, F1854 or F2254	**LA9FH4G4G**	1.375
	LC1F265, F330, F2654 or F3304	LC1F115, F150, F1154 or F1504	**LA9FH4H4F**	1.524
		LC1F185, F225, F1854 or F2254	**LA9FH4H4G**	1.527
		LC1F265, F330, F2654 or F3304	**LA9FH4H4H**	1.684
LC1F400, F4002 or F4004	LC1F115, F150, F1154 or F1504	LC1F115, F150, F1154 or F1504	**LA9FJ4F4F**	1.421
	LC1F185, F225, F1854 or F2254	LC1F115, F150, F1154 or F1504	**LA9FJ4G4F**	1.424
		LC1F185, F225, F1854 or F2254	**LA9FJ4G4G**	1.428
	LC1F265, F330, F2654 or F3304	LC1F115, F150, F1154 or F1504	**LA9FJ4H4F**	1.595
		LC1F185, F225, F1854 or F2254	**LA9FJ4H4G**	1.598
		LC1F265, F330, F2654 or F3304	**LA9FJ4H4H**	1.755
	LC1F400, F4002 or F4004	LC1F115, F150, F1154 or F1504	**LA9FJ4J4F**	1.666
		LC1F185, F225, F1854 or F2254	**LA9FJ4J4G**	1.669
		LC1F265, F330, F2654 or F3304	**LA9FJ4J4H**	1.829
		LC1-F400, F4002 or F4004	**LA9FJ4J4J**	1.890
LC1F500, F5002 or F5004 (continued on page B9/39)	LC1F115, F150, F1154 or F1504	LC1F115, F150, F1154 or F1504	**LA9FK4F4F**	1.421
	LC1F185, F225, F1854 or F2254	LC1F115, F150, F1154 or F1504	**LA9FK4G4F**	1.424
		LC1F185, F225, F1854 or F2254	**LA9FK4G4G**	1.428
	LC1F265, F330, F2654 or F3304	LC1F115, F150, F1154 or F1504	**LA9FK4H4F**	1.595
		LC1F185, F225, F1854 or F2254	**LA9FK4H4G**	1.598
		LC1F265, F330, F2654 or F3304	**LA9FK4H4H**	1.755
	LC1F400, F4002 or F4004	LC1F115, F150, F1154 or F1504	**LA9FK4J4F**	1.666
		LC1F185, F225, F2654 or F3304	**LA9FK4J4G**	1.669
		LC1F265, F330, F2654 or F3304	**LA9FK4J4H**	1.829
		LC1F400, F4002 or F4004	**LA9FK4J4J**	1.896
	LC1F500, F5002 or F5004	LC1F115, F150, F1154 or F1504	**LA9FK4K4F**	1.666

*(1) To order the 3 contactors, see pages B9/2 and B9/3. For auxiliary contact blocks **LADN02** used for electrical locking, see page B9/11. For accessories, see pages B9/12 to B9/14.*
(2) Minimum distances between contactors, see page B9/39.
*(3) The kit contains the lever arms, the 2 x Ø8 mm rods and all parts required for assembly. 1 right-angled mounting bracket included per driven contactor **LC1F265** to **5004**.*



Example of assembly using LA9FL4J4J kit (2 right-angled mounting brackets included)



LA9FL4G4F

Components for reversing and changeover assemblies of 3 LC1F contactors - 3-pole, 4-pole.

Mechanical interlock kits (continued)

Vertically mounted

Contactor type (1)			Mechanical interlock (2)	
Top	Middle	Bottom	Kit reference (3)	Weight kg
LC1F500, F5002 or F5004 *(continued)*	LC1F500, F5002 or F5004	LC1F185, F225, F1854 or F2254	**LA9FK4K4G**	1.669
		LC1F265, F330, F2654 or F3304	**LA9FK4K4H**	1.825
		LC1F400, F4002 or F4004	**LA9FK4K4J**	1.896
		LC1-F500, F5002 or F5004	**LA9FK4K4K**	1.896
LC1F630, F800, F6302 or F6304	LC1F115, F150, F1154 or F1504	LC1F115, F150, F1154 or F1504	**LA9FL4F4F**	1.428
	LC1F185, F225, F1854 or F2254	LC1F115, F150, F1154 or F1504	**LA9FL4G4F**	1.431
		LC1F185, F225, F1854 or F2254	**LA9FL4G4G**	1.436
	LC1F265, F330, F2654 or F3304	LC1F115, F150, F1154 or F1504	**LA9FL4H4F**	1.602
		LC1F185, F225, F1854 or F2254	**LA9FL4H4G**	1.606
		LC1F265, F330, F2654 or F3304	**LA9FL4H4H**	1.751
	LC1F400, F4002 or F4004	LC1F115, F150, F1154 or F1504	**LA9FL4J4F**	1.673
		LC1F185, F225, F1854 or F2254	**LA9FL4J4G**	1.676
		LC1F265, F330, F2654 or F3304	**LA9FL4J4H**	1.832
		LC1F400, F4002 or F4004	**LA9FL4J4J**	1.903
	LC1-F500, F5002 or F5004	LC1F115, F150, F1154 or F1504	**LA9FK4K4F**	1.666
		LC1F185, F225, F1854 or F2254	**LA9FK4K4G**	1.669
		LC1F265, F330, F2654 or F3304	**LA9FK4K4H**	1.825
		LC1F400, F4002 or F4004	**LA9FK4K4J**	1.896
		LC1-F500, F5002 or F5004	**LA9FK4K4K**	1.896
	LC1F630, F800, F6302 or F6304	LC1F115, F150, F1154 or F1504	**LA9FL4L4F**	1.680
		LC1F185, F225, F1854 or F2254	**LA9FL4L4G**	1.683
		LC1F265, F330, F2654 or F3304	**LA9FL4L4H**	1.910
		LC1F400, F4002 or F4004	**LA9FL4L4J**	1.896
		LC1F500, F5002 or F5004	**LA9FL4L4K**	1.896
		LC1F630, F800, F6302, or F6304	**LA9FL4L4L**	1.920

*(1) To order the 3 contactors, see pages B9/2 and B9/3. For auxiliary contact blocks **LADN02** used for electrical locking, see page B9/11. For accessories, see pages B9/12 to B9/14.*
(2) Minimum distances between contactors.
This is the distance, in mm, between the centres of two adjacent contactors (between the top and middle contactors or between the middle and bottom contactors).

Contactor

Bottom or top	Middle					
	LC1F115 or F150	LC1F185 or F225	LC1F265 or F330	LC1F400	LC1F500	LC1F630 or F800
LC1F115 or F150	200	210	240	250	270	320
LC1F185 or F225	210	220	250	250	270	330
LC1F265 or F330	240	250	250	260	280	350
LC1F400	250	250	260	260	280	320
LC1F500	270	270	280	280	300	340
LC1F630 or F800	320	330	350	320	340	380

*(3) The kit contains the lever arms, the 2 x Ø8 mm rods and all parts required for assembly. 1 right-angled mounting bracket included per driven contactor **LC1F265** to **8004**.*

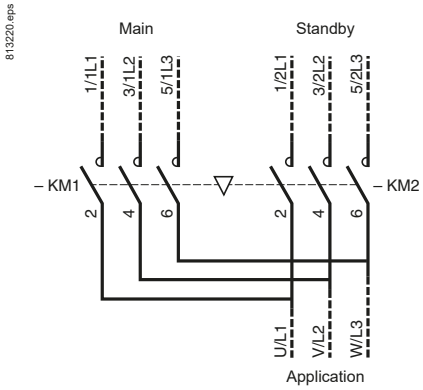
3-pole, 4-pole electrical distribution - changeover application

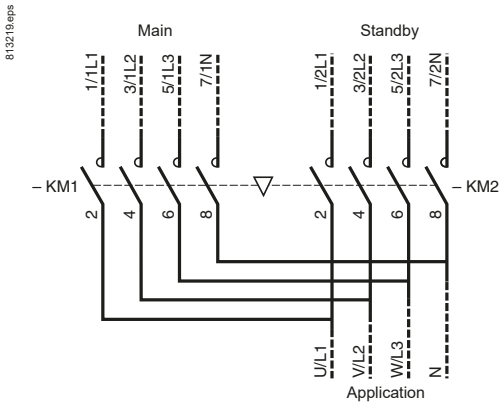
A changeover contactor pair ensures continuity of operation of an installation and energy management.

It switches between:
- a power supply source M (main) which normally supplies the installation
- and a power supply source S (standby) which may be an incoming line from an additional network or a generating set.

The supply sources may be 3-phase or 3-phase + neutral.

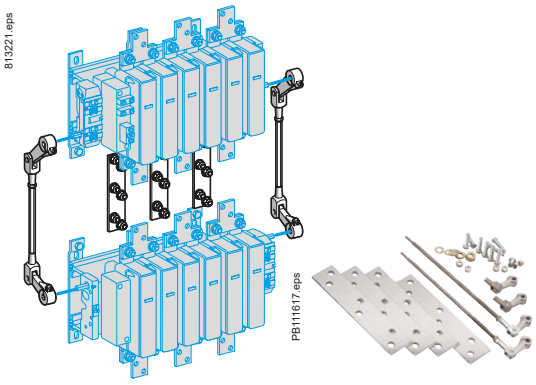
Supply - 3-phase





The 2 contactors must be mechanically and electrically interlocked to prevent any paralleling, even transitory, of the two supplies.

High power contactors



LA9FX970

Changeover contactor pairs for customer assembly: 3-phase

Vertically mounted.
Maximum operational voltage: 1000 V.
Utilisation category: AC-1.
Maximum temperature in the vicinity of the devices: 40 °C.
a.c. or d.c. contactor control voltage.

Maximum operational current AC-1		Contactors (1)		Mechanical interlock (2)
Main	Standby	Main	Standby	
3-phase	3-phase	Reference	Reference	Reference
1600 A	1000 A	**LC1F780**	**LC1F6309**	**LA9FX970**
1600 A	1600 A	**LC1F780**	**LC1F780**	**LA9FX970**

Changeover contactor pairs for customer assembly: 3-phase + neutral

Vertically mounted.
Maximum operational voltage: 1000 V.
Utilisation category: AC-1.
Maximum temperature in the vicinity of the devices: 40 °C.
a.c. or d.c. contactor control voltage.

Maximum operational current AC-1		Contactors (1)		Mechanical interlock (2)
Main	Standby	Main	Standby	
3-phase + N	3-phase + N	Reference	Reference	Reference
1600 A + 1000 A	1000 A + 1000 A	**LC1F78041**	**LC1F63049**	**LA9FX970** (3)
1600 A + 1000 A	1600 A + 1000 A	**LC1F78041**	**LC1F78040**	**LA9FX970** (3)
1600 A + 1600 A	1000 A + 1000 A	**LC1F7804**	**LC1F63049**	**LA9FX971**
1600 A + 1600 A	1600 A + 1600 A	**LC1F7804**	**LC1F7804**	**LA9FX971**

(1) Coils to be ordered separately, see pages B9/17 to B9/26.
*(2) Double mechanical interlock mechanism with 2 interlock connecting rods and 4 power connecting links. To order the the 2 auxiliary contact blocks **LADN●1** required to obtain electrical interlocking between the 2 contactors: see page B9/11.*
(3) Neutral connecting link not supplied (to be ordered separately).



Control Panel Technical Guide:
Description and product reference of all mounting kits and wiring accessories for TeSys D, K, F - Star Delta, reverser, low-high speed control motor starters and changeover applications.

> Ref. Document: CPTG011_EN

> Click on QR code to download

Dimensions:
pages B9/105 and B9/107

Schemes:
page B9/107

TeSys F

Technical Data for Designers

Contents

TeSys F contactors:
> characteristics ..... B9/44 to B9/53
> dimensions ..... B9/54 to B9/60
> schemes ..... B9/61 and B9/62

TeSys V vacuum contactors:
> characteristics ..... B9/64 and B9/65
> dimensions ..... B9/66 and B9/67
> schemes ..... B9/66 to B9/69

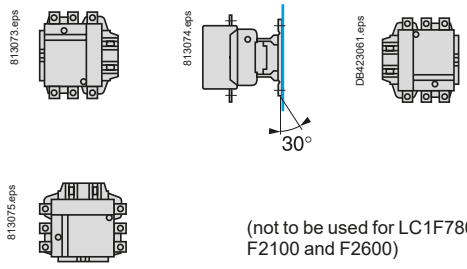
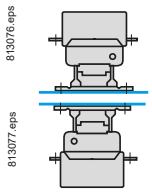
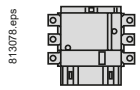
TeSys FG shockproof contactors:
> characteristics ..... B9/70 to B9/85
> dimensions and schemes ..... B9/86 and B9/87

TeSys CR1F magnetic latching contactors:
> characteristics ..... B9/88 to B9/97
> dimensions ..... B9/98 to B9/101

TeSys F - reversing and changeover contactors:
> dimensions ..... B9/102 to B9/107
> schemes ..... B9/106 to B9/107

Characteristics

Environment

Contactor type			LC1F115	LC1F150	LC1F185
Rated insulation voltage (Ui)	Conforming to IEC 60947-4-1. Overvoltage category III, degree of pollution: 3	V	1000	1000	1000
Rated impulse withstand voltage (Uimp)	Coil not connected to the power circuit	kV	8	8	8
Conforming to standards			IEC/EN 60947-4-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, JIS C 8201-4-1		
Product certifications			UL, CSA , CCC, CB certification, EAC, ABS, BV, DNV-GL, LRoS, RINA, RMRoS		
Degree of protection	Conforming to IEC 60529		IP 2X front face with shrouds LA9F		
Climatic withstand			According to IACS E10		
Ambient air temperature around the device	Storage	°C	-60…+80		
	Operation	°C	-5…+55		
	Permissible at Uc (1)	°C	-40…+70		
Maximum operating altitude	Without derating	m	3000		
Operating positions	Without derating		 (not to be used for LC1F780, F1000, F1400, F1700, F2100 and F2600)		
	With derating		 Apply the following derating coefficients: 0.75 on the pull-in voltage, 0.9 on the drop-out voltage and 0.8 on the operational current in AC-1. Apply the following derating coefficients: 1.15 on the pull-in voltage, 1.1 on the drop-out voltage and 0.8 on the operational current in AC-1. In either case: neither the making and breaking capacities nor the electrical and mechanical durabilities can be assured.		
	Not to be used				
Shock resistance (2) 1/2 sine wave = 11 ms	Contactor open		9 gn	9 gn	7 gn
	Contactor closed (3)		15 gn	15 gn	15 gn
Vibration resistance (2) 5…300 Hz	Contactor open		2 gn	2 gn	2 gn
	Contactor closed		6 gn	6 gn	5 gn

(1) In these conditions, it is recommended that LX9F coils be used for contactor sizes F115 to F225.
(2) In the least favourable direction, without change of contact state (coil at Uc). Where higher resistance to mechanical shock is required, select shock-proof contactors. Please consult your Regional Sales Office.
(3) 12 gn for F115-F1250 contactors when used with Electronic control module (LA4EM) & LXE coils.

COORD.
Ref.
High power contactors

Coordination tables: pages A6/36 to A6/45
References: pages B9/2 and B9/3
Dimensions: pages B9/54 to B9/57
Schemes: pages B9/61 and B9/62

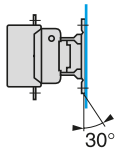
Characteristics

LC1F225	LC1F265	LC1F330	LC1F400	LC1F500	LC1F630	LC1F780	LC1F800	LC1 F1000	LC1 SF1200	LC1 F1250	LC1 F1400	LC1 F1700	LC1 F2100	LC1 F2600
1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
EN 60947-1, EN 60947-4-1, IEC 60947-1, IEC 60947-4-1, JIS C 8201-4-1 (except for LC1F1000 & LC1SF1200)														
UL, CSA , CCC, CB certification, EAC, ABS, BV, DNV-GL, LRoS, RINA, RMRoS							CB, CSA, UL, CCC, LROS, ABS, RMROS	CB, CSA, CCC	CB, CCC	CB, CSA, CCC, UL				
IP 20 front face with shrouds LA9F								–	–	–				
According to IACS E10														
-60…+80														
-5…+55								-5…+40	-5…+60	-5…+40				
-40…+70							-5…+55	-40…+60	-40…+70	-40…+60				
3000														

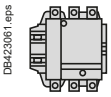
813073.eps



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DB423061.eps



813075.eps



(not to be used for LC1F780, F1000, F1400, F1700, F2100 and F2600)

813076.eps



813077.eps



Apply the following derating coefficients: 0.75 on the pull-in voltage, 0.9 on the drop-out voltage and 0.8 on the operational current in AC-1. Apply the following derating coefficients: 1.15 on the pull-in voltage, 1.1 on the drop-out voltage and 0.8 on the operational current in AC-1. In either case: neither the making and breaking capacities nor the electrical and mechanical durabilities can be assured.	Not to be used	Possible positions with derating (see corres-ponding paragraph on left, same line)	Not to be used

813078.eps



7 gn	6 gn	6 gn	6 gn	9 gn	6 gn	5 gn	6 gn	6 gn	6 gn	6 gn	6 gn	6 gn	6 gn	6 gn
15 gn	15 gn	15 gn	15 gn	15 gn	15 gn	15 gn	15 gn	15 gn	15 gn	15 gn	15 gn	15 gn	15 gn	15 gn
2 gn	2 gn	2 gn	1.5 gn	2 gn	2 gn	2.5 gn	2 gn	2 gn	2 gn	2 gn	2 gn	2 gn	2 gn	2 gn
5 gn	5 gn	5 gn	5 gn	4 gn	4 gn	5.5 gn	4 gn	4 gn	4 gn (1)	4 gn	4 gn	4 gn	4 gn	4 gn

(1) Vibration resistance 5...30 Hz, when used with Electronic Control Module (ECM).

Characteristics

Pole characteristics

Contactor type				LC1F115	LC1F150	LC1F185	LC1F225	LC1F265
Number of poles				3 or 4	3 or 4	3 or 4	3 or 4	3 or 4
Rated operational current (Ie) (Ue ≤ 440 V)	In AC-3, θ ≤ 55 °C		A	115	150	185	225	265
	In AC-1, θ ≤ 40 °C		A	200	250	275	315	350
Rated operational voltage (Ue)	Up to		V	690	690	690	690	1000 (5)
Frequency limits	Of the operational current (1)		Hz	16$^{2/3}$…200	16$^{2/3}$…200	16$^{2/3}$…200	16$^{2/3}$…200	16$^{2/3}$…200
Conventional thermal current	θ ≤ 40 °C		A	200	250	275	315	350
Rated making capacity	I rms conforming to IEC 60947-4-1		A	Making current: 10 x I in AC-3 or 12 x I in AC-4				
Rated breaking capacity	I rms conforming to IEC 60947-4-1		A	Making and breaking current: 8 x I in AC-3 or 10 x I in AC-4				
Maximum permissible current No current flowing for previous 60 minutes, at θ ≤ 40 °C	For 10 s		A	1100	1200	1500	1800	2200
	For 30 s		A	640	700	920	1000	1230
	For 1 min		A	520	600	740	850	950
	For 3 min		A	400	450	500	560	620
	For 10 min		A	320	350	400	440	480
Short-circuit protection by fuses U ≤ 440 V	Motor circuit (type aM)		A	125	160	200	250	315
	With thermal overload relay (type gG)		A	200	200	315	315	500
	gG fuses		A	200	250	315	315	400
Average impedance per pole	At Ith and 50 Hz		mΩ	0.37	0.35	0.33	0.32	0.3
Power dissipation per pole for the above operational currents	AC-3		W	5	8	12	16	21
	AC-1		W	15	22	25	32	37
Connection				Maximum c.s.a.				
	Bar	Number of bars		2	2	2	2	2
		Bar	mm	20 x 3	25 x 3	25 x 3	32 x 4	32 x 4
	Cable with lug		mm²	95	120	150	185	240
	Cable with connector		mm²	95	120	150	185	240
	Bolt diameter		mm	Ø6	Ø8	Ø8	Ø10	Ø10
Tightening torque	Power circuit connections		N.m	10	18	18	35	35

(1) Sine wave without interference. Above these values, contactors can be used only for AC-1 application.
*(2) With set of right-angled connectors **LA9F2100** (see page B9/13).*
(3) Paralleling of poles must be carried out only in accordance with the fuse manufacturer's recommendations.
*(4) θ ≤ 60 °C with set of right-angled connectors **LA9F2600** (see page B9/13).*
(5) Ue ≤ 690 V in AC-3; Ue ≤ 1000 V in AC-1.
*(6) Ue =1000 V, with set of right angled connectors **LA9F2100** (see page B9/13).*

COORD.
Ref.
High power contactors

Characteristics

LC1F330	LC1F400	LC1F500	LC1F630	LC1F780	LC1F800	LC1F1000	LC1SF1200	LC1F1250	LC1F1400	LC1F1700	LC1F2100	LC1F2600
3 or 4	2, 3 or 4	2, 3 or 4	2, 3 or 4	3 or 4	3	3	3	3	3	3	3	3
330	400	500	630	780	800	1000	-	-	-	-	-	-
400	500	700	1000	1600	1000	1250	1200	1260	1400	1700	2100 (2)	2600 (4)
1000	1000	1000 (5)	1000	1000	1000	440	690	690	1000	1000	1000 (6)	1000
$16^{2/3}$…200	$16^{2/3}$…200	$16^{2/3}$…200	$16^{2/3}$…200	$16^{2/3}$…200	$16^{2/3}$…200	$16^{2/3}$…200	$16^{2/3}$…200	$16^{2/3}$…200	$16^{2/3}$…200	$16^{2/3}$…200	$16^{2/3}$…200	$16^{2/3}$…200
400	500	700	1000	1600	1000	1250	1200	1260	1400	1700	2100 (2)	2600 (4)
Making current: 10 x I in AC-3 or 12 x I in AC-4						10 x I in AC-3	Making current: 1.5 x I in AC-1					
Making and breaking current: 8 x I in AC-3 or 10 x I in AC-4						8 x I in AC-3	Making and breaking current: 1.5 x I in AC-1					
2650	3600	4200	5050	6250	5500	10000	8000	8000	8000	10000	10000	12000
1800	2400	3200	4400	5600	4600	7500	5200	5200	6000	7500	7500	9000
1300	1700	2400	3400	4600	3600	5500	4000	4000	4500	5500	5500	7000
900	1200	1500	2200	3000	2600	4200	3000	3000	4000	4200	4200	6000
750	1000	1200	1600	2200	1700	3000	2000	2000	2600	3000	3000	4000
400	400	500	630	800	800	1000	–	–	–	–	–	–
500	630	800	800	1000	1000	1000	–	–	–	–	–	–
500	500	800	1000	2 x 800 (3)	1000	1000	1400	1400	2 x 800 (3)	2 x 800 (3)	2 x 1000 (3)	2 x 1250 (3)
0.28	0.26	0.18	0.12	0.10	0.12	0.12	0.10	0.12	0.10	0.10	0.10	0.10
31	42	45	48	60	77	100	–	–	–	–	–	–
44	65	88	120	250	120	120	120	120	150	200	200	250
Maximum c.s.a.												
2	2	2	2	2	2	3	2	2	2	3	4	3
30 x 5	30 x 5	40 x 5	60 x 5	100 x 5	60 x 5	100 x 5	50x8	100 x 5	100 x 5	100 x 5	100 x 5	100 x 10
240	2 x 150	2 x 240	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–
Ø10	Ø10	Ø10	Ø12	2 x Ø12	Ø12	4 x Ø12 (Ø11.5 with set of right-angled connectors LA9F2100)	3 x Ø12	3 x Ø12 (Ø11.5 with set of right-angled connectors LA9F1250)	4 x Ø12 (Ø11.5 with set of right-angled connectors LA9F2100)			4 x Ø12 (Ø11.5 with set of right-angled connectors LA9F2600)
35	35	35	58	58	58	58 (35 with set of right-angled connectors LA9F2100)	58	58 (35 with set of right-angled connectors LA9F1250)	58 (35 with set of right-angled connectors LA9F2100)			58 (35 with set of right-angled connectors LA9F2600)

Characteristics

a.c. control circuit characteristics with LX9 coil

Contactor type					LC1F115	LC1F150	LC1F185	LC1F225	LC1F265
Rated control circuit voltage (Uc)				**V**	48...500				24...1000
Control voltage limits ($\theta \leq 55$ °C)	40…400 Hz coils	Operation			0.85…1.1 Uc				0.85…1.1 Uc
		Drop-out			0.2…0.55 Uc				0.35…0.55 Uc
Average consumption at 20 °C and at Uc	Inrush	40…400 Hz coil		**VA**	690...855	690...855	950...1180	950...1180	600...700
		Cos φ			0.9	0.9	0.9	0.9	0.9
	Sealed	40…400 Hz coil		**VA**	6.6...8.1	6.6...8.1	8.9...10.9	8.9...10.9	8...10
		Cos φ			0.9	0.9	0.9	0.9	0.9
Heat dissipation				**W**	5.9...7.2	5.9...7.2	8...9.8	8...9.8	8
Operating time [2]	Closing "C"			**ms**	35	35	35	35	40…65
	Opening "O"			**ms**	130	130	130	130	100…170
Mechanical durability at Uc	In millions of operating cycles				10	10	10	10	10
Maximum operating rate at ambient temperature ≤ 55 °C	In operating cycles per hour				2400	2400	2400	2400	2400
Connection					Min/max c.s.a.				
	Flexible cable without cable end	1 or 2 conductors		**mm²**	1/4	1/4	1/4	1/4	1/4
	Flexible cable with cable end	1 conductor		**mm²**	1/4	1/4	1/4	1/4	1/4
		2 conductors		**mm²**	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5
	Solid cable without cable end	1 or 2 conductors		**mm²**	1/4	1/4	1/4	1/4	1/4
Tightening torque				**N.m**	1.2	1.2	1.2	1.2	1.2
Mechanical latching					Mechanical latch blocks LA6DK must not be fitted on LC1F contactors. For similar type of operation, use magnetic latching contactors CR1F. See pages B9/28 to B9/33.				

(1) Equipped with 2 coils.

(2) The closing time "C" is measured from the moment the coil supply is switched on to initial contact of the main poles. The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separate.

COORD.
Ref.
High power contactors

Characteristics

LC1 F330	LC1 F400	LC1 F500	LC1 F630	LC1 F780 (1)	LC1 F800	LC1 F1000 (1)	LC1 F1250	LC1 F1400 (1)	LC1 F1700	LC1 F2100 (1)	LC1 F2600 (1)
24…1000	48…1000		48…1000	110…500	110…400	110...500	110...600	110...500	110…500	110…500	110…500
0.85…1.1 Uc	0.85…1.1 Uc		0.85…1.1 Uc	0.85…1.1 Uc	0.85…1.1 Uc	0.85…1.1 Uc	0.85…1.1 Uc	0.85…1.1 Uc	0.85…1.1 Uc	0.85…1.1 Uc	0.85…1.1 Uc
0.35…0.55 Uc	0.3…0.5 Uc		0.25…0.5 Uc	0.2…0.4 Uc	0.3…0.5 Uc	0.3…0.5 Uc	0.25...0.5 Uc	0.3…0.5 Uc	0.3…0.5 Uc	0.3…0.5 Uc	0.3…0.5 Uc
600...700	1000...1150	1050...1150	1500...1730	1900...2300	1700	1600...2400	1500...1730	1600...2400	1600...2400	1600...2400	2200...2700
0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
8...10	12...18	16...20	20...25	44...55	12	29...37	20...25	29...37	29...37	29...37	37.4...50.6
0.9	0.9	0.9	0.9	0.9	–	0.9	0.9	0.9	0.9	0.9	0.9
8	14	18	20	2 x 22	25	2 x 18	20	2 x 18	2 x 18	2 x 18	2 x 25
40…65	40…75	40…75	40…80	40…80	60…80	40…75	40…80	40…75	40…75	40…75	40…80
100…170	100…170	100…170	100…200	130…230	160…180	100...170	100...200	100...170	100…170	100…170	100…200
10	10	10	5	5	5	0.5	1	0.5	0.5	0.5	0.5
2400	2400	2400	1200	600	600	600	1200	600	600	600	600
Min/max c.s.a.											
1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
1/2.5	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5
1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2

Mechanical latch blocks LA6DK must not be fitted on LC1F contactors.
For similar type of operation, use magnetic latching contactors CR1F.
See pages B9/28 to B9/33.

Characteristics

d.c. control circuit characteristics with LX4 coil

Contactor type				LC1F115	LC1F150	LC1F185	LC1F225	LC1F265
Rated control circuit voltage (Uc) ⎓			**V**	24…460	24…460	24…460	24…460	24…460
Control voltage limits (θ ≤ 55 °C)	Operation			0.85…1.1 Uc	0.85…1.1 Uc	0.85…1.1 Uc	0.85…1.1 Uc	0.85…1.1 Uc
	Drop-out			0.15…0.2 Uc	0.15…0.2 Uc	0.15…0.2 Uc	0.15…0.2 Uc	0.15…0.2 Uc
Average consumption at 20 °C and at Uc	⎓	Inrush	**W**	543...665	543...665	737...902	737...902	655...803
		Sealed	**W**	3.94...4.83	3.94...4.83	4.13...5.07	4.13...5.07	3.68...4.53
Average operating time at Uc (1)	Closing "C"		**ms**	30…40	30…40	30…40	30…40	40…50
	Opening "O"		**ms**	30…50	30…50	30…50	30…50	40…65
				***Note:** the arcing time depends on the circuit switched by the poles. For all normal 3-phase applications, the arcing time is less than 10 ms. The load is isolated from the supply after a time equal to the sum of the opening time and the arcing time.*				
Mechanical durability at Uc	In millions of operating cycles			10	10	10	10	10
Maximum operating rate at ambient temperature ≤ 55 °C	In operating cycles per hour			2400	2400	2400	2400	2400
Cabling				Min/max c.s.a.				
Flexible cable without cable end	1 conductor		**mm²**	1/4	1/4	1/4	1/4	1/4
	2 conductors		**mm²**	1/4	1/4	1/4	1/4	1/4
Flexible cable with cable end	1 conductor		**mm²**	1/4	1/4	1/4	1/4	1/4
	2 conductors		**mm²**	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5
Solid cable without cable end	1 conductor		**mm²**	1/4	1/4	1/4	1/4	1/4
	2 conductors		**mm²**	1/4	1/4	1/4	1/4	1/4
Tightening torque			**N.m**	1.2	1.2	1.2	1.2	1.2
Mechanical latching				Mechanical latch blocks LA6DK must not be fitted on LC1F contactors. For similar type of operation, use magnetic latching contactors CR1F. See pages B9/28 to B9/33.				

(1) The operating times depend on the type of contactor electromagnet and its control mode. The closing time "C" is measured from the moment the coil supply is switched on to initial contact of the main poles. The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separate.

Characteristics

LC1F330	LC1F400	LC1F500 / LC1SF1200 (1)	LC1F630	LC1F780	LC1F800	LC1F1000	LC1F1250	LC1F1400	LC1F1700	LC1F2100	LC1F2600
24…460	48…440	48…440	48…440	110…440	110…400	110…440	48…250	110…440	110…440	110…440	110…440
0.85…1.1 Uc	0.85…1.1 Uc	0.85…1.1 Uc	0.85…1.1 Uc	0.85…1.1 Uc	0.85…1.1 Uc	0.85…1.1 Uc	0.85…1.1 Uc	0.85…1.1 Uc	0.85…1.1 Uc	0.85…1.1 Uc	0.85…1.1 Uc
0.15…0.2 Uc	0.2…0.35 Uc	0.2…0.35 Uc (2)	0.2…0.35 Uc	0.2…0.4 Uc	0.3…0.5 Uc	0.2…0.35 Uc	0.2…0.35 Uc	0.2…0.35 Uc	0.2…0.35 Uc	0.2…0.35 Uc	0.2…0.35 Uc
655...803	920...1140	990...1220	1420...1920	1960...2420	1900	2000...2200	1420...1920	2000...2200	2000...2200	2000...2200	2130...2880
3.68...4.53	4...7.5	4.54...8	6.5...12.5	42...52	12	8...10	6.5...12.5	8...10	8...10	8...10	13...25
40…50	50…60	50…60	60…70	70…80	60…80	50…60	60…70	50…60	50…60	50…60	60…70
40…65	45…60	45…60	40…50	100…130	40…50	45…60	40…50	45…60	45…60	45…60	40…50

Note: *the arcing time depends on the circuit switched by the poles. For all normal 3-phase applications. the arcing time is less than 10 ms. The load is isolated from the supply after a time equal to the sum of the opening time and the arcing time.*

10	10	10/0.5	5	5	5	0.5	1	0.5	0.5	0.5	0.5
2400	2400	2400/1200	1200	600	600	600	1200	600	600	600	600
Min/max c.s.a.											
1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
1/2.5	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5
1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2

Mechanical latch blocks LA6DK must not be fitted on LC1F contactors.
For similar type of operation, use magnetic latching contactors CR1F.
See pages B9/28 to B9/33.

(1) ***LC1SF1200BD***, ***LC1SF1200FD***, ***LC1SF1200MD*** *ranges are available.*
(2) Drop-out limits for ***LC1SF1200BD*** *shall be 0.2...0.4 Uc.*

Characteristics

a.c. or d.c. control circuit characteristics with LXE coil (1)

Contactor type				**LC1F115, F150**	**LC1F185, F225**	**LC1F265, F330**
ECM (2) reference				**LA4EM250FF**	**LA4EM250FG**	**LA4EM250FH**
Coil reference				**LXEFF250**	**LXEFG250**	**LXEFH250**
Rated control circuit voltage (Uc)	50/60 Hz		**V**	**100…250**		
	⎓		**V**	**100…380**		
Control voltage limits (< 55 °C) 50/60 Hz	Operation		**V**	85…275		
	Drop-out		**V**	< 60		
⎓	Operation		**V**	85…418		
	Drop-out		**V**	< 45		
Average consumption at 20 °C and at Uc	Inrush	50/60 Hz	**VA rms**	280..310	280..310	300…350
		Cos φ		0.5…0.6		
		⎓	**W**	270…320	270…320	300…310
	Sealed	50/60 Hz	**VA**	4.5…7.0	4.5…7.0	4.5…7.0
		Cos φ		0.5…0.6		
		⎓		2.5…4.0	2.5…4.0	2.5…4.0
Embedded PLC (4) input according IEC 61131-2 type 2	Off state		**V DC**	0…5		
	On state			11…30		
Heat dissipation			**W**	2.2...5.5		
Operating time	Closing “C”		**ms**	40…80		
	Opening “O”		**ms**	6…54		
Mechanical durability at Uc	In millions of operating cycles			10		
Maximum operating rate at ambient temperature ⩽ 55 °C	In operating cycles per hour			2400		
Connection (5)						
Flexible cable without cable end	1 conductor			0.2/2.5		
Flexible cable with cable end	1 conductor			0.25/2.5		
Solid cable without cable end	1 conductor			0.2/2.5		
Tightening torque			**N.m**	0.6		

(1) LXE coil shall be always used along with Electronic Control Module (ECM) ***LA4EM250••***.
(2) Electronic Control Module enables wider coil operating voltage for the TeSys F *range of contactors. ECM* ***LA4EM250••*** *shall be always used along with suitable type of* ***LXE••250*** *coils.*
(3) ***LC1SF1200KUE*** *is supplied with* ***LA4EM250FK*** *&* ***LXEFK250****.*
(4) PLC control connectors shall be provided by customer (Type MC 1.5/2-ST-3.81).
(5) Connection input is made to Electronic control module (ECM).

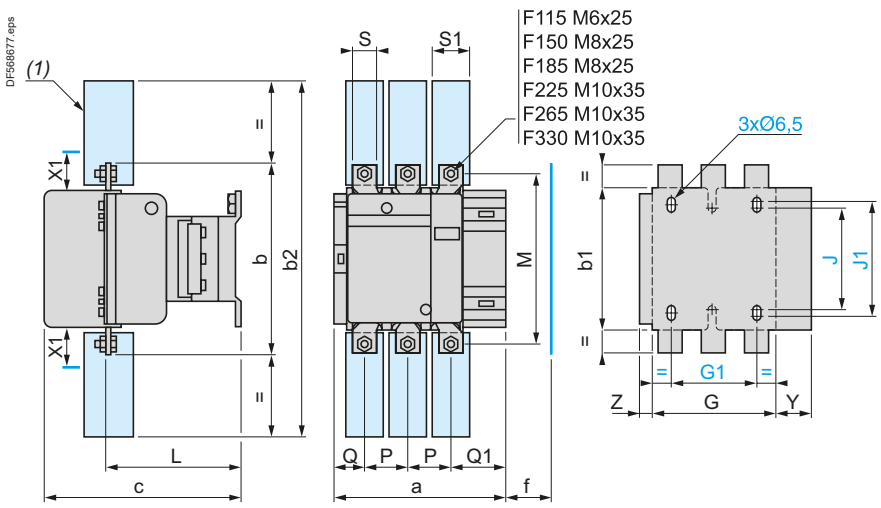
COORD.
Ref.
High power contactors

Characteristics

LC1F400 **LA4EM250FJ** **LXEFJ250**	**LC1SF1200** [3] **LA4EM250FK** **LXEFK250**	**LC1F1250** **LA4EM250FL** **LXEFL250**	**LC1F800** **LA4EM250FW** **LXEFW250**
100…250			
100…380			–
85…275			
< 60			
85…418			
< 45			
360…470	360…550	460…730	460…730
0.5…0.6			
410…450	410…500	500…680	–
4.5…7.0	5.0…8.0	7…10	7…10
0.5…0.6			
2.5…4.0	2.7…5.0	4.0…5.5	–
0…5			
11…30			
2.2...5.5			
40…80			
6…54			
10	10/0.5	5/1	5
2400	2400/1200	1200	600
0.2/2.5			
0.25/2.5			
0.2/2.5			
0.6			

Dimensions

LC1F115 to F330



X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

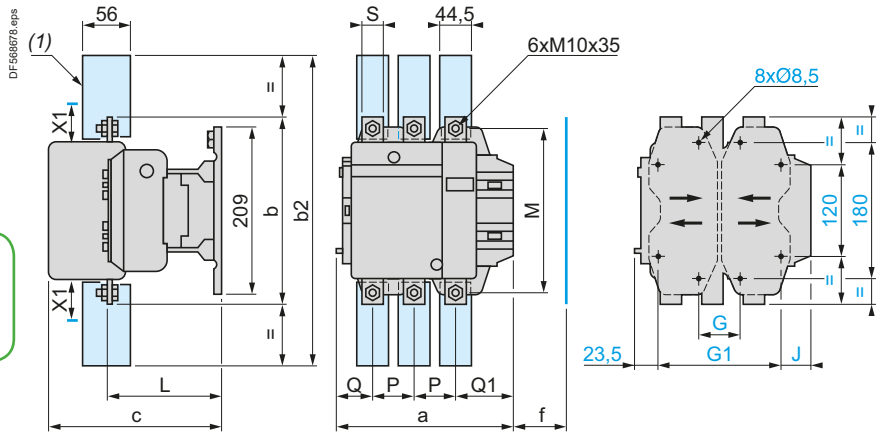
LC1	200...500 V	600...1000 V
F115, F150	10	15
F185	10	15
F225, F265	10	15
F330	10	15

(1) Power terminal protection shroud (see page B9/14).

LC1		a	b	b1	b2	c	f	G	G1	J	J1	L	M	P	Q	Q1	S	S1	Y	Z
F115	3P	163.5	162	137	265	171	131	106	80	106	120	107	147	37	29.5	60	20	26	44	13.5
	4P	200.5	162	137	265	171	131	143	80	106	120	107	147	37	29.5	60	20	26	44	13.5
F150	3P	163.5	170	137	301	171	131	106	80	106	120	107	150	40	26	57.5	20	34	44	13.5
	4P	200.5	170	137	301	171	131	143	80	106	120	107	150	40	26	55.5	20	34	44	13.5
F185	3P	168.5	174	137	305	181	130	111	80	106	120	113.5	154	40	29	59.5	20	34	44	13.5
	4P	208.5	174	137	305	181	130	151	80	106	120	113.5	154	40	29	59.5	20	34	44	13.5
F225	3P	168.5	197	137	364	181	130	111	80	106	120	113.5	172	48	21	51.5	25	44.5	44	13.5
	4P	208.5	197	137	364	181	130	151	80	106	120	113.5	172	48	17	47.5	25	44.5	44	13.5
F265	3P	201.5	203	145	375	213	147	142	96	106	120	141	178	48	39	66.5	25	44.5	38	21.5
	4P	244.5	203	145	375	213	147	190	96	106	120	141	178	48	34	66.5	25	44.5	38	16.5
F330	3P	213	206	145	375	219	147	154.5	96	106	120	145	181	48	43	74	25	44.5	38	20.5
	4P	261	206	145	375	219	147	202.5	96	106	120	145	181	48	43	74	25	44.5	38	20.5

f = minimum distance required for coil removal.

LC1F400 and F500



X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

LC1	200...500 V	600...1000 V
F400	15	20
F500	15	20

(1) Power terminal protection shroud (see page B9/14).

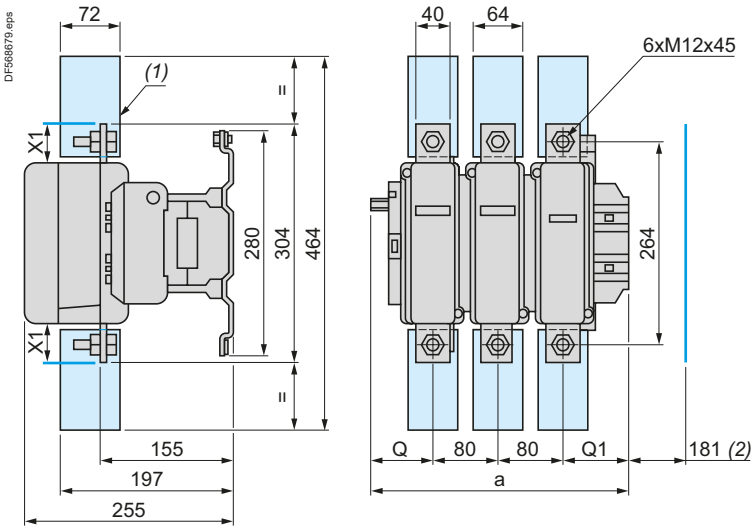
LC1		a	b	b2	c	f	G supplied	G min.	G max.	G1 supplied	G1 min	G1 max.	J	L	M	P	Q	Q1	S
F400	2P	213	206	375	219	146	80	66	102	170	156	192	19.5	145	181	48	69	96	25
	3P	213	206	375	219	146	80	66	102	170	156	192	19.5	145	181	48	43	74	25
	4P	261	206	375	219	146	80	66	150	170	156	240	67.5	145	181	48	43	74	25
F500	2P	233	238	400	232	150	80	66	120	170	156	210	39.5	146	208	55	76	102	30
	3P	233	238	400	232	150	80	66	120	170	156	210	39.5	146	208	55	46	77	30
	4P	288	238	400	232	150	140	66	175	230	156	265	34.5	146	208	55	46	77	30

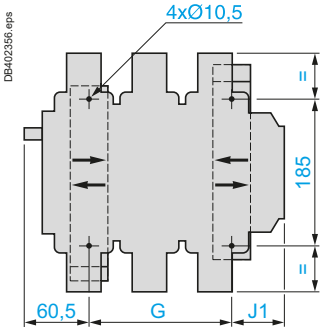
f = minimum distance required for coil removal.

Coordination tables: pages A6/36 to A6/45
References: pages B9/2 to B9/9
Characteristics: pages B9/44 to B9/51
Schemes: page B9/62

Dimensions

LC1F630 and F800





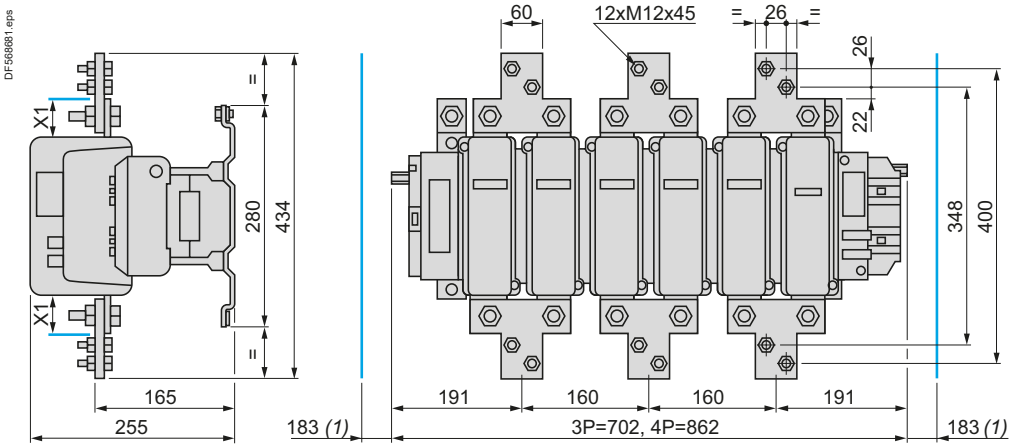
LC1		a	G supplied	G min.	G max.	J1	Q	Q1
F630	2P	309	180	100	195	68.5	102	127
F630, F800	3P	309	180	100	195	68.5	60	89
F630	4P	389	240	150	275	88.5	60	89

X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

Voltage	200…500 V	690…1000 V	200…690 V	1000 V
LC1F630	20	30	–	–
LC1F800	–	–	10	20

(1) Power terminal protection shroud (see page B9/14).
(2) Minimum distance required for coil removal.

LC1F780

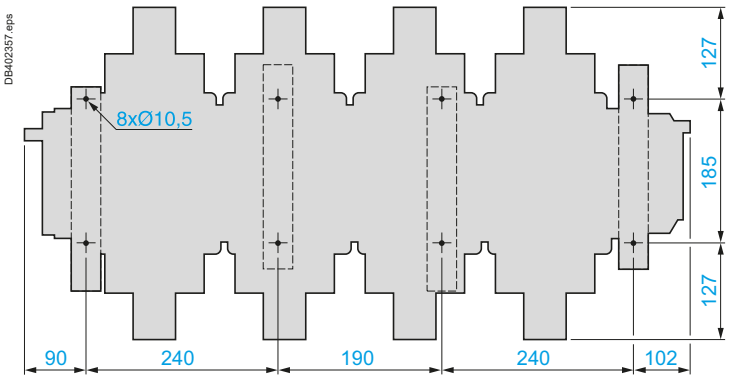


X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

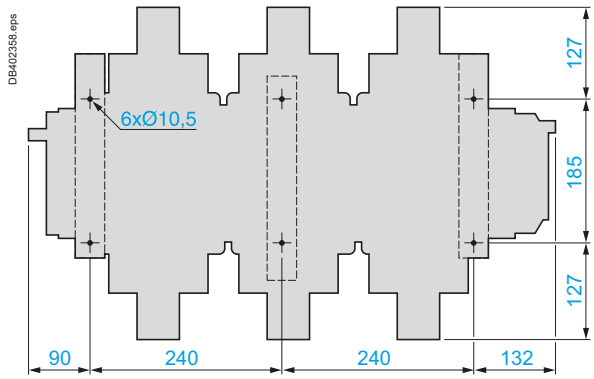
Voltage	200…500 V	690…1000 V
X1 (mm)	30	35

(1) Minimum distance required for coil removal.

Fixing centres of LC1F7804



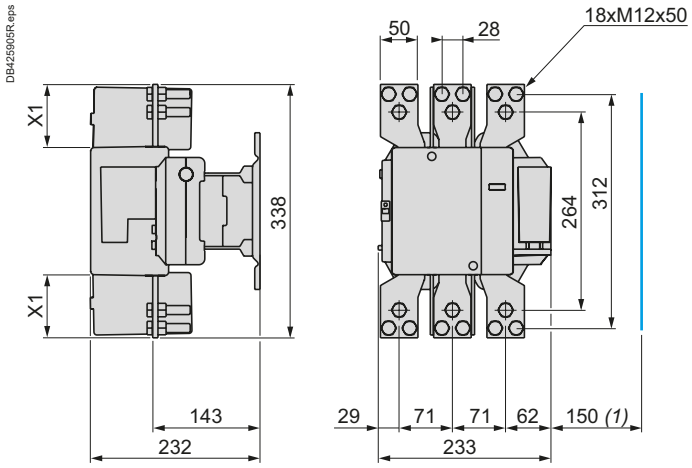
Fixing centres of LC1F780

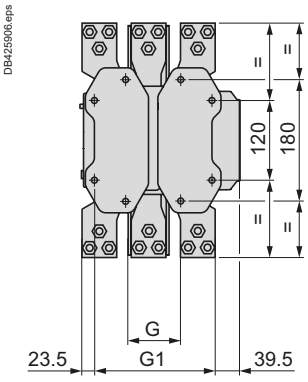


References:
pages B9/2 to B9/9
Characteristics:
pages B9/44 to B9/51
Schemes:
page B9/62

Dimensions

LC1SF1200





(1) Minimum distance required for coil removal.

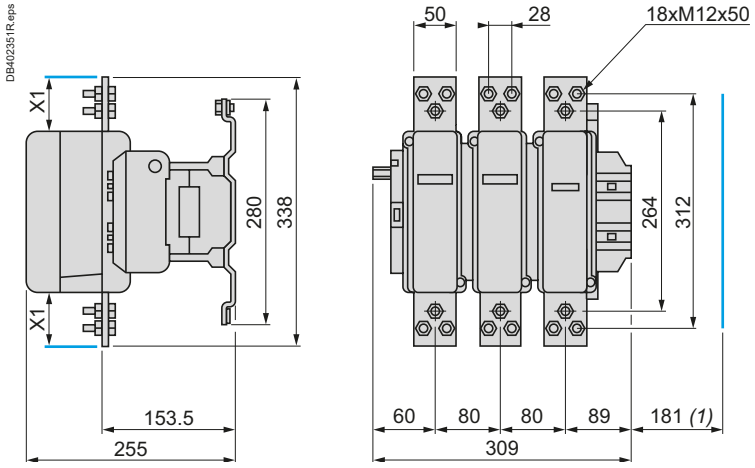
X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

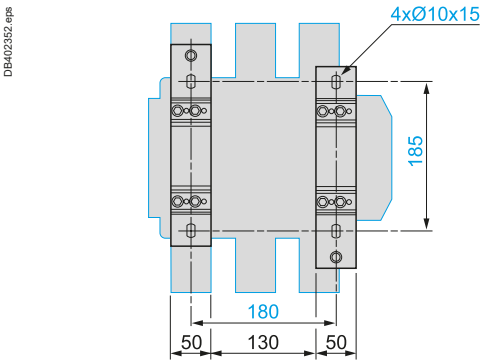
Voltage	200...500 V	≤ 690 V
X1 (mm)	20	30

G (2)	Gmin	Gmax	G1 (2)	Gmin	Gmax
80	66	120	170	156	210

(2) Factory setting.

LC1F1250



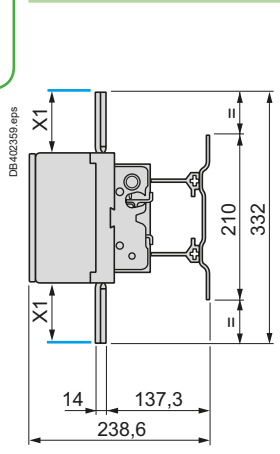


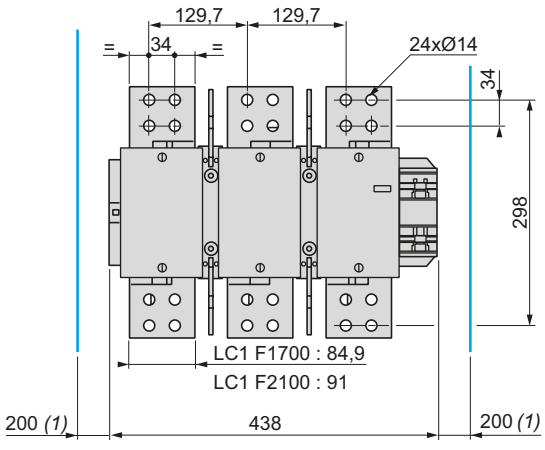
(1) Minimum distance required for coil removal.

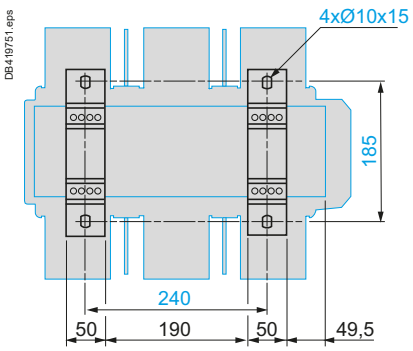
X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

Voltage	200…500 V	690…1000 V
X1 (mm)	20	30

LC1F1000, LC1F1400, LC1F1700 and LC2F2100







(1) Minimum distance required for coil removal.

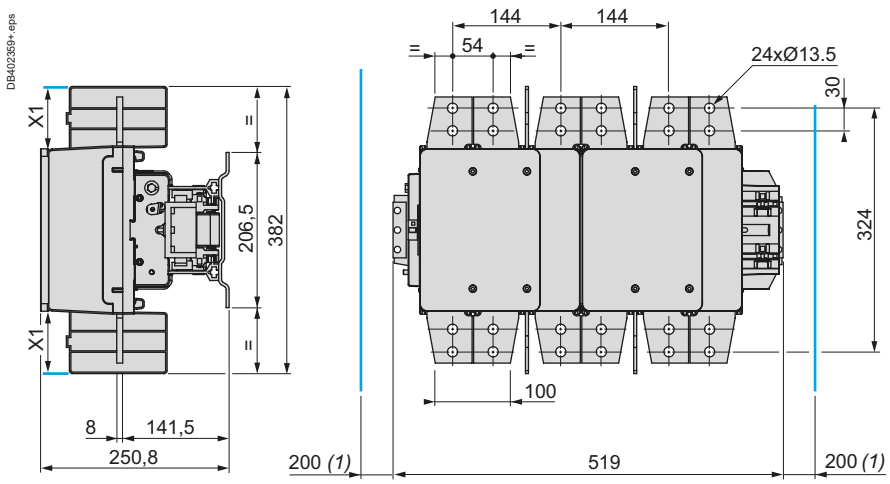
X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

Voltage	200…500 V	690…1000 V
X1 (mm)	90	100

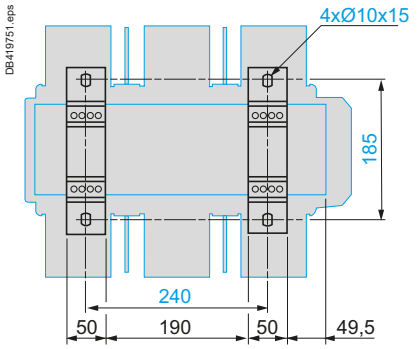
Coordination tables: pages A6/36 to A6/45
References: pages B9/2 to B9/9
Characteristics: pages B9/44 to B9/51
Schemes: page B9/62

Dimensions

LC1F2600



(1) Minimum distance required for coil removal.

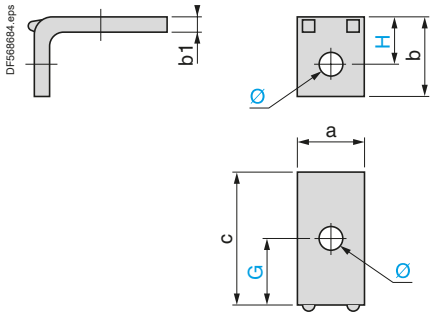


X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

Voltage	**200…500 V**	**690…1000 V**
X1 (mm)	90	100

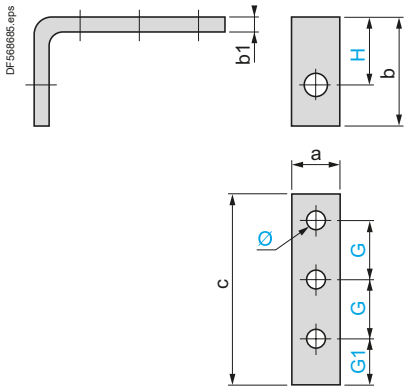
Dimensions

Right-angled connectors LA9F•981 (set of 3) for rear connection



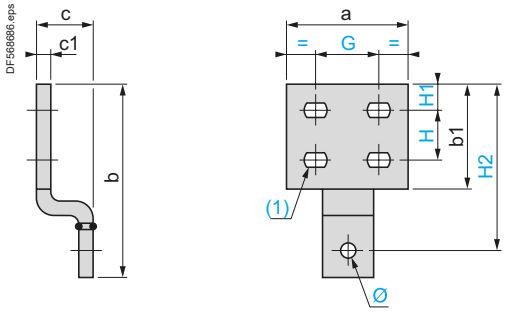
LA9	FF981	FG981	FJ981	FK981	FL981
a	15	20	25	30	40
b	18	23	29	35	48
b1	3	3	4	5	8
c	42	45	55	52	86
G	24	26	32.5	26	45
H	10.5	13	16.5	20	28
Ø	6.5	9	11	11	13

Right-angled connectors LA9F•979 (set of 3) for side connection



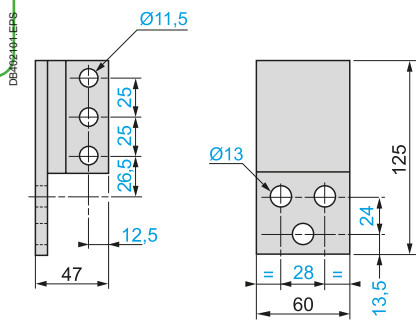
LA9	FF979	FG979	FJ979	FK979	FL979
a	15	20	25	30	40
b	54	58	63.5	68	117
b1	5	5	6	6	10
c	80	92	120	120	130
G	24	28	37	37	37.5
G1	20	22	29	29	35
H	36	39	41	42	76
Ø	6.5	9	11	11	13

Right-angled connectors LA9F•980 with large surface area (set of 3)

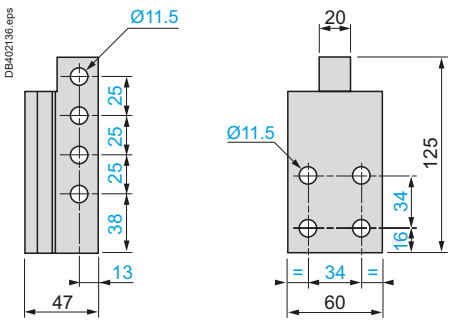


LA9	FF980	FG980	FJ980	FK980	FL980
a	35	40	50	60	100
b	70.5	82.5	98.5	114	154
b1	40	45	55	65	85
c	29	29	33	33	43
c1	3	3	5	5	10
G	18	20	25	29	53
H	18	20	22	26	40
H1	10	12	14	17	20
H2	60.5	72.5	84.5	97	132
Ø	6.5	9	11	11	13
(1)	Ø7 x 10	Ø9 x 12	Ø11 x 14	Ø12.5 x 15	Ø12.5 x 15

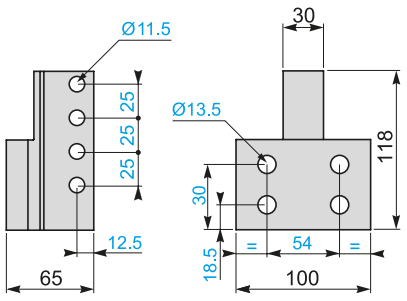
Right-angled connectors LA9F1250 (set of 6)



Right-angled connectors LA9F2100 (set of 6) for rear connection



Right-angled connectors LA9F2600 (set of 6) for rear connection



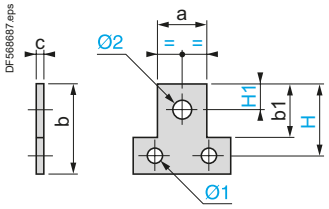
Ref.
High power contactors

References:
pages B9/12 and B9/13

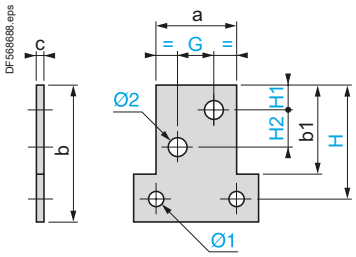
Dimensions

Paralleling links (set of 4)

LA9FF602, FG602, FH602



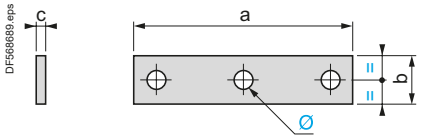
LA9FK602, FL602



LA9	FF602	FG602	FH602	FK602	FL602
a	25	30	40	50	60
b	45	55	60	85	100
b1	30	35	40	55	65
c	4	5	8	10	10
G	–	–	–	22	26
H	37.5	45	52.5	70	85
H1	12.5	15	15	14	17
H2	–	–	–	22	26
Ø1	6.5	9	11	11	13
Ø2	11	11	13	11	14

Links for "star" connection of 3 poles

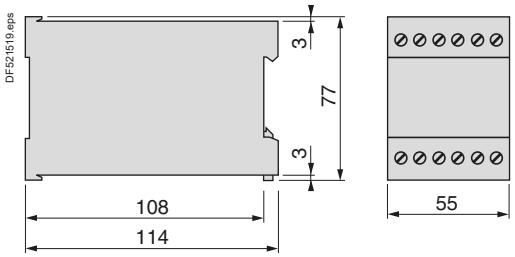
LA9F●601



LA9	FF601	FG601	FH601	FK601	FL601
a	69	100	121	140	200
b	15	20	20	30	40
c	3	3	5	5	8
Ø	6.5 x 8.5	8.5 x 10.5	10.5 x 13	11	13

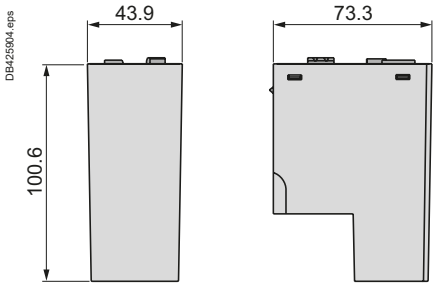
Capacitive delayed opening devices for TeSys F contactors

LAZR9●●



Electronic Control Module for LXE●●250 coils

LA4EM250●●



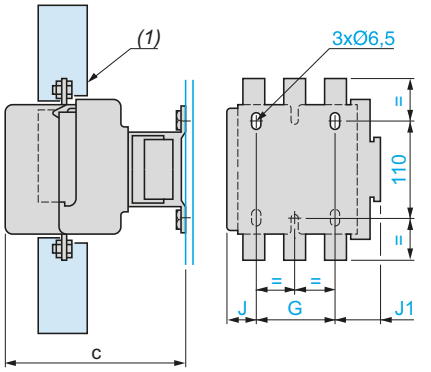
References:
pages B9/12 and B9/13

Mounting

LC1F115 to F330

On panel

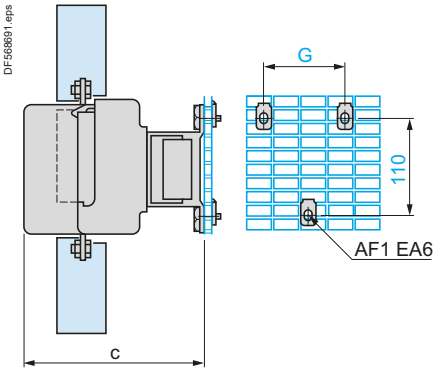
DF568690.eps



LC1		F115 F150	F185 F225	F265	F330
c (2)	3P	171	181	213	219
	4P	171	181	213	219
G	3P	80	80	96	96
	4P	80	80	96	96
J	3P	26.5	29	44.5	44.5
	4P	45	49	68.5	68.5
J1	3P	57	59.5	61.5	61.5
	4P	75.5	79.5	85.5	85.5

On pre-slotted mounting plate AM1PA, PB, PC

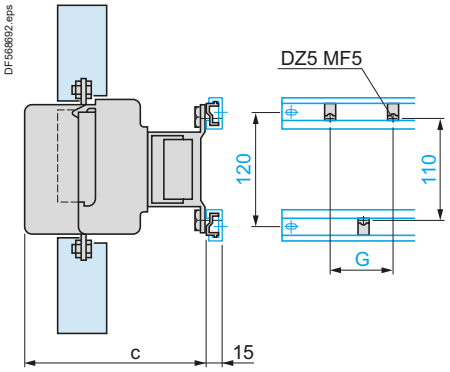
DF568691.eps



LC1		F115 F150	F185 F225	F265	F330
c (2)	3P	171	181	213	219
	4P	171	181	213	219
G	3P	80	80	96	96
	4P	80	80	96	96

On rails DZ5MB on 120 mm centres

DF568692.eps

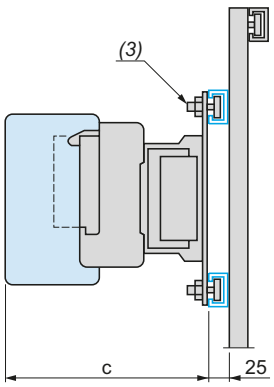


LC1		F115 F150	F185 F225	F265	F330
c (2)	3P	171	181	213	219
	4P	171	181	213	219
G	3P	80	80	96	96
	4P	80	80	96	96

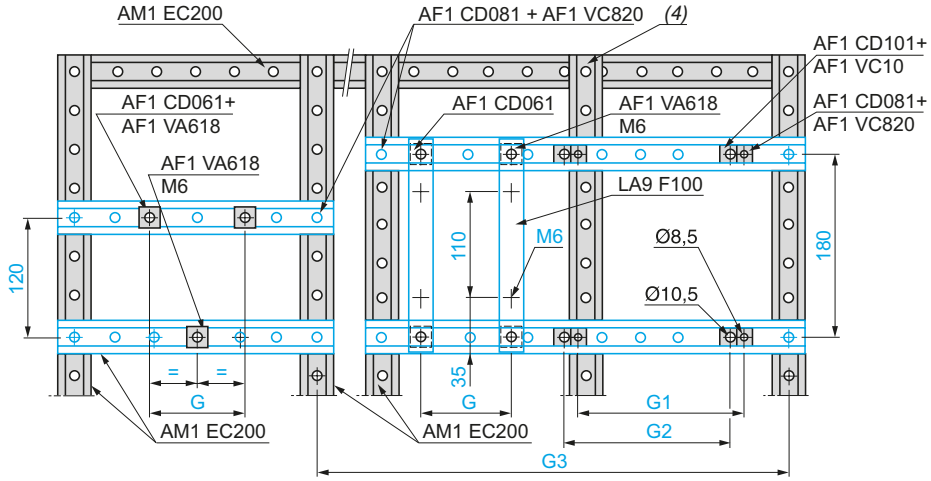
LC1F

On 2 notched rails AM1EC●●●

DF568693.eps



LC1F115 to F330



LC1F400 to F800

LC1		F115, F150	F185, F225	F265	F330	F400	F500	F630	F780	F800
c	3P	165 (5)	176	207	213	219	232	255	255	255
	4P	165 (5)	176	207	213	219	232	255	255	–
G (M6)	3P	80	80	96	96	–	–	–	–	–
	4P	80	80	96	96	–	–	–	–	–
G1 (∅ 8.5)	3P	–	–	–	–	80	80	–	–	–
	4P	–	–	–	–	80	140	–	–	–
G2 (∅ 10.5)	3P	–	–	–	–	–	–	180	See page B9/55	180
	4P	–	–	–	–	–	–	240	See page B9/55	–

(1) Power terminal protection shroud (see page B9/14).
(2) See X1 (minimum electrical clearance) pages B9/54 and B9/55.
*(3) **AF1CD●●●** and **AF1VA●●●**.*
*(4) This **AM1EC200** upright is required when G2 or G3 is greater than 700 mm (please consult your Regional Sales Office).*
(5) + 6 mm with time-delay block on LC1F.

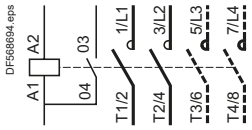
Coordination tables: pages A6/36 to A6/45
References: pages B9/2 to B9/9
Characteristics: pages B9/44 to B9/51
Schemes: page B9/62

Schemes

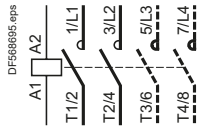
Contactors

2, 3 and 4-pole contactors

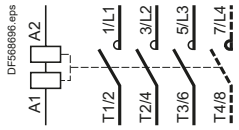
LC1F115 to F630 , F1250 (coil LX1F ∿)



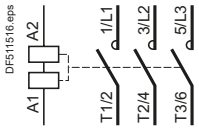
LC1F115 to F630 , F1250 (coil LX4F ⎓)
LC1F115 to F265 (coil LX9F ∿)
LC1F800 (coil LX8 F ∿/ ⎓)



LC1F780 ∿ or ⎓



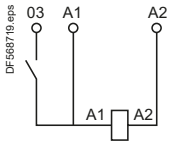
LC1F1000
LC1F1400 ∿ or ⎓ , LC1F1700 ∿ or ⎓
LC1F2100 ∿ or ⎓ , LC1F2600 ∿ or ⎓



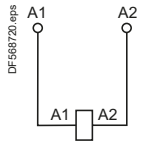
Coils

Standard ∿ coils

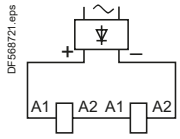
LX1FJ…FL
LX1FH0422…FH3802



LX1FH0202…FH0362
LX1FH4402…FH10002
LX1F8●

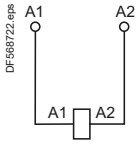


LX1FX
Rectifier supplied and fixed on the contactor



Standard ⎓ coils

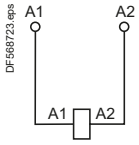
LX4FF, FG, FH, FJ, FK, FL, FX (1), LX4F8●



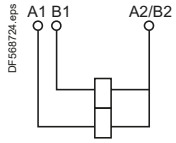
(1) 2 coils in series.

Special ∿ coils

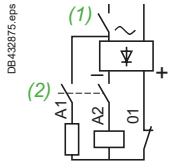
LX9FF, FG



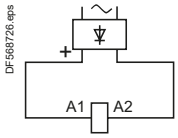
LX9FH●●●2



LX9FJ, FK, FL



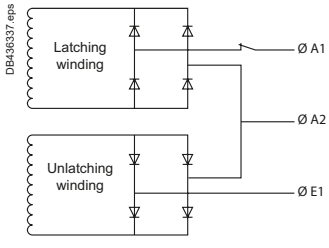
LX4F8●



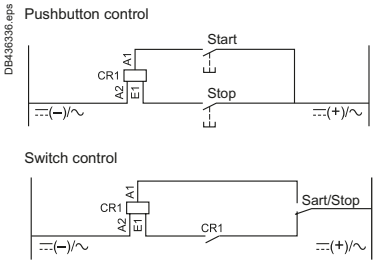
(1) Breaking on ∿ side. Drop-out time 50 ms.
(2) Breaking on ⎓ side. Drop-out time 20 ms.

Specific wiring diagrams for CR1F contactors

Internal latching/unlatching diagram

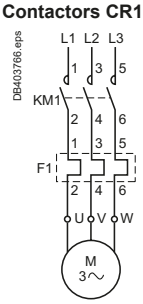


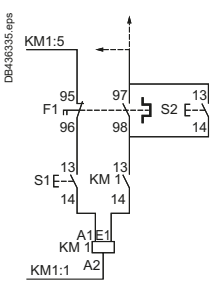
Control diagrams



Warning: terminal A2 is common to both windings in all cases.

Contactors CR1F with thermal overload relay





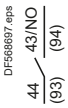
Coordination tables: pages A6/36 to A6/45
References: pages B9/2 to B9/9
Characteristics: pages B9/44 to B9/51
Dimensions: pages B9/54 to B9/56

Schemes

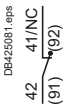
Add-on blocks

Instantaneous auxiliary contacts

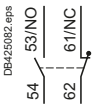
1 N/O LADN10 (1)



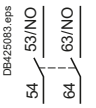
1 N/C LADN01 (1)



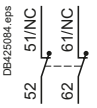
1 N/O + 1 N/C LADN11



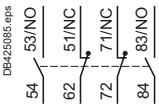
2 N/O LADN20



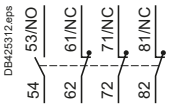
2 N/C LADN02



2 N/O + 2 N/C LADN22



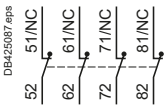
1 N/O + 3 N/C LADN13



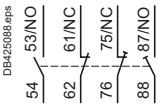
4 N/O LADN40



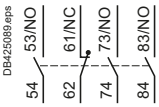
4 N/C LADN04



2 N/O + 2 N/C (2) **LADC22**



3 N/O + 1 N/C LADN31

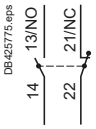


*(1) Items in brackets: See "*TeSys D *contactors".*

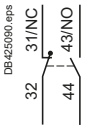
(2) 1 N/O + 1 N/C make before break.

Instantaneous auxiliary contacts with terminal referencing conforming to standard EN 50012 (References: pages B9/10 and B9/11)

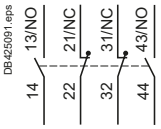
1 N/O + 1 N/C
LADN11P



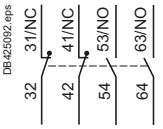
1 N/O + 1 N/C
LADN11G



2 N/O + 2 N/C
LADN22P

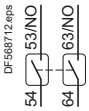


2 N/O + 2 N/C
LADN22G

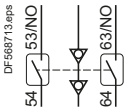


Dust and damp protected instantaneous auxiliary contacts

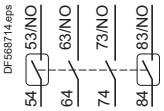
2 N/O (24-50 V)
LA1DX20



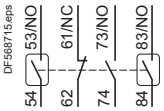
2 N/O (5-24 V) with 2 earth terminals for screened cables
LA1DY20



2 N/O protected (24-50 V) + 2 N/O standard
LA1DZ40

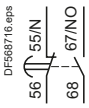


2 N/O protected (24-50 V) + 1 N/O + 1 N/C standard
LA1DZ31

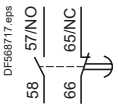


Time delay auxiliary contacts

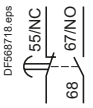
On-delay 1 N/O +1 N/C LADT●



Off-delay 1 N/O + 1 N/C LAD R●

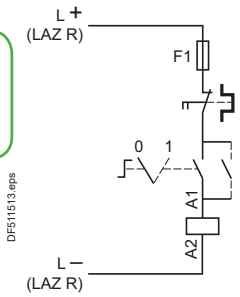


On-delay 1 N/C + 1 N/O break before make LAD S●



Capacitive delayed opening devices for TeSys F contactors

LAZR9●● + LC1F



COORD.
Ref.
High power contactors

Characteristics

Selection

Contactor size			LC1V160	LC1V320	LC1V610
For utilisation category AC-3					
Maximum operational current in AC-3		**A**	160	320	610
Rated operational power P (standard power ratings of motors)	230 V	**kW**	45	90	160
	400 V	**kW**	75	160	300
	525 V	**kW**	110	220	400
	690 V	**kW**	150	280	560
	1000 V	**kW**	200	400	800
	1500 V	**kW**	280	600	930
For 3-phase motors conforming to CSA standards					
Rated operational power P (standard power ratings of 3-phase CSA motors)	200 V	**hp**	50	100	150
	240 V	**hp**	60	125	200
	380 V	**hp**	100	200	300
	480 V	**hp**	125	250	400
	600 V	**hp**	150	300	500
	800 V	**hp**	200	400	700
	1000 V	**hp**	250	500	1000
	1500 V	**hp**	400	800	1300
For switching 3-phase capacitors					
Rated operational power P	240 V	**kVAR**	47	94	176
	480 V	**kVAR**	95	190	356
	600 V	**kVAR**	100	200	400
	1500 V	**kVAR**	250	500	1000
For switching the primaries of 3-phase transformers (LV/LV)					
Rated operational power P	208 V	**kVA**	20	41	81
	240 V	**kVA**	23	47	94
	480 V	**kVA**	47	94	188
	600 V	**kVA**	59	117	234

Environment characteristics

Contactor type				LC1V160	LC1V320	LC1V610
Shock resistance (1/2 sine wave = 11 ms)		Contacts closed		10 gn	10 gn	10 gn
		Contacts open		10 gn	10 gn	10 gn
Vibration resistance		10…500 Hz		2 gn	2 gn	2 gn
Operating altitude	Above sea level	Maximum	**m**	3600	3600	3600
	Below sea level	Minimum	**m**	2500	4500	4500
Ambient air temperature around the device		Storage	**°C**	-40…+80	-40…+80	-40…+80
		Operation 0.8… 1.1 Uc	**°C**	-5…+55	-5…+55	-5…+55
		Permissible for operation at Uc	**°C**	-10…+75	-10…+75	-10…+75
Degree of protection		Conforming to IEC 60529		IP 00	IP 00	IP 00
Operating position				Any	Any	Any
Cabling		Cable c.s.a.	**mm²**	70	185	2 x 185
		Key for hex. screws	**mm**	Allen 4	20	20
		Tightening torque	**N.m**	14	39	39

Control circuit characteristics

Rated insulation voltage (Ui)	To earth	**V**	2000	2000	2000
Consumption	Inrush	**VA**	300	600	1700
	Sealed	**VA**	30	20	28
Permissible control circuit voltage			0.8…1.1 Uc	0.8…1.1 Uc	0.8…1.1 Uc
Closing time (1)		**ms**	18...22	24...32	24...32
Opening time (1)		**ms**	95...115	95...115	95...115

(1) The closing time "C" is measured from the moment the coil supply is switched on to initial contact of the main poles. The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separate.

References: page B9/4
Dimensions: pages B9/66 and B9/67
Schemes: pages B9/66 to B9/69

Characteristics

Main pole characteristics

Contactor type			LC1V160	LC1V320	LC1V610
Rated insulation voltage (Ui)		V	1500	1500	1500
Rated impulse withstand voltage (Uimp)		kV	8	8	8
Conforming to standards			EN 60947-4-1 - IEC 60947-4-1		
Conventional rated thermal current (Ith)		A	160	320	630
Rated operational current (Ie)	θ ≤ 40 °C AC-1	A	160	320	630
	θ ≤ 55 °C AC-3	A	160	320	610
	θ ≤ 55 °C AC-4	A	130	270	540
Electrical durability in millions of operating cycles (400 V at I max)	AC-1		1.2	1	1
	AC-3		1.6	1.5	1.5
	AC-4		0.18	0.15	0.12
Mechanical durability	In millions of operating cycles		5	2.5	2
Maximum operating rate in operating cycles per hour	Mechanical		1200	1200	1200
	AC-1		900	900	900
	AC-3		900	900	900
	AC-4		450	450	450
Maximum making capacity (Irms)	Ue = 1500 V To IEC 60947	A	1900	3800	7300
Maximum breaking capacity (Irms)	Ue = 1500 V To IEC 60947	A	1600	3200	6100
Maximum permissible current	For 1 s	A	2400	4500	9000
	For 2 s	A	2000	3750	7580
	For 10 s	A	1600	3200	6100
	For 30 s	A	960	1920	3600
Short-circuit protection at Ie in cat. AC-3 max.	aM fuse	A	160	400	630

Auxiliary contact characteristics

Rated insulation voltage (Ui)		V	690
Conventional rated thermal current (Ith)		A	10
Rated operational current (Ie)	AC-15, 230 V	A	0.78
	AC-15, 400 V	A	0.45
	AC-15, 500 V	A	0.35
	DC-13, 24 V	A	1.1
	DC-13, 110 V	A	0.24
	DC-13, 220 V	A	0.12
Cabling	Cable c.s.a.	mm^2	2.5
Short-circuit protection	gG fuse	A	10
Operating time (1) (at 100 % of Uc)	"C"	ms	±5
	"O"	ms	±5

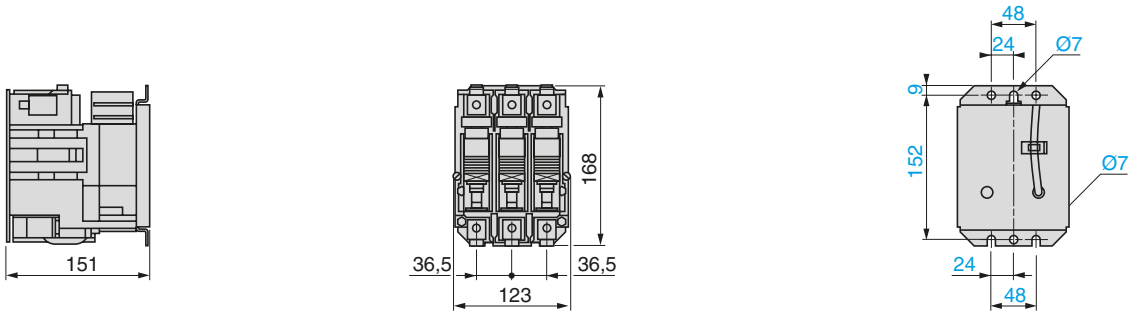
(1) Operating time in relation to the main contacts.

References: page B9/4
Dimensions: pages B9/66 and B9/67
Schemes: pages B9/66 to B9/69

Dimensions, mounting

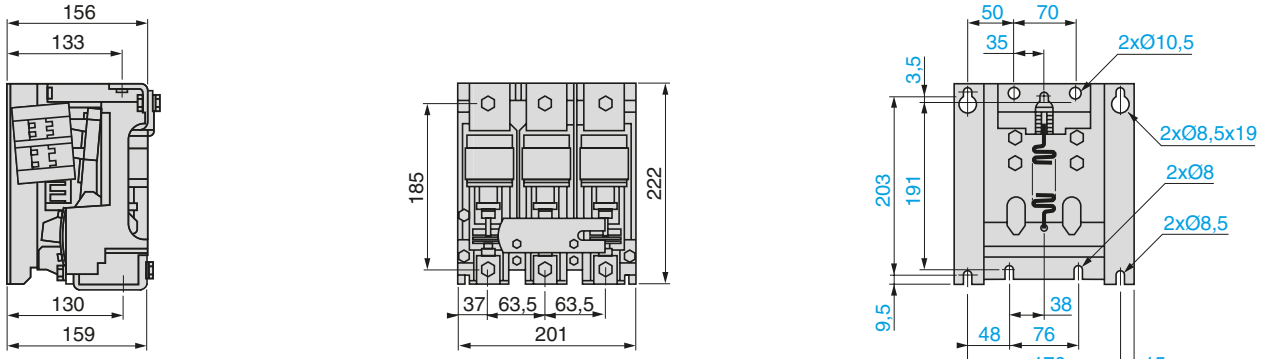
LC1V160

500311.eps



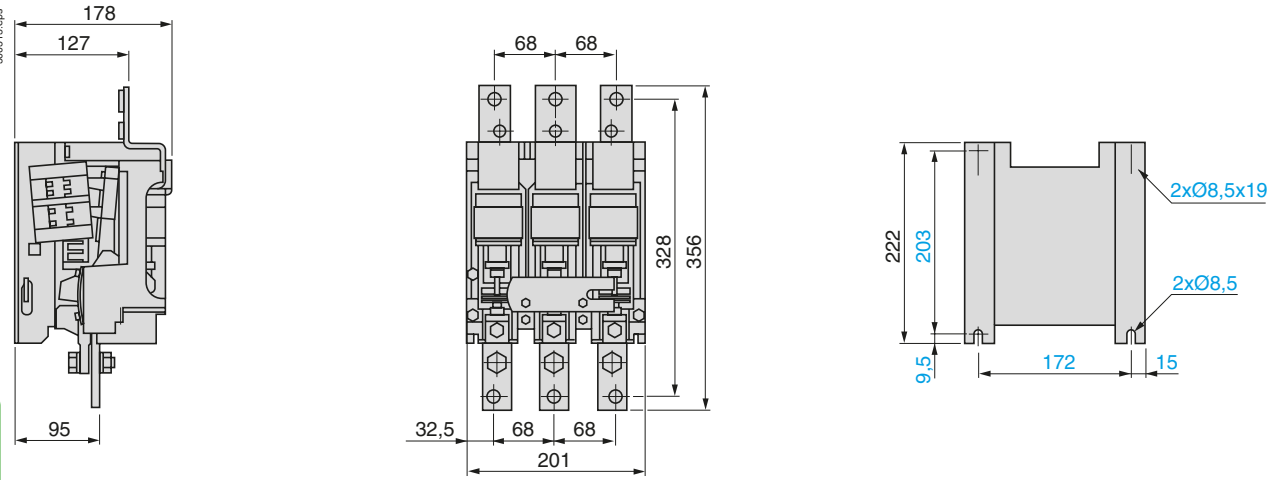
LC1V320

500312.eps



LC1V610

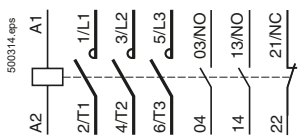
500313.eps



Schemes

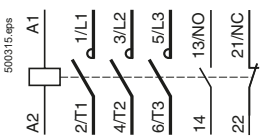
LC1V160

500314.eps



LC1V320, V610

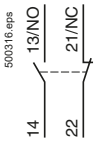
500315.eps



Auxiliary contact blocks

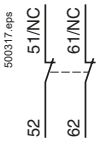
LA1VN11 1 N/O & 1 N/C

500316.eps



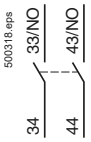
LA1VN02 2 N/C

500317.eps



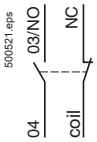
LA1VN20 2 N/O

500318.eps



LA1VN11X 1 N/O

500521.eps

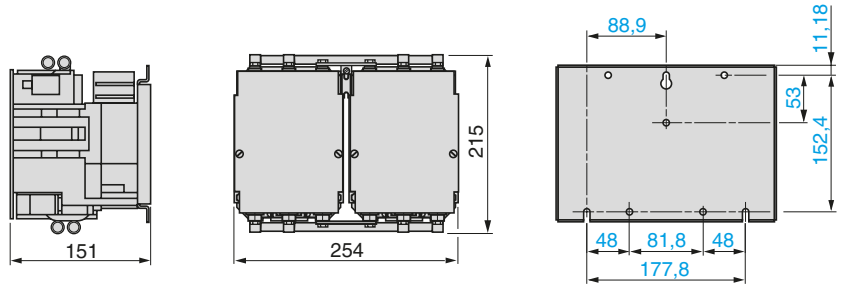


References:
page B9/4

Dimensions, mounting

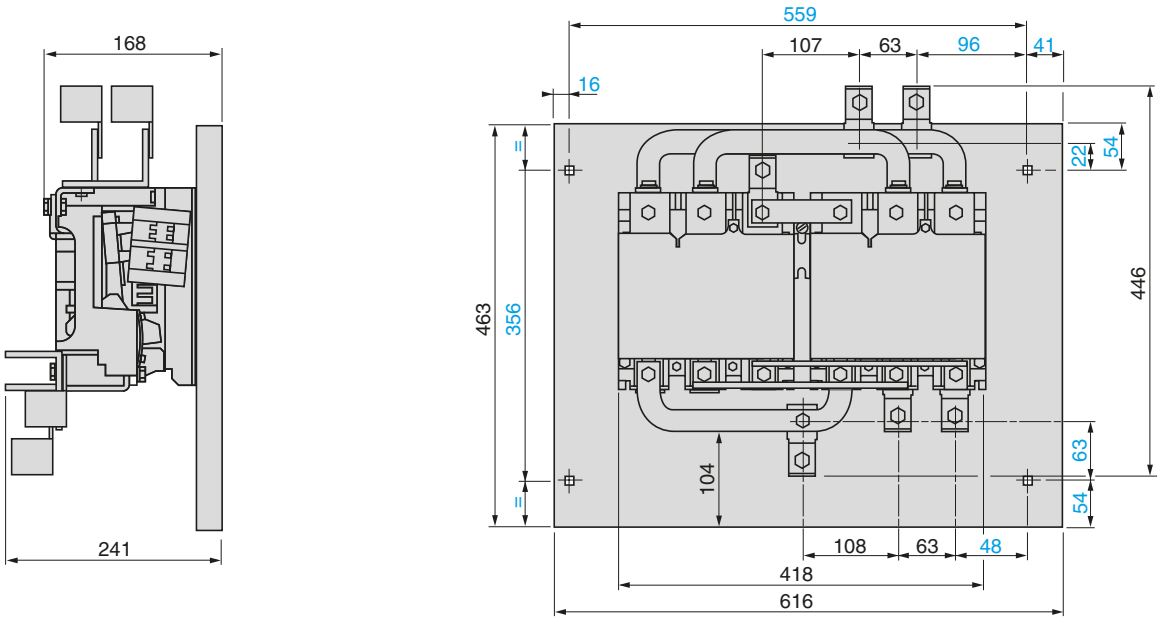
LA9V974 + 2 x LC1V160

562320.eps



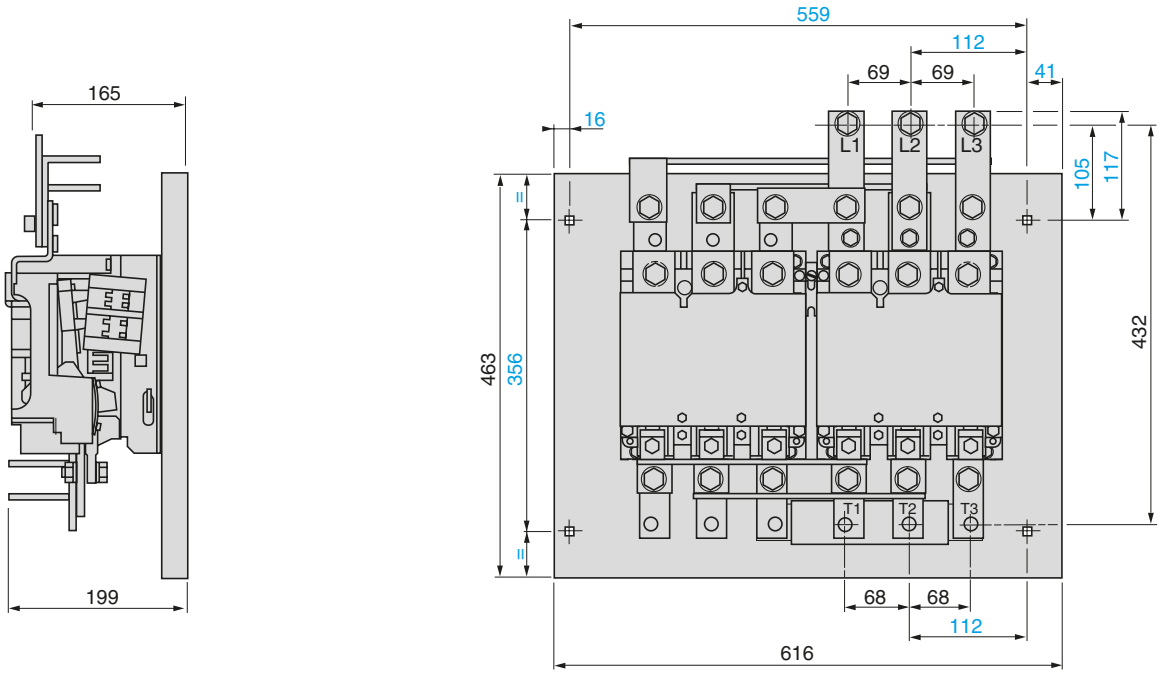
LC2V320

DF536047.eps



LC2V610

562322.eps



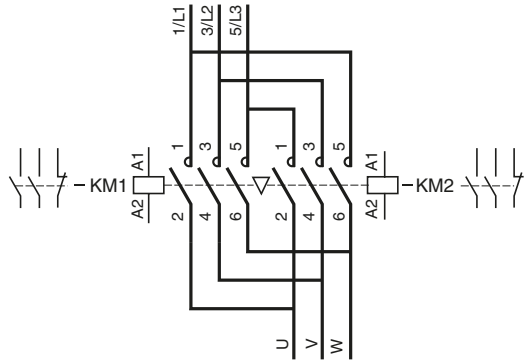
References:
page B9/4

Characteristics:
pages B9/64 and B9/65

Schemes

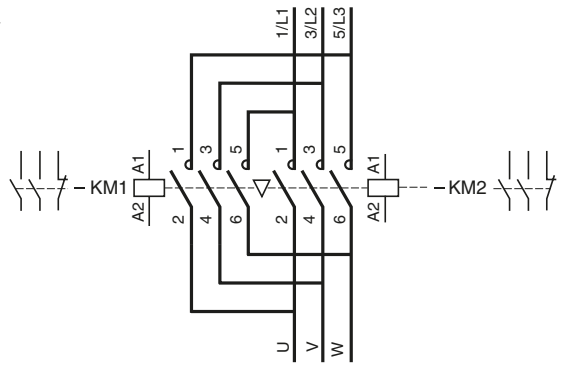
LA9V974 + 2 x LC1V160

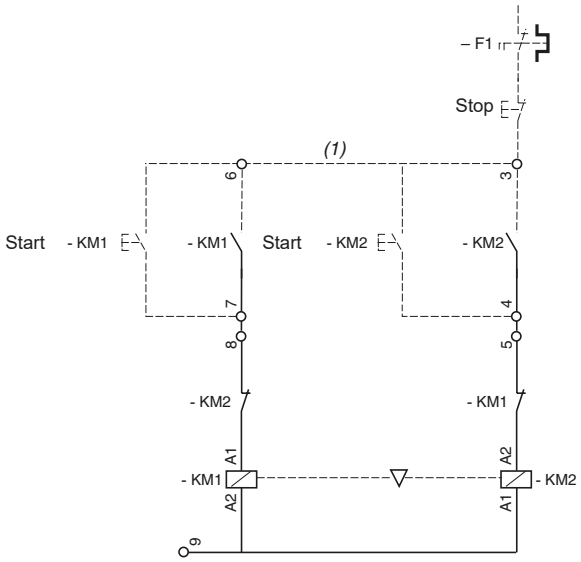
562323.eps



LC2V320

562324.eps





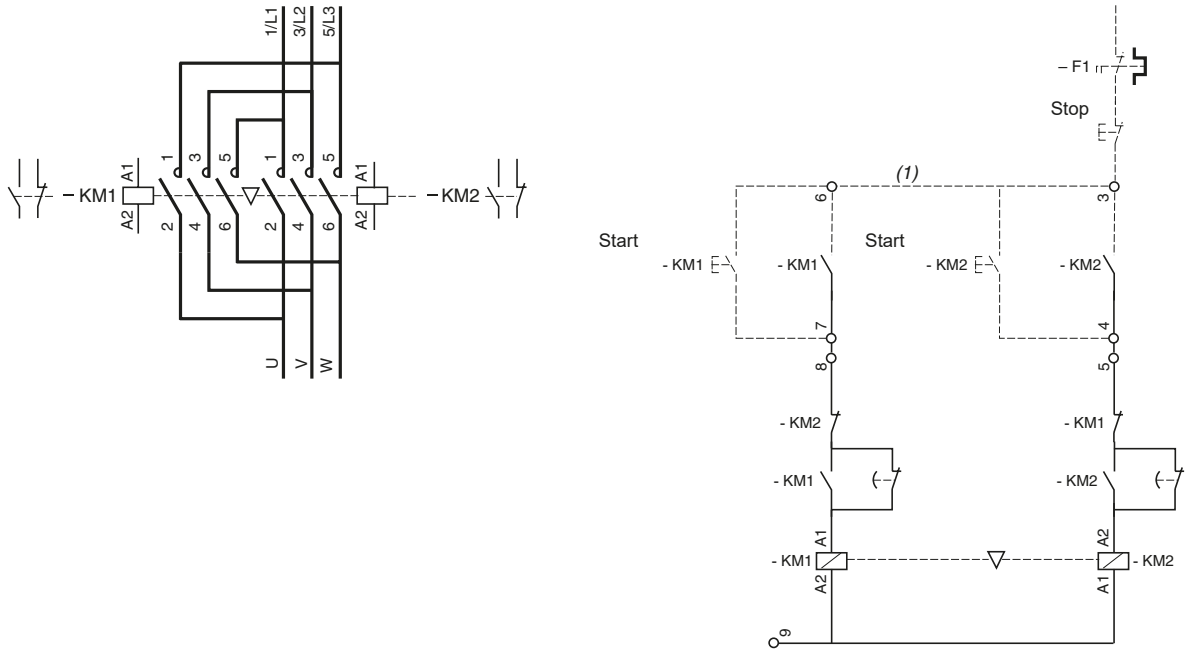
(1) Dotted line indicates wiring to be installed by the customer.

Ref.
High power contactors

Schemes

LC2V610

562325.eps



(1) Dotted line indicates wiring to be installed by the customer.

Ref.
High power contactors

Characteristics

PB121431.eps



LC1FG150

PB121432.eps



LC1FG265

Shockproof contactor specificity

In an environment subject to severe mechanical shocks, unwanted closing of a contactor's poles and the serious consequences of this, is not permissible.

Shockproof contactors **LC1FG150** to **FG630** are equipped with an auxiliary electromechanical device which ensures that the contactor is mechanically locked in the “open” position when it’s main electromagnet is not energised.

If the contactor is subjected to mechanical impact, from back to front or from front to back, accidental closing of the poles is then impossible.

In addition, accidental opening of the poles (when the contactor is in the “on” position), is virtually impossible due to the significant pull-in force characteristic of these contactors.

Applications

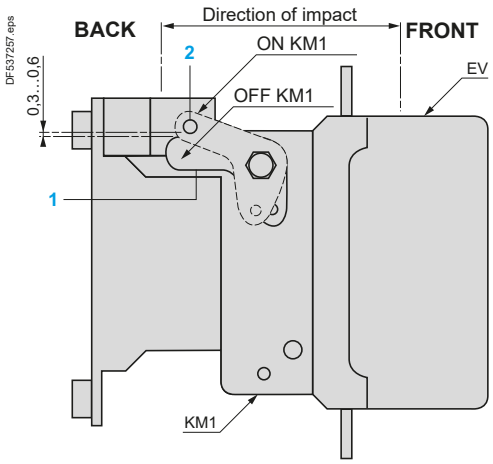
- **Marine:** on-board equipment, windlasses, capstans, winches, etc…
- **Military equipment:** land, sea, launching silos.
- **Heavy mechanical handling systems:** travelling cranes, cranes, gantries.
- **Conveying and handling:** lifts, hoists, conveyors.
- **Equipment for power stations.**
- **Distribution boards.**

References:
page B9/6

Dimensions, schemes:
pages B9/86 and B9/87

Description of shockproof device

Shockproof contactors **LC1FG●●●** are equipped with:
- a lever **1** that is rotated by the core of the contactor's electromagnet.
- an auxiliary electromagnet (EV) for the locking function.
- an RC circuit (Resistor-Capacitor) to limit overvoltage.

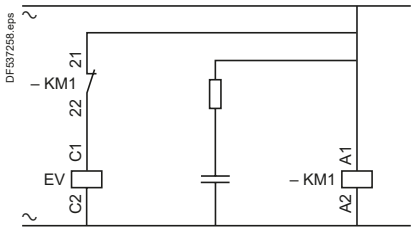


Operation

- In the 'off' position (contactor open and not energised) the core **2** of the electromagnet (EV) locks the lever **1** and therefore the contactor.
- The coils (KM1) and (EV) are energised simultaneously, the core **2** releases the lever **1** and allows the contactor to close.
- De-energisation of the locking electromagnet (EV) is achieved by an auxiliary contact within the contactor.

The core **2** rests freely in lever **1**.
- On de-energisation of coil KM1, the moving contact drops out.

Core **2**, under spring pressure, once again locks lever **1**.



Ref.
High power contactors

References:
page B9/6
Dimensions, schemes:
pages B9/86 and B9/87

Characteristics - Durability (AC)

Use in category AC-3 (Ue ≤ 440 V)

Operational current and power (θ ≤ 55 °C)

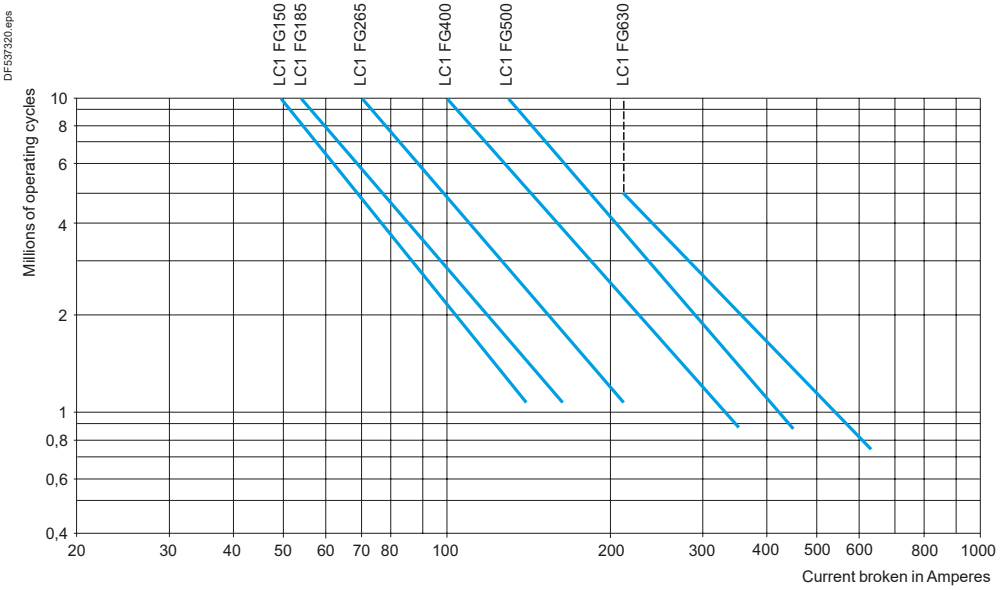
Contactors			LC1FG150	LC1FG185	LC1FG265	LC1FG400	LC1FG500	LC1FG630
Operational current		**A**	150	185	265	400	500	630
Operational power Standard power ratings of motors)	220/230 V	**kW**	40	55	75	110	147	200
		hp	*54*	*75*	*100*	*150*	*200*	*270*
	380/400 V	**kW**	75	90	132	200	250	335
		hp	*100*	*185*	*180*	*270*	*340*	*450*
	415 V	**kW**	80	100	140	220	280	375
		hp	*110*	*136*	*180*	*300*	*380*	*500*
	440 V	**kW**	80	100	140	250	295	400
		hp	*110*	*136*	*190*	*340*	*400*	*545*
	500 V	**kW**	90	110	160	257	355	400
		hp	*125*	*150*	*220*	*350*	*480*	*545*
	660/690 V	**kW**	100	110	160	280	335	450
		hp	*136*	*150*	*220*	*380*	*450*	*600*
	1000 V	**kW**	65	100	147	185	335	450
		hp	*85*	*136*	*200*	*250*	*450*	*610*

Maximum operating rate (operating cycles/hour) (1)

On-load factor	Operational power	LC1FG150	LC1FG185	LC1FG265	LC1FG400	LC1FG500	LC1FG630
≤ 85 %	P	750	750	750	500	500	500
≤ 85 %	0.5 P	2000	2000	2000	1200	1200	1200
≤ 25 %	P	1200	1200	1200	1200	1200	1200

(1) Depending on the operational power and the on-load factor (θ ≤ 55 °C).

Electrical durability in utilisation category AC-3 (Ue ≤ 440 V)



Control of 3-phase asynchronous squirrel cage motors with breaking whilst running.
The current broken (Ie) in category AC-3 is equal to the rated operational current of the motor.
Example:
Asynchronous motor with P = 55 kW - Ue = 380 V - Ie = 105 A
4 million operating cycles required.
The above selection curves show the contactor rating needed: **LC1FG265**.

References: page B9/6
Dimensions, schemes: pages B9/86 and B9/87

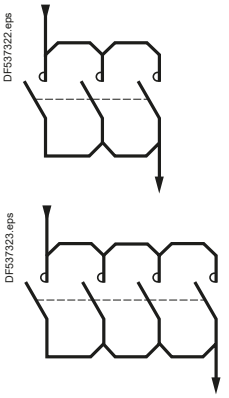
Characteristics - Durability (AC)

Use in category AC-1 (Ue ⩽ 440 V)

Contactors				LC1FG150	LC1FG185	LC1FG265	LC1FG400	LC1FG500	LC1FG630
Connection	Cable	C.s.a.	mm²	120	150	240	–	–	–
	Bar	Number		–	–	–	2	2	2
		C.s.a.	mm	–	–	–	30 x 5	40 x 5	60 x 5
Maximum operating rate in operating cycles/hour				600	600	600	600	600	600
Operational current AC-1		⩽ 40 °C	A	250	270	350	500	700	1000
		⩽ 55 °C	A	220	240	300	430	580	850
		⩽ 70 °C (1)	A	170	180	250	340	500	700

(1) Only for operation with coil supplied at Uc.

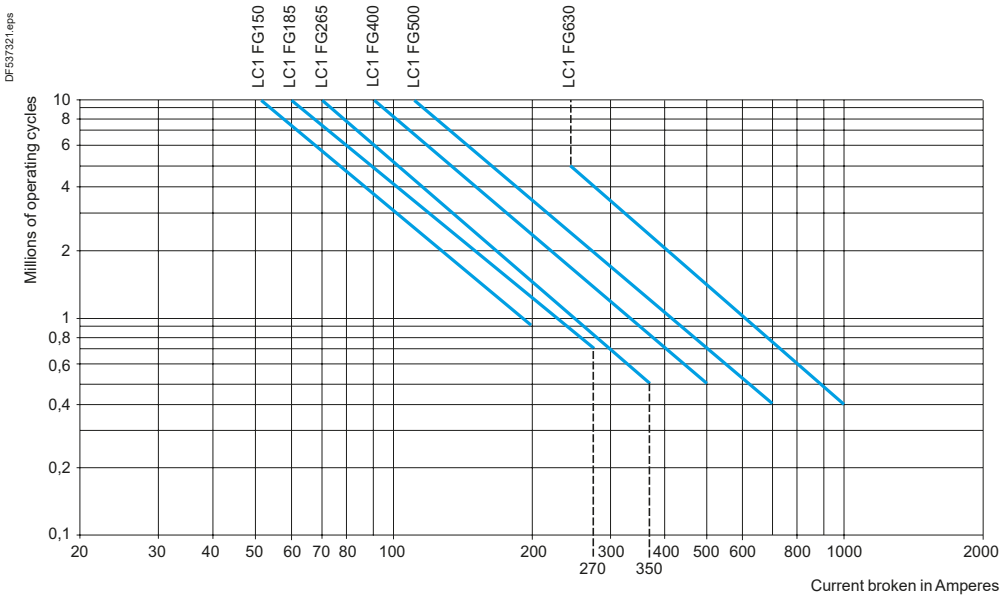
Increase in operational current by parallel connection of poles



Apply the following multiplying factors to the current values given above.
The factors take into account the often unbalanced current distribution between the 2 poles:
- 2 poles in parallel: K = 1.6
- 3 poles in parallel: K = 2.25
- 4 poles in parallel: K = 2.8.

Recommended connection scheme to equalise the currents in each pole (see opposite).

Electrical durability in utilisation category AC-1 (Ue ⩽ 440 V)



Example:
Control of resistive circuits (cos φ ⩾ 0.95).
The current broken (Ic) in category AC-1 is equal to the current (Ie) normally drawn by the load.
Ue = 220 V - Ic = Ie = 300 A - θ = 40 °C.
1 million operating cycles required.
The above selection curves show the contactor rating needed: **LC1FG400**.

References:
page B9/6

Dimensions, schemes:
pages B9/86 and B9/87

Characteristics - Durability (AC)

Thermal limits in utilisation categories AC-2/AC-4

Contactors		LC1 FG150	LC1 FG185	LC1 FG265	LC1 FG400	LC1 FG500	LC1 FG630
Thermal limit zone	**Operating cycles/hour (1) and on-load factor**	**Maximum current broken according to the duty requirements** (thermal limit, ambient temperature ⩽ 55 °C)					
A	From 150 and 15 % to 300 and 10 %	310	380	560	780	1100	1400
B	From 150 and 20 % to 600 and 10 %	280	350	500	700	950	1250
C	From 150 and 30 % to 1200 and 10 %	240	300	400	600	750	950
D	From 150 and 55 % to 2400 and 10 %	190	240	320	450	600	720
E	From 150 and 85 % to 3600 and 10 %	145	170	230	350	500	660

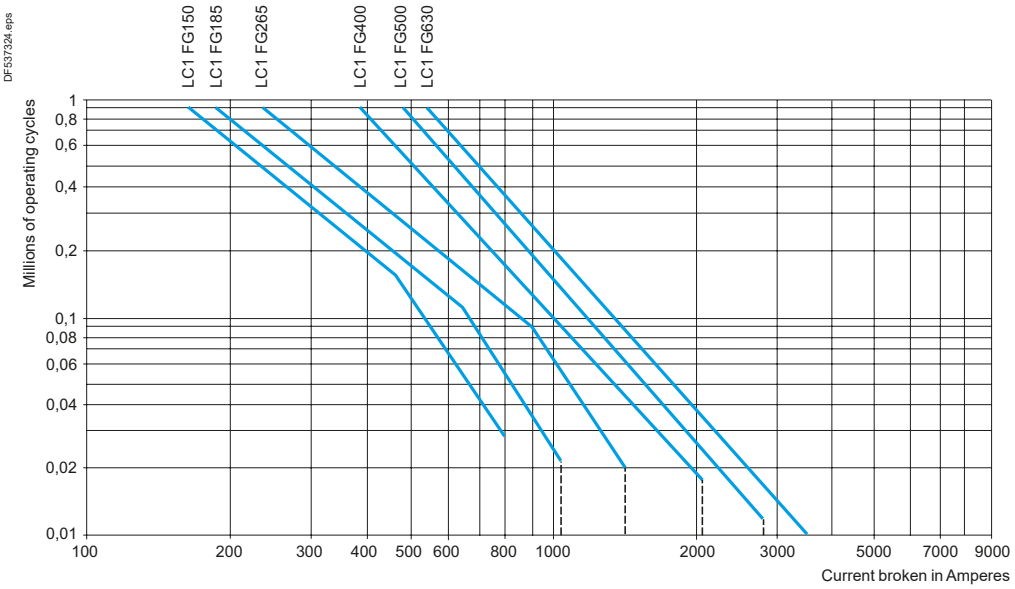
(1) Do not exceed the maximum limit for the mechanical operating cycles.

Counter current braking (plugging)

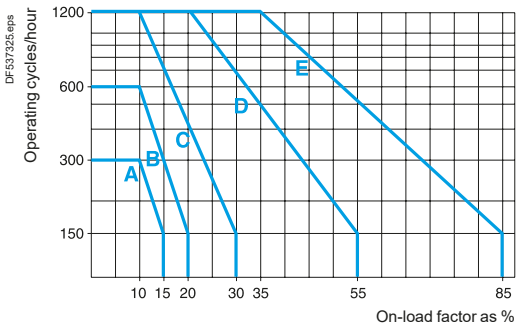
The current varies from the maximum plug-braking current to the rated motor current.
The current made must be compatible with the making and breaking capacities of the contactor.

In most cases, breaking occurs at a current value close to the locked rotor current and contactor selection can therefore be made using the criteria for utilisation categories AC-2 and AC-4.

Electrical durability in utilisation categories AC-2/AC-4 (Ue ⩽ 440 V)



Example: Contactor selection



For an on-load factor of 10 % at 400 operating cycles per hour, the curve on the left indicates zone B. If the current broken is 600 A, the above table leads to selection of an **LC1FG400** contactor. Referring to the electrical durability curves, it can be seen that the contactor will be able to perform 350 000 operating cycles. Where a higher value of electrical durability is required, 1 million operating cycles for example, an **LC1FG630** contactor would be recommended.

Ref.
High power contactors

Switching 3-phase capacitors

Capacitors, together with the circuits to which they are connected, form oscillatory circuits which can, at the moment of switch-on, give rise to high transient currents (> 180 In) at high frequencies (1 to 15 kHz).
The contactors are used for direct switching. The values of peak current at switch-on must not exceed the values indicated below.

An inductor or an early break resistor may be inserted in each of the three phases supplying the capacitors to reduce the peak current, if necessary. This must be done when switching multiple step capacitor banks.
Inductance values are determined according to the selected operating temperature: please refer to our “Motor starter solutions - Control and protection components” catalogue.

In addition, in accordance with standards IEC 60070, NF C 54 100, VDE 0560, the switching contactor must be able to withstand a continuous current of 1.43 times the rated current of the capacitor bank step being switched. The rated operational powers given in table the below take this overload into account.

Short-circuit protection is normally provided by g1 fuses rated at 1.3 to 1.6 In.

Maximum operational power of contactors

Maximum operating rate: 120 operating cycles/hour.
Electrical durability at maximum load: 100 000 operations.
With choke inductors connected, where necessary.

Operational power at 50/60 Hz						Maximum peak current	Contactor to be used
$\theta \leq 40$ °C			$\theta \leq 55$ °C				
220 V 240 V	400 V 440 V	600 V 660 V	220 V 240 V	400 V 440 V	600 V 660 V		
kvar	kvar	kvar	kvar	kvar	kvar	A	
60	100	135	40	85	90	3200	**LC1FG150**
70	125	160	50	100	100	3500	**LC1FG185**
90	160	225	75	125	125	5000	**LC1FG265**
125	220	300	100	160	200	8000	**LC1FG400**
180	300	400	125	220	300	10 000	**LC1FG500**
250	400	600	190	350	500	12 000	**LC1FG630**

Switching the primaries of 3-phase transformers (LV/LV)

When a transformer is switched on, there is generally an initial current surge which can reach 20 to 40 times the rated current for the power ratings shown below.
This current reaches its peak value almost instantaneously and then decreases in a largely exponential manner, quickly dropping back down to its steady state value.

Contactor selection

Operating rate less than 120 operating cycles/hour.
Maximum operational voltages: 690/1000 V 50/60 Hz (2).
The value of the peak magnetising current must be lower than the values indicated below.
Maximum ambient temperature: 55 °C.

Contactor			LC1FG150	LC1FG185	LC1FG265	LC1FG400	LC1FG500	LC1FG630
Maximum permissible current peak at switch-on		**A**	1700	2800	3500	5500	6800	9000
Maximum operational power (1)	220 V	**kVA**	25	40	50	75	100	140
	380 V	**kVA**	50	75	90	130	170	225
	415/440 V	**kVA**	55	80	100	140	190	250
	500 V	**kVA**	65	95	110	170	225	280
	660 V	**kVA**	80	120	140	200	270	315
	1000 V	**kVA**	100	150	200	250	375	470

(1) Maximum operational power corresponding to a current peak at switch-on of 30 In.
(2) Refer to page B9/80 and B9/81 for details on operational voltage.

References: page B9/6
Dimensions, schemes: pages B9/86 and B9/87

Characteristics (DC)

Use in category DC-1 (resistive loads; time constant L/R ⩽ 1 ms)

Rated operational current Ie

Operational voltage (Ue)	Number of poles to be wired in series	Contactors					
		LC1 FG150	LC1 FG185	LC1 FG265	LC1 FG400	LC1 FG500	LC1 FG630
V		A	A	A	A	A	A
24	1	160	220	300	400	600	850
	2	160	220	300	400	600	850
	3	160	220	300	400	600	850
	4	160	220	300	400	600	850
48/75	1	160	220	300	400	600	850
	2	160	220	300	400	600	850
	3	160	220	300	400	600	850
	4	160	220	300	400	600	850
125	1	–	–	–	–	–	–
	2	130	170	300	400	550	850
	3	130	170	300	400	600	850
	4	130	170	300	400	600	850
225	1	–	–	–	–	–	–
	2	100	150	250	350	450	700
	3	130	170	300	400	600	850
	4	130	170	300	400	600	850
300	3	100	150	250	350	450	700
	4	130	170	300	400	600	850
460	4	100	150	250	350	450	700

Use in category DC-2 to DC-5 (inductive loads; time constant L/R ⩽ 15 ms)

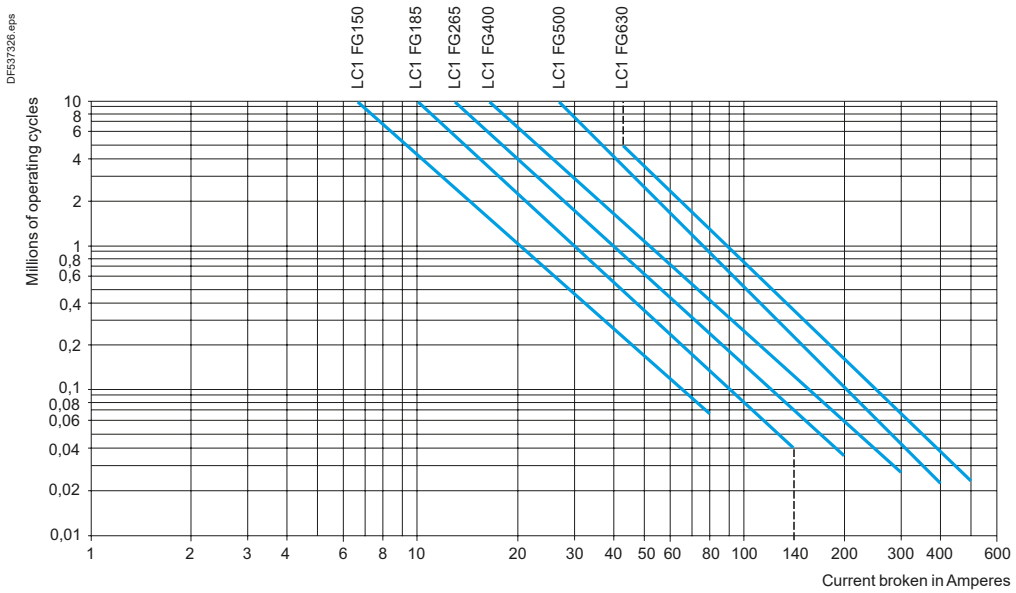
Rated operational current Ie

Operational voltage (Ue)	Number of poles to be wired in series	Contactors					
		LC1 FG150	LC1 FG185	LC1 FG265	LC1 FG400	LC1 FG500	LC1 FG630
V		A	A	A	A	A	A
24	1	140	180	280	350	550	850
	2	140	180	280	350	550	850
	3	140	180	280	350	550	850
	4	140	180	280	350	550	850
48/75	1	140	180	280	350	550	850
	2	140	180	280	350	550	850
	3	140	180	280	350	550	850
	4	140	180	280	350	550	850
125	1	–	–	–	–	–	–
	2	100	140	250	350	550	850
	3	120	160	280	350	550	850
	4	120	160	280	350	550	850
225	1	–	–	–	–	–	–
	2	80	100	200	280	450	700
	3	100	140	250	350	550	850
	4	120	160	280	350	550	850
300	3	80	100	200	280	450	700
	4	120	160	280	350	550	850
460	4	80	100	200	280	450	700

References: page B9/6
Dimensions, schemes: pages B9/86 and B9/87

Electrical durability

Utilisation categories DC-1 to DC-5



Determining the electrical durability

The electrical durability can be read directly from the curve above, having previously calculated the power broken Pc. The following table gives, for each utilisation category, the value of Pc according to the operational current Ie and the operational voltage Ue.

Utilisation categories		**Pc** (Power broken)
DC-1	Non-inductive loads	Pc = Ue x Ie
DC-2	Shunt motors, breaking whilst running	Pc = 0.1 Ue x Ie
DC-3	Shunt motors, reversing	Pc = Ue x 2.5 Ie
DC-4	Series wound motors, breaking whilst running	Pc = 0.3 Ue x Ie
DC-5	Series wound motors, reversing	Pc = Ue x 2.5 Ie
Counter current braking (plugging)		Pc = 1.5 Ue x 1.5 Ie

Example:
Series wound motor, breaking whilst motor running, category DC-4.
P = 50 kW, Ue = 200 V, Ie = 250 A.
Select contactor **LC1FG265** with 3 poles in series.
The power broken is: Pc = 0.3 Ue x Ie = 0.3 x 200 x 250 = 15 kW.
The electrical durability read from the curve is 8 million operating cycles.

Maximum operating rate

The following operating rate used at Ie must not be exceeded: 120 operating cycles/hour.

Use of poles in parallel

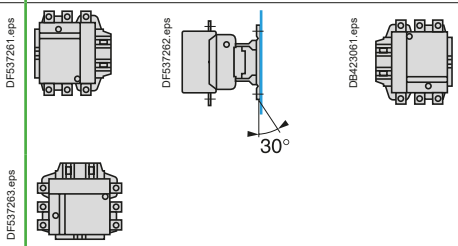
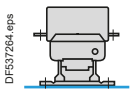
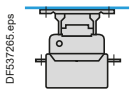
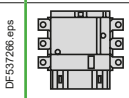
The electrical durability is equal to the number of operating cycles performed by a pole, multiplied by the number of poles in parallel, multiplied by a coefficient of 0.70.

Ref.
High power contactors

References:
page B9/6
Dimensions, schemes:
pages B9/86 and B9/87

Characteristics

Environment

Contactor type			LC1FG150	LC1FG185
Rated insulation voltage (Ui)	Conforming to IEC 60947-4-1	V	1000	
Rated impulse withstand voltage (Uimp)	Coil not connected to the power circuit	kV	8	
Conforming to standards			IEC/EN 60947-4-1	
Product certifications			N.A.T.O.	
Degree of protection	Conforming to IEC 60529		IP 20 front face with shrouds LA9F	
Ambient air temperature around the device	Storage	°C	-60…+80	
	Operation	°C	-5…+55	
	Permissible at Uc (1)	°C	-40…+70	
Maximum operating altitude	Without derating	m	3000	
Operating positions	Without derating			
	With derating (3)		**Fixing A**  **Fixing B** 	
	Not to be used			
Shock resistance (2)			12 g, 50 ms on the three axes: X, Y, Z	
			15 g, 11 ms on the three axes: X, Y, Z	

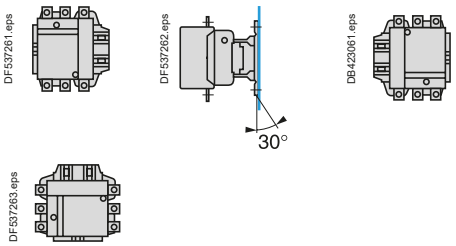
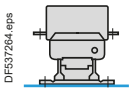
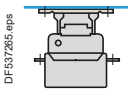
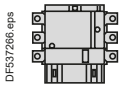
*(1) In these conditions, it is recommended that coils LX9F be used for contactor sizes **FG150** to **FG265**.*
(2) In the least favourable direction, without change of contact state (coil at Uc).
(3) Horizontal fixing:
- *the operational current AC-1 is equivalent to 80 % of the value indicated in the catalogue*
- *breaking and making capacities not guaranteed*
- *mechanical and electrical durabilities not guaranteed.*

Derating of pull-in and drop-out voltage

Contactors LC1		FG150	FG185	FG265	FG400	FG500	FG630
Fixing A	Pull-in	75 %	75 %	75 %	80 %	80 %	80 %
	Drop-out	105 %	105 %	105 %	110 %	110 %	110 %
Fixing B	Pull-in	115 %	115 %	115 %	120 %	120 %	120 %
	Drop-out	90 %	90 %	90 %	95 %	95 %	95 %

References: page B9/6
Dimensions, schemes: pages B9/86 and B9/87

Characteristics

LC1FG265	LC1FG400	LC1FG500	LC1FG630
1000			
8			
IEC/EN 60947-4-1			
N.A.T.O.			
IP 20 front face with shrouds LA9F			
-60…+80			
-5…+55			
-40…+70			
3000			
			
A 			
B 			
			
12 g, 50 ms on the three axes: X, Y, Z			
15 g, 11 ms on the three axes: X, Y, Z			

Characteristics

Pole characteristics

Contactor type				LC1FG150	LC1FG185
Number of poles				3	3
Rated operational current (Ie) (Ue ≤ 440 V)	In AC-3, θ ≤ 55 °C	θ ≤ 70 °C	A	150/150	185/180
	In AC-1, θ ≤ 55 °C	θ ≤ 70 °C	A	220/170	240/180
Rated operational voltage (Ue)	Up to		V	690	690
Frequency limits	Of the operational current (1)		Hz	25 to 200	25 to 200
Conventional thermal current	θ ≤ 40		°C	250	275
Rated making capacity	I rms conforming to IEC 60947-4-1		A	Making current: 10 x I in AC-3	
Rated breaking capacity	I rms conforming to IEC 60947-4-1		A	Making and breaking current: 8 x I in cat. AC-3	
Permissible short time rating No current flowing for preceding 60 minutes with θ ≤ 40 °C	For 1.5 or 10 s		A	1200	1500
	For 30 s		A	700	920
	For 1 mn		A	600	740
	For 3 mn		A	450	500
	For 10 mn		A	350	400
Fuse protection against short-circuits (U ≤ 440 V)	Motor circuit (type aM)		A	160	200
	With thermal overload relay (type gG)		A	200	315
	gG fuses		A	250	315
Average impedance per pole	At Ith and 50 Hz		mΩ	0.35	0.33
Power dissipation per pole for the above operational currents	AC-3		W	8	12
	AC-1		W	22	25
Cabling Minimum c.s.a.	Bar	No. of bars		2	2
		Bar	mm	25 x 3	25 x 3
	Cable with lug		mm²	120	150
	Cable with connector		mm²	120	150
	Bolt diameter		mm	Ø8	Ø8
Tightening torque	Power circuit connections		N.m	18	18

(1) Sine wave without interference. Above these values, please consult your Regional Sales Office.
(2) Ue ≤ 690 V in AC-3; Ue ≤ 1000 V in AC-1.

Ref.
High power contactors

References: page B9/6
Dimensions, schemes: pages B9/86 and B9/87

Characteristics

LC1FG265	LC1FG400	LC1FG500	LC1FG630
3	3	3	3
265/250	400/340	500/500	630/630
300/250	430/340	580/500	850/700
1000 (2)	1000	1000 (2)	1000
25 to 200	25 to 200	25 to 200	25 to 200
350	500	700	1000
Making current: 10 x I in AC-3			
Making and breaking current: 8 x I in AC-3			
2200	3600	4200	5050
1230	2400	3200	4400
950	1700	2400	3400
620	1200	1500	2200
480	1000	1200	1600
315	400	500	630
500	630	800	800
400	500	800	1000
0.3	0.26	0.18	0.12
21	42	45	48
37	65	88	120
2	2	2	2
32 x 4	30 x 5	40 x 5	60 x 5
240	2 x 150	2 x 240	–
240	–	–	–
Ø10	Ø10	Ø10	Ø12
35	35	35	58

Characteristics

a.c. control circuit characteristics with LX1/LX9 coil

Contactor type					LC1FG150	LC1FG185
Rated control circuit voltage (Uc)		50 or 60 Hz		V	48…440	
Control voltage limits (θ ≤ 55 °C)	40…400 Hz coils	Operation			0.85...1.1 Uc	
		Drop-out			0.20...0.55 Uc	
Average consumption at 20 °C and at Uc	∼ 50 Hz	Inrush	40…400 Hz coil	VA	690...855	950...1180
			Cos φ		0.9	0.9
		Sealed	40…400 Hz coil	VA	6.6...8.1	8.9...10.9
			Cos φ		0.9	0.9
Heat dissipation				W	5.9...7.2	8...9.8
Operating time [1]		Closing "C"		ms	35	35
		Opening "O"		ms	130	130
Mechanical durability at Uc		In millions of operating cycles			10	10
Maximum operating rate at ambient temperature ≤ 55 °C		In operating cycles per hour			2400	2400
Cabling Min/max c.s.a.	Flexible cable without cable end		1 or 2 conductors	mm^2	1/4	1/4
	Flexible cable with cable end		1 conductor	mm^2	1/4	1/4
			2 conductors	mm^2	1/2.5	1/2.5
	Solid cable without cable end		1 or 2 conductors	mm^2	1/4	1/4
Tightening torque				N.m	1.2	1.2

Characteristics of the locking electromagnet (shockproof device)

Contactor type		LC1FG150	LC1FG185
Control circuit voltage 40...400 Hz	V	48…440	48…440
Inrush consumption	VA	100	100
Maximum energisation time at Uc	ms	20	20
Maximum operating rate	In operating cycles per hour	2400	2400
Mechanical durability at Uc	In millions of operating cycles	1×10^6	1×10^6

(1) The closing time "C" is measured from the moment the coil supply is switched on to initial contact of the main poles.
The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separate.

Ref.
High power contactors

Characteristics

LC1FG265	**LC1FG400**	**LC1FG500**	**LC1FG630**
48…440	110…440	110…440	110…440
0.85…1.1 Uc	0.85…1.1 Uc	0.85…1.1 Uc	0.85…1.1 Uc
0.35…0.55 Uc	0.3…0.5 Uc	0.3…0.5 Uc	0.25…0.5 Uc
650	1075	1100	1650
0.9	0.9	0.9	0.9
10	15	18	22
0.9	0.9	0.9	0.9
8	14	18	20
40…65	40…75	40…75	40…80
100…170	100…170	100…170	100…200
10	10	10	10
2400	2400	2400	1200
1/4	1/4	1/4	1/4
1/4	1/4	1/4	1/4
1/2.5	1/2.5	1/2.5	1/2.5
1/4	1/4	1/4	1/4
1.2	1.2	1.2	1.2

LC1FG265	**LC1FG400**	**LC1FG500**	**LC1FG630**
48…440	110…440	110…440	110…440
100	100	100	100
20	20	20	20
2400	2400	2400	1200
1 x 10^6	1 x 10^6	1 x 10^6	1 x 10^6

Characteristics

Environment

Contact block type			LADN	LADT and LADS	LADR
Conforming to standards			IEC 60947-5-1, EN 60947-5-1		
Product certifications			UL, CSA		
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact IP2X		
Ambient air temperature around the device	Storage	°C	-60…+80		
	Operation	°C	-5…+60		
	Permissible for operation at Uc	°C	-40…+70		
Maximum operating altitude	Without derating	m	3000		
Cabling	Phillips n° 2 and Ø6 mm. Flexible or solid cable with or without cable end	mm^2	Min: 1 x 1; max: 2 x 2.5		

Ref.

High power contactors

References:
page B9/27

Dimensions and schemes:
page B9/87

Life Is On Schneider Electric

Characteristics

Instantaneous and time delay contact characteristics

Contact block type				LADN	LADT and LADS	LADR
Number of contacts				1 or 4	2	2
Rated operational voltage (Ue)	Up to		V	660		
Rated insulation voltage (Ui)	Conforming to IEC 60947-5-1		V	690		
	Conforming to UL, CSA		V	600		
Conventional thermal current (Ith)	For ambient temperature ≤ 60 °C		A	10		
Frequency of the operational current			Hz	25…400		
Minimum switching capacity	U min		V	17		
	I min		mA	5		
Short-circuit protection	Conforming to IEC 60947-5-1 and VDE 0660. gG fuse		A	10		
Rated making capacity	Conforming to IEC 60947-5-1, I rms		A	∼ 140; ⎓ 250		
Short-time rating	Permissible for	1 s	A	100		
		500 ms	A	120		
		100 ms	A	140		
Insulation resistance			MΩ	> 10		
Non-overlap time	Guaranteed between N/C and N/O contacts		ms	1.5 (on energisation and on de-energisation)		
Time delay (LADT, R and S contact blocks) Accuracy only valid for setting range indicated on the front face	Ambient air temperature for operation		°C	–	-40…+70	-40…+70
	Repeat accuracy			–	±2 %	±2 %
	Drift up to 0.5 million operating cycles			–	+15 %	+15 %
	Drift depending on ambient air temperature			–	0.25 % per °C	0.25 % per °C
Mechanical durability	In millions of operating cycles			30	5	5

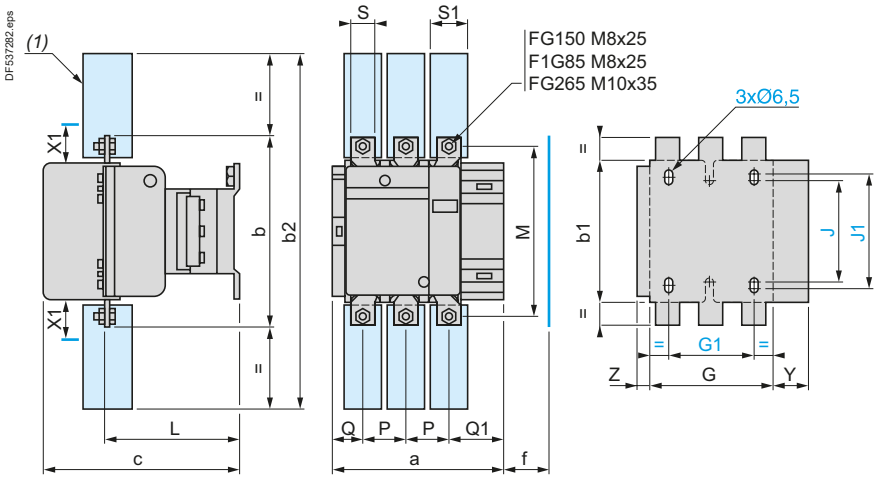
Rated operational power of contacts Conforming to IEC 60947-5-1			24	48	110/127	220/230	380/400	440	600
	1 million operating cycles	VA	150	300	400	480	500	500	500
	3 million operating cycles	VA	80	170	250	290	320	320	320
	10 million operating cycles	VA	30	65	90	120	130	130	130
	Occasional making capacity	VA	1200	2600	7000	13 000	15 000	13 000	9000

Ref.
High power contactors

References: page B9/27
Dimensions and schemes: page B9/87

Dimensions

LC1FG150, FG185 and FG265



X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

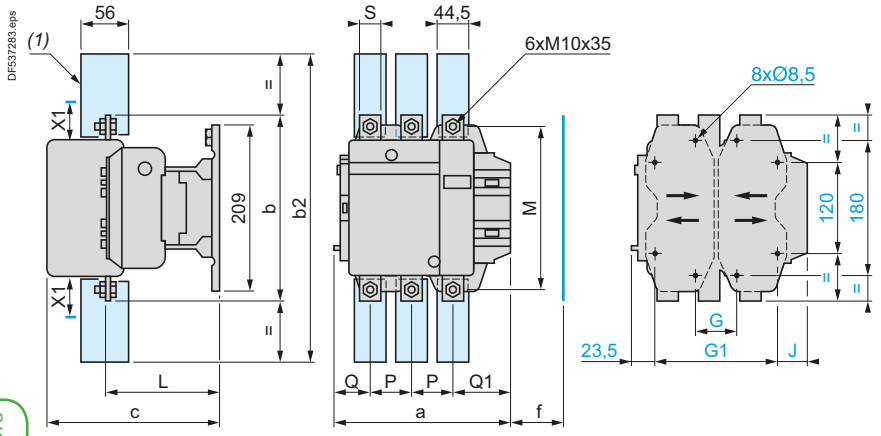
LC1	200…500 V	600…1000 V
FG150	10	15
FG185	10	15
FG265	10	15

(1) Power terminal protection shroud (see page B9/14).

LC1	a	b	b1	b2	c	f	G	G1	J	J1	L	M	P	Q	Q1	S	S1	Y	Z
FG150	181	170	137	301	180	131	106	80	106	120	116	150	40	26	57.5	20	34	44	13.5
FG185	183.5	174	137	305	190	130	111	80	106	120	122.5	154	40	29	59.5	20	34	44	13.5
FG265	217.5	203	145	375	222	147	142	96	106	120	150	178	48	39	66.5	25	44.5	38	21.5

f = minimum distance required for coil removal.

LC1FG400 and FG500



X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

LC1	200…500 V	600…1000 V
FG400	15	20
FG500	15	20

(1) Power terminal protection shroud (see page B9/14).

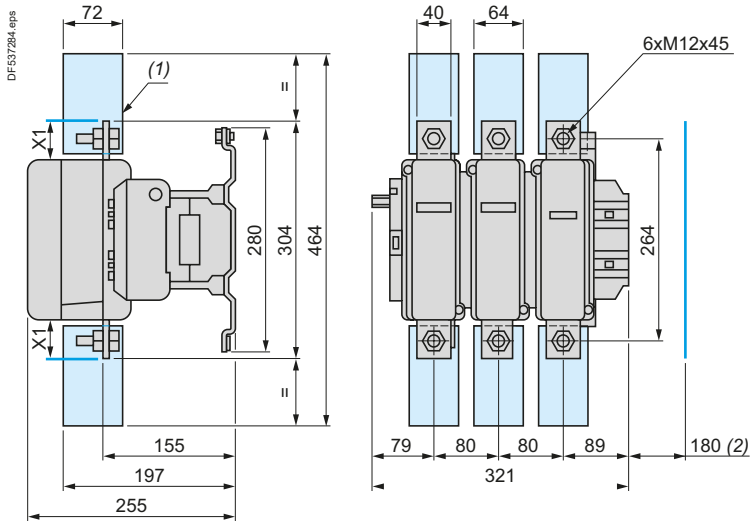
LC1	a	b	b2	c	f	G supplied	G min.	G max.	G1 supplied	G1 min.	G1 max.	J	L	M	P	Q	Q1	S
FG400	237	206	375	234	146	80	66	102	223	156	192	19.5	160	181	48	75	74	25
FG500	257	238	400	247	150	80	66	120	223	156	210	39.5	181	208	55	78	77	30

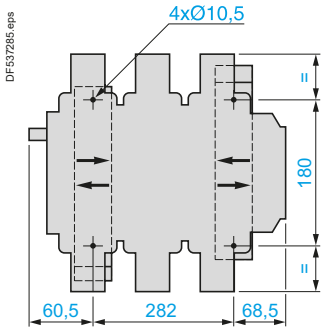
f = minimum distance required for coil removal.

Ref.
High power contactors

Dimensions

LC1FG630





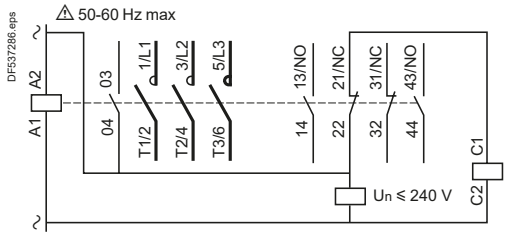
X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

LC1	200…500 V	690…1000 V
FG630	20	30

(1) Power terminal protection shroud (see page B9/14).
(2) Minimum distance required for coil removal.

Schemes

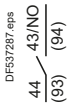
Contactors LC1-FG150 to FG630



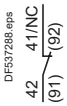
Add-on blocks

Instantaneous auxiliary contacts

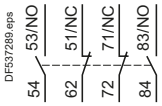
1 N/O LADN10



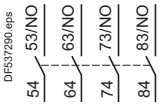
1 N/C LADN01



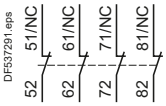
2 N/O + 2 N/C LADN22



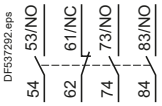
4 N/O LADN40



4 N/C LADN04

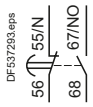


3 N/O + 1 N/C LADN31

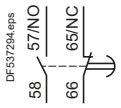


Time delay auxiliary contacts

On-delay 1 N/O + 1 N/C LADT●

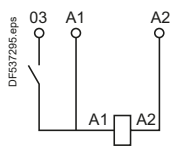


Off-delay 1 N/O + 1 N/C LADR●



Coils ∿

LX1FH, FJ, FK and FL



References:
pages B9/6, B9/28 and B9/29

Characteristics:
pages B9/70 to B9/85

PB108370.eps



CR1F500

Magnetic latching contactors

Magnetic latching contactors of both block and bar mounted types are fitted with a special electromagnet which enables them to remain in the “On” position when the coil is no longer energised.

Applications

The special properties of magnetic latching contactors make them suitable for a large number of applications.

Properties

- Retention of the sequence memory in automatic control equipment in the event of loss of control voltage.
- Energy saving, since the source of supply to the coil does not need to supply current when the contactor is latched in the closed state.
- Change of state from “Closed” to “Open” by current signal through the coil.
- Unaffected by mains interference.
- Utilisation of contactors beyond their breaking capacity, as operations are performed off-load.
- Contactors are silent in the latched position.

Applications

- Refineries, power stations, excitation circuits.
- Contactors remaining in the closed state for long periods.

Examples: refineries, power supplies, low voltage distribution.

- Selective opening control.
- No unwanted opening and closing of the main power poles.
- Current carrying at voltages up to 1000 Volts.

Operation of the electromagnet

CR1F block contactors

CR1F magnetic latching contactors are fitted with a double coil with 3 terminals comprising a latching winding and an unlatching winding. The 2 windings have a common point which can necessitate special wiring precautions when the latching supply is separate from the unlatching supply.

The power supplies may be a.c. or d.c. For d.c. operation, the polarities indicated must be complied with.

Operating precautions:

- the 2 windings must not be supplied simultaneously
- a winding must not be supplied continuously
- supply to the coils must be via pulsed contacts.

Manual opening:
if the control voltage is not present, the contactor can be unlatched manually.

Latching is obtained by direct supply of the coil in one direction of current flow.

Unlatching is obtained by a reverse current, adjusted by resistors.

Ref.

High power contactors

Characteristics - Squirrel cage motor

TeSys CR1F selection - Squirrel cage motor Direct On Line starter

Continuous or intermittent duty up to 30 operating cycles/hour

Motor (1) 220 V 230 V			380 V 400 V			415 V			440 V			3-pole contactor	3-pole differential thermal overload relay		3 fuses Type	
												(2)	Reference	Setting range	aM	BS-88
P		In	P		In	P		In	P		In	Reference			Rating	
kW	HP	A	kW	HP	A	kW	HP	A	kW	HP	A			A	A	A
25	35	85	–	–	–	–	–	–	–	–	–	CR1F150	LR9F5367	60…100	100	125
30	40	103	51	70	98	55	75	100	59	80	97	CR1F150	LR9F5369	90…150	100	160
33	45	113	55	75	105	–	–	–								
–	–	–	59	80	112	59	80	105	63	85	109	CR1F150	LR9F5369	90…150	125	160
–	–	–	63	85	117	63	85	115	–	–	–					
37	50	126	75	100	138	75	100	135	75	100	125	CR1F150	LR9F5369	90…150	160	200
40	54	134	–	–	–	–	–	–	80	110	131					
45	60	150	80	110	147	80	110	138	90	125	146	CR1F185	LR9F5369	90…150	160	200
51	70	170	90	125	170	90	125	165	100	136	162	CR1F185	LR9F5371	132…220	200	250
55	75	182	–	–	–	100	136	182	–	–	–					
59	80	195	100	138	188	110	150	200	110	150	178	CR1F265	LR9F5371	132…220	250	315
63	85	203	110	150	205	–	–	–	129	175	209					
75	100	240	129	175	242	129	175	230	132	180	215	CR1F265	LR9F7375	200…330	250	315
–	–	–	132	180	245	132	180	240	–	–	–					
–	–	–	–	–	–	140	190	250	140	190	227	CR1F265	LR9F7375	200…330	315	400
80	110	260	140	190	260	147	200	260	147	200	236	CR1F400	LR9F7375	200…330	315	400
–	–	–	147	200	273	150	205	270	150	205	246					
–	–	–	150	205	280	160	220	280	160	220	256					
90	125	295	160	220	300	–	–	–	180	245	289	CR1F400	LR9F7375	200…330	315	400
–	–	–	–	–	–				185	250	295					
100	136	325	180	245	333	180	245	320	200	270	321	CR1F400	LR9F7379	300…500	400	500
110	150	356	185	250	342	185	250	325	220	300	353					
–	–	–	200	270	370	200	270	340	250	340	401	CR1F400	LR9F7379	300…500	400	500
						220	300	385	–	–	–					
129	175	420	220	300	408	–	–	–	257	350	412	CR1F500	LR9F7379	300…500	500	630
132	180	425	250	340	460	250	340	425	280	380	450	CR1F500	LR9F7381	380…630	500	630
140	190	450	–	–	–	257	350	450	–	–	–					
147	200	472	–	–	–	–	–	–	295	400	473	CR1F500	LR9F7381	380…630	500	630
–	–	–	257	350	475	280	380	475	300	410	481	CR1F630	LR9F7381	380…630	500	630
			–	–	–	295	400	500	–	–	–					
150	205	483	280	380	510	300	410	510	315	430	505	CR1F630	LR9F7381	380…630	630	800
160	220	520	295	400	546	315	430	535	335	450	518					
180	245	578	300	410	565	335	450	550	355	480	549	CR1F630	LR9F7381	380…630	630	800
185	250	595	315	430	584	355	480	580	375	500	575					
200	270	626	335	450	620	375	500	610	400	454	611	CR1F630	LR9F7381	380…630	800	1000
220	★	700	355	★	635	400	★	650	425	★	650	CR1BL33		500…800	800	1000
			375	★	670	425	★	690	445	★	680					
			400	★	710	445	★	730	450	★	690					
			–		–	450	★	740	475	★	730					
250	★	800	425	★	760	475	★	780	500	★	780	CR1BM33		500…800	800	1000
257	★	826	445	★	790	500	★	820	530	★	825	CR1BM33		630…1000	1000	1250
280	★	900	450	★	800	530	★	870	560	★	870					
295	★	948	475	★	850	560	★	920	600	★	920					
300	★	980	500	★	900	600	★	978	630	★	965					
315	★	990	530	★	950											

(1) The ratings are for standard 220/230 V, 380/400 V, 415 or 440 V motors. The overload relays should preferably be set to the motor full-load current shown on the motor rating plate. For other power ratings, select the overload relay with the appropriate range; the associated contactor and fuses must have ratings equal to or immediately greater than In.

(2) Reference to be completed, see page B9/79.

★ There are no standard power ratings for these motors.

References:
pages B9/7, B9/28 to B9/33

Dimensions:
pages B9/98 to B9/101

Characteristics - AC

Rated operational current in AC-3 (θ ≤ 55 °C)											
Contactor size		**CR1F 150**	**CR1 F185**	**CR1F 265**	**CR1F 400**	**CR1 F500**	**CR1F 630**	**CR1 BL**	**CR1 BM**	**CR1 BP**	**CR1 BR**
440 V	**A**	150	185	265	400	500	630	750	1000	1500	1800
500 V	**A**	135	175	245	385	500	540	750	900	1200	1500
660/690 V	**A**	130	140	230	365	435	470	700	800	900	1100
1000 V	**A**	47	73	95	135	270	330	400	400	500	600
Rated operational power (standard motor power ratings)											
220…240 V	**kW**	40	55	75	110	147	200	220	280	425	500
	HP	*54*	*75*	*100*	*150*	*200*	*270*	*300*	*380*	*580*	*680*
380…400 V	**kW**	75	90	132	200	250	335	400	500	750	900
	HP	*100*	*185*	*180*	*270*	*340*	*450*	*545*	*680*	*1000*	*1220*
415 V	**kW**	80	100	140	220	280	375	425	530	800	900
	HP	*110*	*136*	*180*	*300*	*380*	*500*	*580*	*720*	*1100*	*1220*
440 V	**kW**	80	100	140	250	295	400	450	560	800	900
	HP	*110*	*136*	*190*	*340*	*400*	*545*	*610*	*760*	*1100*	*1220*
500 V	**kW**	90	110	160	257	355	400	500	600	750	900
	HP	*125*	*150*	*220*	*350*	*480*	*545*	*680*	*810*	*1000*	*1220*
660/690 V	**kW**	100	110	160	280	335	450	560	670	750	900
	HP	–	–	–	–	–	*610*	*760*	*910*	*1000*	*1220*
1000 V	**kW**	65	100	147	185	335	450	530	530	670	750
	HP	–	*136*	*200*	*250*	–	*610*	*720*	*720*	*910*	*1000*

Maximum operating rate in operating cycles/hour, at rated operational power with an on-load factor = 85 %: 750 for CR1F150 to F265, 500 for CR1F400 to F630 and 120 for CR1 B.

Ref.

High power contactors

References:
pages B9/7, B9/28 to B9/33

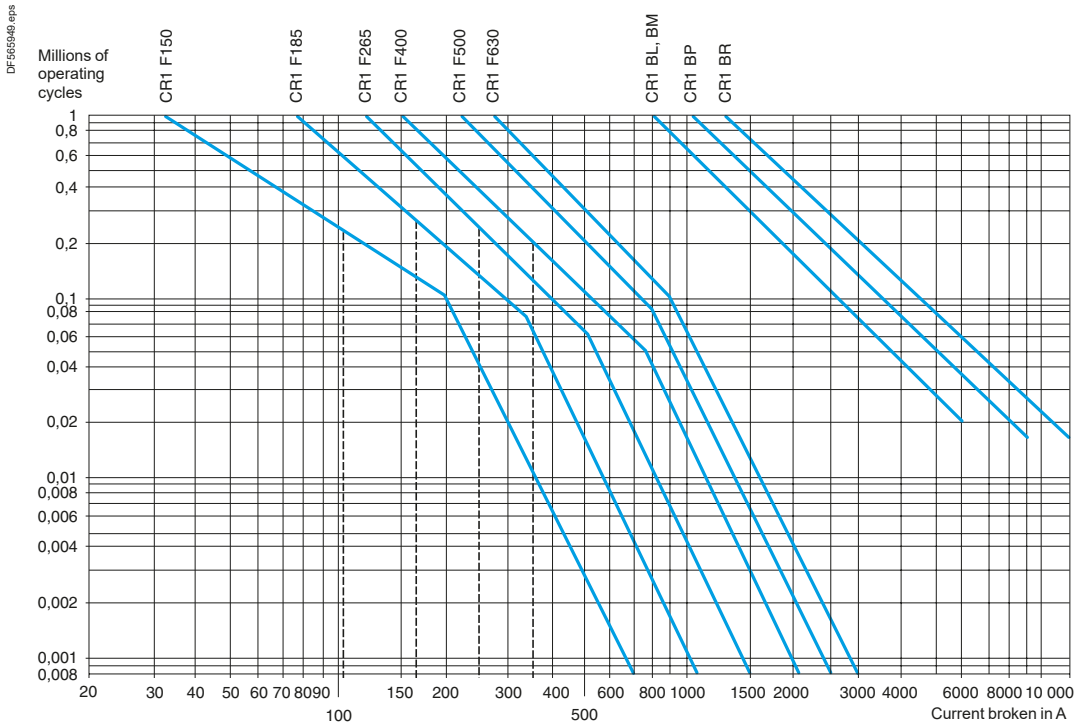
Dimensions:
pages B9/98 to B9/101

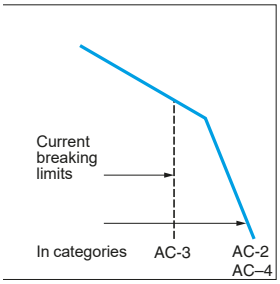
Life Is On Schneider Electric

Characteristics - Durability (AC)

Use in category AC-3 (Ue ≤ 440 V) (1) (θ ≤ 55 °C)

The current (Ic) in AC-3 is equal to the rated operational current (Ie) drawn by the motor.





Example:
Asynchronous motor with P = 50 kW, Ue = 380 V, Ie = 100 A, Ic = Ie = 100 A, or asynchronous motor with P = 55 kW, Ue = 415 V, Ie = 100 A, Ic = Ie = 100 A.
600000 operating cycles required.
The above selection curves show the contactor rating needed, CR1F185.

(1) For 660 V, multiply the number of operating cycles by 0.8.

Ref.
High power contactors

References:
pages B9/7, B9/28 to B9/33
Dimensions:
pages B9/98 to B9/101

Characteristics - Durability (AC)

Maximum operational current (on-load factor ≥ 0.95)

Maximum operating rate: 120 operating cycles/hour

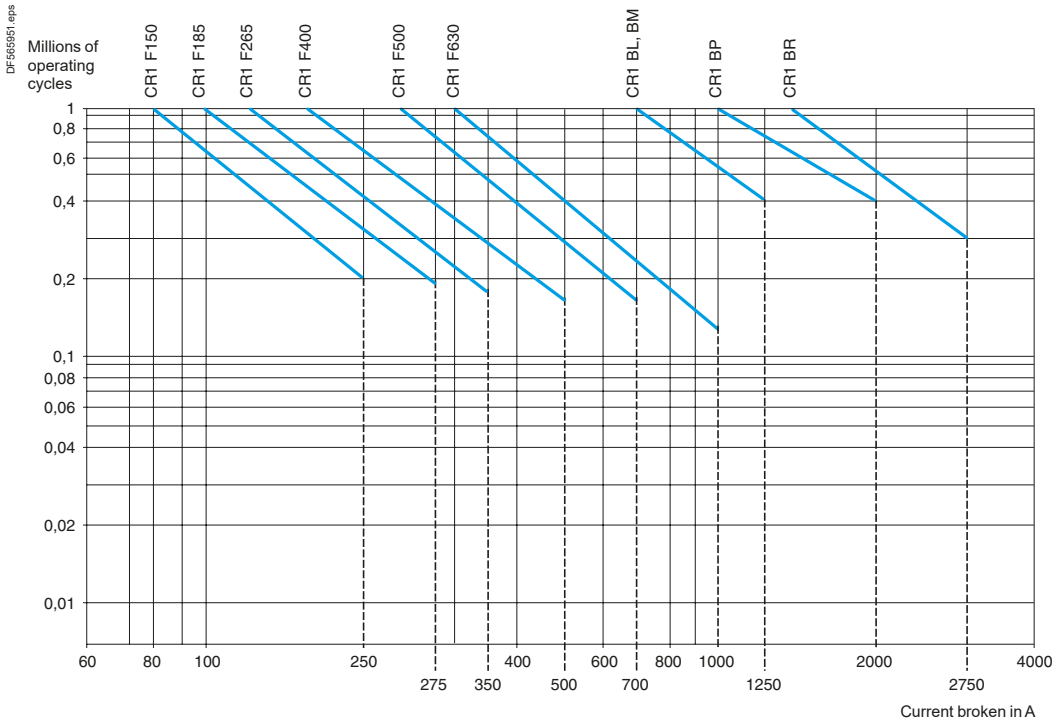
Contactor size			CR1 F150	CR1 F185	CR1 F265	CR1 F400	CR1 F500	CR1 F630	CR1 BL	CR1 BM	CR1 BP	CR1 BR
Cable c.s.a.		mm²	120	150	185	–	–	–	–	–	–	–
Number of bars			–	–	–	2	2	2	2	2	3	4
Bar c.s.a.		mm	–	–	–	30 x 5	40 x 5	60 x 5	50 x 5	80 x 5	100 x 5	100 x 5
Operational current in category AC-1 at ambient temperature	≤ 40 °C	A	250	275	350	500	700	1000	800	1250	2000	2750
	≤ 55 °C	A	250	275	300	430	580	850	700	1100	1750	2400
	≤ 70 °C	A	170	180	250	340	500	700	600	900	1500	2000

Increase in operational current by parallel connection of poles

Apply the following coefficients to the above currents; these coefficients take into account an often unbalanced distribution of current between the poles:

- 2 poles in parallel: K = 1.6
- 3 poles in parallel: K = 2.25
- 4 poles in parallel: K = 2.8.

Electrical durability (Ue ≤ 440 V) (1)



Example:
Ue = 220 V - Ie = 200 A - θ = 40 °C - Ic = Ie = 200 A
600000 operating cycles required.
The above selection curves show the contactor rating needed, CR1F400.

(1) For 660 V, multiply the number of operating cycles by 0.8.

References:
pages B9/7, B9/28 to B9/33
Dimensions:
pages B9/98 to B9/101

3-phase transformer primaries switching

Operating conditions

Maximum ambient temperature: 55 °C.
Maximum operational voltage: 1000 V, 50…60 Hz.

When a transformer is switched on, there is generally an initial current surge which reaches its peak value almost instantaneously and then decreases in a largely exponential manner to quickly reach its steady state value.

The value of this current depends on:
- the characteristics of the magnetic circuit and of the windings (cross sectional area of the core, rated inductance, number of turns, size of the windings, ...)
- the performance of the magnetic laminations used (residual induction and saturation inductance),
- the magnetic state of the circuit and the instantaneous value of the a.c. mains voltage at the moment of switch-on.

The peak current at the moment of switch-on can reach 20 to 40 times the rated current for the various kVA power ratings in the tables below. This value is independent of the “no-load” or “on-load” state of the transformer.

The peak magnetising current of the transformer must be lower than the values given in the tables below.

Contactor selection

Maximum operating rate: 120 operating cycles/hour

Contactor size			CR1 F150	CR1 F185	CR1 F265	CR1 F400	CR1 F500	CR1 F630	CR1 BL	CR1 BM	CR1 BP	CR1 BR
Maximum permissible current peak at switch-on		**A**	1700	2800	3500	5500	6800	9000	18 000	18 000	24 000	30 000
Maximum operational power (1)	220…230 V	**kVA**	25	40	50	75	100	140	230	230	300	380
	380…400 V	**kVA**	50	75	90	130	170	225	400	400	530	660
	415…440 V	**kVA**	55	80	100	140	190	250	450	450	560	700
	500 V	**kVA**	65	95	110	170	225	280	480	480	600	750
	660 V	**kVA**	80	120	140	200	270	315	600	600	800	950
	1000 V	**kVA**	100	150	200	250	375	470	700	700	1000	1200

(1) Maximum operational power corresponding to a current peak at switch-on of 30 In.

References:
pages B9/7, B9/28 to B9/33
Dimensions:
pages B9/98 to B9/101

Characteristics

Environment

Contactor type			CR1F150	CR1F185	CR1F265
Rated insulation voltage (Ui)	Conforming to IEC 60158-1, BS 775, 60947-4	**V**	1000	1000	1000
Ambient air temperature around the device	Storage	**°C**	-60…+80		
	For operation at Uc	**°C**	-15…+70		
Maximum operating altitude	Without derating	**m**	3000		
Operating positions	Without derating		±5 ° in relation to normal vertical mounting plane		

Pole characteristics

Number of poles				3 or 4	3 or 4	3 or 4
Rated operational current (Ie) (Ue ≤ 440 V)	In AC-3, θ ≤ 40 °C		**A**	150	185	265
	In AC-1, θ ≤ 40 °C		**A**	250	275	350
	In AC-4, θ ≤ 40 °C		**A**	138	170	245
Rated operational voltage (Ue)	Up to		**V**	1000	1000	1000
Frequency limits (sine wave)	Of the opeational current		**Hz**	25…200	25…200	25…200
Rated making capacity	I rms		**A**	1700	2100	2940
Rated breaking capacity	I rms	220…440 V	**A**	1500	1800	2450
		500 V	**A**	1200	1600	2200
		660/690 V	**A**	1100	1200	1700
		1000 V	**A**	450	600	800
Permissible short time rating from cold state, with no current flowing for previous 60 minutes at θ ≤ 40 °C	For 1 s		**A**	1200	1500	2200
	For 5 s		**A**	1200	1500	2200
	For 10 s		**A**	1200	1500	2200
	For 30 s		**A**	700	920	1230
	For 1 min		**A**	600	740	950
	For 3 min		**A**	450	500	620
	For 10 min		**A**	350	400	480
Short-circuit protection by fuses θ ≤ 440 V	Motor circuit AC-3 (type aM)		**A**	160	200	315
	AC-1 circuit (type gG, BS 88)		**A**	250	315	400
Average impedance per pole	At Ith and 50 Hz		**mΩ**	0.45	0.36	0.32
Power dissipated per pole for the above operational currents	AC-3		**W**	6	12	22
	AC-1		**W**	18	26	39
Connection	Number of conductors			1	1	1
	Cable with lugs		**mm²**	120	150	240
	Cable with connector		**mm²**	120	150	240
	Number of bars			2	2	2
	Bar c.s.a.		**mm**	25 x 3	25 x 3	32 x 4
	Bolt diameter			Ø8	Ø8	Ø10
	Tightening torque		**N.m**	18	18	35

References:
pages B9/7, B9/28 to B9/33
Dimensions:
pages B9/98 to B9/101

Characteristics

CR1F400	**CR1F500**	**CR1F630**	**CR1BL**	**CR1BM**	**CR1BP**	**CR1BR**
1000	1000	1000	1000	1000	1000	1000
-60…+80			-60…+80			
-15…+70			-15…+60			
3000			3000			
±5 ° in relation to normal vertical mounting plane			±5 ° in relation to normal vertical mounting plane			
3 or 4	3 or 4	3 or 4	1, 2, 3 or 4	1, 2, 3 or 4	1, 2, 3 or 4	1, 2, 3 or 4
400	500	630	750	1000	1500	1800
500	700	1000	800	1250	2000	2750
370	460	560	700	800	1250	1500
1000	1000	1000	1000	1000	1000	1000
25…200	25…200	25…200	50…60	50…60	50…60	50…60
4500	5000	6740	10 000	10 000	15 000	18 000
4000	5000	6300	10 000	10 000	15 000	18 000
3500	4500	5400	9000	9000	12 000	15 000
3000	3560	4600	8000	8000	9000	11 000
1200	2500	3200	4000	4000	5000	6000
3600	4200	5050	9600	9600	12 000	15 000
3600	4200	5050	9600	9600	12 000	15 000
3600	4200	5050	7000	8000	9600	12 000
2400	3200	4400	4800	5200	6400	8000
1700	2400	3400	3500	3800	5200	6300
1200	1500	2200	2100	2400	3600	4400
1000	1200	1600	1200	1800	2800	3600
400	500	630	800	1200	800 x 2 (1)	1000 x 2 (1)
500	800	1000	800	1200	1000 x 2 (1)	1200 x 2 (1)
0.28	0.18	0.12	0.18	0.18	0.13	0.09
45	45	48	88	180	290	360
70	88	120	115	280	520	680
2	2	–	–	–	–	–
150	240	–	–	–	–	–
–	–	–	–	–	–	–
2	2	2	2	2	3	4
30 x 5	40 x 5	60 x 5	50 x 5	80 x 5	100 x 5	100 x 10
Ø10	Ø10	Ø12	4 x Ø8	4 x Ø10	4 x Ø10	4 x Ø10
35	35	58	21	35	35	35

(1) Paralleling of poles must be carried out only in accordance with the fuse manufacturer's recommendations.

Characteristics

a.c. and d.c. control circuit characteristics

Contactor type					CR1F150	CR1F185	CR1F265
Rated control circuit voltage (Uc)	∿ 50 or 60 Hz			V	48…415		
	∿ 400 Hz			V	48…220		
	⎓			V	48…220		
	⎓ low consumption			V	48…220		
Control voltage limits ∿ and ⎓	Latching				0.85…1.1 Uc		
	Unlatching				0.85…1.1 Uc		
Maximum operating rate at ambient temperature ≤ 40 °C	In operating cycles per hour				120		
Mechanical durability	In millions of operating cycles				1		
Average consumption	Latching	1-pole		VA	–	–	–
50/60 Hz		2-pole		VA	–	–	–
		3-pole		VA	1100	1600	1650
		4-pole		VA	100	1600	1650
	Unlatching	1-pole		VA	–	–	–
		2-pole		VA	–	–	–
		3-pole		VA	7.3	8	9
		4-pole		VA	7.3	8	9
400 Hz and ⎓	Latching	1-pole		VA	–	–	–
		2-pole		VA	–	–	–
		3-pole		VA	1260	1750	1800
		4-pole		VA	1260	1750	1800
	Unlatching	1-pole		VA	–	–	–
		2-pole		VA	–	–	–
		3-pole		VA	10	11	12
		4-pole		VA	10	11	12
⎓ low consumption	Latching	3/4-pole		W	500	500	500
	Unlatching	3/4-pole		W	15	20	40
Average operating time at Uc (1)	Latching			ms	35…40	35…40	45…50
	Unlatching			ms	50…100	50…100	50…100

(1) The closing time is measured from the moment the closing coil is energised to initial contact of the main poles. The opening time is measured from the moment the opening coil is energised to the moment the main poles separate.

Note: *the arcing time depends on the circuit switched by the main poles. For 3-phase applications the arcing time is usually less than 10 ms. The load is isolated from the supply after a time equal to the sum of the opening time and the arcing time.*

Auxiliary contact characteristics

Type of contacts			LADN for contactors CR1F
Conventional thermal current		A	10
Rated insulation voltage (Ui)	Conforming to IEC 60947-5-1	V	690
Connection	Flexible or solid conductor with or without cable end	mm²	1 x 1 min; 2 x 2.5 max

Operational power of contacts LADN for contactors CR1F

a.c. supply

Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current (cos φ 0.7) = 10 times the power broken (cos φ 0.4).

	V	48	115	230	400	600
1 million operating cycles	VA	120	280	560	960	1440
Occasional making capacity	VA	2600	7000	13 000	15 000	9000

d.c. supply

Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.

	V	48	125	250	440
1 million operating cycles	W	90	75	68	61
Occasional making capacity	W	700	400	260	220

Ref.
High power contactors

References:
pages B9/7, B9/28 to B9/33
Dimensions:
pages B9/98 to B9/101

Characteristics

CR1F400	CR1F500	CR1F630	CR1BL	CR1BM	CR1BP	CR1BR
48…415			110…500			
48…220			110…500			
48…220			110…500			
48…220			–			
0.85…1.1 Uc			0.85…1.1 Uc			
0.85…1.1 Uc			0.85…1.1 Uc			
120			120			
1			1			
–	–	–	650	650	650	650
–	–	–	1100	1100	1100	1100
1450	1650	2100	1650	1650	1650	1650
1450	1650	2100	1850	1850	1850	1850
–	–	–	110	110	110	110
–	–	–	125	125	125	125
12	9.5	8	165	165	165	165
12	9.5	8	175	175	175	175
–	–	–	600	600	600	600
–	–	–	1000	1000	1000	1000
1600	1800	2300	1500	1500	1500	1500
1600	1800	2300	1700	1700	1700	1700
–	–	–	100	100	100	100
–	–	–	115	115	115	115
16	13	11	150	150	150	150
16	13	11	160	160	160	160
500	550	620	–	–	–	–
70	60	45	–	–	–	–
40…75	40…80	40…80	100…150	100…150	100…150	100…150
50…100	50…100	50…100	20…40	20…40	20…40	20…40

(1) The closing time is measured from the moment the closing coil is energised to initial contact of the main poles. The opening time is measured from the moment the opening coil is energised to the moment the main poles separate.

Note: *the arcing time depends on the circuit switched by the main poles. For 3-phase applications the arcing time is usually less than 10 ms. The load is isolated from the supply after a time equal to the sum of the opening time and the arcing time.*

LADN for contactors CR1F	ZC4GM for contactors CR1B
10	20
690	660
1 x 1 min; 2 x 2.5 max	2 min; 4 max

Operational power of contacts ZC4GM for contactors CR1 B

a.c. supply

Electrical durability (valid for up to 2400 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current (cos φ 0.7) = 10 times the power broken (cos φ 0.4).

	V	110 127	220	380	415 440	500
1 million operating cycles	VA	2000	4000	4000	4000	3500
Occasional making capacity	VA	14000	23000	35000	45000	35000

d.c. supply

Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.

V	110	120	440	500
W	250	250	230	200
W	1600	800	400	360

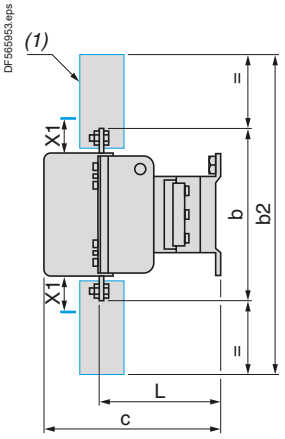
Ref.
High power contactors

References:
pages B9/7, B9/28 to B9/33
Dimensions:
pages B9/98 to B9/101

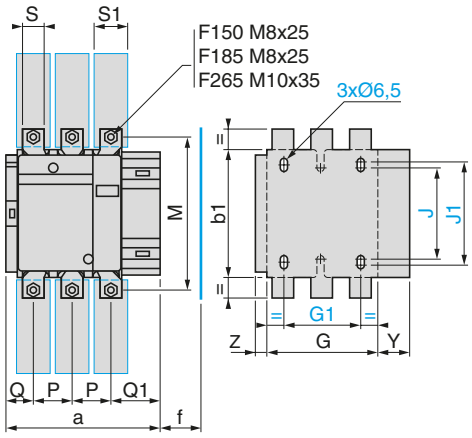
Dimensions

CR1F150 to F500

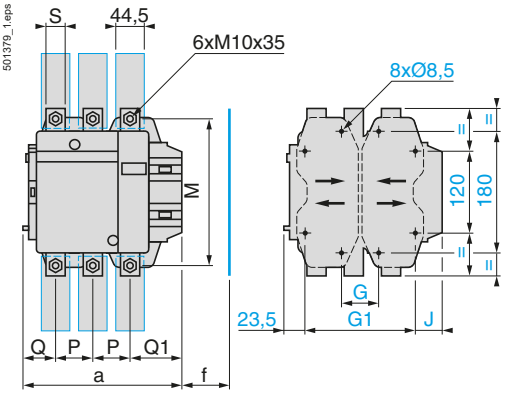
Common side view



CR1F150, F185, F265



CR1F400, F500



CR1	F150		F185		F265	
	3P	4P	3P	4P	3P	4P
a	163.5	201.5	168.5	208.5	201.5	244.5
b	170	170	174	174	203	203
b1	137	137	137	137	145	145
b2	301	301	305	305	370	370
c	171	171	181	181	213	213
f	131	131	130	130	147	147
G	106	143	111	151	142	190
G1	80	80	80	80	96	96
J	106	106	106	106	106	106
J1	120	120	120	120	120	120
L	107	107	113.5	113.5	141	141
M	150	150	154	154	178	178
P	40	40	40	40	48	48
Q	26	26	29	29	39	34
Q1	57.5	55.5	59.5	59.5	66.5	66.5
S	20	20	20	20	25	25
S1	27	27	34	34	38	38
Y	44	44	38.5	30.5	30.5	21.5
Z	13.5	13.5	13.5	13.5	15.5	15.5

f = minimum distance required for coil removal.

X1: Minimum electrical clearance according to operational voltage and breaking capacity.

Voltage in V	200…500	660…1000
CR1F150	10	15
CR1F185	10	15
CR1F265	10	15

CR1	F400		F500	
	3P	4P	3P	4P
a	213	261	233	288
G min.	66	66	66	66
b	206	206	238	238
b2	375	375	400	400
c	219	219	232	232
f	146	146	150	150
G supplied	80	80	80	140
G max.	102	150	120	175
G1 supplied	170	170	170	230
G1 min.	156	156	156	156
G1 max.	192	240	210	265
J	12	60	32	27
L	145	145	146	146
M	181	181	208	208
P	48	48	55	55
Q	43	43	47	47
Q1	74	74	77	77
S	25	25	30	30

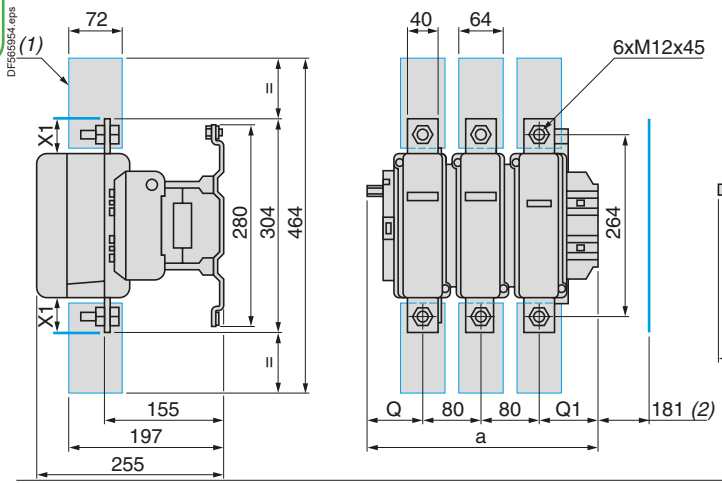
f = minimum distance required for coil removal.

X1: Minimum electrical clearance according to operational voltage and breaking capacity.

Voltage in V	200…500	660…1000
CR1F400	15	20
CR1F500	15	20

(1) Power terminal protection shroud (see page B9/14).

CR1F630



CR1F630	3P	4P
a	309	389
G supplied	180	240
G min.	100	150
G max.	195	275
J1	61	81
Q	60	60
Q1	89	89

X1: Min. electrical clearance according to operational voltage and breaking capacity.

Voltage in V	X1
200…500	20
690…1000	30

(1) Power terminal protection shroud.
(2) Minimum distance required for coil removal.

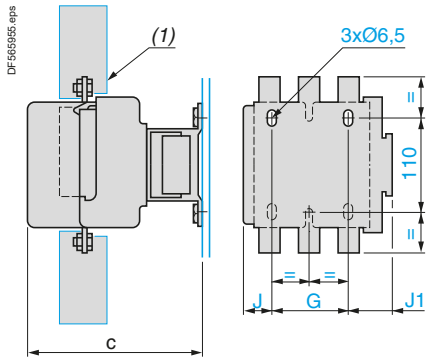
References:
pages B9/7, B9/28 to B9/33

Characteristics:
pages B9/88 to B9/97

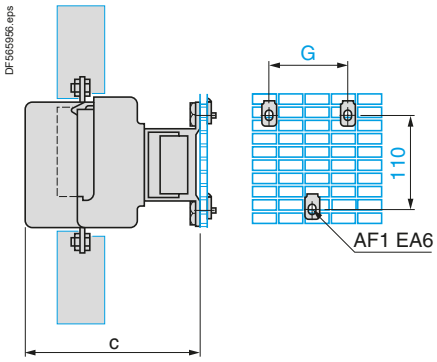
Mounting

CR1F150…F265

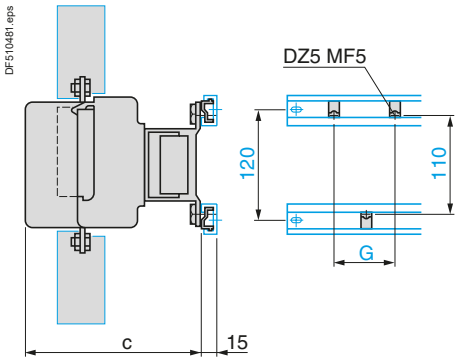
Panel mounted



On pre-slotted mounting plate AM1PA, PB, PC



On rails DZ5MB on 120 mm centres



CR1		F150	F185	F265
c	3P	171	181	213
	4P	171	181	213
G	3P	80	80	96
	4P	80	80	96
J	3P	26.5	29	44.5
	4P	45	49	68.5
J1	3P	57	59.5	61.5
	4P	75.5	79.5	85.5

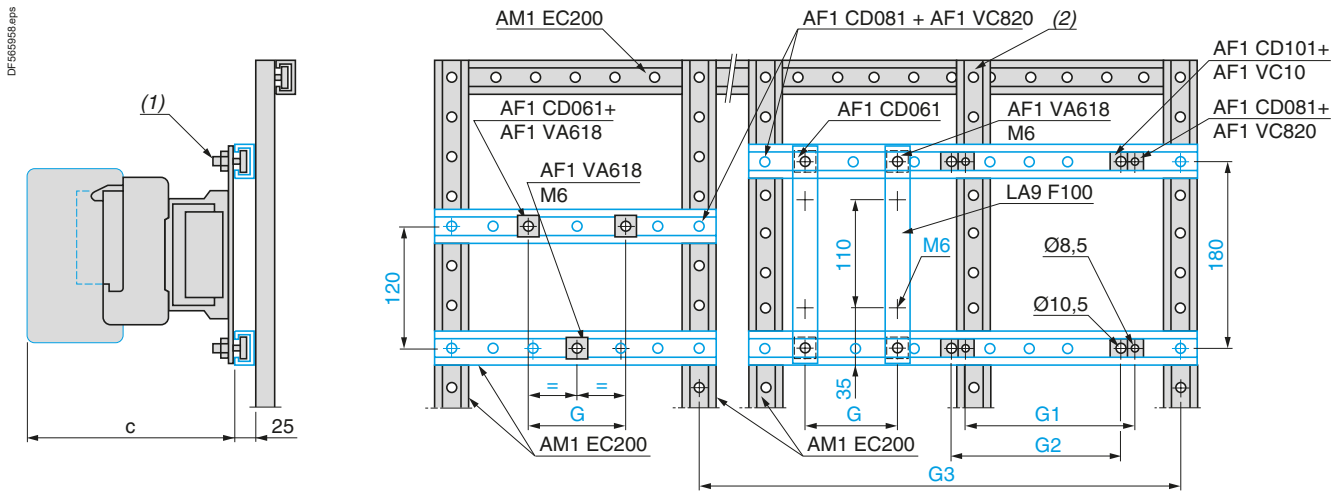
CR1		F150	F185	F265
c	3P	171	181	213
	4P	171	181	213
G	3P	80	80	96
	4P	80	80	96

CR1		F150	F185	F265
c	3P	171	181	213
	4P	171	181	213
G	3P	80	80	96
	4P	80	80	96

(1) Power terminal protection shroud (see page B9/14).

CR1F150…F650

On 2 notched uprights AM1EC●●●



CR1		F150	F185	F265	F400	F500	F630
c	3P	171	181	213	213	226	250
	4P	171	181	213	213	226	250
G (M6)	3P	80	80	96	–	–	–
	4P	80	80	96	–	–	–
G1 (Ø8,5)	3P	–	–	–	80	80	–
	4P	–	–	–	80	140	–
G2 (Ø10,5)	3P	–	–	–	–	–	180
	4P	–	–	–	–	–	240

(1) AF1CD●●● or AF1VA●●●.
(2) This AM1EC200 upright is required when G2 or G3 is greater than 700 mm (please consult your Regional Sales Office).

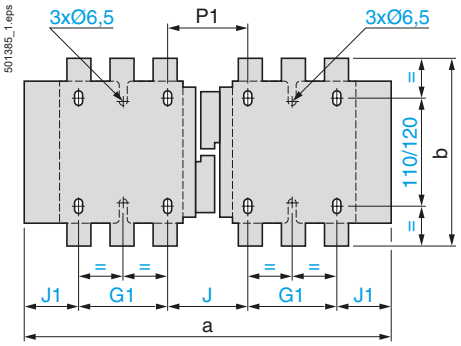
References:
pages B9/7, B9/28 to B9/33

Characteristics:
pages B9/88 to B9/97

Mounting

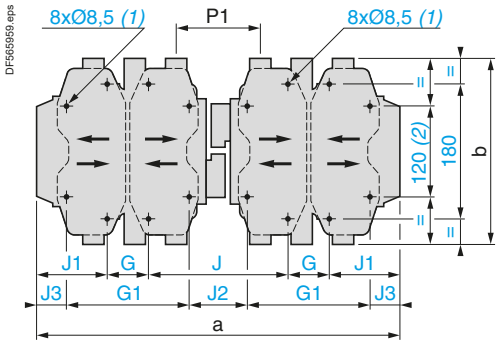
Reversing contactors 2 x CR1F150…F265

Horizontally mounted



2 x **CR1**		**F150**	**F185**	**F265**
a	3P	345	357	425
	4P	422	437	521
b	3P	170	174	203
	4P	170	174	203
G1	3P	80	80	96
	4P	80	80	96
J	3P	71	78	109
	4P	111	118	157
J1	3P	57	59.5	61.5
	4P	75.5	79.5	85.5
P1	3P	71	78	100
	4P	71	78	100

Reversing contactors 2 x CR1F400…F630



2 x **CR1**		**F400**	**F500**	**F630**
a	3P	446	485	636
	4P	542	595	796
b	3P	206	238	304
	4P	206	238	304
G	3P	80	80	180
	4P	80	140	240
G1	3P	170	170	–
	4P	170	230	–
J	3P	157	156	139
	4P	157	156	139
J1	3P	64.5	84.5	68.5
	4P	112.5	79.5	68.5
J2	3P	67	66	–
	4P	67	66	–
J3	3P	19.5	39.5	–
	4P	67.5	34.5	–
P1	3P	107	112	137
	4P	107	112	137

(1) Except F630: 4 x Ø 10.5.
(2) Except F630: 180.

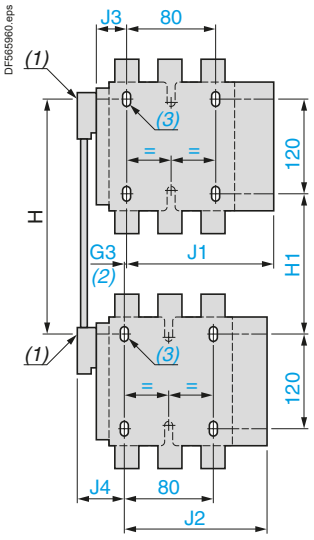
Ref.
High power contactors

Mounting

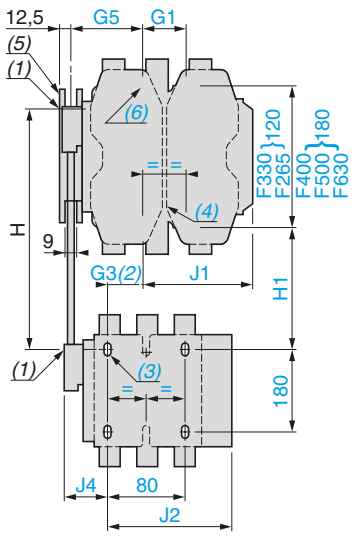
Reversing contactors

Vertically mounted with mechanical interlock **LA9F●●●**.
2 contactors **CR1F** of identical or different ratings (CR1F150…F630), see pages B9/81 and B9/81.

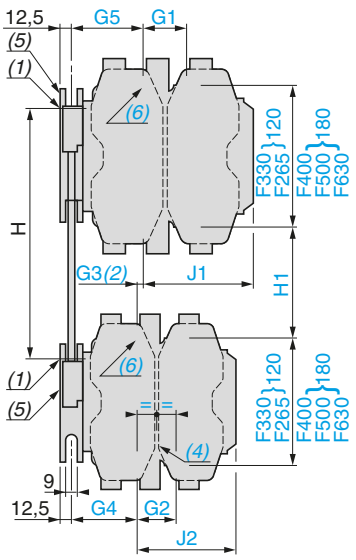
Assembly A



Assembly B



Assembly C



(1) Mechanical interlock shaft.
(2) For assembly of contactors of different ratings only.
(3) 3 x Ø6.5 mm for CR1F150…F265.
(4) 3 x Ø6.5 mm for CR1F265.
(5) Mechanical interlock guide bracket.
(6) 4 x Ø8.5 mm for CR1F400, F500 or 4 x Ø10.5 mm.

Assembly type LA9F		A			B								C								
		F4F	G4F	G4G	H4F	J4F	K4F	L4F	H4G	J4G	K4G	L4G	H4H	J4H	K4H	L4H	J4J	K4J	L4J	K4K	L4K	L4L
G1	3P	–	–	–	96	80	80	180	96	80	80	180	96	80	80	180	80	80	180	80	180	180
	4P	–	–	–	96	80	140	240	96	80	140	240	96	80	140	240	80	140	240	140	240	240
G2	3P	–	–	–	–	–	–	–	–	–	–	–	96	96	96	96	80	80	80	80	80	180
	4P	–	–	–	–	–	–	–	–	–	–	–	96	96	96	96	80	80	80	140	140	240
G3	3P	0	3	0	21	45	45	35	19	42	42	33	0	23	23	14	0	0	9 (7)	0	9 (7)	0
	4P	0	4	0	27	26	26	17	23	22	22	13	0	0	0	9 (7)	0	0	9 (7)	0	9 (7)	0
G4	3P	–	–	–	–	–	–	–	–	–	–	–	60	60	60	60	83	83	83	83	83	74
	4P	–	–	–	–	–	–	–	–	–	–	–	83	83	83	83	83	83	83	83	83	74
G5	3P	–	–	–	60	83	83	74	60	83	83	74	60	83	83	74	83	83	74	83	74	74
	4P	–	–	–	83	83	83	74	83	83	83	74	83	83	83	74	83	83	74	83	74	74
H	min.	200	210	220	240	250	270	310	250	250	270	310	250	260	280	330	260	280	325	300	345	380
	max.	310	300	310	380	380	380	380	380	380	380	380	380	380	380	380	380	380	380	380	380	380
H1	min.	80	90	100	110	80	100	140	120	90	110	150	130	110	130	170	60	100	140	120	160	200
	max.	190	180	190	250	210	210	210	250	220	220	220	260	230	230	220	200	200	195	200	195	200
J1	3P	133	134	134	149.5	137	157	241	149.5	137	157	241	149.5	137	157	24	137	157	241	157	244	241
	4P	145	146	146	164.5	185	212	321	164.5	185	212	321	164.5	185	212	321	185	212	321	212	321	321
J2	3P	133	133	134	183	133	183	133	134	134	134	134	142.5	149.5	149.5	149.5	137	137	137	157	157	241
	4P	145	145	146	145	145	145	145	146	146	146	146	164.5	164.5	164.5	164.5	185	185	185	212	212	312
J3	3P	48.5	53	53	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	4P	67	73	73	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
J4	3P	48.5	54	53	48.5	48.5	48.5	48.5	53	53	53	53	–	–	–	–	–	–	–	–	–	–
	4P	67	69	73	67	67	67	67	73	73	73	73	–	–	–	–	–	–	–	–	–	–

(7) In this case, G4 is greater than G5.

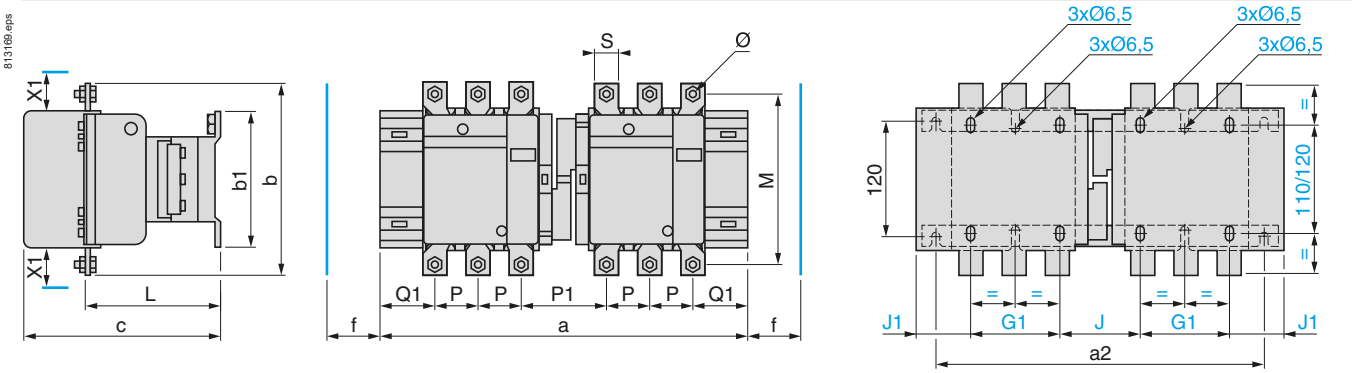
References:
pages B9/7, B9/28 to B9/33

Characteristics:
pages B9/88 to B9/97

Dimensions

Pre-assembled

LC2F115 to F265 (reverser supplied on 2 bars which can be used for fixing the device)



f - Minimum distance required for coil removal.

Bar fixing centres
Vertical: 120 mm
Horizontal: a2 see table

X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

LC1	200…500 V	660…1000 V
F115, F150	10	15
F185	10	15
F225, F265	10	15

LC2		a	a2	b	b1	c	G1	J	J1	L	M	P	P1	Q1	S	f	Ø
F115	3P	345	317	162	137	171	80	71	57	107	147	37	77	60	20	131	M6
	4P	419	378	162	137	171	80	108	75.5	107	147	37	77	60	20	131	M6
F150	3P	345	317	170	137	171	80	71	57	107	150	40	71	57	20	131	M8
	4P	422	381	170	137	171	80	111	75.5	107	150	40	71	55.5	20	131	M8
F185	3P	357	326	174	137	181	80	78	59.5	113.5	154	40	78	59.5	20	130	M8
	4P	437	390	174	137	181	80	118	79.5	113.5	154	40	78	59.5	20	130	M8
F225	3P	357	326	197	137	181	80	78	59.5	113.5	172	48	62	51.5	25	130	M10
	4P	437	390	197	137	181	80	118	79.5	113.5	172	48	54	47.5	25	130	M10
F265	3P	425	386	203	145	213	96	109	61.5	141	178	48	100	66.5	25	147	M10
	4P	521	464	203	145	213	96	157	85.5	141	178	48	100	66.5	25	147	M10

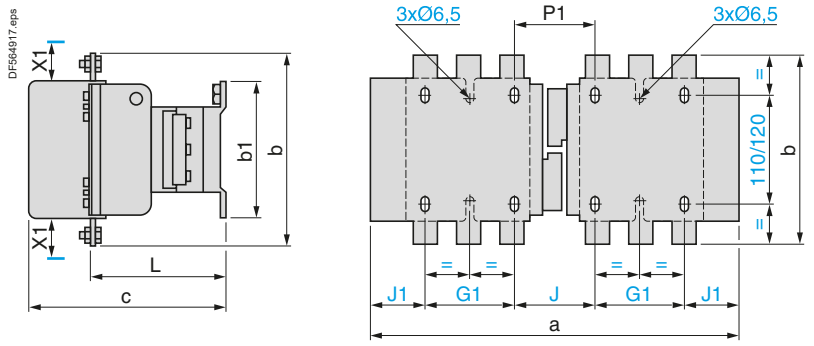
Ref.

High power contactors

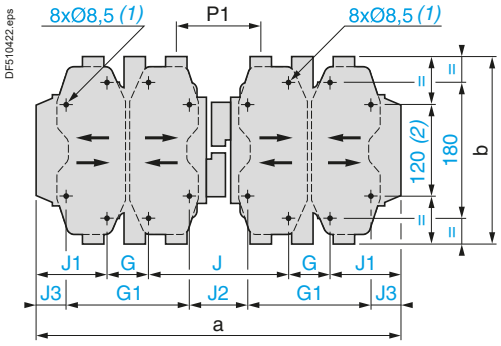
Dimensions

For customer assembly, fixing recommended on AM1EC uprights, please consult your Regional Sales Office.

2 x **LC1F115 to F330**



2 x **LC1F400, F500, F630, F800**



X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

LC1	200…500 V	660…1000 V	200…690 V	1000 V
F115, F150	10	15	–	–
F185	10	15	–	–
F225, F265	10	15	–	–
F330	10	15	–	–
F400	15	20	–	–
F500	15	20	–	–
F630	20	30	–	–
F800	–	–	10	20

2 x LC1		a	b	b1	c	G	G1	J	J1	J2	J3	L	P1
F115	3P	345	162	137	171	–	80	71	57	–	–	107	77
	4P	419	162	137	171	–	80	108	75.5	–	–	107	77
F150	3P	345	170	137	171	–	80	71	57	–	–	107	71
	4P	422	170	137	171	–	80	111	75.5	–	–	107	71
F185	3P	357	174	137	181	–	80	78	59.5	–	–	113.5	78
	4P	437	174	137	181	–	80	118	79.5	–	–	113.5	78
F225	3P	357	197	137	181	–	80	78	59.5	–	–	113.5	62
	4P	437	197	137	181	–	80	118	79.5	–	–	113.5	54
F265	3P	425	203	145	213	–	96	109	61.5	–	–	141	100
	4P	521	203	145	213	–	96	157	85.5	–	–	141	100
F330	3P	447	206	145	219	–	96	124	65.5	–	–	145	107
	4P	543	206	145	219	–	96	172	89.5	–	–	145	107
F400	3P	446	206	209	219	80	170	157	64.5	67	19.5	145	107
	4P	542	206	209	219	80	170	157	112.5	67	67.5	145	107
F500	3P	485	238	209	232	80	170	156	84.5	66	39.5	146	112
	4P	595	238	209	232	140	230	156	79.5	66	34.5	146	112
F630	3P	636	304	280	255	180	–	139	68.5	–	–	155	137
	4P	796	304	280	255	240	–	139	88.5	–	–	155	137
F800	3P	636	304	280	255	180	–	139	68.5	–	–	155	137

(1) Except LC1F630 and F800: 4 x Ø10.5.
(2) Except LC1F630 and F800.

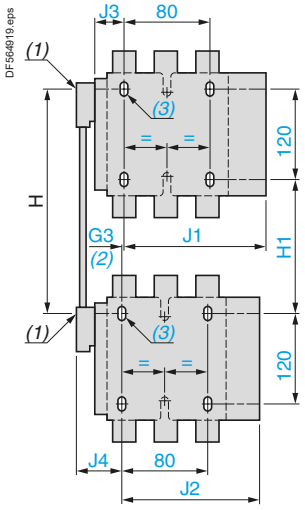
For other dimensions: see pages B9/54 and B9/55.

COORD.
Ref.
High power contactors

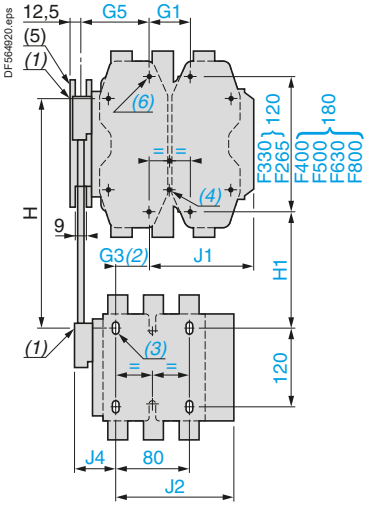
Dimensions

For customer assembly, with mechanical interlock (MI) **LA9F**, fixing recommended on AM1EC uprights (please consult your Regional Sales Office). 2 x **LC1** identical or different ratings (**LC1F115 to F630 and F800**). See pages B9/34 to B9/37.

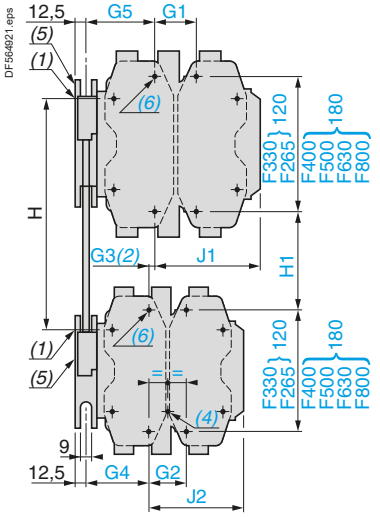
Assembly A



Assembly B



Assembly C



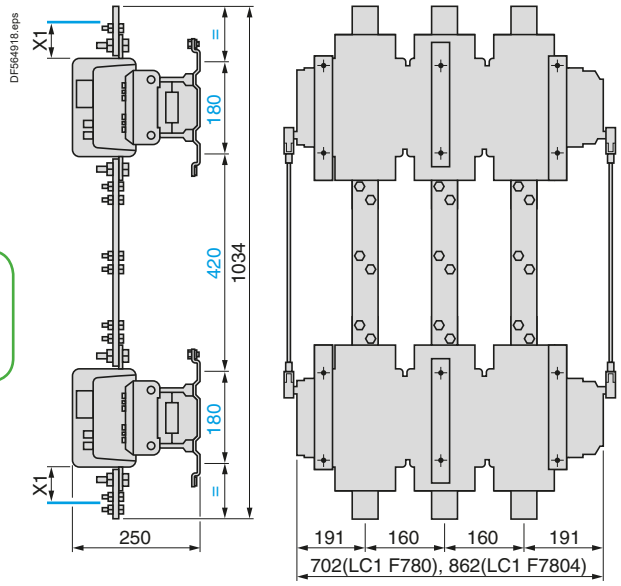
(1) Mechanical interlock shaft.
(2) For assembly of contactors of different ratings only.
(3) 4 x Ø6.5 for LC1F115 to F225.
(4) 4 x Ø6.5 for LC1F265.
(5) Mechanical interlock guide bracket.
(6) 4 x Ø8.5 for LC1F400, F500 or 4 x Ø10.5 for LC1F630 and F800.

Assembly A (7) - Mechanical interlock reference

	G3 3P	G3 4P	H min.	H max.	H1 min.	H1 max.	J1 3P	J1 4P
LA9FF4F	0	0	200	310	80	190	137	155.5
LA9FG4F	3	4	210	300	90	180	139.5	159.5
LA9FG4G	0	0	220	310	100	190	139.5	159.5

	J2 3P	J2 4P	J3 3P	J3 4P	J4 3P	J4 4P
LA9FF4F	137	155.5	48.5	67	48.5	67
LA9FG4F	137	155.5	53	73	54	69
LA9FG4G	139.5	159.5	53	73	53	73

For customer assembly, fixing recommended on AM1EC uprights, please consult your Regional Sales Office.
2 x **LC1F780**



X1 and fixings, see page B9/86.

(7) Only 3P for F800.
(8) In this case, G4 is greater than G5.

Assembly B (7) - Mechanical interlock reference

	G1 3P	G1 4P	G3 3P	G3 4P	G5 3P	G5 4P	H min.	H max.
LA9FH4F	96	96	21	27	60	83	240	380
LA9FJ4F	80	80	45	26	83	83	250	380
LA9FK4F	80	140	45	26	83	83	270	380
LA9FL4F	180	240	35	17	74	74	310	380
LA9FH4G	96	96	19	23	60	83	250	380
LA9FJ4G	80	80	42	22	83	83	250	380
LA9FK4G	80	140	42	22	83	83	270	380
LA9FL4G	180	240	33	13	74	74	310	380

	H1 min.	H1 max.	J1 3P	J1 4P	J2 3P	J2 4P	J4 3P	J4 4P
LA9FH4F	110	250	157.5	181.5	137	155.5	48.5	67
LA9FJ4F	80	210	144.5	192.5	137	155.5	48.5	67
LA9FK4F	100	210	164.5	219.5	137	155.5	48.5	67
LA9FL4F	140	210	248.5	328.5	137	155.5	48.5	67
LA9FH4G	120	250	157.5	181.5	139.5	159.5	53	73
LA9FJ4G	90	220	144.5	192.5	139.5	159.5	53	73
LA9FK4G	110	220	164.5	219.5	139.5	159.5	53	73
LA9FL4G	150	220	248.5	328.5	139.5	159.5	53	73

Assembly C (7)

	G1 3P	G1 4P	G2 3P	G2 4P	G3 3P	G3 4P	G4 3P	G4 4P	G5 3P	G5 4P
LA9FH4H	96	96	96	96	0	0	60	83	60	83
LA9FJ4H	80	80	96	96	23	0	60	83	83	83
LA9FK4H	80	140	96	96	23	0	60	83	83	83
LA9FL4H	180	240	96	96	14	9 (8)	60	83	74	74
LA9FJ4J	80	80	80	80	0	0	83	83	83	83
LA9FK4J	80	140	80	80	0	0	83	83	83	83
LA9FL4J	180	240	80	80	9 (8)	9 (8)	83	83	74	74
LA9FK4K	80	140	80	140	0	0	83	83	83	83
LA9FL4K	180	240	80	140	9 (8)	9 (8)	83	83	74	74
LA9FL4L	180	240	180	240	0	0	74	74	74	74

	H min.	H max.	H1 min.	H1 max.	J1 3P	J1 4P	J2 3P	J2 4P
LA9FH4H	250	380	130	260	157.5	181.5	157.5	181.5
LA9FJ4H	260	380	110	230	144.5	192.5	157.5	181.5
LA9FK4H	280	380	130	230	164.5	219.5	157.5	181.5
LA9FL4H	330	380	170	220	248.5	328.5	157.5	181.5
LA9FJ4J	260	380	60	200	144.5	192.5	144.5	192.5
LA9FK4J	280	380	100	200	164.5	219.5	144.5	192.5
LA9FL4J	325	380	140	195	248.5	329.5	144.5	192.5
LA9FK4K	300	380	120	200	164.5	329.5	164.5	219.5
LA9FL4K	345	380	160	195	248.5	328.5	164.5	219.5
LA9FL4L	380	380	200	200	248.5	328.5	248.5	328.5

Coordination tables: pages A6/34 to A6/59
References: pages B9/34 to B9/39
Schemes: pages B9/106 and B9/107

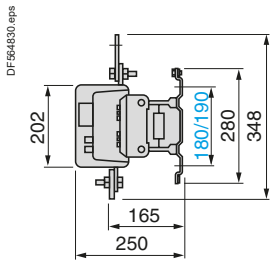
Dimensions

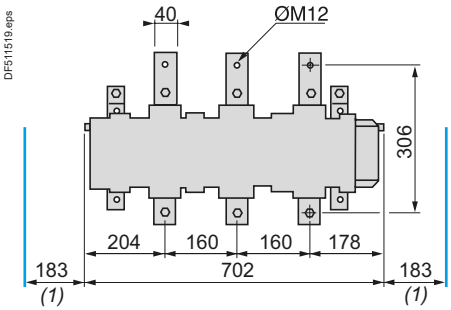
Dimensions

Contactors used to assemble high power changeover contactor pairs LC1F780: see page B9/41

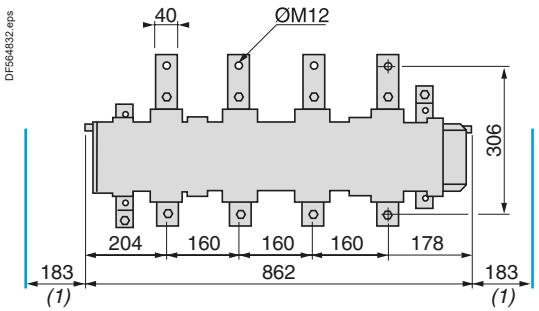
LC1F6309

Common side view



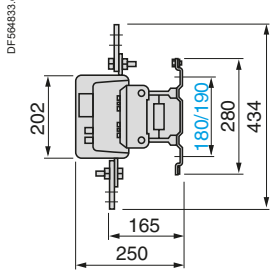


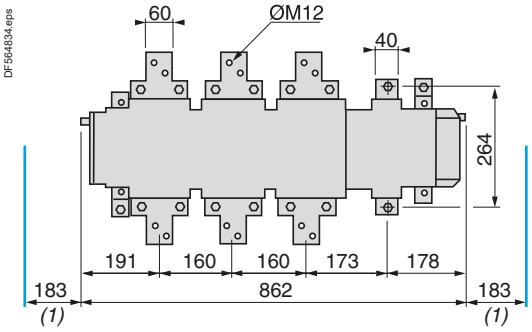
LC1F63049



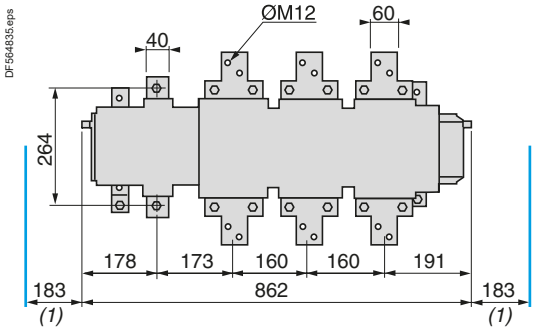
LC1F78040

Common side view





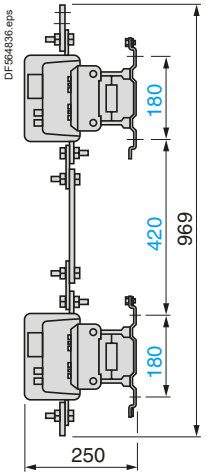
LC1F78041

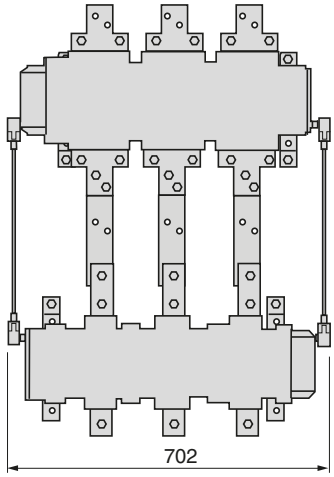


(1) Minimum distance required for removal of each coil.

3-phase changeover contactor pairs

LC1F780 + LC1F780 + LA9FX970: see page B9/41
LC1F780 + LC1F6309 + LA9FX970





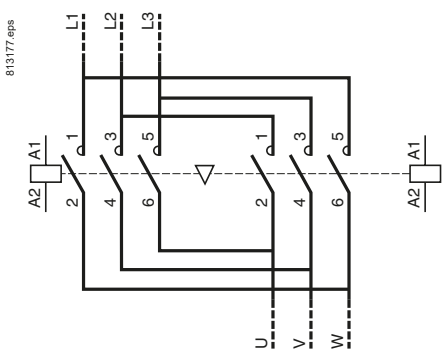
References:
page B9/41

Schemes

Reversing contactors for motor control LC2F

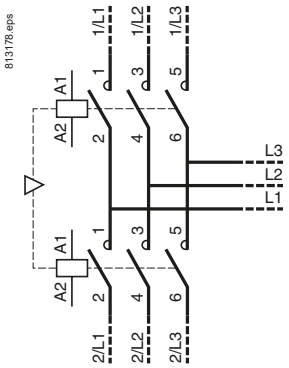
2 x LC1F

Horizontally mounted



2 x LC1F

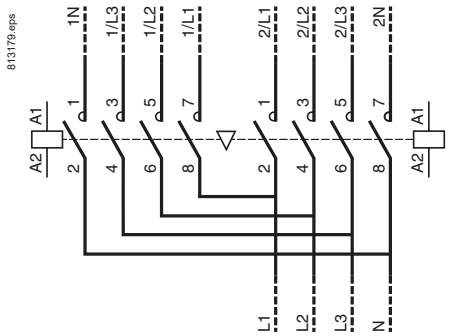
Vertically mounted



Changeover contactor pairs for distribution LC2F

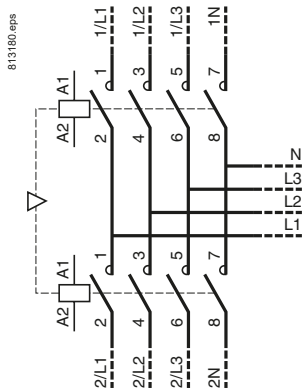
2 x LC1F

Horizontally mounted



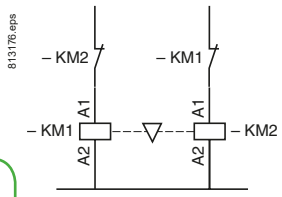
2 x LC1F

Vertically mounted



Electrical interlocking of reversers fitted with mechanical interlock without integral electrical contacts

LA9F



Ref.

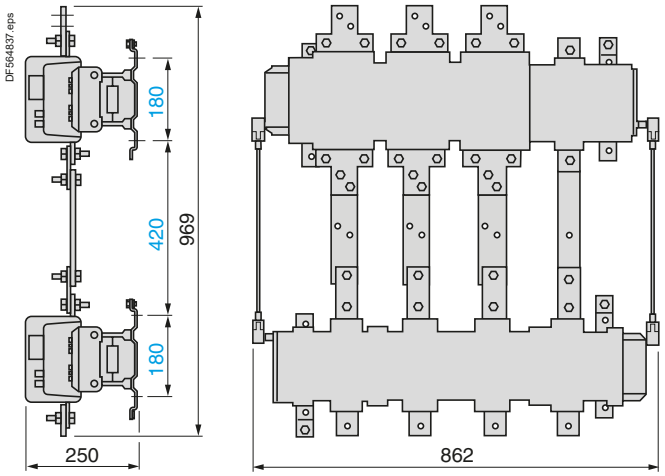
High power contactors

Dimensions, schemes

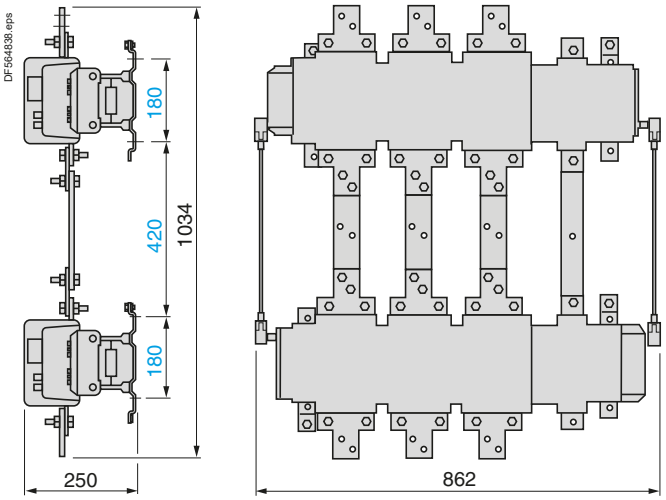
Dimensions

3-phase + neutral changeover contactor pairs

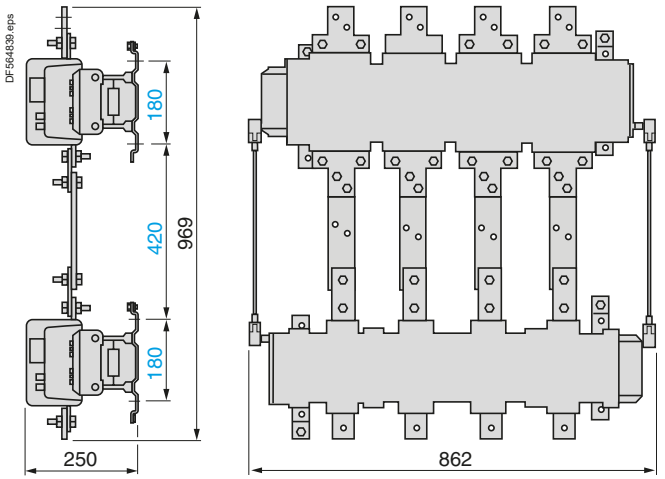
LC1F78041 + LC1F63049 + LA9FX970



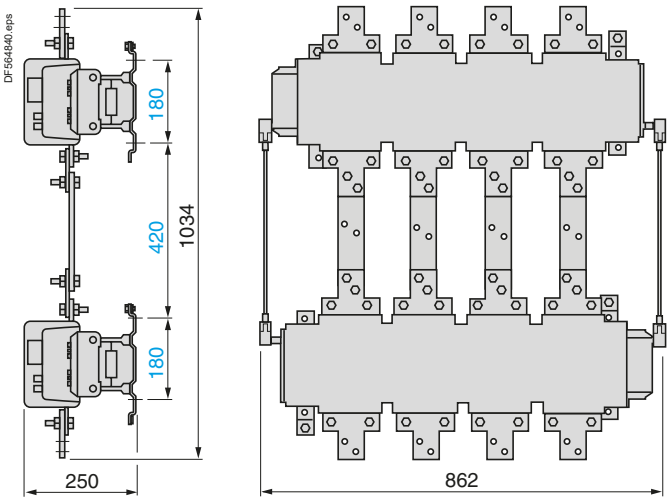
LC1F78041 + LC1F78040 + LA9FX970



LC1F7804 + LC1F63049 + LA9FX971

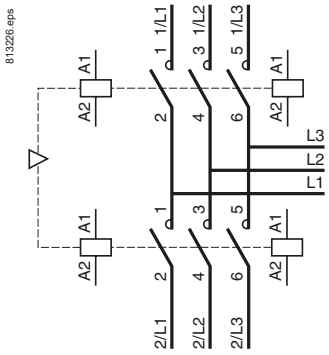


LC1F7804 + LC1F7804 + LA9FX971

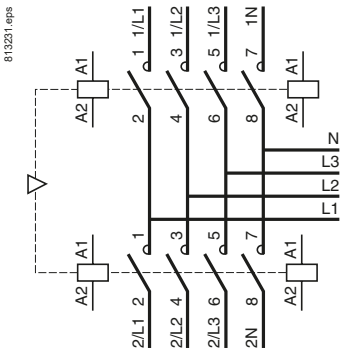


Schemes

3-phase changeover contactor pairs



3-phase + neutral changeover contactor pairs



Ref.
High power contactors

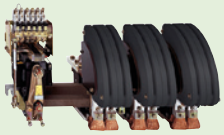
References:
page B9/41

TeSys B
Bar mounted contactors

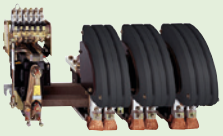
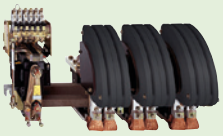
Chapter
B10

Introduction	
Applications	B10/2
Offer panorama	B10/4
Technology	B10/6

TeSys B Bar mounted contactors - Variable composition (composition is defined by customer)

Type of product	Range		Pages
CV1B - Standard performance - 690 V	From 80 to 700 A - AC-3 From 80 to 1000 A - AC-1		B10/10
CV3B - LC1B - High performance - 1000 V	From 80 to 1800 A - AC-3 From 80 to 2750 A - AC-1		B10/20
Variable composition contactors - ordering process			B10/29

TeSys B Bar mounted contactors - Predefined composition

LC1B - High performance / power - 1000 V	From 750 to 1800 A - AC-3 From 800 to 2750 A - AC-1		B10/32
CRXB, CVXB, CWXB - For control of DC excitation circuit of synchronous motors - 1200 V DC	From 80 to 2750 A - DC		B10/35
CR1B - Magnetic latching - 1000 V	From 750 to 1800 A - AC-3 From 800 to 2750 A - AC-1		B10/40

Variable composition contactors – TeSys B

All details and composition list in the

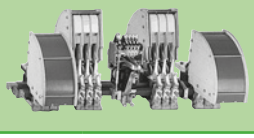
TeSys B Bar mounted contactors dedicated catalogue >



Catalogue ref:
DIA1ED2070702EN

Click here to download

TeSys B Bar mounted contactors - from specification of customer's application

Excitation circuit of synchronous motor, magnetic latching, furnaces and induction heating applications, tramways rails grounding... CF452 - Customer requirements specification form	From 80 to 16300 A - AC-1		B10/43

Variable composition contactors: other solution

The use of a variable composition contactor becomes evident when the specification of the application can no longer be met with a standard contactor.

- High power load: > 400 kW.
- AC main supply from 1000 to 3000 V.
- Very inductive DC load: L/R > 15 ms.
- DC main supply with low current but voltage over 1000 V.
- High operating frequency: up to 1200 op./h.
- High durability: several millions of operations.

Some examples

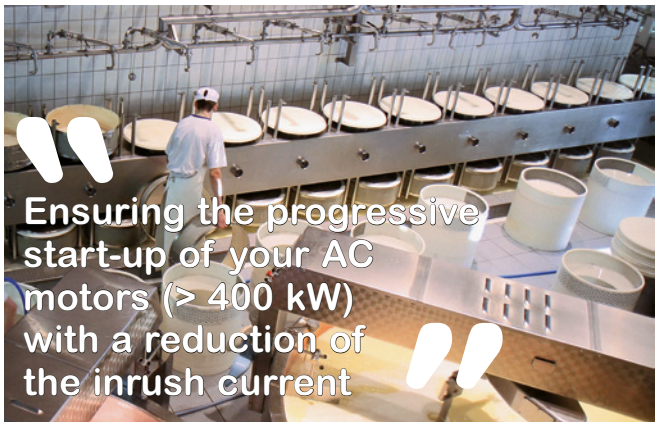
The fact sheets are available at http://www.se.com/



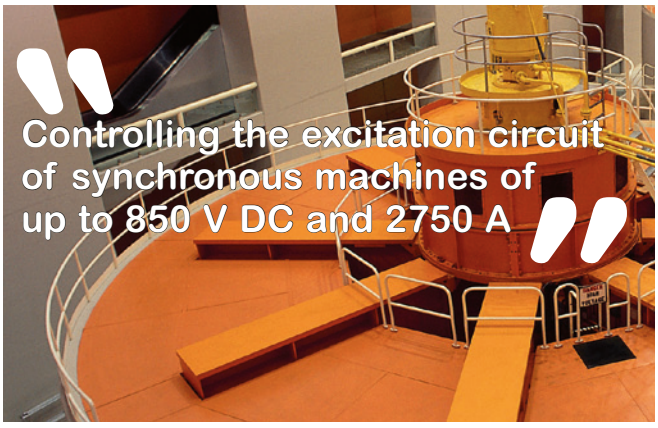
Application form ref. EDCED110013EN



Application form ref. EDCED110014EN



Application form ref. EDCED110017EN



Application form ref. EDCED110018EN

Videos

Very high power contactors - **TeSys** B - 1 - Discovery

Discover Schneider Electric's TeSys B bar contactors that are designed to cut out considerable electric arcs. See how they are manufactured in the Schneider Electric factory and check out the presentation of the range.

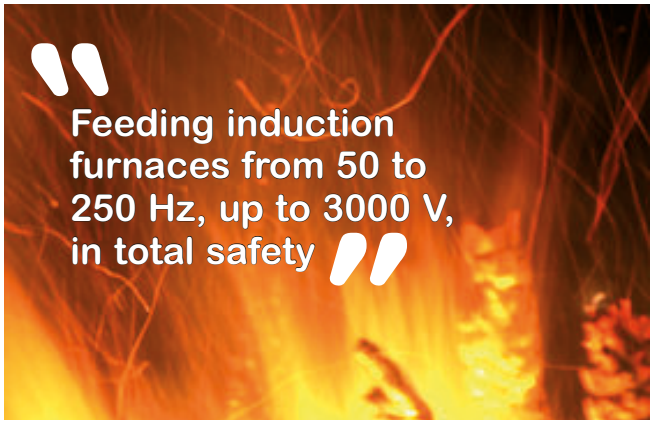


Very high power contactors -**TeSys** B - 2 - Applications

Discover very high-power applications for which Schneider Electric's TeSys B bar contactors offer great advantages.



Applications



Application form ref. EDCED110015EN



Application form ref. EDCED110016EN



Application form ref. EDCED110019EN



Application form ref. EDCED110020EN

Very high power contactors -**TeSys** B - 3 - Technology

Discover how Schneider Electric's TeSys B bar contactors cut out electric arcs of up to several thousand Amps: 'magnetic blowing'.



Offer panorama

Applications	■ Motor switching in categories AC-3. ■ Resistive load switching: heating, lighting. ■ Distribution circuit switching: line contactor. ■ Supply changeover switching: circuit coupling. ■ Transformer, capacitor.

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PB110869.eps

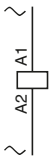


Contactors	Type	**CV1B**						
	Size	**F**	**G** (1)	**H**	**J** (1)	**K** (with Type 1 pole)	**K** (with Type 3 poles)	**L** (1)
Rated operational current	AC-3	80 A		250 A		460 A	460 A	
	AC-4/DC-5	72 A/–		205 A/–		–/– A	380 / 630 A	
	AC-1	80 A		300 A		630 A	630 A	
Max. rated operational voltage		690 V ∼		690 V ∼		690 V ∼	1 000 V ∼	
Available with configuration type command		A - B - C - D						

Available control circuit configuration

Type A
a.c. supply ∼

501346_1.eps



Type B
d.c. supply ⎓

501347_1.eps



(1) CV1B legacy size 'G', 'J', 'L' , CV3B legacy size 'G', 'J', 'K', please consult us.

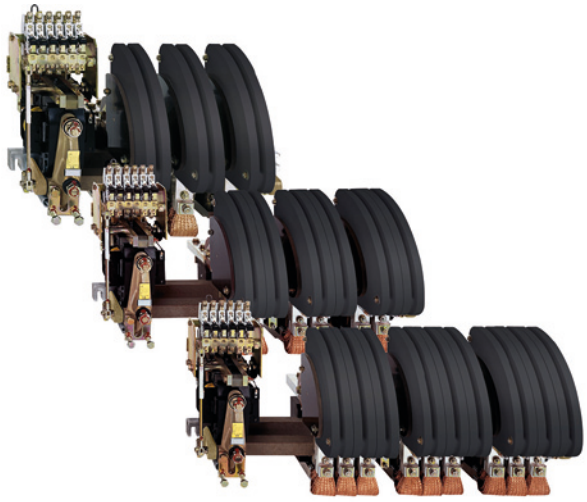
Offer panorama

- Motor switching in categories AC-4, DC-5.
- Inductive circuit switching: crane electromagnets.
- High voltage d.c. switching: railway locomotives.
- Load switching at high operating rates.

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PB121216.eps

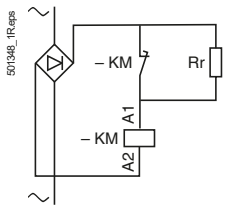


CV3B					CV3B and LC1B			
F	G (1)	H	J (1)	K (1)	L	M	P	R
80 A		250 A			800 A	1000 A	1500 A	1800 A
80/80 A		208/300 A			720/800 A	830/1000 A	1200/1800 A	1500/2500 A
80A		300 A			800 A	1250 A	2000 A	2750 A
1000 V ~		1000 V ~			1000 V ~	1000 V ~	1000 V ~	1000 V ~
A - B - C - D					C - D (B: special conditions - contact us)			

Type C

a.c. supply via economy resistor

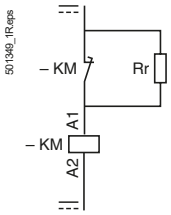
501348_1R.eps



Type D

d.c. supply via economy resistor

501349_1R.eps

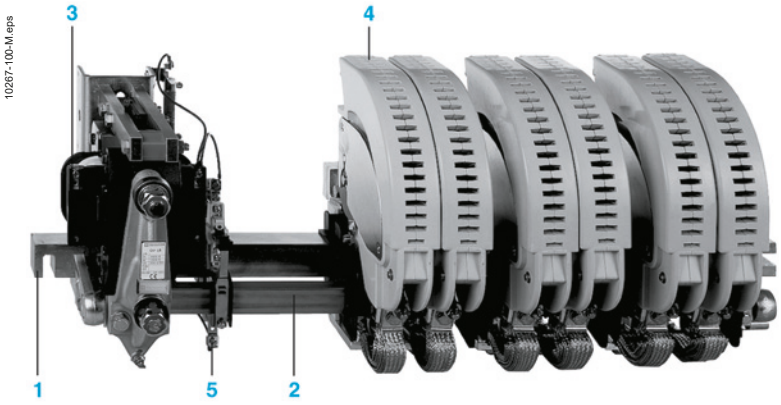


The variable composition contactor range is split into 3 groups:

■ **Low power switching contactors:**
□ type CV1B●, 80 to 630 A
□ type CV3B●, 80 to 300 A.
For motor control, the references of the CV1 and CV3 contactors are given on catalogue DIA2070702EN.
For other applications, the composition of the commercial references is described on Symbol combination table, see pages B10/29 to B10/31 or use the configuration software “bar contactor soft-customer.xls” to download on: www.se.com.

■ **Increased power switching contactors:**
□ type LC1B●, 800 to 2750 A. References shown on B10/32 and B10/33.

■ **Specific contactors** (large number of main poles, pole arrangement, customised fixing and dimensions, component referencing, etc.) :
□ type CV1●B, 80 to 630 A
□ type CV3●B, 80 to 2750 A.
To order these contactors, complete the Order form on catalogue DIA2070702EN.



1 Mounting bar
2 Rotating armature shaft
3 Electromagnet
4 Main pole
5 Instantaneous auxiliary contacts

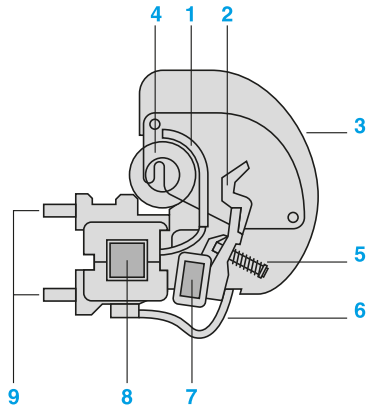
Variable composition contactors are particularly suited for switching a.c. or d.c. motors and other circuits and are capable of providing a high number of operating cycles.
Their variable composition design allows them to be built to customer specification.

Applications

These variable composition contactors are ideally suited for the most frequently encountered applications:

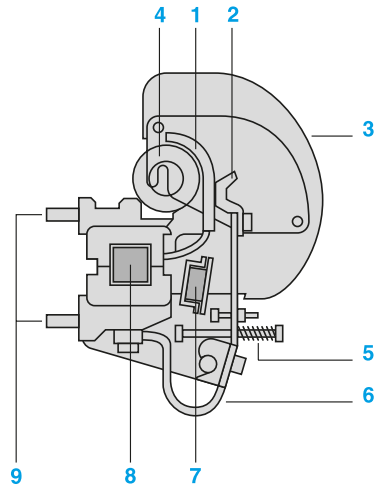
■ Switching a.c. squirrel cage and slip-ring motors in all utilisation categories (AC-2, AC-3, AC-4).
■ Switching d.c. motors in all utilisation categories (DC-2, DC-3, DC-4, DC-5).
■ Switching a.c. resistive loads (category AC-1) and d.c. resistive loads (category DC-1).
■ Switching distribution circuits (category AC-1).
■ Short-circuiting of rotor resistors.
■ Switching capacitors, power factor correction.
■ Switching transformer primaries.
■ Switching inductive circuits with high time constant (L/R > 15 ms)
Example: alternator excitation circuit.
■ Severe duty requirements and main pole arrangements comprising 1 to 6 N/O and/or N/C poles.

DF511200.eps



N/O pole 80…2750 A.

DF511201.eps



N/C pole 80…1000 A.

1 Fixed contact
2 Moving contact
3 Arc chamber
4 Blow-out coil
5 Pole pressure spring
6 Braided conductor
7 Rotating armature shaft (moving contact actuator)
8 Mounting bar
9 Terminal lugs

Power circuit

The principal function of a main pole is to make and break the supply current.
It is designed to continuously carry its nominal operational current.

Making the current

On energisation of the electromagnet coil, the armature shaft rotates and the moving contact makes with the fixed contact. The contact pressure, maintained by the pole pressure spring, is sufficient to overcome the electrodynamic forces of transient current peaks (e.g.: switching a transformer, starting a motor, etc.).

Breaking the current

On de-energisation of the electromagnet coil, the contacts separate and electrical arcing is dissipated by the blow-out coil and arc chamber. To optimise the performance of the magnetic blow-out, the blow-out coil can be selected to suit the operational current, which is particularly important when switching d.c.
The N/C pole operates in a reverse manner to the N/O pole, i.e. the contacts are closed whilst the electromagnet coil is de-energised and open during energisation.

CV1 contactors

■ **690 V ∿, 220 V ⎓ / pole**
□ N/O poles 80…1000 A (PN1)
□ N/C poles 80…1000 A (PR1).

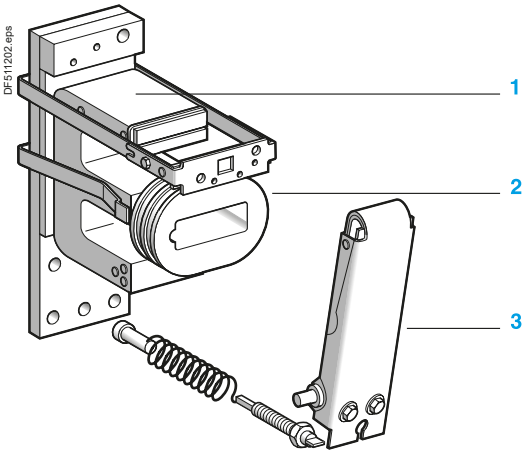
■ **Variants:**
□ no-load breaking poles
- N/O poles 80…1000 A (PN5)
- N/C poles 80…1000 A (PR5).

□ arc chambers with splitters for dispersing the electric arc: 1000 V ∿ / 440 V ⎓ per pole
- N/O poles 630…1000 A (PN3)
- N/C poles 630…1000 A (PR3).

CV3 contactors

■ **1000 V ∿, 440 V ⎓ / pole**
□ N/O poles 0…300 A (PA3)
□ N/C poles 80…300 A (PR3)
□ N/O poles 750…2750 A (PA1).

■ **Variants:**
□ high making capacity poles 750…2750 A (PA2)
□ high breaking capacity poles and poles with reduced safety clearances (arc chambers with closed splitters) 750…2750 A (PA1PX8)
□ no-load breaking poles
- N/O poles 750…2750 A (PA5).



Electromagnet EB1
1 Electromagnet core
2 Coil
3 Electromagnet armature

Control circuit

■ 2 types of electromagnet: E shaped core and U shaped core.
■ 2 types of coil: type WB1 and type WB2.

Electromagnet with E shaped core and coil type WB1

■ **Electromagnet with E shaped laminated iron core, type EB**
□ with central air gap machined in armature,
□ with single coil type **WB1** fitted on centre limb of core.
The upper limb incorporates a shading ring, the armature rotates.

■ **Coil - direct a.c. 50 or 60 Hz supply**
□ 20 to 600 V
□ 1200 operations/hour.

At the moment of inrush, with the armature open, the coil impedance is low and power consumption is high.
In the sealed state the armature is closed, the coil impedance increases and power consumption is low.
The inrush current is 6 to 10 times higher than the sealed current.

■ **Electromagnet** directly DC powered or via individual rectifier (50-400 Hz):
□ the electromagnet is mounted with the reduction in consumption
□ 12 to 500 V
□ 120 operations/hour.

■ **Electromagnet** powered via individual rectifier (50-400 Hz):
□ the electromagnet is mounted with the reduction in consumption
□ 12 to 500 V
□ 120 operations/hour.

At the moment of inrush, the full actuating voltage is applied to the coil and the inrush current is determined by the coil resistance.
In the sealed state an additional resistor is switched automatically in series with the coil, so as to reduce power consumption.
This economy resistor is switched by a N/C auxiliary contact which is adjusted to open only when the armature is fully closed.
The inrush current is 15 to 40 times higher than the sealed current.

Coils type WB1, used in conjunction with laminated iron cores, have a much higher inrush current than sealed current, whatever the nature of the supply current.

When establishing the current and selecting the supply voltage rating, it is important to take into account the line voltage drop due to the inrush current.

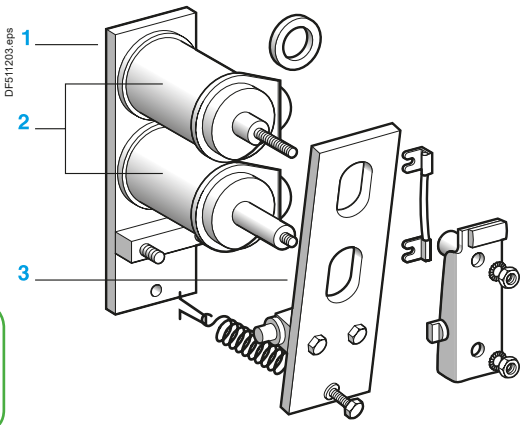
Electromagnet with U shaped core and coil type WB2 for d.c. supply

■ **Electromagnet** with U shaped solid iron core, type **EK:**
□ 2 similar coils type **WB2** connected in series, one coil being fitted to each limb of the core
□ the armature rotates.

■ **Electromagnet** for d.c. supply
□ 12 to 600 V
□ 1200 operations/hour.

The coils for this type of electromagnet have a considerable number of turns so as to obtain sufficient magnetic flux to attract the armature.

Due to its simplicity and relatively slow movements the assembly is very robust and, therefore, has increased mechanical durability.



Electromagnet EK
1 Electromagnet core
2 Coil
3 Electromagnet armature

Instantaneous and time delay auxiliary contacts

Signalling, electrical interlocking and slave functions can be achieved by using auxiliary contacts.

Instantaneous auxiliary contacts suitable for use with all contactor types are available:
■ 1 block of 3 instantaneous N/O contacts and 2 N/C instantaneous contacts, reference LA1BN32A.

Delayed auxiliary contacts can be mounted onto contactors CV1 and CV3:
■ On the block LA1BN32A, 1 block of N/O ON-delayed contact + 1 N/C ON-delayed contact , references LADT0 (delay from 0.1 to 3 s), LADT2 (0.1 to 30 s), LADT4 (10 to 180 s)
■ On the block ref. LA1BN32A: 1 block of N/O OFF-delayed contact + 1 N/C OFF-delayed contact, references LADR0 (delay from 0.1 to 3 s), LADR4 (10 to 180 s).

The delayed contacts are established or separate some time after the closing or opening of the contactor which operates them. This time is adjustable.

On the block LA1BN32A all TeSys D contactors additives can be mounted, with the exception of LA6DK, LAD6K, LAD8N, LADN01, LADN10.

Assembling reversing/changeover contactor pairs

Mounting accessories

For applications involving the switching of reversing motors or changeover circuits, contactors of different ratings can easily be mounted vertically and interlocked. Mechanical interlock kits are available and auxiliary contacts can be used for electrical interlocking.

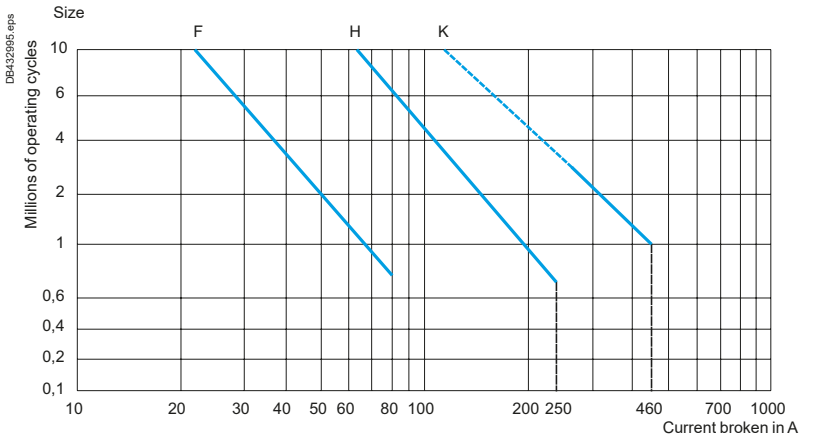
Selection criteria of the CV1B contactor size - utilisation category AC-3

Rated operational current in A at θ ≤ 55 °C						
CV1 contactors	**Size**					
	F	**G** (1)	**H**	**J** (1)	**K**	**L** (1)
Maximum operating rate in operating cycles/hour	**1200**		**1200**		**1200**	
≤ 440 V	80		250		460	
500 V	50		200		450	
690 V	35		150		400	

Nominal operational power at θ ≤ 55 °C						
CV1 contactors	**Size**					
	F	**G** (1)	**H**	**J** (1)	**K**	**L** (1)
Maximum operating rate in operating cycles/hour	**1200**		**1200**		**1200**	
220/230 V	22		75		140	
380/400 V	37		132		250	
415/440 V	37		140		260	
500 V	30		110		315	
660/690 V	22		110		315	

(1) CV1B legacy size 'G', 'J', 'L', please consult us.

Electrical durability (Ue ≤ 440 V)



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CV1BF●A

Contactor reference tables, according standard motor power ratings in category AC-3

References

3-pole contactors for motor control

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3						Maximum rated operational current, category AC-3	Instantaneous auxiliary contacts per contactor		Basic reference, to be completed by adding the voltage code (1) (2)	Frequently used voltage codes	Weight
220 V 230 V	380 V 400 V	415 V	440 V	500 V	660/ 690 V						
kW	kW	kW	kW	kW	kW	A					kg
22	37	37	37	30	22	**80**	3	2	**CV1BF3F0Z●●A**	**E5 F5 M5 Q5**	4.000
75	132	140	140	110	110	**250**	3	2	**CV1BH3H0Z●●A**	**E5 F5 M5 Q5**	11.000
140	250	260	260	315	315	**460**	1	1	**CV1BK3K0Z●●11**	**F5 M5 Q5**	40.000

(1) For other compositions, make up the contactor reference as explained on pages B10/29 to B10/31.
(2) Standard control circuit voltages (variable delivery, please contact us):

Volts	48	110	120	127	208	220	230	240	380	400	440
50 Hz	E5	F5	–	G5	–	M5	P5	U5	Q5	V5	R5
60 Hz	E6	–	K6	–	L6	M6	P6	U6	Q6	V6	R6
50/60 Hz	E7	F7	K7	G7	L7	M7	P7	U7	Q7	V7	R7
⎓	ED	FD	KD	GD	–	MD	PD	UD	QD	VD	–
⎓ + *Econ.R.* (3)	ER	FR	KR	GR	–	MR	PR	UR	QR	VR	–

For other voltages: please consult your Regional Sales Office.
(3) Econ.R.: Economy resistor.

Selection criteria of the CV1B contactor size - utilisation category AC-1

Maximum rated operational current (open-mounted device)

CV1 contactors				Size					
				F	G (1)	H	J (1)	K	L (1)
Maximum operating rate in operating cycles/hour				1200		1200		1200	
Connections									
	Cable	C.s.a.	mm²	25		185		–	
	Bars	Number		–		–		2	
		C.s.a.	mm	–		–		40 x 5	
≤ 40 °C			A	80		300		630	
≤ 55 °C			A	80		300		600	
≤ 70 °C			A	80		300		550	

(1) CV1B legacy size 'G', 'J', 'L', please consult us.

Increase in operational current by paralleling of poles

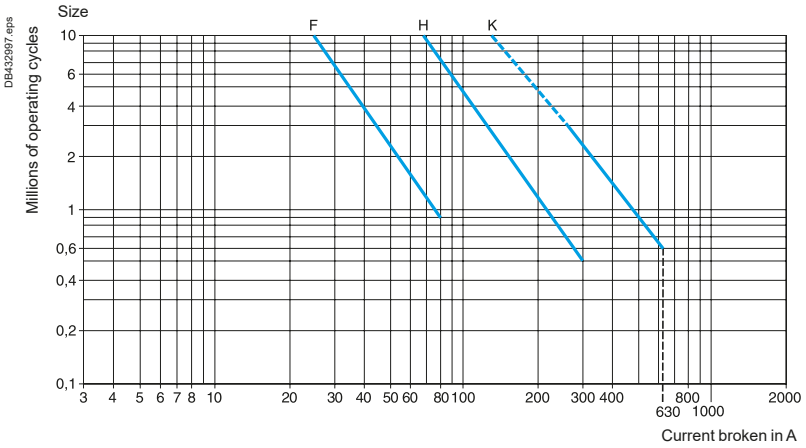
Apply the following multiplying factors to the current values given above. The factors take into account the often unbalanced current distribution between poles:

- 2 poles in parallel: K = 1.6
- 3 poles in parallel: K = 2.25
- 4 poles in parallel: K = 2.8.

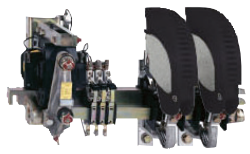


Example: 2 poles in parallel.

Electrical durability (Ue ≤ 440 V)



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CV1BK

Selection criteria of the CV1B contactor size - utilisation category AC-1

Maximum possibilities of the contactor, new design (size F to H)

N/O poles	N/C poles
0	1
1	0
1	1
2	0
2	1
3	0
4	0

For another combination, please contact us.

Maximum possibilities of the standard contactor (size K)

N/O poles	N/C poles
0	1
1	0
1	1
0	2
2	0
2	1
3	0
4	0

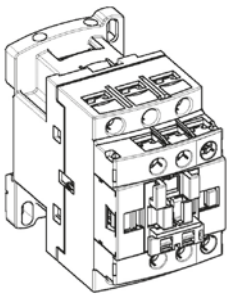
Auxiliaries contacts

■ Size F-H, 5 instantaneous contacts (3N/C + 2N/O) + TeSys D contactor (except for LA6DK, LADN01, LADN10, LAD6K and LAD8N).

Electromagnet and coil(s)

■ For direct a.c. control
■ For direct d.c. control
■ For a.c. or d.c. control via economy resistor
(accessories: economy resistor + contact, rectifier).

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LA1BN32A

Auxiliary contact blocks per contactor

Contact type	Composition		Control circuit ~ direct	Control circuit ⎓ direct	Control circuit ~ or ⎓ with economy resistor	Reference	Weight kg
Contactor - Size F - H - K							
Instantaneous	3	2	1	1	1	**LA1BN32A**	0.060
Time delay							
On-delay	1	1	1	1	1	**LADT●** (1)	0.060
Off-delay	1	1	1	1	1	**LADR●** (1)	0.060

(1) Choose additives LADT● and LADR● from the TeSys D *range.*

Selection criteria of the CV1B contactor size - utilisation category AC-2 and AC-4

Maximum current broken in A

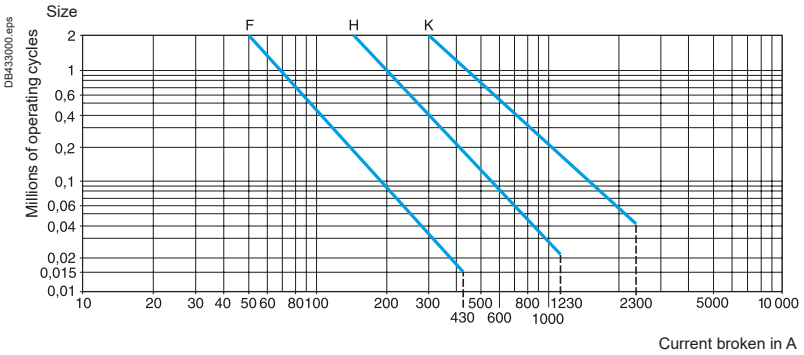
Related to maximum operating rate (operating cycles/hour) and on-load factor

CV1B contactors [1]		**Size**					
		F	**G** [2]	**H**	**J** [2]	**K**	**L** [2]
Operating cycles/hour [3] and on-load factor	Thermal limit zone [4]	Maximum current broken in A					
From 150 and 15 % to 300 and 10 %	**A**	165		520		1300	
From 150 and 20 % to 600 and 10 %	**B**	145		460		1150	
From 150 and 30 % to 1200 and 10 %	**C**	120		380		950	
From 150 and 55 % to 1200 and 20 %	**D**	90		280		700	
From 150 and 85 % to 1200 and 35 %	**E**	70		220		550	

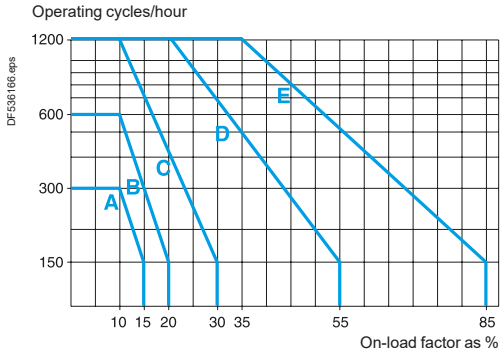
Counter current braking (plugging)

The current varies from the maximum counter current braking value up to the nominal motor current. The current made must be compatible with the making and breaking capacities of the contactor. In most cases, breaking occurs at a current value close to the locked rotor current and contactor selection can therefore be made using the criteria for utilisation categories AC-2 and AC-4.

Electrical durability (Ue ≤ 440 V)



Example: contactor size selection



For an on-load factor of 17 % at 180 operating cycles per hour, the above curve indicates zone B. If the maximum current broken is 200 A, the table above will lead to the selection of a size H contactor. Referring to the electrical durability curves, it can be seen that the contactor will have a life of 1 million operating cycles. Where a higher value of electrical durability is required, 2 million operating cycles for example, size K would be recommended.

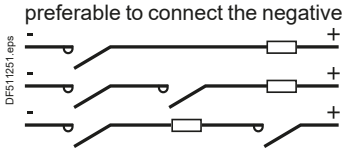
(1) To obtain the complete reference of the contactor see the Symbol combination table on pages B10/29 to B10/31. For customised compositions or dimensional specifications, please use the Order form on page B10/43 or consult your Regional Sales Office.
(2) CV1B legacy size 'G', 'J', 'L', please consult us.
(3) Do not exceed the maximum limit for the mechanical operating cycles.
(4) See curve at foot of page for thermal limit zone.

Selection criteria of the CV1B contactor size - utilization category DC-1

The selection of the contactor size and number of poles to be connected in series is made according to:
- the maximum operational voltage Ue
- the power broken
- the required electrical durability
- the nature of the load, in particular the time constant L/R
- the thermal operating conditions.

Maximum operational voltage Ue

This depends on the time constant of the circuit L/R ≤ 1 ms and the number of poles connected in series, on a single polarity or divided between both polarities (it is preferable to connect the negative polarity to the fixed contact side).



Number of poles to be connected in series according to the operational voltage (time constant of the circuit L/R ≤ 1 ms)				
CV1B contactors (1)		**Size**		
		F	**H**	**K**
1 pole PN1	**V**	220	220	220
2 poles PN1 in series	**V**	440	440	440
1 pole PN3	**V**	–	–	500
2 poles PN3 in series	**V**	–	–	1000

Normal operation: Ue ≥ U supply.

Rated operational current in A at θ ≤ 40 °C			
CV1B contactors	**Size**		
	F	**H**	**K**
	80	300	630

The use of a contactor selected according to the table above ensures current breaking up to 4 times the operational current.

Increase in rated operational current by connecting 2 poles in parallel

The equivalent operational current for 2 poles in parallel is equal to 2 x Ie x 0.8.



(1) To obtain the complete reference of the contactor refer to pages B10/29 to B10/31. For customised compositions or dimensional specifications, please use the Order form on page B10/43 or consult your Regional Sales Office.

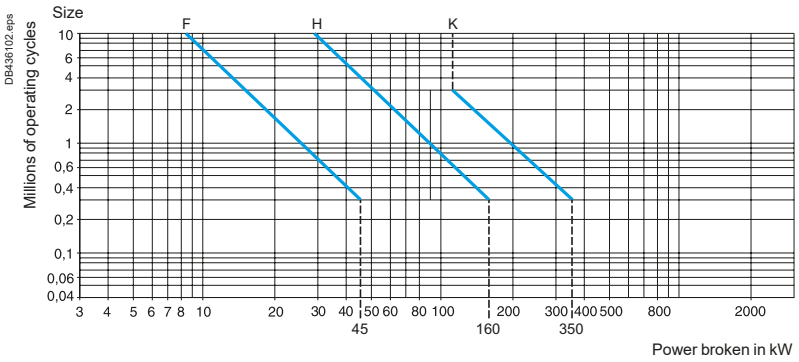
Selection guide for utilisation categorie DC-1 according to required electrical durability

Power broken			
Utilisation categories	**U broken**	**I broken**	**P broken**
DC-1: Non inductive or slightly inductive loads	Ue	Ie	Ue x Ie

Electrical durability (time constant L/R ≤ 1 ms)

The electrical durability can be read directly from the curves below, having previously calculated the power broken as follows:
P broken = U broken x I broken.
The table gives the values of Uc and Ic for the various utilisation categories.

Two-pole switching (time constant L/R ≤ 1 ms)
The required durability can be obtained, depending on the application, by increasing the number of poles in series or in parallel, or by increasing the contactor size.



Number of main poles

The curve shows the number of operating cycles according to the power broken by two main poles connected in series. For a single pole, double the value of power broken before using the curves.

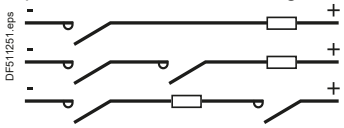
Thermal limit
The following limits must not be exceeded: 120 operating cycles/hour at 60 % or 300 operating cycles/hour at 30 % on-load factor, at the rated operational current Ie.

Selection criteria of the CV1B contactor size - utilisation category DC-3 and DC-5

The selection of the contactor size and number of poles to be connected in series is made according to:
- the maximum operational voltage Ue
- the power broken
- the required electrical durability
- the nature of the load, in particular the time constant L/R
- the thermal operating conditions.

Maximum operational voltage Ue

This depends on the time constant of the circuit L/R ≤ 15 ms and the number of poles connected in series, on a single polarity or divided between both polarities (it is preferable to connect the negative polarity to the fixed contact side).



Number of poles to be connected in series according to the operational voltage (time constant of the circuit L/R ≤ 15 ms)				
CV1B contactors (1)		**Size**		
		F	**H**	**K**
1 pole PN1	**V**	220	220	220
2 poles PN1 in series	**V**	440	440	440
1 pole PN3	**V**	–	–	440
2 poles PN3 in series	**V**	–	–	850

Normal operation: Ue ≥ U supply.
With breaking during counter current braking (plugging): Ue ≥ 1.5 U supply.

Rated operational current in A at θ ≤ 40 °C			
CV1B contactors	**Size**		
	F	**H**	**K**
	80	300	630

The use of a contactor selected according to the table above ensures current breaking up to 4 times the operational current.

Increase in rated operational current by connecting 2 poles in parallel

The equivalent operational current for 2 poles in parallel is equal to 2 x Ie x 0.8.



(1) To obtain the complete reference of the contactor, refer to pages B10/29 to B10/31. For customised compositions or dimensional specifications, please use the Order form on page B10/43 or consult your Regional Sales Office.

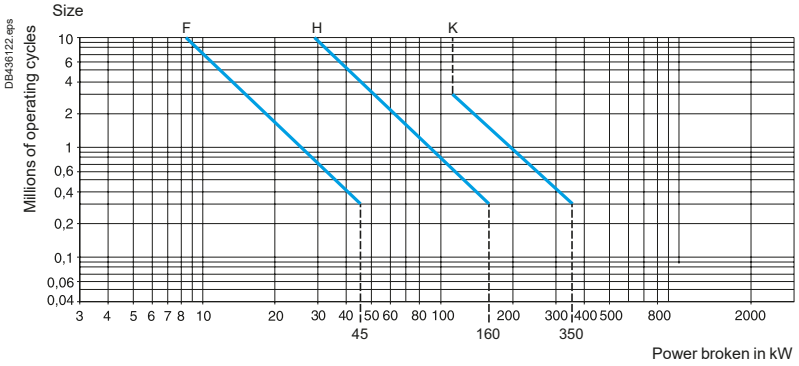
Selection criteria of the CV1B contactor size - utilisation category DC-3 and DC-5

Power broken			
Utilisation categories	**U broken**	**I broken**	**P broken**
DC-3: Shunt motors, reversing, inching	Ue	2.5 Ie	Ue x 2.5 Ie
DC-5: Shunt motors, reversing, inching	Ue	2.5 Ie	Ue x 2.5 Ie

Electrical durability (time constant L/R ≤ 15 ms)

The electrical durability can be read directly from the curves below, having previously calculated the power broken as follows:
P broken = U broken x I broken.
The table gives the values of Uc and Ic for the various utilisation categories.

Two-pole switching (time constant L/R ≤ 15 ms)
The required durability can be obtained, depending on the application, by increasing the number of poles in series or in parallel, or by increasing the contactor size.



Number of main poles
The curve shows the number of operating cycles according to the power broken by two main poles connected in series. For a single pole, double the value of power broken before using the curves.

Thermal limit
The following limits must not be exceeded: 120 operating cycles/hour at 60 % or 300 operating cycles/hour at 30 % on-load factor, at the rated operational current Ie.

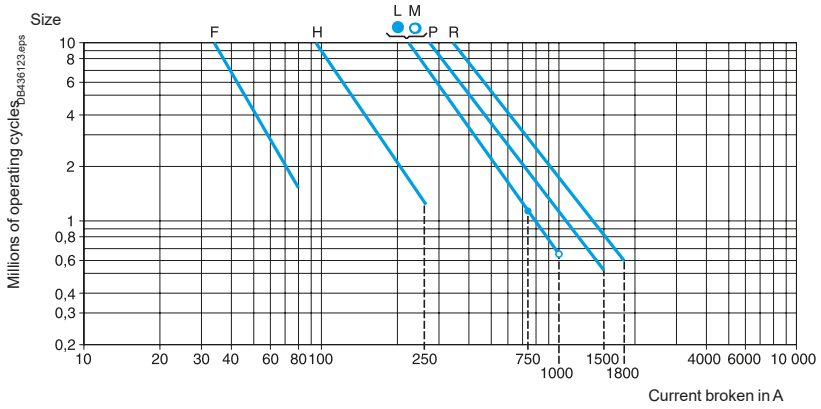
Selection criteria of the CV3B and LC1B contactor size - utilization category AC-3

Rated operational current in A at θ ≤ 55 °C									
Contactors CV3 and LC1B	Size								
	F	G (1)	H	J (1)	K (1)	L	M	P	R
Maximum operating rate in operating cycles/hour	**1200**		**1200**			**120**	**120**	**120**	**120**
≤ 440 V	80		290			800	1000	1500	1800
500 V	80		250			800	1000	1500	1800
690 V	70		240			750	900	1000	1100
1000 V	70		220			500	500	600	700

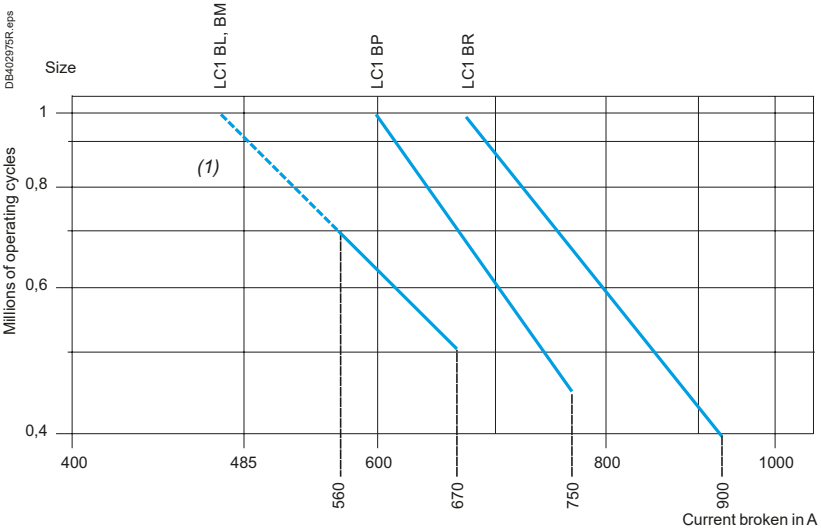
Nominal operational power at θ ≤ 55 °C									
Contactors CV3 and LC1B	Size								
	F	G (1)	H	J (1)	K (1)	L	M	P	R
Maximum operating rate in operating cycles/hour	**1200**		**1200**			**120**	**120**	**120**	**120**
220/230 V	22		75			220	280	425	500
380/400 V	37		132			400	500	750	900
415 V	37		132			425	530	800	900
440 V	45		132			450	560	800	900
500 V	45		160			500	600	750	900
660/690 V	55		200			560	670	750	900
1000 V	90		250			530	530	670	750

(1) CV3B legacy size 'G', 'J', 'K', please consult us.

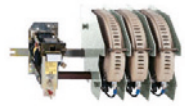
Electrical durability (Ue ≤ 440 V)



Electrical durability (Ue ≤ 690 V)

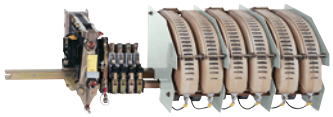


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CV3BF

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CV3BK

References

Contactors for motor control in category AC-3, from 80 to 460 A

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3							Maximum rated operational current, category AC-3	Instantaneous auxiliary contacts per contactor		Basic reference, to be completed by adding the voltage code (1) (2)	Frequently used voltage codes	Weight
220 V 230 V	380 V 400 V	415 V	440 V	500 V	660/ 690 V	1000 V						
kW	kW	kW	kW	kW	kW	kW	A					kg
22	37	37	45	45	55	90	**80**	3	2	**CV3BF3F0Z●●A**	**E5 F5 M5 Q5**	10.600
75	132	132	132	160	200	250	**285**	3	2	**CV3BH3F0Z●●A**	**E5 F5 M5 Q5**	15.000

(1) For other compositions, make up the contactor reference as explained on pages B10/29 and B10/30.
(2) Standard control circuit voltages (variable delivery, please contact us):

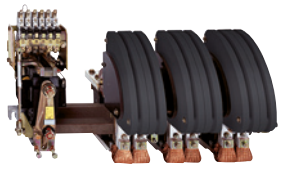
Volts	48	110	120	127	208	220	230	240	380	400	440
50 Hz	E5	F5	–	G5	–	M5	P5	U5	Q5	V5	R5
60 Hz	E6	–	K6	–	L6	M6	P6	U6	Q6	V6	R6
50/60 Hz	E7	F7	K7	G7	L7	M7	P7	U7	Q7	V7	R7
⎓	ED	FD	KD	GD	–	MD	PD	UD	QD	VD	–
⎓ + *Econ.R.* (3)	ER	FR	KR	GR	–	MR	PR	UR	QR	VR	–

For other voltages: please consult your Regional Sales Office.
(3) Econ.R.: Economy resistor.

Contactors for motor control in category AC-3, from 750 to 1800 A (∼ or ⎓)

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3							Maximum rated operational current in AC-3	Instantaneous auxiliary contacts per contactor (4)		Basic reference, to be completed by adding the voltage code	Frequently used voltage codes	Weight
220 V 230 V	380 V 400 V	415 V	440 V	500 V	660 V 690 V	1000 V						
kW	kW	kW	kW	kW	kW	kW	A					kg
220	400	425	450	500	560	530	**800**	2	2	**LC1BL33●22**	**G P V**	57.000
								3	1	**LC1BL33●31**	**G P V**	57.000
								1	3	**LC1BL33●13**	**G P V**	57.000
								4	–	**LC1BL33●40**	**G P V**	57.000
280	500	530	560	600	670	530	**1000**	2	2	**LC1BM33●22**	**G P V**	60.000
								3	1	**LC1BM33●31**	**G P V**	60.000
								1	3	**LC1BM33●13**	**G P V**	60.000
								4	–	**LC1BM33●40**	**G P V**	60.000
425	750	800	800	700	750	670	**1500**	2	2	**LC1BP33●22**	**G P V**	94.000
								3	1	**LC1BP33●31**	**G P V**	94.000
								1	3	**LC1BP33●13**	**G P V**	94.000
								4	–	**LC1BP33●40**	**G P V**	94.000
500	900	900	900	900	900	750	**1800**	2	2	**LC1BR33●22**	**G P V**	129.000
								3	1	**LC1BR33●31**	**G P V**	129.000
								1	3	**LC1BR33●13**	**G P V**	129.000
								4	–	**LC1BR33●40**	**G P V**	129.000

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LC1BP

(4) Standard control circuit voltages (variable delivery, please contact us):

Volts	48	110	120	125	127	220	230	240	380	400	415	440	500
∼ 50…400 Hz	–	F	K	–	G	M	P	U	Q	V	N	R	S
⎓	ED	FD	–	GD	–	MD	–	UD	–	–	–	RD	SD

For voltages other than those listed above, please consult us.

Selection criteria of the CV3B and LC1B contactor size - utilization category AC-1

Maximum rated operational current (open-mounted device)

Contactors CV3 and LC1B			Size								
			F	G (1)	H	J (1)	K (1)	L	M	P	R
Maximum operating rate in operating cycles/hour			1200		1200			120	120	120	120
Connections											
Cable	C.s.a.	mm²	25		120			–	–	–	–
Bars	Number		–		–			2	2	3	3
	C.s.a.	mm	–		–			50 x 5	80 x 5	100 x 5	100 x 10
≤ 40 °C		A	80		250			800	1250	2000	2750
≤ 55 °C		A	80		250			700	1100	1750	2400
≤ 70 °C		A	80		250			600	900	1500	2000

(1) CV3B legacy size 'G', 'J', 'K', please consult us.

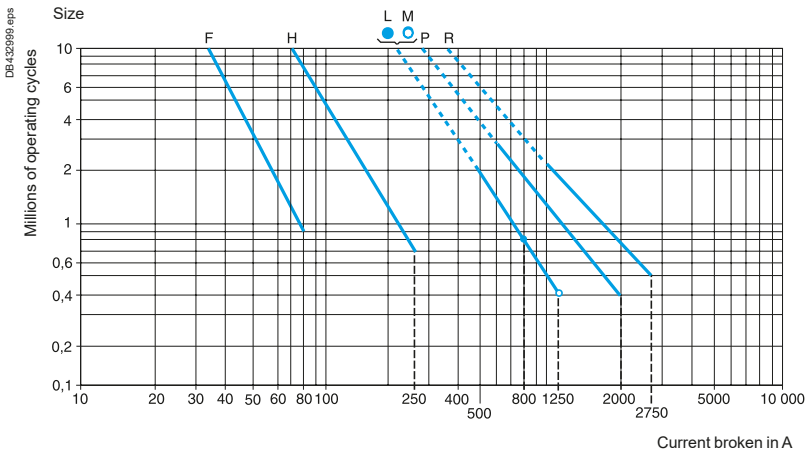
Increase in operational current by paralleling of poles
Apply the following multiplying factors to the current values given above. The factors take into account the often unbalanced current distribution between poles:

- 2 poles in parallel: K = 1.6
- 3 poles in parallel: K = 2.25
- 4 poles in parallel: K = 2.8.



Example: 2 poles in parallel.

Electrical durability (Ue ≤ 440 V)



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CV3BF

Selection criteria of the CV3B and LC1B contactor size - utilization category AC-1

Maximum possibilities of the contactor

CV3B contactors are characterised by their extensive composition alternatives:

■ Poles [1]

Size F - H	
N/O poles	N/C poles
0	1
1	0
1	1
2	0
2	1
3	0
4	0

Size L - M - P - R	
N/O poles	N/C poles
1	0
2	0
3	0
4	0

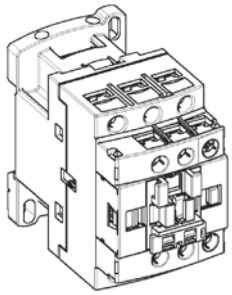
Auxiliaries contacts

■ Size F-H, 5 instantaneous contacts (3N/C + 2N/O) + TeSys D contactor (except for LA6DK, LAD6K, LADN01, LADN10 and LAD8N).

Electromagnet and coil(s)

■ For direct a.c. control
■ For direct d.c. control
■ For a.c. or d.c. control via economy resistor
(accessories: economy resistor + contact, rectifier).

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LA1BN32A

Auxiliary contact blocks contactor - Size F - H

Contact type	Composition		Control circuit ~ direct	Control circuit ⎓ direct	Control circuit ~ or ⎓ with economy resistor	Reference	Weight kg
Instantaneous	3	2	1	1	1	**LA1BN32A**	0.060
Time delay							
On-delay	1	1	1	1	1	**LADT●** [2]	0.060
Off-delay	1	1	1	1	1	**LADR●** [2]	0.060

(1) For possible compositions, see pages B10/29 to B10/31.
(2) Choose additives LADT● and LADR● from the TeSys D *range.*

Selection criteria of the CV3B and LC1B contactor size - utilization category AC-2 and AC-4

Thermal limits

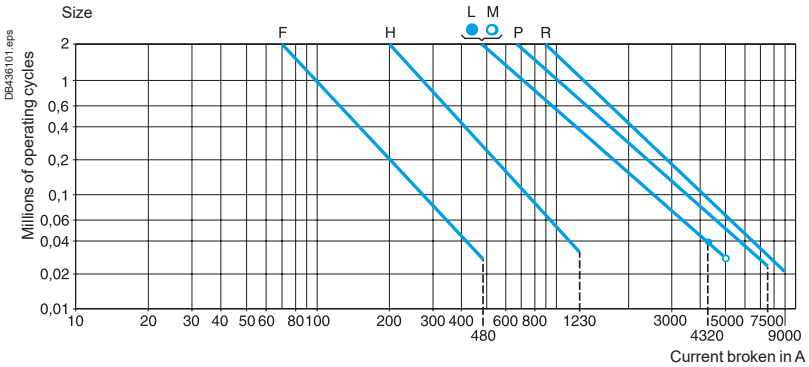
Related to maximum operating rate (operating cycles/hour) and on-load factor

Contactors CV3 (1) and LC1B		Size								
		F	G (2)	H	J (2)	K (2)	L	M	P	R
Operating cycles/hour (3) and on-load factor	Thermal limit zone (4)	Maximum current broken depending on the duty Thermal limit at ambient temperature ≤ 55 °C								
From 150 and 15 % to 300 and 10 %	**A**	165		520			2250	3000	4500	5400
From 150 and 20 % to 600 and 10 %	**B**	145		460			2000	2400	3750	5000
From 150 and 30 % to 1200 and 10 %	**C**	120		380			1500	2000	3000	3600
From 150 and 55 % to 1200 and 20 %	**D**	90		280			1000	1500	2000	2500
From 150 and 85 % to 1200 and 35 %	**E**	70		220			750	1000	1500	1800

Counter current braking (plugging)

The current varies from the maximum counter current braking value up to the nominal motor current. The current made must be compatible with the making and breaking capacities of the contactor. In most cases, breaking occurs at a current value close to the locked rotor current and contactor selection can therefore be made using the criteria for utilisation categories AC-2 and AC-4.

Electrical durability (Ue ≤ 440 V)

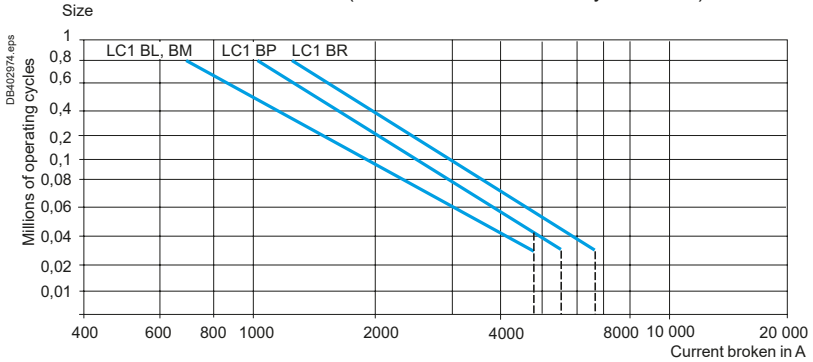


Example:

For an on-load factor of 17 % at 180 operating cycles per hour, the above curve indicates zone B. If the maximum current broken is 90 A, the table above will lead to the selection of a size F contactor. Referring to the electrical durability curves, it can be seen that the contactor will have a life of 1 100 000 operating cycles. Where a higher value of electrical durability is required, 2 million operating cycles for example, size H would be recommended.

Electrical durability (Ue ≤ 690 V)

Control of 3 phase asynchronous squirrel cage motors with “motor stalled” stop. The current Ic cut in AC-4 is 6 x Ie. (Ie = rated current drawn by the motor).



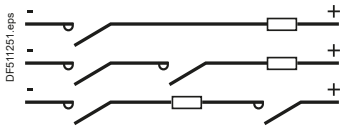
(1) To obtain the complete reference of the contactor see the Symbol combination table on pages B10/29 to B10/31. For customised compositions or dimensional specifications, please use the Order form on page B10/43 or consult your Regional Sales Office.
(2) CV3B legacy size 'G', 'J', 'K', please consult us.
(3) Do not exceed the maximum limit for the mechanical operating cycles.
(4) See curve at the previous page for thermal limit zone.

Selection criteria of the CV3B and LC1B contactor size - utilization category DC-1

The selection of the contactor size and number of poles to be connected in series is made according to:
- the maximum operational voltage Ue
- the power broken
- the required electrical durability
- the nature of the load, in particular the time constant L/R
- the thermal operating conditions.

Maximum operational voltage Ue

This depends on the time constant L/R of the circuit and the number of poles connected in series, on a single polarity or divided between both polarities (it is preferable to connect the negative polarity to the fixed contact side).



Number of poles to be connected in series according to the operational voltage		
Operational voltage	500 V	1
	1000 V	2
	1500 V	Please, consult us.

Normal operation: Ue ≥ U supply.

Rated operational current in A at θ ≤ 40 °C					
Contactor size CV3B [1]		**CV3B** and **LC1B**			
F	**H**	**L**	**M**	**P**	**R**
80	300	800	1000	1800	2500

The use of a contactor selected according to the table above ensures current breaking up to 4 times the operational current.

Increase in rated operational current by connecting 2 poles in parallel

The equivalent operational current for 2 poles in parallel is equal to 2 x Ie x 0.8.



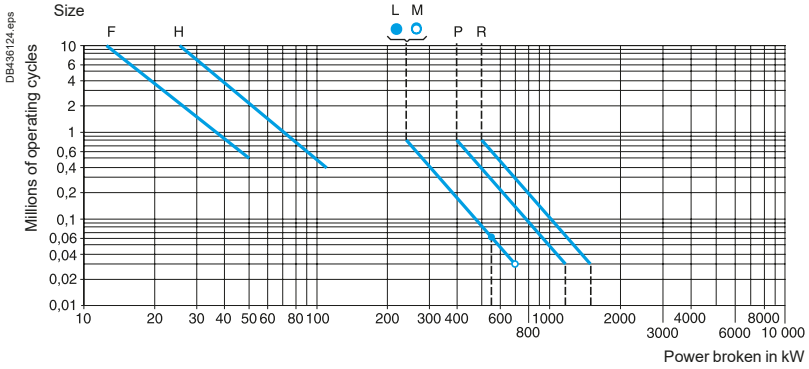
(1) To obtain the complete reference of the contactor refer to pages B10/29 and B10/30. For customised compositions or dimensional specifications, please use the Order form on page B10/43 or consult your Regional Sales Office.

Selection criteria of the CV3B and LC1B contactor size - utilization category DC-1

Power broken			
Utilisation category	**U broken**	**I broken**	**P broken**
DC-1: Non inductive or slightly inductive loads	Ue	Ie	Ue x Ie

Electrical durability (time constant L/R ≤ 1 ms)
The electrical durability can be read directly from the curves below, having previously calculated the power broken as follows:
P broken = U broken x I broken.
The table gives the values of Uc and Ic for the various utilisation categories.

Power broken per pole (time constant L/R ≤ 1 ms)
The required durability can be obtained, depending on the application, by increasing the number of poles in series or in parallel, or by increasing the contactor size.



Number of main poles

The curve shows the number of operating cycles according to the power broken by two main poles connected in series. For a single pole, double the value of power broken before using the curves.

Thermal limit

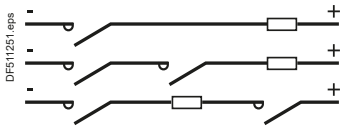
The following limits must not be exceeded: 120 operating cycles/hour at 60 % or 300 operating cycles/hour at 30 % on-load factor, at the rated operational current Ie.

Selection criteria of the CV3B and LC1B contactor size - utilization category DC-3 and DC-5

The selection of the contactor size and number of poles to be connected in series is made according to:
- the maximum operational voltage Ue
- the power broken
- the required electrical durability
- the nature of the load, in particular the time constant L/R
- the thermal operating conditions.

Maximum operational voltage Ue

This depends on the time constant L/R of the circuit and the number of poles connected in series, on a single polarity or divided between both polarities (it is preferable to connect the negative polarity to the fixed contact side).



Number of poles to be connected in series according to the operational voltage and time constant L/R (in ms) of the circuit

Time constant in ms		15	30	60	90	120	150
Operational voltage	125 V	1	1	1	2	2	2
	225 V	1	1	2	3	3	4
	330 V	1	2	3	3	4	–
	440 V	1	2	3	4	–	–
	850 V	2	3	4	–	–	–
	1200 V (consult us)	3	4	–	–	–	–
	1500 V (consult us)	4	–	–	–	–	–

Normal operation: Ue ≥ U supply.
With breaking during counter current braking (plugging): Ue ≥ 1.5 U supply.

Rated operational current in A at θ ≤ 40 °C

Contactor size CV3B (1)		CV3B and LC1B			
F	H	L	M	P	R
80	300	800	1000	1800	2500

The use of a contactor selected according to the table above ensures current breaking up to 4 times the operational current.

Increase in rated operational current by connecting 2 poles in parallel

The equivalent operational current for 2 poles in parallel is equal to 2 x Ie x 0.8.



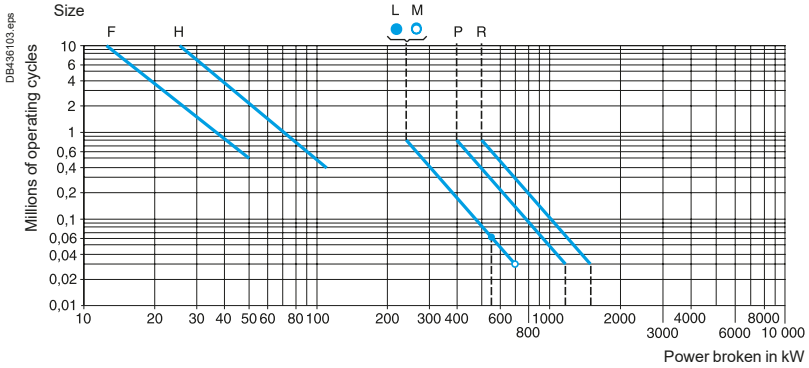
(1) To obtain the complete reference of the contactor refer to pages B10/29 and B10/30. For customised compositions or dimensional specifications, please use the Order form on page B10/43 or consult your Regional Sales Office.

Selection criteria of the CV3B and LC1B contactor size - utilization category DC-3 and DC-5

Power broken			
Utilisation category	**U broken**	**I broken**	**P broken**
DC-3: Shunt motors, reversing, inching	Ue	2.5 Ie	Ue x 2.5 Ie
DC-5: Series motors, reversing, inching	Ue	2.5 Ie	Ue x 2.5 Ie

Electrical durability (time constant L/R ≤ 15 ms)
The electrical durability can be read directly from the curves below, having previously calculated the power broken as follows:
P broken = U broken x I broken.
The table gives the values of Uc and Ic for the various utilisation categories.

Power broken per pole (time constant L/R ≤ 15 ms)
The required durability can be obtained, depending on the application, by increasing the number of poles in series or in parallel, or by increasing the contactor size.



Example: 30 kW motor, 500 V-70 A in category DC-3: P broken = Ue x 2.5 Ie = 500 x 2.5 x 70 = 86 kW or 43 kW per pole.
*For a 2-pole size **F** contactor, the curve gives an electrical durability of 6 x 10^5 operating cycles.*

Electrical durability depending on the time constant

- According to the time constant L/R.
- L/R ≤ 15 ms, read the number of operating cycles directly from the curves.
- 15 < L/R ≤ 30 ms, the number of operating cycles is equal to the number read from the curves x $\frac{15}{L/R}$.
- L/R > 30 ms, please consult your Regional Sales Office.

Thermal limit

The following limits must not be exceeded: 120 operating cycles/hour at 60 % or 300 operating cycles/hour at 30 % on-load factor, at the rated operational current Ie.

From assembly definition to contactor ordering

Contactor assembly definition
The criteria required to define the composition of a contactor are:
- the number of N/O and N/C power poles
- the current and power supply voltage
(note: on a d.c. supply, the time constant $\frac{L}{R}$ of the load must be known in order to define the number of poles to be wired in series to break the arc)
- the control circuit voltage
- the number of auxiliary contacts.

Contactor ordering - product reference composition
For all contactors:
- configuration software “bar contactor soft-customer.xls”
Link for download: https://www.se.com/ww/en/product-range-download/667-tesys-b/#/software-firmware-tab
- from order form in TeSys B catalogue ref. DIA2070702EN.

For contactors CV1BF/BH/BK, CV3BF/BH:
- software or selection tables below.

Checking of contactor possible assemblies
CV1B and CV3B have some restrictions:
- in rated operational current (Ie) per power pole
- in number of N/O - N/C power poles
- in number of auxiliary contacts.
Please refer to tables below.

Rated operational current per poles - codes per contactor type

Contactor type		CV1BF CV3BF	CV1BH CV3BH	CV1BK
Rated operational current (1)	11 A	E	–	–
	13 A	M	–	–
	20 A	N	–	–
	40 A	P	–	–
	50 A	Q	Q	–
	80 A	F	F	–
	125 A	–	R	I
	200 A	–	G	S
	250 A	–	–	H
	300 A	–	H	–
	320 A	–	–	–
	400 A	–	–	U
	470 A	–	–	–
	500 A	–	–	V
	630 A	–	–	K
	1000 A	–	–	–
	0 no magnetic blowing	Z	Z	Z

(1) Other rating: contact us.

CV1B contactors: maximum number of power poles

Contactor type	CV1BF		CV1BH		CV1BK	
Pole type	N/O	N/C	N/O	N/C	N/O	N/C
Number of poles	5	0	4	0	4	0
	0	2	0	2	0	2
	2	1	2	1	2	1

CV3B contactors: maximum number of power poles

Contactor type	CV3BF		CV3BH	
Pole type	N/O	N/C	N/O	N/C
Number of poles	5	0	4	0
	0	2	0	2
	1	2	–	–
	3	1	2	1

CV1B/CV3B contactors: maximum number of auxiliary contacts

Contactor type	CV1B		CV3B	
Pole type	N/O	N/C	N/O	N/C
	4 + 1 time delay if necessary			

Examples

- Switching of single-phase capacitor: 400 V - 80 A - 1 N/O main pole. 220 V / 50 Hz.
control circuit voltage, 3 N/O and 2 N/C auxiliary contacts. Reference: **CV1BF1F0ZM5A**.
- Switching of d.c. heating circuits: 800 V - 250 A - 2 N/O main poles - 48 V ⎓.
control circuit, instantaneous auxiliary contact 1 N/O + 1 on-delay. Reference: **CV3BH2H0ZEDA + LADT0, 2 or 4**.

Other versions

To obtain a composition with more main poles or with more than 4 auxiliary contacts, please use **order form CF 452, on** catalogue DIA2070702EN.

Product reference coding table

			Serie		Size		Number of N/O poles	Op. current in N/O pole	Number of N/C poles	Op. current in N/C pole		Control voltage	Control frequency	Aux. contacts
Type of contactor related to application														
~ 690 V, ⎓ 220 V/pole			**CV1B**											
~ 1000 V, ⎓ 440 V/pole			**CV3B**											
Contactor size AC-1/AC-3														
CV1: 80/80 A		CV3: 80/80 A			**F** *									
CV1: 300/250 A		CV3: 300/285 A			**H** *									
Number of poles														
N/O poles		0 N/O					**0**							
		1 N/O					**1**							
		2 N/O					**2**							
		3 N/O					**3**							
		4 N/O					**4**							
N/C poles		0 N/C							**0**					
		1 N/C							**1**					
Operational current (determines the blow-out coil size)														
CV1BF/CV3BF		CV1BH/CV3BH												
AC	DC	AC	DC											
0 A breaking		0 A breaking						**Z**		**Z**				
0.9 A	1 A	0.7 A	1.05 A					**A**		**A**				
1.75 A	1.9 A	1.25 A	1.95 A					**B**		**B**				
3.6 A	4 A	2.5 A	3.85 A					**C**		**C**				
6.8 A	7.6 A	4.7 A	7.5 A					**D**		**D**				
11 A	12 A	8 A	12 A					**E**		**E**				
13 A	14.5 A	10 A	15 A					**M**		**M**				
20 A	22 A	17 A	24 A					**N**		**N**				
40 A	45 A							**P**		**P**				
50 A	55 A	60 A	90 A					**Q**		**Q**				
80 A	80 A	80 A	120 A					**F**		**F**				
125 A		130 A	190 A					**R**		**R**				
200 A		200 A	200 A					**G**		**G**				
300 A		300 A	300 A					**H**		**H**				
Control circuit voltage														
24 V												**B**		
48 V												**E**		
110 V												**F**		
120 V												**K**		
127 V												**G**		
208 V												**L**		
220 V												**M**		
230 V												**P**		
240 V												**U**		
380 V												**Q**		
400 V												**V**		
Operating frequency														
50 Hz													**5**	
60 Hz													**6**	
50/60 Hz (with rectifier + economy resistor)													**7**	
⎓													**D**	
⎓ with economy resistor													**R**	
Auxiliary contacts (LA1BN32 + additives (fitted as standard))														
Instantaneous		3 N/O + 2 N/C												**A**

To check whether the symbol combinations are possible, refer to the selection information and guide on page B10/29.
If in doubt, fill out order form CF 452, on page B10/43.

★ *Can use any additives in the range of contactors* TeSys D *except LA6DK, and LAD6K LAD8N.*

Important information for use by Schneider Electric
To place an order in SAP GRC switch-LOGOS
Example: Order the contactor CV1BH2HCZM5A
■ enter in the Reference product "CV1BH"
■ in the field "Technical text", specify "CV1BH2H02M5A".

Product reference coding table

		Serie	Size		Number of N/O poles	Op. current in N/O pole	Number of N/C poles	Op. current in N/C pole	Pole type	Control voltage	Control frequency		Aux. contacts
Type of contactor related to application													
∼ 690 V, ⎓ 220 V/pole		**CV1B**											
∼ 1000 V, ⎓ 440 V/pole													
Contactor size AC-1/AC-3													
CV1: 630/460 A			**K**										
Number of poles													
N/O poles	0 N/O				**0**								
	1 N/O				**1**								
	2 N/O				**2**								
	3 N/O				**3**								
	4 N/O				**4**								
N/C poles	0 N/C						**0**						
	1 N/C						**1**						
	2 N/C						**2**						
Type of poles													
∼ 690 V, ⎓ 220 V/pole	Type 1 pole (PN1)								**1**				
∼ 1000 V, ⎓ 440 V/pole	Type 3 pole (PN3)								**3**				
Operational current (determines the blow-out coil size)													
0 A breaking						**Z**		**Z**					
150 A						**I**		**I**					
250 A						**S**		**S**					
300 A						**H**		**H**					
400 A						**U**		**U**					
500 A						**V**		**V**					
630 A						**K**		**K**					
Control circuit voltage													
24 V										**B**			
48 V										**E**			
110 V										**F**			
120 V										**K**			
127 V										**G**			
208 V										**L**			
220 V										**M**			
230 V										**P**			
240 V										**U**			
380 V										**Q**			
400 V										**V**			
415 V										**N**			
440 V										**R**			
480 V										**T**			
500 V										**S**			
600 V										**X**			
Operating frequency													
50 Hz											**5**		
60 Hz											**6**		
50/60 Hz (with rectifier + economy resistor)											**7**		
⎓											**D**		
⎓ with economy resistor											**R**		
Auxiliary contacts (LA1BN32 auxiliary contact block)													
3 N/O - instantaneous	1 aux. contact block												**A**
2 N/C - instantaneous	2 aux. contact blocks												**B**

To check whether the symbol combinations are possible, refer to the selection information and guide on page B10/29.
If in doubt, fill out order form CF 452, on page B10/43.



LC1BP33

Contactors for motor control in category AC-3, from 750 to 1800 A (~ or ⎓)

3-pole contactors

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3							Rated operational current in AC-3 440V up to	Instantaneous auxiliary contacts		Basic reference, to be completed by adding the voltage code (1)	Weight
220 V 230 V	380 V 400 V	415 V	440 V	500 V	660 V 690 V	1000 V					
kW	kW	kW	kW	kW	kW	kW	A				kg
220	400	425	450	500	560	530	750	2	2	**LC1BL33●22**	57.000
								3	1	**LC1BL33●31**	57.000
								1	3	**LC1BL33●13**	57.000
								4	–	**LC1BL33●40**	57.000
280	500	530	560	600	670	530	1000	2	2	**LC1BM33●22**	60.000
								3	1	**LC1BM33●31**	60.000
								1	3	**LC1BM33●13**	60.000
								4	–	**LC1BM33●40**	60.000
425	750	800	800	750	750	670	1500	2	2	**LC1BP33●22**	94.000
								3	1	**LC1BP33●31**	94.000
								1	3	**LC1BP33●13**	94.000
								4	–	**LC1BP33●40**	94.000
500	900	900	900	900	900	750	1800	2	2	**LC1BR33●22**	129.000
								3	1	**LC1BR33●31**	129.000
								1	3	**LC1BR33●13**	129.000
								4	–	**LC1BR33●40**	129.000

Contactors for control in category AC-1, from 800 to 2750 A (~ or ⎓)

Single, 2, 3 or 4-pole contactors

Maximum operational current in AC-1 (θ ≤ 40 °C)	Number of poles	Instantaneous auxiliary contacts		Basic reference, to be completed by adding the voltage code (1)	Weight
A					kg
800	1	2	2	**LC1BL31●22**	31.000
		3	1	**LC1BL31●31**	31.000
		1	3	**LC1BL31●13**	31.000
		4	–	**LC1BL31●40**	31.000
	2	2	2	**LC1BL32●22**	44.000
		3	1	**LC1BL32●31**	44.000
		1	3	**LC1BL32●13**	44.000
		4	–	**LC1BL32●40**	44.000
	3	2	2	**LC1BL33●22**	57.000
		3	1	**LC1BL33●31**	57.000
		1	3	**LC1BL33●13**	57.000
		4	–	**LC1BL33●40**	57.000
	4	2	2	**LC1BL34●22**	71.000
		3	1	**LC1BL34●31**	71.000
		1	3	**LC1BL34●13**	71.000
		4	–	**LC1BL34●40**	71.000

(1) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Volts	48	110	120	125	127	220	230	240	380	400	415	440	500
~ 50…400 Hz	–	F	K	–	G	M	P	U	Q	V	N	R	S
⎓	ED	FD	–	GD	–	MD	–	UD	–	–	–	RD	SD

*For voltages other than those indicated above, replace the p in the reference with the the operational voltage (3 figures) and the type of current (2 letters: **AC** for a.c. supply and **DC** for d.c. supply). Example: 82 V d.c., the reference becomes LC1BP33**082DC**22.*



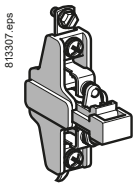
LC1BP33

Contactors for control in category AC-1, from 800 to 2750 A (~ or ⎓)

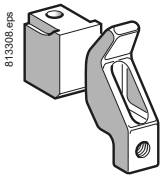
Single, 2, 3 or 4-pole contactors

Maximum operational current in AC-1 (θ ≤ 40 °C)	Number of poles	Instantaneous auxiliary contacts		Basic reference, to be completed by adding the voltage code (1)	Weight
A					kg
1250	1	2	2	**LC1BM31●22**	34.000
		3	1	**LC1BM31●31**	34.000
		1	3	**LC1BM31●13**	34.000
		4	–	**LC1BM31●40**	34.000
	2	2	2	**LC1BM32●22**	47.000
		3	1	**LC1BM32●31**	47.000
		1	3	**LC1BM32●13**	47.000
		4	–	**LC1BM32●40**	47.000
	3	2	2	**LC1BM33●22**	60.000
		3	1	**LC1BM33●31**	60.000
		1	3	**LC1BM33●13**	60.000
		4	–	**LC1BM33●40**	60.000
	4	2	2	**LC1BM34●22**	74.000
		3	1	**LC1BM34●31**	74.000
		1	3	**LC1BM34●13**	74.000
		4	–	**LC1BM34●40**	74.000
2000	1	2	2	**LC1BP31●22**	41.000
		3	1	**LC1BP31●31**	41.000
		1	3	**LC1BP31●13**	41.000
		4	–	**LC1BP31●40**	41.000
	2	2	2	**LC1BP32●22**	65.000
		3	1	**LC1BP32●31**	65.000
		1	3	**LC1BP32●13**	65.000
		4	–	**LC1BP32●40**	65.000
	3	2	2	**LC1BP33●22**	94.000
		3	1	**LC1BP33●31**	94.000
		1	3	**LC1BP33●13**	94.000
		4	–	**LC1BP33●40**	94.000
	4	2	2	**LC1BP34●22**	120.000
		3	1	**LC1BP34●31**	120.000
		1	3	**LC1BP34●13**	120.000
		4	–	**LC1BP34●40**	120.000
2750	1	2	2	**LC1BR31●22**	52.000
		3	1	**LC1BR31●31**	52.000
		1	3	**LC1BR31●13**	52.000
		4	–	**LC1BR31●40**	52.000
	2	2	2	**LC1BR32●22**	85.000
		3	1	**LC1BR32●31**	85.000
		1	3	**LC1BR32●13**	85.000
		4	–	**LC1BR32●40**	85.000
	3	2	2	**LC1BR33●22**	129.000
		3	1	**LC1BR33●31**	129.000
		1	3	**LC1BR33●13**	129.000
		4	–	**LC1BR33●40**	129.000
	4	2	2	**LC1BR34●22**	160.000
		3	1	**LC1BR34●31**	160.000
		1	3	**LC1BR34●13**	160.000
		4	–	**LC1BR34●40**	160.000

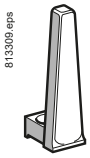
(1) See previous page.



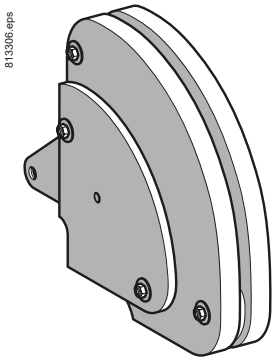
ZC4GM1



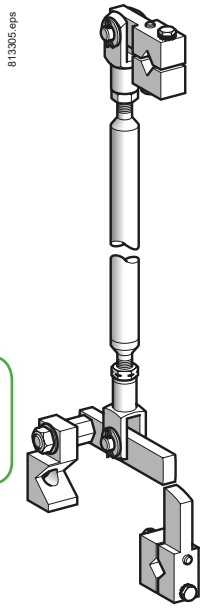
PA1LB80
(PA1LB76 + PA1LB75)



PA1LB89



PA1LB50



EZ2LB0601

Spare parts

Description	For contactor	Composition	Reference	Weight kg
Instantaneous auxiliary contact blocks	LC1B	1 N/O	**ZC4GM1**	0.030
		1 N/C	**ZC4GM2**	0.030

Description	For contactor	Number of sets required per contactor pole	Set reference	Weight kg
Set of contacts (1 moving contact, 1 fixed contact)	LC1BL	1	**PA1LB80**	0.420
	LC1BM	1	**PA1LB80**	0.420
	LC1BP	2	**PA1LB80**	0.420
	LC1BR	3	**PA1LB80**	0.420

Description	For contactor	Reference	Weight kg
Moving contact only (for 1 finger)	LC1B	**PA1LB75**	0.220
Fixed contact only (for 1 finger)	LC1B	**PA1LB76**	0.200
Blow-out horn only (for 1 finger)	LC1B	**PA1LB89**	0.120
Arc chamber (for 1 contactor pole)	LC1BL	**PA1LB50**	3.700
	LC1BM	**PA1LB50**	3.700
	LC1BP	**PA1PB50**	6.200
	LC1BR	**PA1RB50**	8.500

Mounting accessories

Description	For contactor	Sold in lots of	Unit reference	Weight kg
Bar support bracket for mounting on 120 or 150 mm centres	LC1BL to BR	2	**LA9B103**	1.620

Assembly of two vertically mounted contactors by the customer

Description	For contactor	Reference	Weight kg
Mechanical interlock and locking device components	LC1B	**EZ2LB0601**	1.280

Specifications

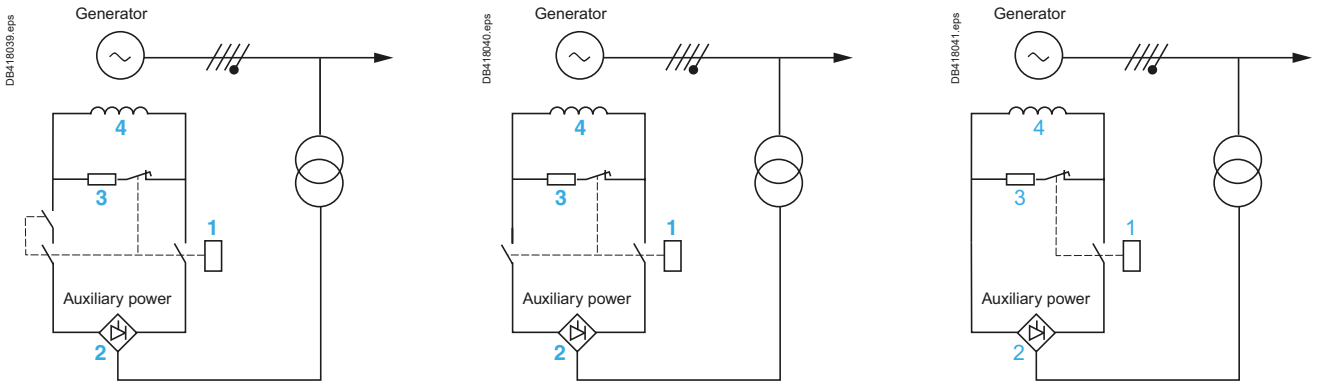
- Positive mechanical interlock between two vertically mounted contactors of the same or different ratings.
- Connecting rod with cranks mounted on the right-hand, pole side.
- Vertical fixing centres of the two contactors: 600 mm.

Description	Specification	Height mm	Sold in lots of	Unit reference	Weight kg
Notched mounting rails used as uprights and as equipment support	2 mm steel, with zinc chromate treatment	1650	4	**AM1EC165**	2.460
		1850	4	**AM1EC185**	2.760
		2000	4	**AM1EC200**	2.980
1/4 turn sliding clip nut and corresponding screw for assembly of rails AM1EC	M8	–	10	**NSYSNM8**	0.020
	M8 x 18	–	10	**AF1VC820**	0.024

Introduction

Variable composition contactors CVE, CWE, CVX, CRX, CWXB are designed for switching the excitation circuits of synchronous machines, in particular electrical power station generators, for operational currents from 80 to 2750 A.
Example: Static excitation generator.

Basic scheme



1 Excitation contactor
2 Thyristor bridge
3 Discharge resistor Rd
4 Excitation winding

Operating principle

The voltage delivered by the generator is related to the current flowing through the excitation winding 4.

Start-up phase

- The contactor 1 closes, off load.
- An adjustable auxiliary power supply generates current in the excitation winding 4 to allow power-up of the generator.
- When the voltage delivered by the generator is sufficient to supply the excitation winding 4 via a thyristor bridge 2, the auxiliary supply is switched off.

Stop phase

When a stop instruction is received, the thyristor bridge 2 operates for a few seconds as an inverter, then the excitation contactor 1 opens.
The function of the N/C pole is to discharge residual electromagnetic energy from the excitation winding 4 via the discharge resistor Rd 3.

Under normal operating conditions, breaking is therefore easy, especially as the N/O poles and the N/C pole are make before break.
However, in the event of a problem, the contactor must be able to break.

Contactor selection

Selection is done according to the nominal operating voltage of the machine and the necessity or not to fully isolate the thyristor bridge coil of the power supply (1, 2, or 3 N/O poles).

Note: *The N/C pole, which is used for machine de-excitation, has no arc chambers. Its breaking capacity is nil. Re-energisation of the contactor must therefore be avoided during the de-excitation phase.*
If there is any risk of this happening, it is advisable to add an off-delay function that prevents pick-up of the contactor for the 10 seconds following drop-out.

CVEB and CWEB contactors composition:

■ 2 or N/O poles with magnetic blow-out (80…300 A)
■ 1 N/C pole without blow-out, overlapping contacts (possible mounting of a blow-out device)
■ 1 electromagnet with d.c. supply
□ either mechanical latching (CWEB)
□ or with economy resistor (CVEB).
■ 1 ZC4GM auxiliary contact or 1 or 2 instantaneous auxiliary contact heads (3 to 6 N/O contacts + 2 to 4 N/C contacts).
■ 1 mounting bar, 1 rotary drive shaft.

The following can be added:
■ 1 or 2 blocks of 4 instantaneous auxiliary contacts LADN●●, without increasing the overall size of the contactor
■ or 1 time delay block LADT● or LADR●.

Note: *it is not possible to fit a mechanical latch block type LA6DK●● on these contactors.*

Characteristics

CVEB, CWEB contactor sizes			F		H	
N/O pole			**1 pole**	**2 poles**	**1 pole**	**2 poles**
Rated current	θ ≤ 40°C	**A**	80	80	300	300
Maximum operating voltage	d.c	**V**	220	440	220	440
Rated insulation voltage According to IEC 60664-1	d.c	**V**	690	690	690	690
Making capacity	d.c	**A**	1600	1600	4000	4000
Breaking capacity	d.c L/R = 15 ms	**A**	240	240	900	900
Overlap time with the N/C pole		**ms**	2	2	2	2
N/C pole						
Rated current	θ ≤ 40°C	**A**	80	80	300	300
Making capacity	d.c	**A**	1600	1600	4000	4000
Breaking capacity	d.c L/R = 15 ms	**A**	0	0	0	0
Permissible current	For 10 s	**A**	480	480	1400	1400

TeSys B Bar mounted contactors

Predefined composition - CVEB, CWEB, CVXB, CWXB contactors for synchronous motor excitation circuit

CVXB, CRXB and CWXB contactors composition:

■ 1 to 3 N/O poles with magnetic blow-out (80…2750 A)
■ 1 N/C pole without blow-out, overlapping contacts (possible mounting of a blow-out device)
■ 1 electromagnet with d.c supply
□ or with economy resistor (CVXB)
□ either with magnetic latching (CRXB)
□ either with mechanical latching (CWXB)
■ 1 ZC4GM auxiliary contact or 1 or 2 instantaneous auxiliary contacts (3 to 6 N/O contacts + 2 to 4 N/C contacts)
■ 1 mounting bar, 1 rotary drive shaft.

The following can be added:
■ 1 or 2 blocks of 4 instantaneous auxiliary contacts type LADN●●, without increasing the overall size of the contactor.
■ or 1 time delay block type LADT● or LADR●.

Note: *it is not possible to fit a mechanical latch block type LA6DK●● on these contactors.*

Characteristics

Size of contactors C●XB (1)			F			H		
N/O pole			**1 pole**	**2 poles**	**3 poles**	**1 pole**	**2 poles**	**3 poles**
Rated current	θ ≤ 40°C	**A**	80	80	80	300	300	300
Maximum operating voltage		**V DC**	440	850	1000	440	850	1000
Rated insulation voltage		**V DC**	1000	1000	1000	1000	1000	1000
Making capacity		**A**	1400	1400	1400	3500	3500	3500
Breaking capacity	For U max	**A**	500	500	500	1200	1200	1200
Overlap time with the N/C pole		**ms**	2	2	2	2	2	2
N/C pole								
Rated current	θ ≤ 40°C	**A**	80	80	80	300	300	300
Making capacity		**A**	1600	1600	1600	4000	4000	4000
Breaking capacity		**A**	0	0	0	0	0	0
Permissible current	For 10s	**A**	480	480	480	1400	1400	1400

Characteristics

Size of contactors C●XB			K			L		
N/O pole			**1 pole**	**2 pole**	**3 poles**	**1 pole**	**2 pole**	**3 poles**
Rated current	θ ≤ 40°C	**A**	630	630	630	800	800	800
Maximum operating voltage		**V DC**	440	850	1000	440	850	1200
Rated insulation voltage		**V DC**	1000	1000	1000	1500	1500	1500
Making capacity		**A**	6500	6500	6500	14000	14000	14000
Breaking capacity	For U max	**A**	2500	2500	2500	3200	3200	3200
Overlap time with the N/C pole		**ms**	2	2	2	2	2	2
N/C pole								
Rated current	θ ≤ 40°C	**A**	630	630	630	630	630	630
Making capacity		**A**	6500	6500	6500	6500	6500	6500
Breaking capacity		**A**	0	0	0	0	0	0
Permissible current	For 10s	**A**	3600	3600	3600	3600	3600	3600

Characteristics

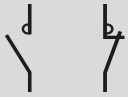
Size of contactors C●XB			M			P			R		
N/O pole			**1 pole**	**2 poles**	**3 poles**	**1 pole**	**2 poles**	**3 poles**	**1 pole**	**2 poles**	**3 poles**
Rated current	θ ≤ 40°C	**A**	1250	1250	1250	2000	2000	2000	2750	2750	2750
Maximum operating voltage		**V DC**	440	850	1200	440	850	1200	440	850	1200
Rated insulation voltage		**V DC**	1500	1500	1500	1500	1500	1500	1500	1500	1500
Making capacity		**A**	14000	14000	14000	21000	21000	21000	25000	25000	25000
Breaking capacity	For U max	**A**	4400	4400	4400	7200	7200	7200	10000	10000	10000
Overlap time with the N/C pole		**ms**	2	2	2	2	2	2	2	2	2
N/C pole											
Rated current	θ ≤ 40°C	**A**	630	630	630	630	630	630	630	630	630
Making capacity		**A**	6500	6500	6500	6500	6500	6500	6500	6500	6500
Breaking capacity		**A**	0	0	0	0	0	0	0	0	0
Permissible current	For 10s	**A**	3600	3600	3600	3600	3600	3600	3600	3600	3600

(1) CRX, CVXB legacy size 'G', 'J'. Please consult us.

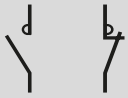
TeSys B Bar mounted contactors

Predefined composition - CVEB, CWEB, CVXB, CWXB contactors for synchronous motor excitation circuit

CVEB, CWEB contactors equipped with type 1 (PN1) N/O poles

Control circuit						With economy resistor	With mechanical latching	
Operational voltage	Number of poles N/O	Number of poles N/C	Instantaneous auxiliary contacts [2]		Rated operational current	Basic reference to be completed by adding the code of the blow-out coils [1], of the control voltage [2] and of the aux. contacts [3]	Basic reference to be completed by adding the code of the blow-out coils [1], of the control voltage [2] and of the aux. contacts [3]	Scheme
								
V					A			
220V DC	1	1	1, 3 or 6	1, 2 or 4	80	CVEBF1●1●●●●	CWEBF1●1●●●●	1
					200	CVEBG1●1●●●●	CWEBG1●1●●●●	1
					300	CVEBH1●1●●●●	CWEBH1●1●●●●	1
440V DC	2	1	1, 3 or 6	1, 2 or 4	80	CVEBF2●1●●●●	CWEBF2●1●●●●	2
					200	CVEBG2●1●●●●	CWEBG2●1●●●●	2
					300	CVEBH2●1●●●●	CWEBH2●1●●●●	2

CVX B, CWX B and CRX B contactors equipped with N/O poles type PA3 (F to H), PN3 (J and K) or PA1 (L to R)

Control circuit						Economy resistor	Mechanical latching	Magnetic latching	
Operational voltage	Number of poles N/O	Number of poles N/C	Instantaneous auxiliary contacts [2]		Rated operational current	Basic reference to be completed by adding the code of the blow-out coils [1], of the control voltage [2] and of the aux. contacts [3]	Basic reference to be completed by adding the code of the blow-out coils [1], of the control voltage [2] and of the aux. contacts [3]	Basic reference to be completed by adding the code of the blow-out coils [1], of the control voltage [2] and of the aux. contacts [3]	Scheme
									
V					A				
440V DC	1	1	1, 3 or 6	1, 2 or 4	80	CVXBF1●1●●●●	CWXBF1●1●●●●	CRXBF1●1●●●●	1
					300	CVXBH1●1●●●●	CWXBH1●1●●●●	CRXBH1●1●●●●	1
					630	CVXBK1●1●●●●	CWXBK1●1●●●●	CRXBK1●1●●●●	1
					800	CVXBL1●1●●●●	CWXBL1●1●●●●	CRXBL1●1●●●●	1
					1250	CVXBM1●1●●●●	CWXBM1●1●●●●	CRXBM1●1●●●●	1
					2000	CVXBP1●1●●●●	CWXBP1●1●●●●	CRXBP1●1●●●●	1
					2750	CVXBR1●1●●●●	CWXBR1●1●●●●	CRXBR1●1●●●●	1
850V DC	2	1	1, 3 or 6	1, 2 or 4	80	CVXBF2●1●●●●	CWXBF2●1●●●●	CRXBF2●1●●●●	2
					300	CVXBH2●1●●●●	CWXBH2●1●●●●	CRXBH2●1●●●●	2
					630	CVXBK2●1●●●●	CWXBK2●1●●●●	CRXBK2●1●●●●	2
					800	CVXBL2●1●●●●	CWXBL2●1●●●●	CRXBL2●1●●●●	2
					1250	CVXBM2●1●●●●	CWXBM2●1●●●●	CRXBM2●1●●●●	2
					2000	CVXBP2●1●●●●	CWXBP2●1●●●●	CRXBP2●1●●●●	2
					2750	CVXBR2●1●●●●	CWXBR2●1●●●●	CRXBR2●1●●●●	2
1000V DC	3	1	1, 3 or 6	1, 2 or 4	80	CVXBF3●1●●●●	CWXBF3●1●●●●	CRXBF3●1●●●●	3
					300	CVXBH3●1●●●●	CWXBH3●1●●●●	CRXBH3●1●●●●	3
					630	CVXBK3●1●●●●	CWXBK3●1●●●●	CRXBK3●1●●●●	3
1200V DC	3	1	1, 3 or 6	1, 2 or 4	800	CVXBL3●1●●●●	CWXBL3●1●●●●	CRXBL3●1●●●●	3
					1250	CVXBM3●1●●●●	CWXBM3●1●●●●	CRXBM3●1●●●●	3
					2000	CVXBP3●1●●●●	CWXBP3●1●●●●	CRXBP3●1●●●●	3
					2750	CVXBR3●1●●●●	CWXBR3●1●●●●	CRXBR3●1●●●●	3

(1) For the codes of the blow-out coils, please refer next page.
(2) Existing control voltages (other voltages, please consult us).

Volts	24	48	110	125	220	230	240	250
DC	BD ★	ED ★	FD	GD	MD	PD	-	UD
AC	B7 ★	E7 ★	F7	G7	M7	P7	U7	-

★ *K to R rating: please consult us.*

(3) 1 auxiliary contact type ZC4GM1 (code 1) or 1 auxiliary contact type ZC4GM2 (code 2) or 1 auxiliary contacts block type LA1BN32 (3 N/O contacts + 2 N/C contacts) (code A) or 2 auxiliary contacts blocks type LA1BN32 (6 N/O contacts + 4 N/C contacts) (code B).

Predefined composition - CVE, CWE, CVX, CRX, CWXB contactors for synchronous motor excitation circuit

Ordering process

Coding principle of an excitation contactor product reference

C	V	E	B	G	2	G	1	Y	G D	1
1	2	3	4	5	6	7	8	7(1)	9	10

(1) Standard construction without blow-out: code Y.

1 - Contactor

2 - Type of control circuit of the contactor
- V = Electromagnet with economy resistor
- R = Electromagnet with magnetic latching
- W = Electromagnet with mechanical latching

3 - Type of N/O poles
- E = PN1
- X= PA3 (FB to HB), PN3 (KB) and PA1 (LB to RB)

4 - Evolution

5 - Size of the contactor (in A)

F	H	K	L	M	P	R
80	300	630	800	1250	2000	2750

6 - Number of N/O poles
1, 2 or 3 according to the scheme used by the customer

7 - Operating current (Ie)

Code	Contactor					
	BF		BH		BK	
	Ie	Rep* blow-out	Ie	Rep* blow-out	Ie	Rep* blow-out
A	1	05				
B	1.9	07				
C	4	10				
D	7,6	14				
E	12	18				
M	12	20				
N	22	25				
P	45	9				
Q	55	7				
F	80	4				
R						
G			200	2		
H			300	1		
T						
U					400	53
J						
V					500	52
K					630	51
Y	Only for CV1 with pole type PN5 ou PR5 without blow-out					

8 - 1 N/C pole

9 - Control voltage

Code	BD	ED	FD	GD	MD		UD
Uc (V DC)	24	48	110	125	220		250
Code	**B7**	**E7**	**F7**	**G7**	**M7**	**P7**	**U7**
Uc (V AC)	24	48	110	127	220	230	240

10 - Block of auxiliary contacts
- 1 = 1 ZC4GM1
- A = 1 block type LA1BN32
- B = 2 blocks type LA1BN32 (standard configuration)

Performance label for the excitation contactors

	CVE, CRE, CWE				CVX, CRX, CWX					
	BF		BH		BF			BH		
	1P	2P	1P	2P	1P	2P	3P	1P	2P	3P
Ue (V DC)	200	440	200	440	440	850	1000	440	850	1000
In (A)	80		300		80			300		
Ie	See table 7									
Uc	See table 9									

	CVX, CRX, CWX														
	BK			BL			BM			BP			BR		
	1P	2P	3P	1P	2P	3P	1P	2P	3P	1P	2P	3P	1P	2P	3P
Ue (V DC)	440	850	1000	440	850	1000	440	850	1000	440	850	1000	440	850	1000
In (A)	630			800			1250			2000			2750		
Ie	See table 7														
Uc	See table 9														

CR1B Magnetic latching contactors introduction

The magnetic latching contactors are equipped with a specific electromagnet allowing them to maintain position “ON” although the coil is fed by any current.

Use

The specific properties of magnetic latching contactors make them suitable for many uses:

Properties	Use
Memory retention of the sequence in automatic equipment, in the event of loss of the control voltage.	Refineries, power plants, excitation circuits.
Energy saving, as no current is drained when the contactor is activated.	Contactor staying activated for long periods. Examples: refineries, alimentation energy, ST distribution.
Change of state “Work” / “Rest” by current pulse sent to the coil.	Selective opening control.
Insensitivity to main perturbations.	No unexpected opening or closing of power poles
Use of contactors beyond breaking capacity as they are activated off-load.	Passer diverter, for use with 1000 V
Silent contactor when locked in ON position	

Electro-magnet operation of the CR1B contactors

The CR1B magnetic latching contactors are equipped with a single coil, supplied with direct current or alternating current through a rectifier.
The latching is obtained by direct feeding of the coil with a current in a given direction.
The unlatching is produced by a current of opposite direction, adjusted by resistors.

Range

- The magnetic latching contactors are available from 80 to 630 A (Size F to K).
- The characteristics of N/O and N/C poles are identical to those of CV1 and CV3B (Size F to K).
- For other characteristics and mounting dimensions, please contact us.
- For ratings of 800 to 2750 A, see next page.

Selection criteria of contactors for rotor starting motors

In simple starting systems the contactors which short-circuit the rotor current are subjected to a static voltage, the value of which, decreasing with time, is lower the further away the contactors are located from the rotor terminals. As a result, the operational rotor voltage is deducted from the maximum operational voltage. In this way, it is possible to use contactors with a rated insulation voltage lower than the rotor voltage.

In this application, making and breaking are easy. The selection table below takes into account a ratio of 2 between the maximum rotor operational voltage (Uer) and the stator operational voltage (Ues). This ratio is proposed in starter standard IEC 60947-4.

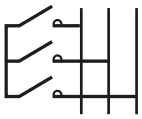
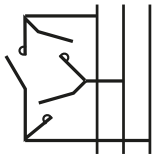
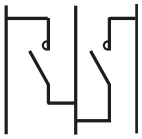
With counter current braking, the rotor operational voltage will be equal to the insulation voltage.

In a system with slowdown or braking, the selection of the contactors concerned should, in addition, take into account the breaking conditions.

The use of magnetic blow-out contactors is recommended in the event of control by a manually operated master controller.

Multiplying factor for rotor voltage and current, depending on type of contactor connection

As far as the current flowing through a rotor circuit contactor is concerned, the short time rating should be taken into account according to the starting time. Only the final rotor short-circuit contactor takes account of the continuous current.

Type of connection	Circuit diagram	I rotor / I operational	Maximum 3-phase rotor voltage Ue	3-phase rotor voltage UE with counter-current braking	Contactor type
			V	V	
Star		1	1320	660	**CV1B**
		1	2000	1000	**CV3B LC1B**
Delta		1,4	1100	550	**CV1B**
		1,4	1700	850	**CV3B LC1B**
V		1	1100	550	**CV1B**
		1	1700	850	**CV3B LC1B**

Hoisting applications

For this type of application contactor selection is made according to the duty requirements, required durability, type of connection, etc.
Please consult your Regional Sales Office.

Other versions: For rotor voltage above 3000 V ∿, please consult your Regional Sales Office.

Contactors for furnaces and induction heating applications (CE1 - CS1, CE5 - CE6, CS5 - CS6)

Induction heating covers all applications where metals (or a metal part) are heated in crucible or “channel” furnaces, or in dies, by the induction of a.c. currents at various frequencies.
There are several frequency ranges which, for industrial purposes, can be grouped as follows:
- 50 Hz to 400 Hz:
  - industrial mains power frequencies from 50 to 250 Hz
  - intermediate frequencies of 350 Hz and 400 Hz.
- Maximum operating limits for contactors (single-pole and 6-pole):
  - frequency range up to 500 Hz
  - supply voltage up to 3000 V
  - currents up to 2750 A.

Please refer to our “Contactors for furnaces and induction heating applications” catalogue.

Contactor for the grounding of supply rail tram (CV1BKS)

Designed for networks up to 1000 V DC (high closing capacity up to 43 kA) to ensure the grounding of the rail when it loses power.
But also under fault condition in the event that the rail remains supplied after the passage of the tram.
View the application form CV1BKS on the site: www.se.com.

TeSys

TeSys B Bar mounted contactors

CF 452 - Customer requirements specification form

Download the configuration software "bar contactor soft-customer.xls" on:
https://www.se.com/ww/en/product-range-download/667-tesys-b/#/software-firmware-tab

Date of order | Editor | Geog. area | Order n° | Required delivery (1) | Job n°

Company: ..... Customer Order N°: .....

Activity sector: ..... Application: .....

Number of contactors: ..... Type - size or symbol combination: .....

For devices with symbol combination: Do not fill out the form below

Voltage: ..... V **AC** ☐ **..... Hz** **DC** ☐

Number of N/O main poles: Rated current: ..... Amp

Number of N/C main poles: Rated current: ..... Amp

Any special details: .....

.....

Voltage: ..... V **AC** ☐ **..... Hz** **DC** ☐

Economy resistor: ☐ Yes ☐ No

(unless specified, an economy resistor will only be included if necessary)

For alternative control, in direct latching contact: ☐ Yes ☐ No

Customer marking: .....

Instantaneous contacts: **Number of N/O** **Number of N/C**

If a specific type or block of contacts is required, please indicate below.

Number	GM1:	GM2:	GP4:	GP5:	GP6:	LA1:

Note : For mechanical interlocking, a N/C contact must be specified for the interlocking function.

Time delay contacts N/C + N/O : **On delay** ☐ **or** **Off delay** ☐

Note: If LA1 is used, a build specification is required.

Fixing centres L: Standard ☐ Specified ☐ With L = ...

Mechanical interlock "MI":

Yes ☐ No ☐

Vertically mounted reversers fixing centres "E" =..... mm

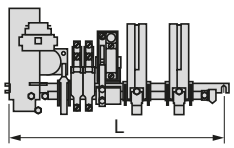
Upper position contactor: ..... Lower position contactor:

If mechanical interlock specified : Ref: .....

Supply linking components for the 2 contactors (Rod, clevis, cranks, lock, etc...) : Yes ☐ No ☐

Note : "MI" components that are part of the contactor such as the bearing, clevis or lock support are factory fitted.

Dimensions in catalogue



(Comments / Specific requirements / Special "MI" / Accessories / Etc...)

(1) Standard delivery time: 3 weeks, from receipt of order. For faster delivery, please consult your Regional Sales Office.

For use by Schneider Electric

Poles

Ref:

Ref:

Electromag:

Coil:

Coil maint. cont:

Rectifier:

Econ. resist. contact:

Econ. Resist.:

No. ZC4GM1 : **(N/O)**
No. ZC4GM2 : **(N/C)**
No. ZC1GP4 : **(N/C)**
No. ZC1GP5 : **(N/C+N/O)**
No. ZC1GP6 : **(N/O+N/O)**
No. ZC2GG1 : **(ON-Del)**
No. ZC2GG5 : **(OFF-Del)**

No. LA1BN●31 : ____
No. LA1DN●● : ____
No. LA●DT● : ____
If CV1, specif. n°:

Shaft: C or E =

Code.:

Bar: L = :

Code.:

Build see drwg.
N° :

"MI" bearing
W1
"MI" ref

Launch date

Delivery date

Contactor reference*

.....

* 3 possibilities

1) Device with symbol combination (see drwg 1492177)

2) Device n° defined on the basis of this form
Type/size/order n°/year. E.g.: CV1GB000599

3) Reference defined to "specification"

Bar mounted contactors

TeSys LR, RM1X, LRD
Overload relays

Chapter
B11

Thermal overload relays - For use with **TeSys** K contactors

Type of product	Range		Pages
Adjustable thermal overload relays For motors TeSys LRK	From 0.16 to 16 A		B11/2
Adjustable thermal overload relays For unbalanced loads TeSys LRK	From 0.8 to 16 A		B11/3

Thermal overload relays Class 10 A - For use with **TeSys** D contactors

Adjustable thermal overload relays For motors TeSys LRD	From 0.16 to 140 A		B11/4
Adjustable thermal overload relays For unbalanced loads TeSys LRD	From 0.16 to 140 A		B11/4

Thermal overload relays Class 20 - For use with **TeSys** D contactors

Adjustable thermal overload relays For motors TeSys LRD	From 0.63 to 80 A		B11/6
Adjustable thermal overload relays For unbalanced loads TeSys LRD	From 0.63 to 32 A		B11/6

Electronic thermal overload relays - For use with **TeSys** D contactors

Adjustable electronic overload relay, Multi-class, multi-scale TeSys LR9D	From 0.1 to 150 A		B11/10

Electronic thermal overload relays - For use with **TeSys** F contactors

Compensated and differential overload relays, with or without alarm TeSys LR9F	From 50 to 630 A		B11/11

Single pole magnetic over current relays

Latching or non latching overload relays TeSys RM1	From 1.15 to 630 A		B11/15

Thermistor-type protection units – For use detection of motor overheating

Protection units and PTC probes, with or without fault memory TeSys LT3	From 90 to 170 °C		B11/17

Electronic over current relays - For machine protection

Predefined or adjustable starting times, Manual reset	From 1.5 to 34 A		B11/19
Automatic, electric or manual reset	From 0.5 to 50 A		B11/19

Product references



LR2K0307

3-pole thermal overload relays for TeSys K contactors

These overload relays are designed for the protection of motors. They are compensated and phase failure sensitive. Resetting can either be manual or automatic.
Direct mounting: under the contactor for versions with screw clamp terminals only; pre-wired terminals, see pages B11/28 and B11/30.
Separate mounting: using terminal block LA7K0064 (see below).
On the front face of the overload relay:
- selection of reset mode: Manual (marked H) or Automatic (marked A),
- red pushbutton: Trip Test function,
- blue pushbutton: Stop and manual Reset,
- yellow trip flag indicator: overload relay tripped.

Protection by magnetic circuit breaker GV2LE, see pages coordination tables chapter A6.

Class 10 A (the standard specifies a tripping time of between 2 and 10 seconds at 7.2 In)

Relay setting range	Fuses to be used with selected relay Maximum rating Type			Reference
	aM	gG	BS88	
A	A	A	A	
0.11…0.16	0.25	0.5	–	**LR2K0301**
0.16…0.23	0.25	0.5	–	**LR2K0302**
0.23…0.36	0.5	1	–	**LR2K0303**
0.36…0.54	1	1.6	–	**LR2K0304**
0.54…0.8	1	2	–	**LR2K0305**
0.8…1.2	2	4	6	**LR2K0306**
1.2…1.8	2	6	6	**LR2K0307**
1.8…2.6	4	8	10	**LR2K0308**
2.6…3.7	4	10	16	**LR2K0310**
3.7…5.5	6	16	16	**LR2K0312**
5.5…8	8	20	20	**LR2K0314**
8…11.5	10	25	20	**LR2K0316**
10…14	16	32	25	**LR2K0321**
12…16	20	40	32	**LR2K0322**

Overload relays for unbalanced loads

Class 10 A: to order, replace the prefix **LR2** by **LR7** in the references selected from above (only applicable to overload relays **LR2K0305** to **LR2K0322**).
Example: **LR7K0308**.

Characteristics: pages B11/28 and B11/29
Dimensions: page B11/30
Schemes: page B11/30

Product references

PB121488.eps



LA7K0064

Accessory for TeSys LRK Thermal overload relay		
Description	**Type of connection**	**Reference**
Terminal block for separate clip-on mounting of the overload relay on 35 mm ⎓ rail	Screw clamp	**LA7K0064**

Product references


PB121489.eps

LRD●●


PB121490.eps

LRD3●●


PB121491.eps

LRD33●●


PB121492.eps

LRD43●●


PB108355.eps

LRD3●●6

3-pole differential thermal overload relays for TeSys D contactors - Class 10

- for use with fuses or magnetic circuit breakers GV2L and GV3L
- compensated relays with manual or automatic reset
- with relay trip indicator
- for a.c. or d.c.

Relay setting range (A)	Fuses to be used with selected relay aM (A)	gG (A)	BS88 (A)	For use with contactor LC1	Reference	Weight kg
Class 10 A (1) for connection by screw clamp terminals or connectors						
0.10…0.16	0.25	2	–	D09…D38	**LRD01**	0.124
0.16…0.25	0.5	2	–	D09…D38	**LRD02**	0.124
0.25…0.40	1	2	–	D09…D38	**LRD03**	0.124
0.40…0.63	1	2	–	D09…D38	**LRD04**	0.124
0.63…1	2	4	–	D09…D38	**LRD05**	0.124
1…1.6	2	4	6	D09…D38	**LRD06**	0.124
1.6…2.5	4	6	10	D09…D38	**LRD07**	0.124
2.5…4	6	10	16	D09…D38	**LRD08**	0.124
4…6	8	16	16	D09…D38	**LRD10**	0.124
5.5…8	12	20	20	D09…D38	**LRD12**	0.124
7…10	12	20	20	D09…D38	**LRD14**	0.124
9…13	16	25	25	D12…D38	**LRD16**	0.124
12…18	20	35	32	D18…D38	**LRD21**	0.124
16…24	25	50	50	D25…D38	**LRD22**	0.124
23…32	40	63	63	D25…D38	**LRD32**	0.124
30…38	40	80	80	D32 and D38	**LRD35**	0.124
Class 10 A (1) for connection by EverLink® BTR screw connectors (2)						
9…13	16	25	25	D40A…D65A	**LRD313**	0.375
12…18	20	32	35	D40A…D65A	**LRD318**	0.375
17…25	25	50	50	D40A…D65A	**LRD325**	0.375
23…32	40	63	63	D40A…D65A	**LRD332**	0.375
30…40	40	80	80	D40A…D65A	**LRD340**	0.375
37…50	63	100	100	D40A…D65A	**LRD350**	0.375
48…65	63	100	100	D50A and D65A	**LRD365**	0.375
62...80	80	125	125	D80A	**LRD380**	0.375
Class 10 A (1) for connection by screw clamp terminals or connectors						
17…25	25	50	50	D80 and D95	**LRD3322**	0.510
23…32	40	63	63	D80 and D95	**LRD3353**	0.510
30…40	40	100	80	D80 and D95	**LRD3355**	0.510
37…50	63	100	100	D80 and D95	**LRD3357**	0.510
48…65	63	100	100	D80 and D95	**LRD3359**	0.510
55…70	80	125	125	D80 and D95	**LRD3361**	0.510
63…80	80	125	125	D80 and D95	**LRD3363**	0.510
80…104	100	160	160	D80 and D95	**LRD3365**	0.510
80…104	125	200	160	D115 and D150	**LRD4365**	0.900
95…120	125	200	200	D115 and D150	**LRD4367**	0.900
110…140	160	250	200	D150	**LRD4369**	0.900
80…104	100	160	160	(3)	**LRD33656**	1.000
95…120	125	200	200	(3)	**LRD33676**	1.000
110…140	160	250	200	(3)	**LRD33696**	1.000

Class 10 A (1) for connection by lugs

Select the appropriate overload relay with screw clamp terminals or connectors from the table above and add one of the following suffixes:

- figure **6** for relays LRD01 to LRD35 and relays LRD313 to LRD380.
- **A66** for relays LRD3322 to LRD3363.

Relays LRD43●● are suitable, as standard, for use with lug-clamps.

Thermal overload relays for use with unbalanced loads

Class 10 A (1) for connection by screw clamp terminals or lugs

In the references selected above, change the prefix **LRD** (except **LRD43●●**) to **LR3D**.
Example: **LRD01** becomes **LR3D01**.
Example with **Ever**Link®connectors: **LRD340** becomes **LR3D340**.
Example with lugs: **LRD3406** becomes **LR3D3406**.

(1) Standard IEC 60947-4-1 specifies a tripping time for 7.2 times the setting current I_R: class 10 A: between 2 and 10 seconds.
*(2) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LADALLEN4**, see page B8/28).*
(3) Independent mounting of the contactor.

Overload relays

Characteristics: pages B11/31 to B11/34
Dimensions: pages B11/35 to B11/37
Schemes: page B11/37

Product references

PB108225.eps



LRD●●3

3-pole differential thermal overload relays for TeSys D contactors - Class 10 A

- for use with fuses or magnetic circuit breakers GV2L and GV3L
- compensated relays with manual or automatic reset
- with relay trip indicator
- for a.c. or d.c.

Relay setting range (A)	Fuses to be used with selected relay			For use with contactor LC1	Reference
	aM (A)	gG (A)	BS88 (A)		
Classes 10 A [1] for connection by spring terminals (only for direct mounting beneath the contactor)					
0.10…0.16	0.25	2	–	D09…D38	**LRD013**
0.16…0.25	0.5	2	–	D09…D38	**LRD023**
0.25…0.40	1	2	–	D09…D38	**LRD033**
0.40…0.63	1	2	–	D09…D38	**LRD043**
0.63…1	2	4	–	D09…D38	**LRD053**
1…1.6	2	4	6	D09…D38	**LRD063**
1.6…2.5	4	6	10	D09…D38	**LRD073**
2.5…4	6	10	16	D09…D38	**LRD083**
4…6	8	16	16	D09…D38	**LRD103**
5.5…8	12	20	20	D09…D38	**LRD123**
7…10	12	20	20	D09…D38	**LRD143**
9…13	16	25	25	D12…D38	**LRD163**
12…18	20	35	32	D18…D38	**LRD213**
16…24	25	50	50	D25…D38	**LRD223**
Class 10 A with connection by EverLink® BTR screw connectors [2] and control by spring terminals					
9…13	16	25	25	D40A…D65A	**LRD3133**
12…18	20	32	35	D40A…D65A	**LRD3183**
17…25	25	50	50	D40A…D65A	**LRD3253**
23…32	40	63	63	D40A…D65A	**LRD3323**
30…40	40	80	80	D40A…D65A	**LRD3403**
37…50	63	100	100	D40A…D65A	**LRD3503**
48…65	63	100	100	D50A and D65A	**LRD3653**
62...80	80	125	125	D80A	**LRD3803**

Thermal overload relays for use with unbalanced loads

Classes 10 A [1] for connection by BTR screw connectors [2] and control by spring terminals

In the references selected above, replace **LRD3** with **LR3D3**.
Example: **LRD3653** becomes **LR3D3653**.

Thermal overload relays for use on 1000 V supplies

Classes 10 A [1] for connection by screw clamp terminals

For relays LRD06 to LRD35 only, for an operating voltage of 1000 V, and only for independent mounting, the reference becomes **LRD33●●A66**.
Order an **LA7D3064** terminal block separately, see page B11/9.

Standard relay	Relay for 1000 V network
LRD06	LRD3306A66
LRD07	LRD3307A66
LRD08	LRD3308A66
LRD10	LRD3310A66
LRD12	LRD3312A66
LRD14	LRD3314A66
LRD16	LRD3316A66
LRD21	LRD3321A66
LRD22	LRD3322A66
LRD32	LRD3353A66
LRD35	LRD3355A66

(1) Standard IEC 60947-4-1 specifies a tripping time for 7.2 times the setting current I_r: class 10 A: between 2 and 10 seconds.
*(2) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LADALLEN4**, see page B8/28).*

Overload relays

Characteristics: pages B11/31 to B11/34
Dimensions: pages B11/35 to B11/37
Schemes: page B11/37

Product references



LRD04L...LRD32L

3-pole differential termal overload relays for TeSys D contactors - Class 20

- for use with fuses or magnetic circuit breakers GV2L and GV3L
- compensated relays with manual or automatic reset
- with relay trip indicator
- for a.c. or d.c.

Relay setting range (A)	Fuses to be used with selected relay aM (A)	gG (A)	BS88 (A)	For use with contactor LC1	Reference
Classes 20 (1) for connection by screw clamp terminals					
0.4...0.63	1	2	-	D09…D38	**LRD04L**
0.63...1	2	4	-	D09…D38	**LRD05L**
1...1.6	2	4	6	D09…D38	**LRD06L**
1.6...2.5	4	6	10	D09…D38	**LRD07L**
2.5...4	6	10	16	D09…D38	**LRD08L**
4...6	8	16	16	D09…D38	**LRD10L**
5.5...8	12	20	20	D09…D38	**LRD12L**
7...10	12	20	20	D09…D38	**LRD14L**
9...13	16	25	25	D12…D38	**LRD16L**
12...18	20	35	32	D18…D38	**LRD21L**
17...24	25	50	50	D25…D38	**LRD22L**
23...32	40	63	63	D25…D38	**LRD32L**
Class 20 (1) for connection by EverLink® BTR screw connectors (2)					
9…13	20	32	35	D40A…D65A	**LRD313L**
12…18	25	40	40	D40A…D65A	**LRD318L**
17…25	32	50	50	D40A…D65A	**LRD325L**
23…32	40	63	63	D40A…D65A	**LRD332L**
30…40	50	80	80	D40A…D65A	**LRD340L**
37…50	63	100	100	D40A…D65A	**LRD350L**
48…65	80	125	125	D50A and D65A	**LRD365L**



LRD3●●L



LR2D35●●

Classes 20 (1) for connection by screw clamp terminals					
17…25	32	50	50	D80 and D95	**LR2D3522**
23…32	40	63	63	D80 and D95	**LR2D3553**
30…40	40	100	80	D80 and D95	**LR2D3555**
37…50	63	100	100	D80 and D95	**LR2D3557**
48…65	80	125	100	D80 and D95	**LR2D3559**
55…70	100	125	125	D80 and D95	**LR2D3561**
63…80	100	160	125	D80 and D95	**LR2D3563**

Class 20 (1) for connection by lugs

For relays LRD04L to LRD32L and relays LRD313L to LRD365L, select the appropriate overload relay with screw clamp terminals or connectors from the table above and add the suffixe **6**.
Example: **LRD04L** becomes **LRD04L6**.

Thermal overload relays for use with unbalanced loads

Class 20 (1) for connection by screw clamp terminals or lugs

For relays LRD04L to LRD32L and relays LR2D3522 to LR2D3563, select the appropriate overload relay with screw clamp terminals or connectors from the table above and change the prefix LRD or LR2D to **LR3D**.
Example: **LRD04L** becomes **LR3D04L**.

(1) Standard IEC 60947-4-1 specifies a tripping time for 7.2 times the setting current I_R:
class 20: between 6 and 20 seconds
*(2) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LADALLEN4**, see page B8/28).*

Overload relays

Characteristics: pages B11/31 to B11/34
Dimensions: pages B11/35 to B11/37
Schemes: page B11/37

3-pole differential thermal overload relays for TeSys D contactors - Class 20

- for use with fuses or magnetic circuit breakers GV2L and GV3L
- compensated relays with manual or automatic reset
- with relay trip indicator
- for a.c. or d.c.

Relay setting range (A)	Fuses to be used with selected relay			For mounting beneath contactor LC1	Reference
	aM (A)	gG (A)	BS88 (A)		
Class 20 (1) with connection by EverLink® BTR screw connectors (2) and control by spring terminals					
9…13	20	32	35	D40A…D65A	**LRD313L3**
12…18	25	40	40	D40A…D65A	**LRD318L3**
17…25	32	50	50	D40A…D65A	**LRD325L3**
23…32	40	63	63	D40A…D65A	**LRD332L3**
30…40	50	80	80	D40A…D65A	**LRD340L3**
37…50	63	100	100	D40A…D65A	**LRD350L3**
48…65	80	125	125	D50A and D65A	**LRD365L3**

(1) Standard IEC 60947-4-1 specifies a tripping time for 7.2 times the setting current I_R:
class 10: between 4 and 10 seconds,
class 10 A: between 2 and 10 seconds,
class 20: between 6 and 20 seconds.
*(2) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LADALLEN4**, see page B8/28).*

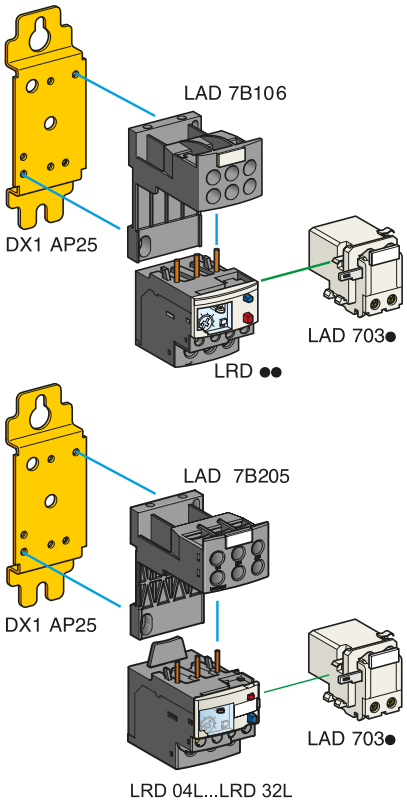
Overload relays

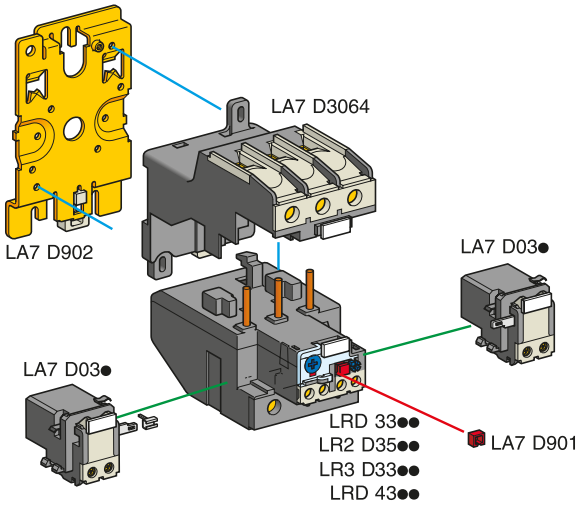
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pages B11/31 to B11/34,
pages B11/38 to B11/41

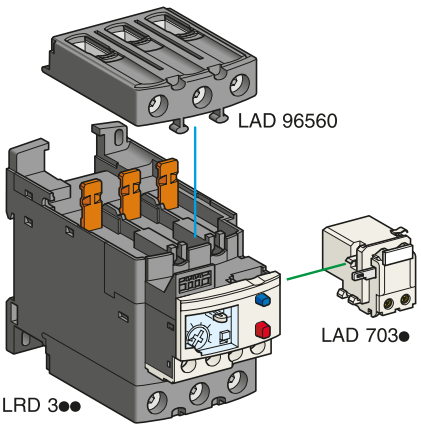
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pages B11/35 to B11/37
and B11/42

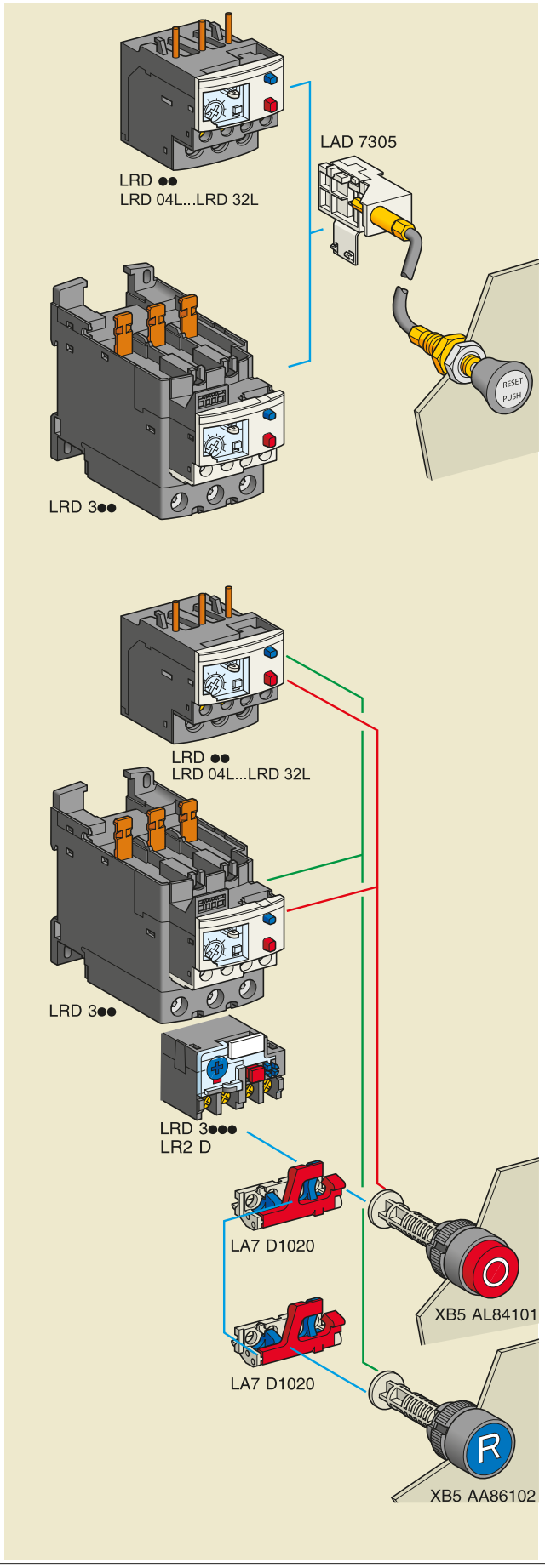
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pages B11/37 and B11/43

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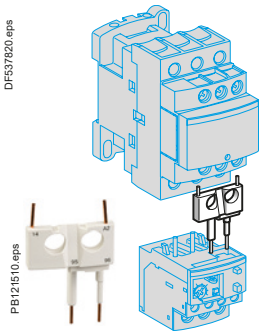








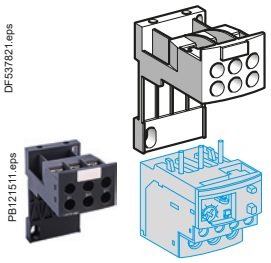
Product references



LAD7C●

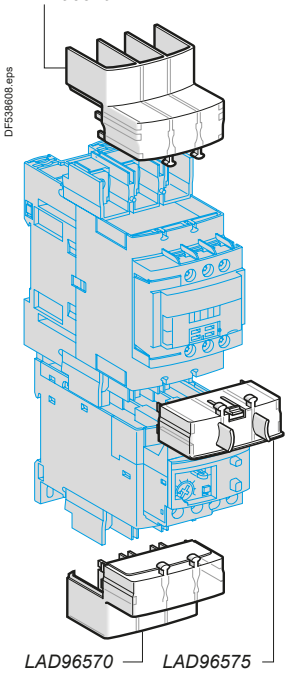
Separate components for relays

Description	For use with	Sold in lots of	Unit reference
Pre-wiring kit allowing direct connection of the N/C contact of relay LRD01…35 or LR3D01…D35 to the contactor	LC1D09…D18	10	**LAD7C1** (1)
	LC1D25…D38	10	**LAD7C2** (1)
Terminal block (2) for clip-on mounting on 35 mm rail (AM1DP200) or screw fixing; for fixing centres, see pages B11/35 to B11/37	LRD01…35 and LR3D01…D35	1	**LAD7B106**
	LRD04L...LRD32L, LR3D04L...LR3D32L	1	**LAD7B205**
	LRD33●●, LR3D33●●, LR2D35●●, LR3D35●●	1	**LA7D3064** (3)
EverLink® terminal block for independent mounting	LRD3●●, LRD3●●L and LR3D3●●	1	**LAD96560**
Size 4 Allen key, insulated, 1000 V	LRD3●●, LRD3●●L and LR3D3●●	5	**LADALLEN4**
Terminal block adapter for mounting a relay beneath an LC1D115 or D150 contactor	LRD33●●, LR3D33●●, LRD35●●	1	**LA7D3058** (3)
Mounting plates (4) for screw fixing on 110 mm centres	LRD01…35, LR3D01…D35, LRD04L... LRD32L, LR3D04L...LR3D32L	10	**DX1AP25**
	LRD3●●●, LR3D3●●●, LR2D35●●	1	**LA7D902**
Marker holders, snap-in 8 x 18 mm	LRD3●●	100	**LAD90**
	All relays except LRD01…35, LRD04L...32L, LR3D04L...D32L LR3D01…D35, LRD3●●, LRD3●●L and LR3D3●●	100	**LA7D903**
Bag of 400 blank legends (self-adhesive, 7 x 16 mm)	All relays	1	**LA9D91**
Stop button locking device	All relays except LRD01…35, LRD04L...32L, LR3D04L...D32L LR3D01…D35, LR9 D and LRD313…LRD380	10	**LA7D901**
Remote Stop or electrical reset device (5)	LRD01…35, LR3D01…D35, LRD04L...32L, LR3D04L...D32L and LRD313…LRD380	1	**LAD703●** (6) (7)
Remote tripping or electrical reset device (5)	All relays except LRD01…35, LR9D01...32, LRD04L...32L, LR3D04L...D32L, LR3D01…D35, LR9D01...32, LRD3●●, LRD3●●L and LR3D3●●	1	**LA7D03●** (6)
Block of insulated terminals	LR9D	2	**LA9F103** (7)
IP 20 cover for lug type terminals for independent mounting	LRD3136…3806	1	**LAD96570**
IP 20 cover for lug type terminals for mounting with contactor LC1D40A6…D65A6	LRD3136…3806	1	**LAD96575**
Terminal block for lug type terminals for independent mounting	LRD3136…3806	1	**LAD96566**



LAD7B106

LAD96570



LAD96570 *LAD96575*



Remote control

"Reset" function

Description	For use with	Sold in lots of	Unit reference
By flexible cable (length = 0.5 m)	LRD01…35, LR3D01…D35, LR3D04L...D32L and LRD313…LRD380, LRD04L...LRD32L	1	**LAD7305** (8)
	All relays except LRD01...35, LR3D01...D35, LRD3●●, LRD04L...32L, LR3D04L...D32L, LRD3●●L, LR3D3●●, LR9D01, LR9D110S	1	**LA7D305**

"Stop" and/or "Reset" functions

The terminal protection shroud must be removed and the following 3 products must be ordered separately:

Adapter for door mounting	LRD33●●, LR2D		1	**LA7D1020**
Operating heads for spring return pushbutton	Stop	All relays	1	**XB5AL84101**
	Reset	All relays	1	**XB5AA86102**

(1) These pre-wiring kits cannot be used with reversing contactors.
(2) Terminal blocks are supplied with terminals protected against direct finger contact and screws in the open, "ready-to-tighten" position.
*(3) To order a terminal block for connection by lugs, the reference becomes **LA7D30646**.*
(4) Remember to order the terminal block corresponding to the type of relay.
*(5) The time for which the coil of remote tripping or electrical resetting device **LA7D03** or **LAD703** can remain energised depends on its rest time: 1 s pulse duration with 9 s rest time; 5 s pulse duration with 30 s rest time; 10 s pulse duration with 90 s rest time; maximum pulse duration 20 s with a rest time of 300 s. Minimum pulse time: 200 ms.*
(6) Reference to be completed by adding the code indicating the control circuit voltage.
Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Volts	12	24	48	96	110	220/230	380/400	415/440
50/60 Hz	–	B	E	–	F	M	Q	N
Consumption, inrush and sealed: < 100 VA								
⎓	J	B	E	DD	F	M	–	–
Consumption, inrush and sealed: < 100 W.								

(7) Only one terminal block can be mounted below LR9D.
(8) Not compatible with 3-pole relays fitted with spring terminals.

Product references

PB114690.eps



LR9D0● and LR9D32

PB114691.eps



LR9D110S

PB108399.eps



LR9D5567

PB113031.eps



LAD7B205

PB114692.eps



LAD7B205 mounted on LR9D01

PB114693.eps



LR9D67

Electronic thermal overload relays for TeSys D contactors

- for use with fuses or magnetic circuit breakers
- compensated relays, with relay trip indicator,
- for a.c.,
- for direct mounting on contactor or independent mounting (1).

Relay setting range	Fuses to be used with selected relay		For direct mounting beneath contactor LC1	Reference
	aM	gG		
A	A	A		
Classes 5.10.20.30 (1) selectable for direct connection on TeSys D contactors or connection using connectors				
0.1...0.5			D09…D38	**LR9D01**
0.4...2			D09…D38	**LR9D02**
1.6…8			D09…D38	**LR9D08**
6.4…32			D09…D38	**LR9D32**
Classes 5.10.20.30 (1) selectable for connection using connectors				
22…110				**LR9D110S**
Classes 10 or 10 A (1) for connection using bars or connectors				
60…100	100	160	D115…D150	**LR9D5367**
90…150	160	250	D115…D150	**LR9D5369**
Classes 20 (1) for connection using bars or connectors				
60…100	125	160	D115…D150	**LR9D5567**
90…150	200	250	D115…D150	**LR9D5569**

Separate components for relays

Description	For use with	Sold in lots of	Unit reference
Terminal block (2) For clips-on mounting on 35 mm rails (AM1DP200) or screws fixing; for fixing centres, see pages B11/35 to B11/37	LR9D01, LR9D02, LR9D08, LR9D32	1	**LAD7B205**

Electronic overload relays for balanced or unbalanced loads

Relay setting range	Fuses to be used with selected relay		For direct mounting beneath contactor LC1	Reference
	aM	gG		
A	A	A		
Classes 10 or 20 (1) selectable for direct connection using bars or connectors				
60…100	100	160	D115…D150	**LR9D67**
90…150	160	250	D115…D150	**LR9D69**

(1) Standard IEC 60947-4-1 specifies a tripping time for 7.2 times the setting current I_R:
class 5: between 0.5 and 5 seconds
class 10: between 4 and 10 seconds
class 10 A: between 2 and 10 seconds
class 20: between 6 and 20 seconds
class 30: between 9 and 30 seconds.
(2) Terminal blocks are supplied with terminals protected against direct finger contact and screws in the open, "ready-to-tighten" position.
(3) Power terminals can be protected against direct finger contact by the addition of shrouds and/or insulated terminal blocks, to be ordered separately (see page B8/20).

Overload relays

Characteristics: pages B11/38 to B11/41
Dimensions: page B11/42
Schemes: page B11/43

Product references



LR9F53●●



LR9F73●●

Compensated and differential overload relays for TeSys F contactors

- with relay trip indicator,
- for a.c.,
- for direct mounting on contactor or independent mounting (1).

Relay setting range	Fuses to be used with selected relay		For direct mounting beneath contactor LC1	Reference	Weight
	aM	gG			
A	A	A			kg
Class 10 (2)					
30…50	50	80	F115…F185	**LR9F5357**	0.885
48…80	80	125	F115…F185	**LR9F5363**	0.900
60…100	100	200	F115…F185	**LR9F5367**	0.900
90…150	160	250	F115…F185	**LR9F5369**	0.885
132…220	250	315	F225…F265	**LR9F5371**	0.950
200…330	400	500	F225…F500	**LR9F7375**	2.320
300…500	500	800	F225…F500	**LR9F7379**	2.320
380…630	630	800	F400…F630 and F800	**LR9F7381**	4.160
Class 20 (2)					
30…50	50	80	F115…F185	**LR9F5557**	0.885
48…80	80	125	F115…F185	**LR9F5563**	0.900
60…100	100	200	F115…F185	**LR9F5567**	0.900
90…150	160	250	F115…F185	**LR9F5569**	0.885
132…220	250	315	F225…F265	**LR9F5571**	0.950
200…330	400	500	F225…F500	**LR9F7575**	2.320
300…500	500	800	F225…F500	**LR9F7579**	2.320
380…630	630	800	F400…F630 and F800	**LR9F7581**	4.160

*(1) When mounting overload relays **LR9F5●57**...**LR9F5●71** directly beneath the contactor, supporting the relays with a mounting plate is recommended (see page B11/14).*
*With overload relays **LR9F7●75**...**LR9F7●81**, use of a support mounting plate is mandatory (see page B11/14).*
Power terminals can be protected against direct finger contact by the addition of shrouds and/or insulated terminal blocks, to be ordered separately (see page B11/14).
*Interconnection kit **LA7F407** is required for mounting an **LR9F5●71** thermal overload relay together with an **LC1F185** contactor.*

(2) Standard IEC 60947-4 specifies a tripping time for 7.2 times the setting current In:
- class 10: between 4 and 10 seconds,
- class 20: between 6 and 20 seconds.

Overload relays

Characteristics: pages B11/44 to B11/47
Dimensions, schemes: pages B11/48 to B11/49

Product references

Compensated overload relays for TeSys F contactors - class 10 or 20

- with relay trip indicator,
- for a.c.,
- for direct mounting on contactor or independent mounting (1),
- class 10 or 20 by selector switch,
- protection of 3-phase or single-phase circuits by selector switch,
- with alarm function that enables tripping to be forestalled.



LR9F57

Relay setting range	Fuses to be used with selected relay		For direct mounting beneath contactor LC1	Reference	Weight
	aM	gG			
A	A	A			kg
30…50	50	80	F115…F185	**LR9F57**	0.885
48…80	80	125	F115…F185	**LR9F63**	0.900
60…100	100	200	F115…F185	**LR9F67**	0.900
90…150	160	250	F115…F185	**LR9F69**	0.885
132…220	250	315	F185…F265	**LR9F71**	0.950
200…330	400	500	F225…F500	**LR9F75**	2.320
300…500	500	800	F225…F500	**LR9F79**	2.320
380…630	630	800	F400…F630 and F800	**LR9F81**	4.160

*(1) When mounting overload relays **LR9F57**...**LR9F71** directly beneath the contactor, supporting the relays with a mounting plate is recommended (see page B11/14).*
*With overload relays **LR9F75**...**LR9F81**, use of a support mounting plate is mandatory (see page B11/14).*
Power terminals can be protected against direct finger contact by the addition of shrouds and/or insulated terminal blocks, to be ordered separately (see page B11/14).
*Interconnection kit **LA7F407** is required for mounting an **LR9F71** thermal overload relay together with an **LC1F185** contactor.*

Characteristics: pages B11/44 to B11/47
Dimensions, schemes: pages B11/48 to B11/49

Life Is On Schneider Electric

Product references

PB111595.eps



LA7D03●

PB111588.eps



LA7D305

Control accessories

Description		Sold in lots of	Unit reference
Remote electrical reset device (1)		1	**LA7D03●** (2)
Remote Reset function control by flexible cable (length = 0.5 m)		1	**LA7D305**
Remote Stop and/or Reset function control	Adapter for door mounted operator	1	**LA7D1020**
	Rod (snap-off end to obtain required length, between 17 and 120 mm)	10	**ZA2BZ13**
	Operating head for spring return pushbutton	1	**ZA2B●●●●** (3)

Connection accessories

For mounting an LR9F5●71 thermal overload relay together with an LC1 F185 contactor

Description	Reference
Set of 3 busbars	**LA7F407**

For mounting a thermal overload relay beneath a reversing contactor or star-delta contactors

Application		Width of terminal lug	Set of 3 busbars Reference
For relay	For contactor		
		mm	
LR9F5●57, F5●63, F5●67, F5●69, LR9F57, F63, F67, F69	LC1 F115	15	**LA7F401**
LR9F5●57, F5●63, F5●67, F5●69, LR9F57, F63, F67, F69	LC1 F150, F185	20	**LA7F402**
LR9F5●71, LR9F71	LC1 F185	25	**LA7F407**
LR9F5●71, LR9F71	LC1 F225, F265	25	**LA7F403**
LR9F7●75, F7●79, LR9F75, F79	LC1 F225...F400	25	**LA7F404**
LR9F7●81, LR9F81	LC1 F400	25	**LA7F404**
LR9F7●75, F7●79, F7●81, LR9F75, F79, F81	LC1 F500	30	**LA7F405**
LR9F7●81, LR9F81	LC1 F630, F800	40	**LA7F406**

*(1) The time for which the coil of remote electrical reset device **LA7D03** can remain energised depends on its rest time: 1 s pulse duration with 9 s rest time; 5 s pulse duration with 30 s rest time; 10 s pulse duration with 90 s rest time. Maximum pulse duration of 20 s with rest time of 300 s. Minimum pulse time: 200 ms.*

(2) Reference to be completed by adding the coil voltage code.
Standard control circuit voltages,
(for other voltages, please consult your Regional Sales Office):

Volts	12	24	48	96	110	220/230	380/400	415/440
~ 50/60 Hz	–	B	E	–	F	M	Q	N
Consumption, inrush and sealed: < 100 VA								
⎓	J	B	E	DD	F	M	–	–
Consumption, inrush and sealed: < 100 W.								

*(3) Stop: **ZA2BL432** and Reset: **ZA2BL639**.*

Product references

PB111591.eps



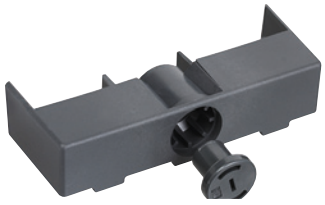
LA7F90●

PB111592.eps



LA9F70●

PB111590.eps



LA7F70●

11176.eps



LA9F103

Mounting plates for overload relay

For use with relays	Reference
LR9F5●57, F5●63, F5●67, F5●69, F5●71, LR9F57, F63, F67, F69, F71	**LA7F901**
LR9F7●75, F7●79, F7●81, LR9F75, F79, F81	**LA7F902**

Sets of power terminal protection shrouds, single-pole

For use with relays	Number of shrouds per set	Set reference
LR9F5●57, LR9F57	6	**LA9F701**
LR9F5●63, F5●67, F5●69, LR9F63, F67, F69	6	**LA9F702**
LR9F5●71, LR9F71	6	**LA9F705**
LR9F7●75, F7●79, F7●81, LR9F75, F79, F81	6	**LA9F703**

Power terminal protection shrouds, 3-pole

For use with relays	Reference
LR9F5●57, F5●63, F5●67, F5●69, LR9F57, F63, F67, F69	**LA7F701**
LR9F5●71, LR9F71	**LA7F702**
LR9F7●75, F7●79, F7●81, LR9F75, F79, F81	**LA7F703**

Insulated terminal blocks

For use with relays	Set of 2 blocks Reference
LR9F5●57, F5●63, F5●67, F5●69, LR9F57, F63, F67, F69	**LA9F103**

Marking accessories

Description	Sold in lots of	Unit reference
Clip-in marker holder	100	**LA7D903**
Bag of 400 blank self-adhesive legends 7 x 16 mm	1	**LA9D91**

Product references

PB121494.eps



RM1XA●●●

Single-pole, non-latching, over current relays

With 1 C/O contact block

Recommanded operating range (motor In)		Setting range (trip current)	Maximum continuous current ∼ or ⎓	Reference
A		A	A	
∼ or ⎓	0.7…1.15	1.25…4	1.6	**RM1XA001**
	1.16…1.8	2…6.3	2.5	**RM1XA002**
	1.9…2.9	3.2…10	4	**RM1XA004**
	3…4.6	5…16	6.3	**RM1XA006**
	4.7…7.2	8…25	10	**RM1XA010**
	7.3…11.5	12.5…40	16	**RM1XA016**
	11.6…18	20…63	25	**RM1XA025**
	18.1…29	32…100	40	**RM1XA040**
	29.1…46	50…160	63	**RM1XA063**
	46.1…72	80…250	100	**RM1XA100**
	73…115	125…400	160	**RM1XA160**
	116…145	160…500	200	**RM1XA200**
	146…230	250…800	315	**RM1XA315**
	231…360	400 …1250	500	**RM1XA500**
∼	361…630	630…2200	1000	**RM1XA101**
⎓	361…570	630…2000	1000	**RM1XA101**

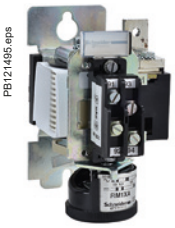
Accessory (to be ordered separately)

Description	Reference
1 C/O contact block, non-latching	**RM1ZG21**

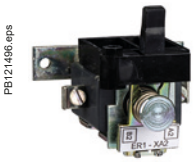
Overload relays

Characteristics: page B11/50
Dimensions: page B11/51
Schemes: page B11/51

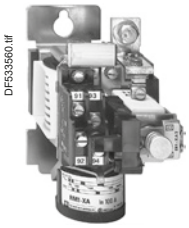
Product references



RM1XA0011



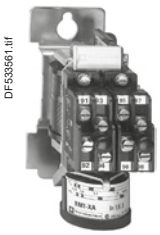
ER1XA2●



ER1XA2● mounted on RM1XA1001



RM1ZH21



2 x RM1ZH21 mounted on RM1XA0011

Single-pole, latching, manual reset, over current relays

With 1 C/O contact block

	Recommanded operating range (motor In)	Setting range (trip current)	Maximum continuous current ∼ or ⎓	Reference
	A	A	A	
∼ or ⎓	0.7…1.15	1.25…4	1.6	**RM1XA0011**
	1.16…1.8	2…6.3	2.5	**RM1XA0021**
	1.9…2.9	3.2…10	4	**RM1XA0041**
	3…4.6	5…16	6.3	**RM1XA0061**
	4.7…7.2	8…25	10	**RM1XA0101**
	7.3…11.5	12.5…40	16	**RM1XA0161**
	11.6…18	20…63	25	**RM1XA0251**
	18.1…29	32…100	40	**RM1XA0401**
	29.1…46	50…160	63	**RM1XA0631**
	46.1…72	80…250	100	**RM1XA1001**
	73…115	125…400	160	**RM1XA1601**
	116…145	160…500	200	**RM1XA2001**
	146…230	250…800	315	**RM1XA3151**
	231…360	400…1250	500	**RM1XA5001**
∼	361…630	630…2200	1000	**RM1XA1011**
⎓	361…570	630…2000	1000	**RM1XA1011**

Accessories (to be ordered separately)

Description	Reference
1 C/O contact block, latching	**RM1ZH21**
Electrical reset [1] (consumption: inrush, sealed: 500 VA) (fitted to the relay together with a latching contact block) Basic reference. Complete with code indicating control circuit voltage [2]	**ER1XA2●**

(1) The impulse duration must not exceed 2 seconds within 10 minute intervals.
(2) Standard coil voltages for electrical reset:

Volts	110	220
50 Hz	F	M

Overload relays

Product references

PB121498.eps



LT3SE00M

Protection units

- to be used with PTC thermistor probes
- with thermistor short-circuit detection
- The contact changes state when a rapid rise in temperature above the nominal probe rating is detected.

With automatic reset

Connection	Voltage		Output contact	Reference
Cage connectors	∼ 50/60 Hz	115 V	N/C	**LT3SE00F**
		230 V	N/C	**LT3SE00M**
	⎓	24 V	N/C	**LT3SE00BD**

PB121499.eps



LT3SA00M

Units with automatic reset and front signalling by LED's (Power-Fault)

Connection	Voltage		Output contact	Reference
Cage connectors	∼ 50/60 Hz	115/230 V	N/C + N/O	**LT3SA00M**
	⎓	24/48 V	N/C + N/O	**LT3SA00ED**
	∼ 50/60 Hz or ⎓	24…230 V	2 C/O	**LT3SA00MW**

Manual reset, on front: Test/Reset pushbutton Power + Fault LED's

Connection	Voltage		Output contact	Reference
Cage connectors	∼ 50/60 Hz	400 V	N/C + N/O	**LT3SM00V**
		24/48 V	N/C + N/O	**LT3SM00E**
		115/230 V	N/C + N/O	**LT3SM00M**
	⎓	24/48 V	N/C + N/O	**LT3SM00ED**
	∼ 50/60 Hz or ⎓	24…230 V	2 C/O	**LT3SM00MW**

PB121500.eps



LT3SM00M

Overload relays

Characteristics: pages B11/52 to B11/55
Dimensions: page B11/56
Schemes: pages B11/56 and B11/57

TeSys PTC[1] thermistor probes for LT3 thermal protection units

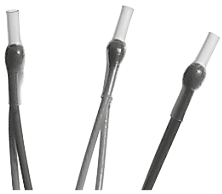
Product references

PB121508.eps



DA1TT●●●

813383.tif



Triple probe to be inserted into equipment

PB121509.eps



DA1TS●●●

813384.tif



Probe to be screwed on equipment casing

PTC thermistor probes

Description	Nominal Operating Temperature (NOT)	Colour	Sold in lots of	Unit reference
	° C			
Integrated triple probes	90	Green/green	10	**DA1TT090**
	110	Brown/brown	10	**DA1TT110**
	120	Grey/grey	10	**DA1TT120**
	130	Blue/blue	10	**DA1TT130**
	140	White/blue	10	**DA1TT140**
	150	Black/black	10	**DA1TT150**
	160	Blue/red	10	**DA1TT160**
	170	White/green	10	**DA1TT170**
Surface probes	60	White/grey	10	**DA1TS060**
	70	White/brown	10	**DA1TS070**
	80	White/white	10	**DA1TS080**
	90	Green/green	10	**DA1TS090**
	100	Red/red	10	**DA1TS100**

Accessories (to be ordered separately)

Mounting accessories

Description	Applicationi	Sold in lots of	Unit reference
Adapter	For fixing on ⊔ rail DZ5 MB	10	**RHZ66**

Marking accessories

Clip-in markers (maximum of 5 per unit)	Strips of 10 identical numbers (0 to 9)	25	**AB1R●** (2)
	Strips of 10 identical capital letters (A to Z)	25	**AB1G●** (2)

(1) PTC: Positive Temperature Coefficient.
(2) When ordering, replace the ● in the reference with the number or letter required.

Product references

PB111974.eps



LR97D07●●

LR97D electronic over current relays

Relay setting range	Usable range (1)	For use with contactor (2)	Relay supply voltage	Reference (3)
A	A			
0.3…1.5	**0.3…1.3**	LC1 D09…D38	∼ 200…240 V	**LR97D015M7**
			∼ 100…120 V	**LR97D015F7**
			⎓/∼ 24 V	**LR97D015B**
			⎓/∼ 48 V	**LR97D015E**
1.2…7	**1.2…6**	LC1 D09…D38	∼ 200…240 V	**LR97D07M7**
			∼ 100…120 V	**LR97D07F7**
			⎓/∼ 24 V	**LR97D07B**
			⎓/∼ 48 V	**LR97D07E**
5…25	**5…21**	LC1 D09…D38	∼ 200…240 V	**LR97D25M7**
			∼ 100…120 V	**LR97D25F7**
			⎓/∼ 24 V	**LR97D25B**
			⎓/∼ 48 V	**LR97D25E**
20…38	**20…34**	LC1 D25…D38	∼ 200…240 V	**LR97D38M7**
			∼ 100…120 V	**LR97D38F7**
			⎓/∼ 24 V	**LR97D38B**
			⎓/∼ 48 V	**LR97D38E**

PB111927.eps



LT4730●●●

LT47 electronic over current relays

Relay setting range	Usable range (1)	Relay supply voltage	Reference
A	A		
LT47 relay with manual/electric reset			
0.5…6	**0.5…5**	∼ 200…240 V	**LT4706M7S**
		∼ 100…120 V	**LT4706F7S**
		⎓/∼ 24 V	**LT4706BS**
		⎓/∼ 48 V	**LT4706ES**
3…30	**3…25**	∼ 200…240 V	**LT4730M7S**
		∼ 100…120 V	**LT4730F7S**
		⎓/∼ 24 V	**LT4730BS**
		⎓/∼ 48 V	**LT4730ES**
5…60	**5…50**	∼ 200…240 V	**LT4760M7S**
		∼ 100…120 V	**LT4760F7S**
		⎓/∼ 24 V	**LT4760BS**
		⎓/∼ 48 V	**LT4760ES**
LT47 relay with automatic reset			
0.5…6	**0.5…5**	∼ 200…240 V	**LT4706M7A**
		∼ 100…120 V	**LT4706F7A**
		⎓/∼ 24 V	**LT4706BA**
		⎓/∼ 48 V	**LT4706EA**
3…30	**3…25**	∼ 200…240 V	**LT4730M7A**
		∼ 100…120 V	**LT4730F7A**
		⎓/∼ 24 V	**LT4730BA**
		⎓/∼ 48 V	**LT4730EA**
5…60	**5…50**	∼ 200…240 V	**LT4760M7A**
		∼ 100…120 V	**LT4760F7A**
		⎓/∼ 24 V	**LT4760BA**
		⎓/∼ 48 V	**LT4760EA**

Accessories (to be ordered separately)

Description	For use with	Sold in lots of	Unit reference
Pre-wiring kits allowing connection of the LR97D relay N/C contact directly to the contactor	LC1 D09…D18	10	**LAD7C1**
	LC1 D25…D38	10	**LAD7C2**
Terminal block for clip-on mounting on 35 mm rail (AM1 DP200)	LR97D	1	**LAD7B106**

(1) To allow adjustment of the tripping sensitivity, see adjustment method (page B11/58).
(2) Please see chapter B8.
(3) If a pre-wiring kit is used, it is no longer possible to electrically wire signalling of tripped status.

Characteristics: pages B11/58 to B11/61
Dimensions, schemes: page B11/62

TeSys LRx, RM1, LT

Technical Data for Designers

Contents

Motor and machine protection ..... B11/22 to B11/27

TeSys LRK - thermal overload protection:
- > characteristics ..... B11/28 to B11/29
- > dimensions and schemes B11/30

TeSys LRD - thermal overload protection:
- > characteristics ..... B11/31 to B11/34
- > dimensions ..... B11/35 to B11/37
- > schemes B11/37

TeSys LR9D - electronic thermal overload protection:
- > characteristics ..... B11/38 to B11/41
- > dimensions B11/42
- > schemes B11/43

TeSys LR9F - electronic thermal overload protection:
- > characteristics ..... B11/44 to B11/47
- > dimensions B11/48
- > schemes B11/49

TeSys RM1 - single pole magnetic over current relays:
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- > dimensions and schemes B11/51

TeSys LT3 - thermistor protection unit:
- > characteristics ..... B11/52 to B11/55
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TeSys LR97, LT47 - electronic over current relays:
- > characteristics ..... B11/58 to B11/61
- > dimensions and schemes B11/62

Introduction

Exceeding the operating limits of an electric motor will lead, eventually, not only to destruction of the motor itself but also of the mechanisms it drives.

This type of load can be the cause of electrical or mechanical faults.
■ Electrical faults:
□ overvoltage, voltage drop, imbalance and phase failure which cause variations in the current drawn,
□ short-circuits which can cause the current to reach levels capable of destroying the load.

■ Mechanical faults:
□ locked rotor,
□ brief or prolonged overload which leads to an increase in the current drawn by the motor, and therefore overheating.

The cost of these faults must take into account loss of production, loss of raw materials, repair of the production tool, poor quality of production and delays in delivery.

These faults can also have dramatic consequences on the safety of persons in direct or indirect contact with the motor.

To prevent these faults, protection measures are necessary. They make it possible to isolate the equipment to be protected from the mains supply by measuring variations in electrical values (voltage, current, etc.).

Each motor starter must therefore have:

■ **short-circuit protection**, to detect and break, as quickly as possible, abnormal currents generally greater than 10 times the rated current (In).

■ **overload protection**, to detect increases in current up to about 10 In and switch off the starter before overheating of the motor and conductors damages the insulation.

This protection is provided by specific devices such as fuses, circuit breakers and thermal overload relays, or by more integrated devices offering several types of protection.

Causes, effects and consequences of various faults

There are two types of fault:
- Internal faults within the motor
- External faults: these are located outside the electric motor but their consequences can lead to damage inside the motor.

Faults	Causes	Effects	Consequences on the motor and on the machine
Short-circuit	Contact between several phases, or between one phase and neutral or between several turns of the same phase.	■ Current peak ■ Electrodynamic forces on the conductors	Destruction of windings
Overvoltage	■ Lightning ■ Electrostatic discharge ■ Operation	Dielectric breakdown in the windings	Destruction of the windings due to loss of insulation
Phase imbalance and phase failure	■ Opening of a phase ■ Single-phase load upstream of the motor ■ Short-circuit between the turns of the same winding	■ Reduction of usable torque, efficiency and speed ■ Increase in losses ■ Starting impossible if phase failure	Overheating (1)
High starting frequency	■ Failure of the automation system ■ Too many manual control operations ■ Numerous fault trips	High stator and rotor temperature rise due to the frequent start current	Overheating (1) Consequences on the process
Voltage variations	■ Instability of the mains voltage ■ Connection of heavy loads	■ Reduction of usable torque ■ Increase in losses	Overheating (1)
Harmonics	■ Pollution of the mains supply by variable speed drives, inverters, etc...	■ Reduction of usable torque ■ Increase in losses	Overheating (1)
Long starting time	■ Resistive torque too high (load too heavy) ■ Voltage drop	Increase in starting time	Overheating (1)
Jamming	■ Mechanical problem (crusher) ■ Seizures	Overcurrent	Overheating (1) Consequences on the process
No-load running	■ Pump running empty ■ Mechanical break in drive to the load	Drop in current drawn	Consequences on the process
Frequency fluctuations	■ Overload of a supply powered by limited independent sources ■ Faulty alternator speed regulator	■ Increase in losses ■ Interferes with synchronous devices (clock, recorder, ...)	–
Overload	■ Increase in resistive torque ■ Voltage drop ■ Drop in power factor	Increase in current consumption	Overheating (1)
Loss of machine excitation	■ Significant drop in excitation current ■ Break in rotor winding	■ Increase in active power ■ Drop in power factor	Significant overheating of rotor and cage
Phase-Earth fault	■ Accidental Phase-Earth contacts ■ Accidental Phase-machine casing contacts (casing connected to earth)	■ Overvoltage developed in the mains supply ■ Rise in earth potential (safety of persons)	Consequences on safety of persons

(1) Then, in the longer or shorter term, depending on the seriousness of the fault and/or its frequency, short-circuit and destruction of the windings.

Protection functions

Short-circuit protection

General

A short-circuit results in a very rapid rise in current which can reach several hundred times the value of the operational current. The consequences of a short-circuit are dangerous to both equipment and persons. It is therefore imperative to use protection devices to detect the fault and very quickly break the circuit.

Two types of protection are commonly used:
■ fuses (cutout) which break the circuit by melting, which then requires their replacement,
■ magnetic trip circuit breakers, often more simply called "magnetic circuit breakers", which only require re-setting to put them back into service.
Short-circuit protection can also be built-into multifunction devices such as motor circuit breakers and contactor-breakers.

The main characteristics of short-circuit protection devices are:
■ their breaking capacity: this is the highest prospective short-circuit current value that a protection device can break at a given voltage.
■ their making capacity: this is the highest current value that the protection device can make at its rated voltage in specified conditions.
The making capacity is equal to k times the breaking capacity.

PB111830.eps



LS1D32
fuse carrier

PB114116.eps



GS2N3
switch disconnectors

Fuses (cutouts)

Fuses provide individual phase protection (single-pole), with a high breaking capacity in a compact size:
■ mounted either in fuse carriers,
■ or in isolators, replacing the original links or shunt bars.

For motor protection, aM type fuses are used. Their design characteristics allow them to conduct the high magnetising currents that occur when motors are switched on. They are therefore unsuitable for overload protection (unlike gG type fuses). This is why an overload relay must be included in the motor power supply circuit.

PB121501.eps



GV2L
magnetic circuit breaker

PB114909.eps



GV4LE
magnetic circuit breaker

Magnetic circuit breakers

These circuit breakers protect installations against short-circuits, within the limit of their breaking capacity.
Magnetic circuit breakers provide omnipole breaking as standard.
For relatively low short-circuit currents, the operation of a circuit breaker is faster than that of fuses.
This protection conforms to standard IEC 60947-2.
The thermal and electrodynamic effects are also limited, therefore ensuring better protection of cables and equipment.

PB121502.eps



LRD10
thermal overload relay

PB108223.eps



LRD365
thermal overload relay

PB121503.eps



RM4JA current measurement relay

Protection functions

Overload protection

General

An overload condition is the most frequently encountered fault. The symptoms are a rise in the current drawn by the motor and thermal effects. A rapid return to normal operating conditions is important.
The actual operating conditions (ambient temperature, operating altitude and type of standard duty) are essential to determine the operating values of the motor (power, current) and to be able to select effective overload protection. These operational values are given by the motor manufacturer.

According to the level required, protection can be provided by:
- overload relays and thermal overload relays (bi-metallic or electronic type) which protect motors in the event of:
  - overload, by monitoring the current drawn by each phase,
  - phase imbalance or failure, by their differential mechanism.
- relays with PTC thermistor probes (Positive Temperature Coefficient).
- overtorque relays,
- multifunction relays.

Overload relays

These relays protect motors against overload. They must allow the temporary overload that occurs on starting and must only trip if the starting time is abnormally long.
The overload relay will be selected according to the length of the starting time (tripping class) and the motor rating.
These relays have a thermal memory (except for certain electronic overload relays, indicated by their manufacturers) and can be connected:
- either in series with the load,
- or to current transformers placed in series with the load.

Bi-metallic thermal overload relays
Combined with a contactor, these relays protect the line and the equipment against small and prolonged overloads. They must be protected against strong overcurrent by a circuit breaker or fuses.
These relays may be used on an a.c. or d.c. system and are generally:
- 3-pole,
- compensated, i.e. insensitive to ambient temperature variations,
- with manual or automatic reset,
- graduated with a "motor FLC" scale: allowing direct setting to the full load current as shown on the motor rating plate.

They can also be sensitive to phase failure: this is known as 'differential'. This function conforms to standards IEC 60947-4-1 and 60947-6-2.
This type of relay is extremely reliable and is a relatively low cost device.

Electronic thermal overload relays
Electronic thermal overload relays have the advantage of electronics which allow a more complex thermal image of the motor to be created.
They can be combined with products having complementary functions, such as:
- temperature sensing via PTC probes,
- protection against jamming and overtorque,
- protection against phase reversal,
- earth fault protection,
- protection against no-load running,
- alarm function.

PB121507.eps



LT3S relays for use with thermistor probes

PB111974.eps



LR97D07 instantaneous electronic overcurrent relays

PB107380.eps



TeSys U *LUB320 starter with multifunction control unit LUCM*

PF526188.eps



TeSys U *controller LUTM20BL*

PB121504.eps



TeSys T *controller LTMR08MBD*

Protection functions *(continued)*

Overload protection (continued)

Relays for use with PTC thermistor probes

With direct sensing of the stator windings, these relays can be used to protect motors against:
- overload,
- a rise in ambient temperature,
- a ventilation circuit fault,
- a high starting frequency,
- mechanical shocks, etc.

Overload (or overtorque) relays

These relays protect the drive line in the event of a locked rotor, seizure or mechanical shocks. This is an additional protection.
Unlike thermal overload relays, these relays do not have a thermal memory. They have definite time characteristics (adjustable current threshold and time delay).
The overtorque relay can be used as overload protection for motors with long starting times or very frequent starting (for example, lifting hoists).

Multifunction relays

- Overcurrent relays are limited when it is necessary to take into account problems associated with voltage, temperature or special applications. New production or maintenance management needs have prompted manufacturers to offer products which provide not only adaptable protection, but also complete management of the motor and its load.

They incorporate:
- current and voltage sensors (TeSys T controllers),
- hybrid analog and digital electronic technology,
- the use of communication buses for data exchange and control,
- powerful motor modelling algorithms,
- integrated application programs whose parameters can be set.

These products make it possible to reduce installation and operating costs by reducing maintenance and downtime.

TeSys U starters:
The multifunction relay is incorporated in the motor starter.
This solution is very compact with reduced wiring. It is limited to 32 A.

TeSys U controllers:
The multifunction relay is separate from the power line and reuses the function blocks from the TeSys U solution. It can be used in conjunction with a contactor up to 810 A.

TeSys T controllers:
The multifunction relay is separate from the power line and incorporates inputs and outputs. It can be used in conjunction with a contactor up to 810 A.

Protection relay selection table

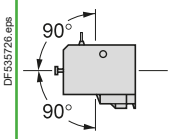
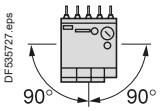
	Motor protection		Machine protection	Motor and machine protection	
Relay type	**Thermal overload relay** **LR2K, LRD, LRD3, LR9 F, LR9 D** (1)	**Relays for use with PTC probes** **LT3S**	**Overtorque relays** **LR97D, LT47**	TeSys U **controller** **LUTM**	TeSys T **controller** **LTMR**
Causes of overheating	(2)		(2)	(2)	(3)
Slight overload	■	■	▒	■	■
Locked rotor	■	▒	■	■	■
No-load running				■	■
Supply phase failure	■	▒	LR97D	■	
Ventilation fault		■			With probes
Abnormal temperature rise	▒	■			With probes
Shaft bearing seizure	▒	■	▒	▒	With probes
Insulation fault	▒			■	■
Protracted starting time	■	▒	■	■	■
Severe duty	▒	■	■	▒	With probes
Voltage variation	▒	▒	▒	▒	■
Frequency fluctuations	▒				■
Loss of machine excitation					■

■ Ideally suited
▒ Possible solution
□ Not suitable (no protection)

*(1) For motor circuit breaker type **GV2ME**.*
(2) Protection based on current.
(3) Protection based on current and voltage.

Characteristics

Environment

Conforming to standards			IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T14048.
Product certifications			UL , CSA, CCC, EAC, CB certification
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact
Ambient air temperature around the device	Storage	°C	-40...+70
	For normal operation (IEC 60947)	°C	-20...+55 (without derating)
	Operating limit	°C	-30...+60 (with derating) (1)
Maximum operating altitude	Without derating	m	2000
Operating positions			**Vertical axis**  Without derating **Horizontal axis**  With derating (1)
Flame resistance	Conforming to 60695-2-11	°C	850
Shock resistance, hot state (1/2 sine wave, 11 ms)	Conforming to IEC 60068-2-27, N/C contact		10 gn
	Conforming to IEC 60068-2-27, N/O contact		10 gn
Vibration resistance, hot state 5 to 300 Hz	Conforming to IEC 60068-2-6, N/C contact		2 gn
	Conforming to IEC 60068-2-6, N/O contact		2 gn

Cabling Screw clamp terminals			Minimum	Maximum	Maximum to IEC 60947
	Solid cable	mm^2	1 x 1.5	2 x 4	1 x 4 + 1 x 2.5
	Flexible cable without cable end	mm^2	1 x 0.75	2 x 4	2 x 2.5
	Flexible cable with cable end	mm^2	1 x 0.34	1 x 1.5 + 1 x 2.5	1 x 1.5 + 1 x 2.5

Tightening torque	Philips head n° 2 - Ø6	N.m	0.8
Mounting			Directly under the contactor or reversing contactor
Connections			Made automatically when mounted under the contactor, as follows: ■ contactor terminal A2 connected to overload relay terminal 96 on all products, ■ contactor terminal 14 connected to overload relay terminal 95 on products with 3 P + N/O. When using 3 P + N/C, or 4 P contactors, or the N/O auxiliary contact marked 13-14, at a voltage other than the coil voltage, break off the link marked 14.

Auxiliary contact characteristics

Number of contacts			1 N/C + 1 N/O						
Conventional thermal current		A	6						
Short-circuit protection	Conforming to IEC 60947 gG fuse or circuit breaker GB2CB●●	A	6 max.						
Maximum power of the controlled contactor coils (sealed) (Occasional operating cycles of contact 95-96)	a.c.	V	24	48	110	220/230	400	415/440	600/690
		VA	100	200	400	600	600	600	600
	d.c.	V	24	48	110	220	250	–	–
		W	100	100	50	45	35	–	–
Maximum operational voltage	a.c., category AC-15	V	690						
	d.c., category DC-13	V	250						

(1) Please consult your Regional Sales Office.
(2) Very low safety voltage.

References: pages B11/2 and B11/3
Dimensions: page B11/30
Schemes: page B11/30

Characteristics

Electrical characteristics of the power circuit

Rated operational voltage (Ue)	Up to	**V**	690
Rated insulation voltage (Ui)	Conforming to IEC 60947	**V**	690
	Conforming to UL 60947-4-1, CSA C22.2 n° 60947-4-1	**V**	600
Rated impulse withstand voltage (Uimp)		**kV**	6
Frequency limits of the operational current		**Hz**	Up to 400
Power dissipated per pole		**W**	2

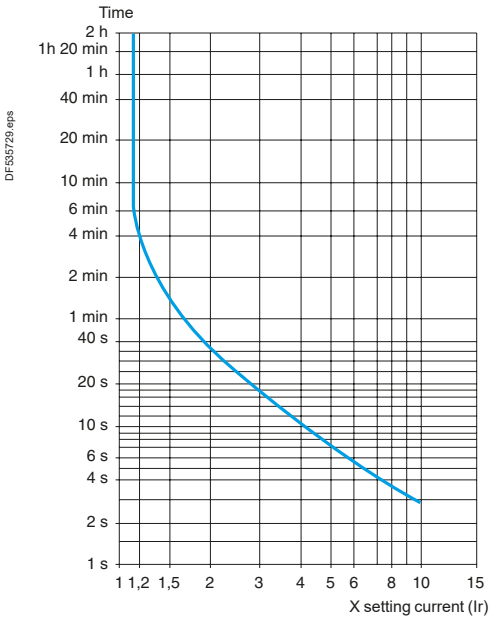
Operating characteristics

Tripping threshold	Conforming to IEC 60947-4-1	**A**	1.14 ±0.06 Ir
Sensitivity to phase failure	Conforming to IEC 60947		Yes
Reset	Manual or automatic		Selected by means of a lockable and sealable switch on the front of the relay
Signalling	On front of relay		Trip indicator
Reset-Stop function			Pressing the Reset-Stop button: - actuates the N/C contact - has no effect on the N/O contact
Test function	By pushbutton		Pressing the Test button enables: - checking of the control circuit wiring - simulation of overload tripping (actuation of both N/C and N/O contacts, and of the trip indicator)
Short-circuit protection and coordination			See pages A6/11 and A6/20

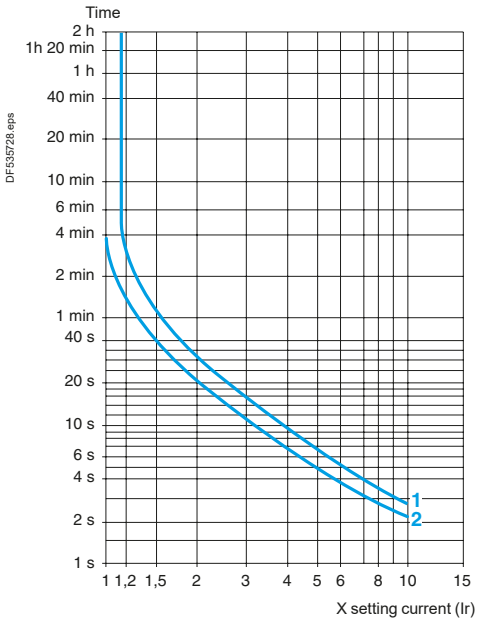
Tripping curves

Average operating time related to multiples of the current setting (Class 10 A)

Balanced 3-phase operation, from cold state



Balanced operation with 2 phases only, from cold state



Setting: at lower end of scale

Setting: at upper end of scale

Ref.
Overload relays

References:
pages B11/2 and B11/3

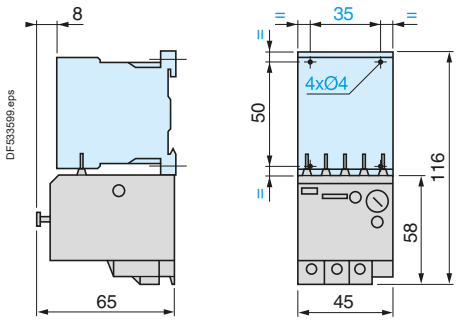
Dimensions:
page B11/30

Schemes:
page B11/30

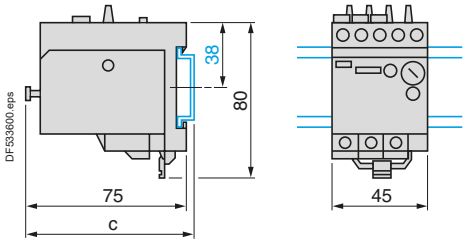
Dimensions, mounting

LR2K

Direct mounting beneath the contactor



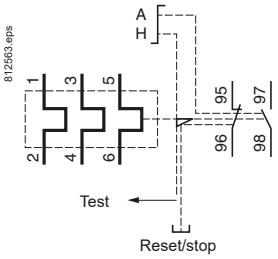
Separate mounting with terminal block LA7 K0064 on 35 mm ⎓ rail
(AM1DP200 or AM1DE200)



AM1	c
DP200	78.5
DE200	86

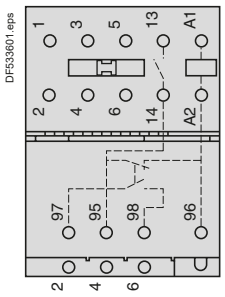
Schemes

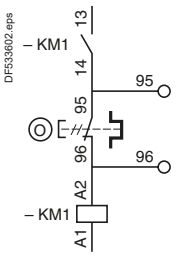
LR2K



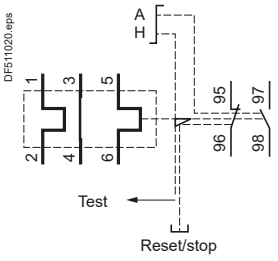
LR2K + LC●K

Pre-wiring scheme

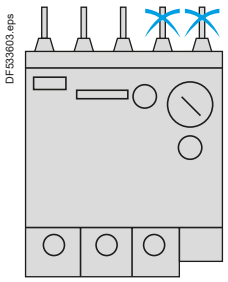




LR7K



Note: *If pre-wiring is not required, break off the 2 links located on the thermal overload relay.*



Ref.
Overload relays

PB121502.eps



LRD10

PB113073.eps



LRD04L...32L

PB121505.eps



LRD365

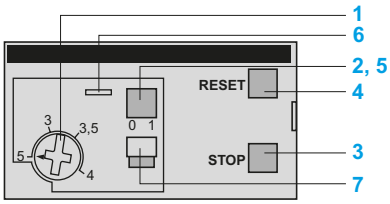
EverLink®

PB121506.eps



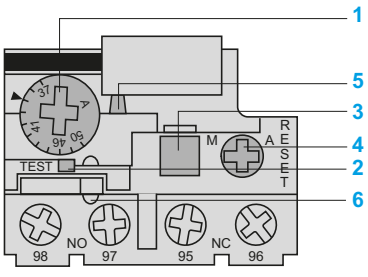
LRD33●●

DF567968.eps



LRD01…35, LRD04L...32L
LRD313…LRD365

DF567969.eps



LRD3361…4369, LR2 D3561…3563

Introduction

3-pole TeSys D thermal overload relays are designed to protect a.c. circuits and motors against:
- overloads
- phase failure
- excessively long starting times
- prolonged stalled rotor condition.

Power connection

LRD01 to LRD35
LRD01 to 35 relays are designed for connection by screw clamp terminals.
They can be supplied for connection by spring terminals or by lugs (1).

LRD04 to LRD32L
These relays are designed for connection by screw clamp terminals. They can be supplied for connection by lugs (1).

LRD313 to LRD380
These relays are for connection by BTR screw connectors (hexagon socket head).
The screws are tightened by means of a size 4, insulated Allen key.
This type of connection uses the **Ever**Link® system with creep compensation (2) (Schneider Electric patent).
This technique makes it possible to achieve accurate and durable tightening torque.

These relays are also available for connection by lugs (1).

LRD3361 to 4369, LR2D3561 to D3563
LRD3361 to 4369 and LR2D3561 to D3563 relays are designed for connection by screw clamp terminals. They can be supplied for connection by lugs (1).

Description

TeSys D 3-pole thermal overload relays are designed to protect a.c. circuits and motors against overloads, phase failure, long starting times and prolonged stalling of the motor.

1 Adjustment dial Ir.
2 Test button.
Operation of the Test button allows:
- checking of control circuit wiring,
- simulation of relay tripping (actuates both the N/O and N/C contacts).

3 Stop button. Actuates the N/C contact; does not affect the N/O contact.
4 Reset button.
5 Trip indicator.
6 Setting locked by sealing the cover.
7 Selector for manual or automatic reset.

LRD01 to 35, LRD04L to 32L and LRD313 to LRD380 relays are supplied with the selector in the manual position, protected by a cover. Deliberate action is required to move it to the automatic position.

(1) Connection by lugs meets the requirements of certain Asian markets and is suitable for applications subject to strong vibration, such as railway transport.
(2) Creep: normal crushing phenomenon of copper conductors, that is accentuated over time.

References:
pages B11/4 to B11/7

Dimensions, mounting:
pages B11/35 to B11/37

Schemes:
page B11/37

Characteristics

Environment

Conforming to standards			IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1 UL 60947-5-1, CSA C22.2 n° 60947-5-1, EN 50495 (1), GB/T 14048.4, GB/T 14048.5
Product certifications			UL (2), CSA (2) IEC, CCC (3), EAC, ATEX (1) ABS, BV (4), DNV-GL (5), LRoS (6), RINA (7), RMRS (8), EU RO Mutual recognition (9)
Degree of protection (front face)	Conforming to IEC 60529		Protection against direct finger contact IP20
Climatic withstand			Conforming to IACS E10
Ambient air temperature around the device	Storage	°C	-60…+70
	Normal operation, without derating (IEC 60947-4-1)	°C	-20…+60
	Minimum /maximum operating temperatures (with derating)	°C	-20…+70
Operating positions without derating	In relation to normal vertical mounting plane		Any position. When mounting on a vertical rail, use a stop.
Flame resistance	Conforming to 60695-2-11	°C	850
Shock resistance	Permissible acceleration conforming to IEC 60068-2-7		15 gn - 11 ms
Vibration resistance (10)	Permissible acceleration conforming to IEC 60068-2-6		6 gn except LRD04L...LRD32L: 3 gn
Dielectric strength at 50 Hz	Conforming to IEC 60947-1	kV	1.89 (product Ui 690 V), 2.2 (product Ui 1000 V)
Impulse withstand voltage	Conforming to IEC 60947-1	kV	6

Electrical characteristics of power circuit

Relay type			LRD01 …16, LR3D01 …16	LRD04L ...32L	LRD21 …35, LR3D21 …35	LRD313 …365 LR3D 313 …38	LRD313L …365L	LRD3322 …33696 LR3D3322 … 33696	LR2D 3522 … 3563	LRD 4365 … 4369
Tripping class	Conforming to UL 60947-4-1, IEC 60947-4-1		10 A	20	10 A	10 A	20	10 A	20	10 A
Rated insulation voltage (Ui)	Conforming to IEC 60947-4-1	V	690					1000 (11)		
	Conforming to UL, CSA	V	600							600 except LRD 4369
Rated impulse withstand voltage (Uimp)		kV	6							
Rated operational voltage (Ue)		V	690							
Frequency limits	Of the operating current	Hz	0…400							
Setting range	Depending on model	A	0.1…13	0.63…32	12…38	9…80	9…65	17…140	17…80	80…140

Auxiliary contact characteristics

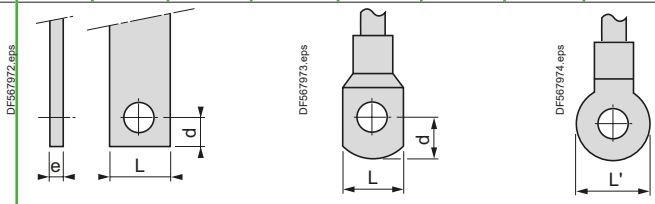
Conventional thermal current		A	5					
Max. sealed consumption of the operating coils of controlled contactors (Occasional operating cycles of contact 95-96)	a.c. supply, AC-15	V	120	240	380	480	500	600
		A	3	1.5	0.95	0.75	0.72	0.12
	d.c. supply, DC-13	V	125	250	440			
		A	0.22	0.1	0.06			
Protection against short-circuits	By gG, BS fuses. Maximum rating or by GB2	A	4					

*(1) For relays **LRD01** to **LRD380**, **LRD3322** to **LRD3365**, **LRD04L** to **LRD32L**, **LRD4365** to **LRD4369**, **LRD33656** to **LRD33696.***
*(2) Except for relays **LRD4369**.*
*(3) CCC: Except for **LRD/LR3D04L** to **LRD/LR3D32L**, **LR2D3522** to **LR2D3563**.*
*(4) BV: except for **LRD/LR3D04L** to **LRD/LR3D32L**, **LRD/LR3D313** to **LRD/LR3D380**.*
*(5) DNV-GL: except for **LRD04L** to **LRD32L**.*
*(6) LRoS: except for **LRD/LR3D04L** to **LRD/LR3D32L**, **LRD/LR3D380**.*
*(7) RINA: for **LRD/LR3D01** to **LRD/LR3D35**.*
*(8) RMRS: for **LRD/LR3D313** to **LRD/LR3D380**.*
*(9) EU RO Mutual Recognition: for **LRD/LR3D313** to **LRD/LR3D380**, **LRD313L** to **LRD365L**.*
(10) In case of vibration above 3gn on TeSys D Green *contactor directly mounted with LRD, it is recommended do mount the devices separately by screws on metal plate.*
*(11) 750 V for **LRD33656**, **LRD33676**, **LRD33696**.*

Ref.
Overload relays

Characteristics

Power circuit connection characteristics

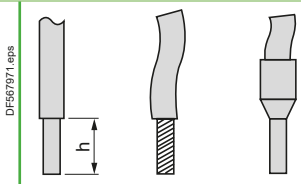
Relay type			LRD01 …16, LR3D01 …16	LRD04L ...21L	LRD22L ...32L	LRD21 …35, LR3D21 …35	LRD 313 …365 LR3D 313 …380	LRD 313L …365L	LRD 3322 …33696 LR3D 3322 … 33696	LR2D 3522 …3563	LRD 4365 …4369
Connection to screw clamp terminals											
Flexible cable without cable end	1 conductor	mm²	1.5…10			1.5…10	1…35	1…35	4…35		4…50
Flexible cable with cable end	1 conductor	mm²	1…4		1...6	1…6 except **LRD21:** 1…4	1…35	1…35	4…35		4…35
Solid cable without cable end	1 conductor	mm²	1…6		1.5…10	1.5/10 except **LRD21:** 1/6	1…35	1…35	4…35		4…50
Tightening torque		N.m	1.7		2.5	2.5	1…25: 5 35: 8	1…25: 5 35: 8	9	9	9
Connection to spring terminals (Min/max c.s.a.) (except LRD04L...LRD32L)											
Flexible cable without cable end	1 conductor	mm²	1.5…4	–	–	1.5…4	–	–	–	–	–
Flexible cable with cable end	1 conductor	mm²	1.5…4	–	–	1.5…4	–	–	–	–	–
Connection by bars or lugs											

Relay type			LRD016…166 LRD04L6 … 16L6	LRD216…356 LRD21L6 … 32L6	LRD3136 … 3806	LRD313L6 … 365L6	LRD3322A66 … 3365A66
Pitch	Without spreaders	mm	14.5	17.5	17.5	17.5	21.5
Bars or cables with lugs	e	mm	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6
	L	mm	≤ 8	≤ 8	≤ 13.5	≤ 13.5	≤ 16
	L'	mm	≤ 9.5	≤ 9.5	≤ 16.5	≤ 16.5	≤ 16
	d		≤ 7	≤ 7	≤ 10	≤ 10	≤ 12
Screws			M4	M4	M6	M6	M10
	Tightening torque	N.m	1.7	2.5	6	6	11.3

Control circuit connection characteristics

Connection to screw clamp terminals or spring terminals

Bare cables



Relay type			LRD01 …16, LR3D01 …16	LRD04L ...21L	LRD22L ...32L	LRD21 …35, LR3D21 …35	LRD 313 …365 LR3D 313 …380	LRD 313L …365L	LRD3322 …33696 LR3D 3322 … 33696	LR2D 3522 … 3563	LRD 4365 …4369
Connection to screw clamp terminals (1)	Solid cable without cable end	mm²	2 x 1…2.5								
	Flexible cable without cable end	mm²	2 x 1…2.5								
	Flexible cable with cable end	mm²	2 x 1…2.5								
Tightening torque		N.m	1.7								
Connection to spring terminals (Min/max c.s.a.) (except LRD04L...LRD32L)	Solid cable	mm²	1…2.5	–		1…2.5			–		
	Flexible cable without cable end	mm²	1…2.5	–		1…2.5			–		

*(1) For relays **LRD313** to **380**: BTR hexagon socket head screws, **Ever**Link® system. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LADALLEN4**, see page B8/28).*

References: pages B11/4 to B11/7
Dimensions, mounting: pages B11/35 to B11/37
Schemes: page B11/37

Characteristics

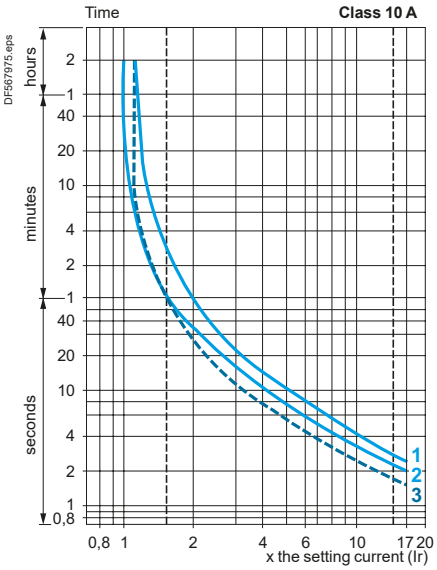
Operating characteristics

Relay type			LRD01 …16, LR3D01 …16	LRD04L... LRD32L	LRD21 …35, LR3D21 …35	LRD313 …365 LR3D 313 …380	LRD313L …365L	LRD3322 …33696 LR3D3322 … 33696	LR2D 3522 … 3563	LRD 4365 …4369
Temperature compensation		°C	-20…+60							
Tripping threshold	Conforming to IEC 60947-4-1	A	1.14 ±0.06 Ir							
Sensitivity to phase failure			Tripping current 130 % of Ir on two phases, the third phase at 0.							

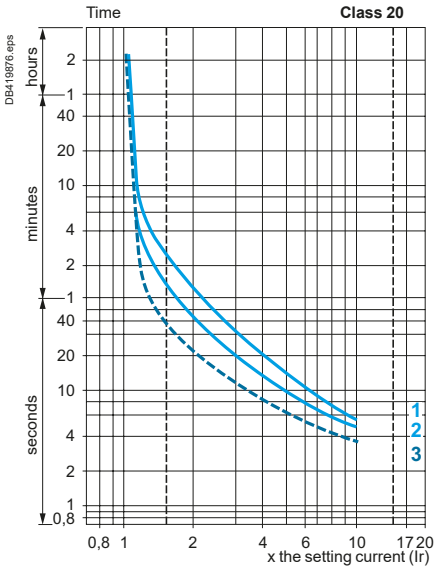
Tripping curves

Average operating time related to multiples of the setting current

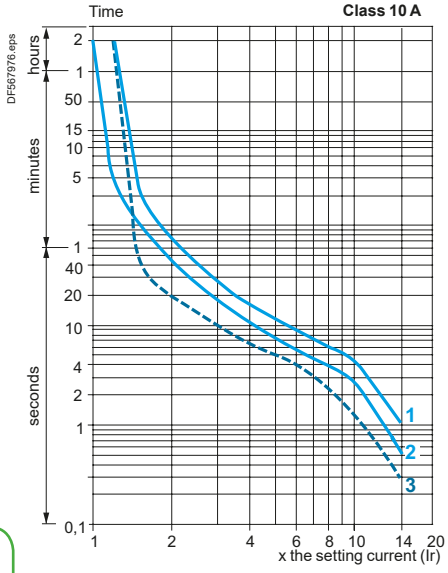
LRD01 to LRD35, LR2D and LRD3322 to LRD4369



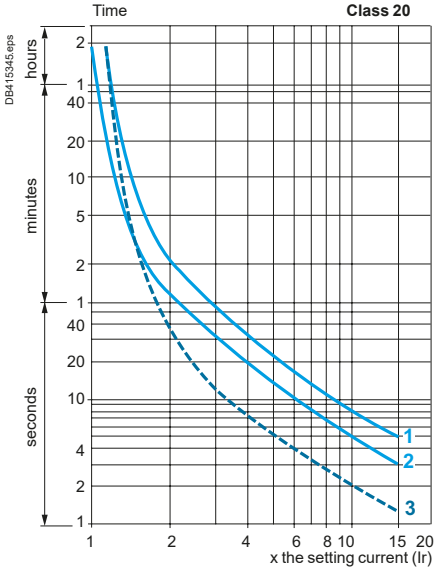
LRD04L to LRD32L and LR2D3522 to LR2D3563



LRD313 to LRD380



LRD313L to LRD365L



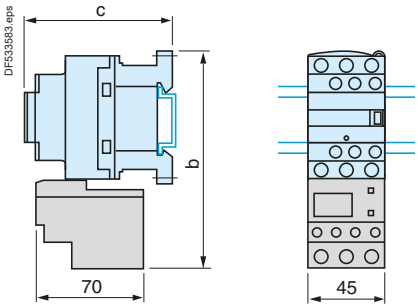
1 Balanced operation, 3-phase, without prior current flow (cold state).
2 2-phase operation, without prior current flow (cold state).
3 Balanced operation, 3-phase, after a long period at the set current (hot state).

References: pages B11/4 to B11/7
Dimensions, mounting: pages B11/35 to B11/37
Schemes: page B11/37

Dimensions, mounting

LRD01…35 (1)

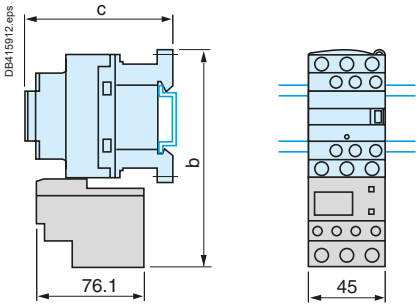
Direct mounting beneath contactors with screw clamp connections



LC1	D09…D18	D25…D38
b	123	137
c	See pages B11/32 and B8/73	

LRD04...32L (1)

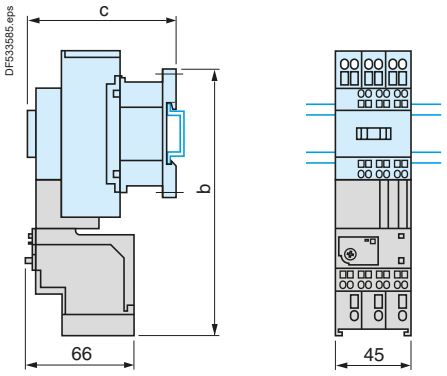
Direct mounting beneath contactors with screw clamp connections



LC1	D09…D18	D25…D38
b	123	137
c	See pages B11/32 and B8/73	

LRD013…223

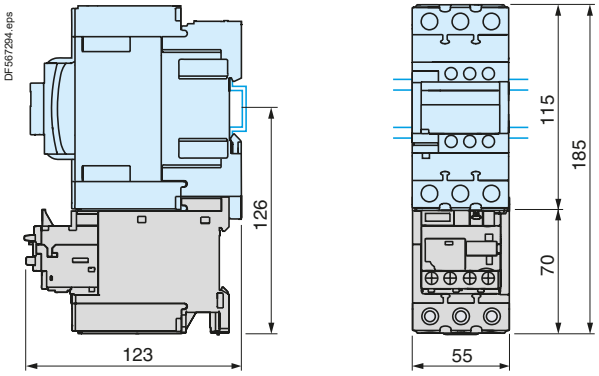
Direct mounting beneath contactors with spring terminal connections



LC1	D093…D253
b	168
c	See pages B11/32 and B8/73

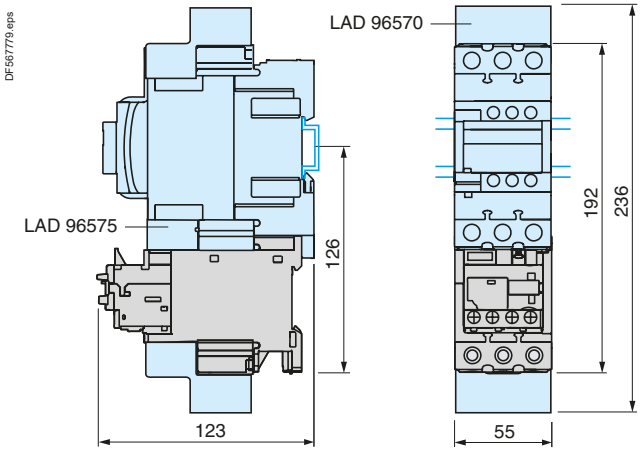
LRD313 …380 (1)

Direct mounting beneath contactors LC1D40A…D80A with screw clamp connections or EverLink® connectors



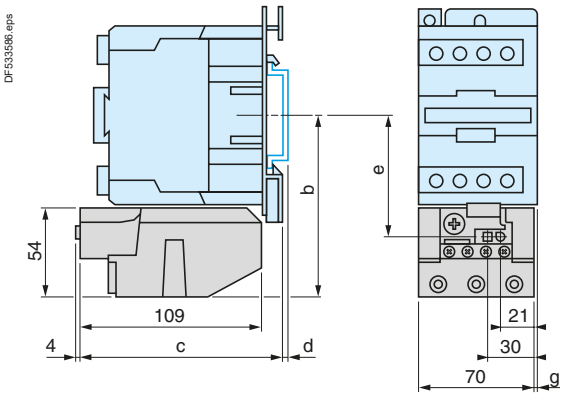
LRD3136 …3806 (1)

Direct mounting beneath contactors LC1D40A6…D80A6 with lugs



LRD33●●●

Direct mounting beneath contactors LC1D80…D95



AM1	DL201	DL200
d	7	17

Control circuit AC	b	c	e	g (tri)	g (tetra)
LC1D80	115.5	124	76.9	9.5	22
LC1D95	115.5	124	76.9	9.5	-
Control circuit DC					
LC1D80, D95	115.5	179.4	76.9	9.5	22

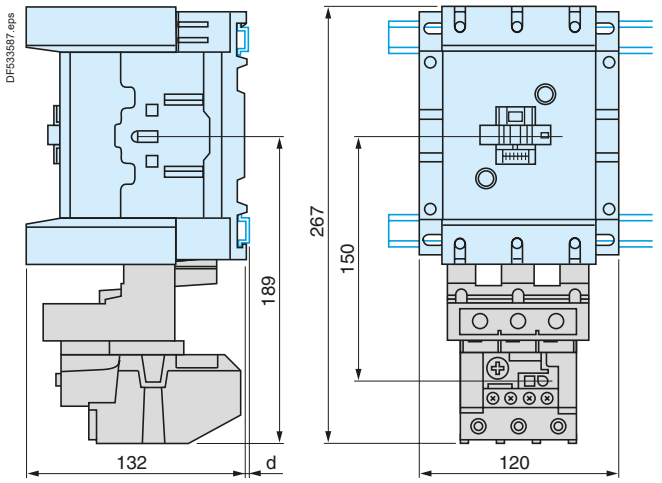
(1) In case of vibration above 3 gn on TeSys D Green *contactor directly mounted with LRD, it is recommended do mount the devices separately by screws on metal plate.*

Characteristics: pages B11/31 to B11/34
References: pages B11/4 to B11/7
Schemes: page B11/37

Dimensions, mounting

LRD4●●●

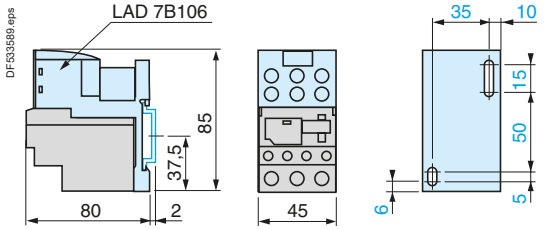
Direct mounting beneath contactors LC1D115 and D150



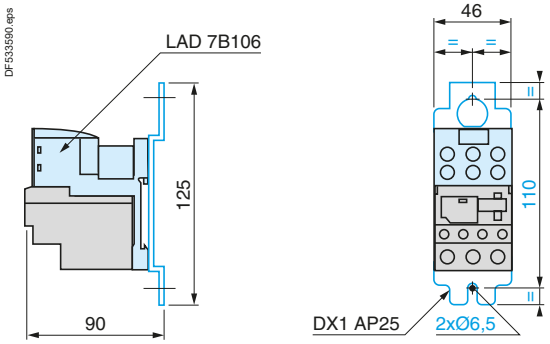
AM1	DL200 and DR200	DE200 and ED●●●
d	2.5	10.5

LRD01…35

Independent mounting on 50 mm centres or on rail AM1DP200 or DE200



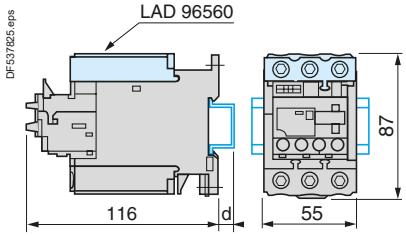
Independent mounting on 110 mm centres



LRD313…380

Mounting on rail AM1D●200 or ED200

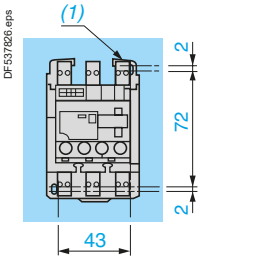
With terminal block LAD96560



AM1	DP200	DE200	ED200
d	2	9.5	9.5

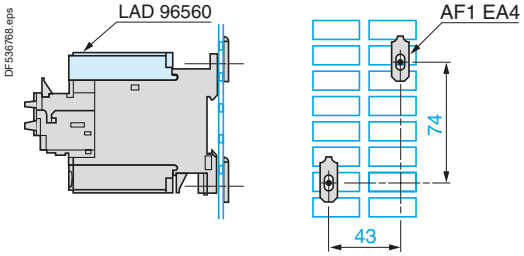
Panel mounting

Outgoing terminal block not shown



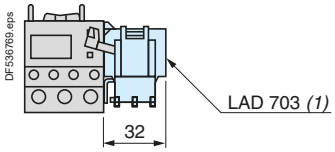
(1) 2 elongated holes Ø 4.2 x 6.

Mounted on plate AM1P



LRD01…35 and LRD313…380

Remote tripping or electrical reset



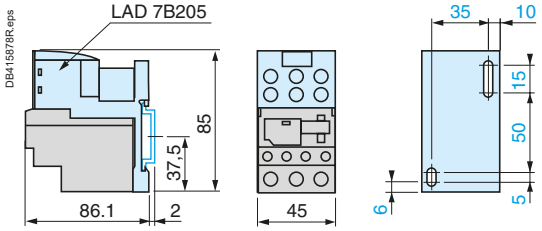
*(1) Can only be mounted on RH side of relay **LRD01**…**35** and **LRD313**…**380** .*

Characteristics: pages B11/31 to B11/34
References: pages B11/4 to B11/7
Schemes: page B11/37

Dimensions, mounting and schemes

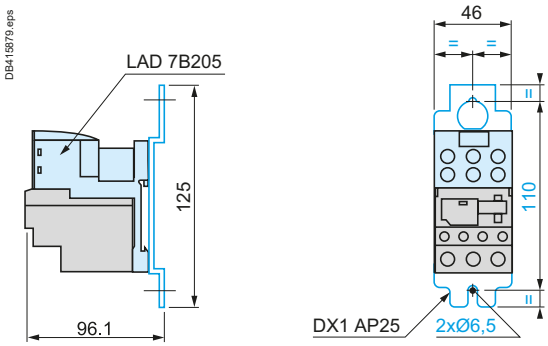
LRD04L...32L

Independent mounting on 50 mm centres or on rail AM1DP200 or DE200

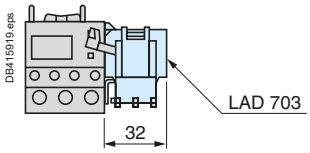


AM1	DP200	DE200
d	2	9.5

Independent mounting on 110 mm centres



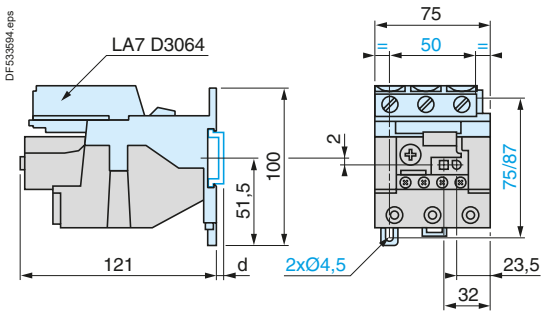
Remote tripping or electrical reset



(1) Can be mounted on RH or LH side of relay LR2D15.

LRD3●●● and LR2D35●●

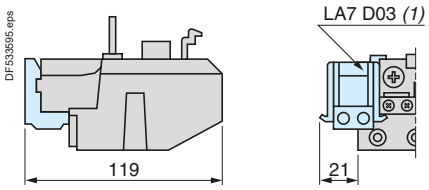
Independent mounting on 50 mm centres or on rail AM1DP200 or DE200



AM1	DP200	DE200
d	2	9.5

LRD3●●●, LR2D35●● and LR9D

Remote tripping or electrical reset



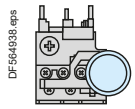
*(1) Can be mounted on RH or LH side of relay **LRD3●●●**, **LR2D35●●** or **LR9D**.*

LRD3●●●

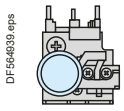
Adapter for door mounted operator

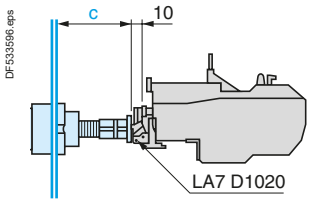
LA7D1020

Stop



Reset





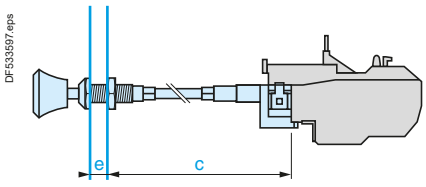
c: adjustable from 17 to 120 mm

LRD, LRD313...380, LRD04...32L

"Reset" by flexible cable

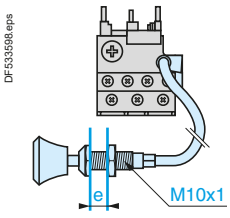
LA7D305 and LAD7305

Mounting with cable straight

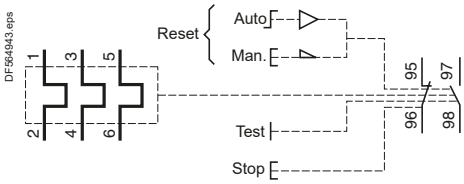


e: up to 20 mm / c: up to 550 mm

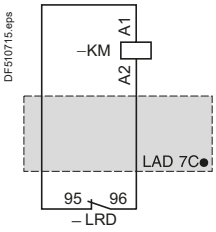
Mounting with cable bent



LRD●●, LRD3●● and LR2D●●

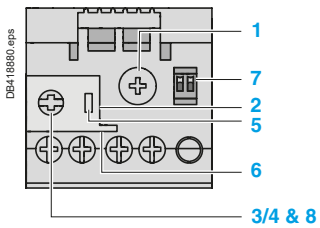


Pre-wiring kit LAD7C1, LAD7C2



Characteristics:
pages B11/31 to B11/34

References:
pages B11/4 to B11/7



LR9D01...110S

Description: LR9D01, 02, 08 and 32

These self-powered electronic thermal overload relays are designed for direct mounting to contactors LC1D09 through LC1D38.
LR9D110S self-powered electronic thermal overload relay is designed for separate mounting only.

In addition to the protection provided by the TeSys D thermal overload relays (see page B11/31), they offer the following additional features:
- protection against phase imbalance
- choice of starting class
- protection of unbalanced circuits
- protection of single-phase circuits

1 Adjustment dial Ir.
2 Test button.
3 Stop button.
4 Reset button.
5 Trip indicator.
6 Setting locked by sealing the cover.
7 Class 5/10/20/30 dipswitches.
8 Reset mode selector.

Environment

Relay type			LR9D01, 02, 08, 32 and LR9D110S
Conforming to standards			IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.4
Product certifications			CCC, CSA, UL, CB certification
Degree of protection	Conforming to IEC 60529 and VDE 0106		IP 20 on front panel
Ambient air temperature around the device (Conforming to IEC 60255-8)	Storage	°C	-55 to +80
	Normal operation	°C	-25 to +70
Maximum operating altitude	Without derating	m	2000
Operating positions without derating	In relation to normal vertical mounting plane		Any position
Shock resistance	Permissible acceleration conforming to IEC 60068-2-27		15 g (11ms)
Vibration resistance	Permissible acceleration conforming to IEC 60068-2-6		6 g (10-150 Hz)
Dielectric strength at 50 Hz	Conforming to IEC 60947-4-1	kV	6
Surge withstand, common mode	Conforming to IEC 61000-4-5	kV	2
Resistance to electrostatic discharge	Conforming to IEC 61000-4-2	kV	8
Immunity to radiated radio-frequency disturbances	Conforming to IEC 61000-4-3 and NF C 46-022	V/m	10
Immunity to fast transient currents	Conforming to IEC 61000-4-4	kV	2
Electromagnetic compatibility	Draft EN 50081-1 and 2, EN 50082-2		Meets requirements

Electrical characteristics of auxiliary contacts

Conventional thermal current		A	5					
Max. sealed consumption of the operating coils of controlled contactors (Occasional operating cycles of contact 95-96)	a.c. supply, AC-15	V	24	48	110	220	380	600
		VA	100	200	400	600	600	600
	d.c. supply, DC-13	V	24	48	110	220	–	–
		W	100	100	50	45	–	–
Protection against short-circuits	By gG or BS fuses or by circuit breaker **GB2**	A	5					
Cabling Flexible cable without cable end	1 or 2 conductors	mm² (AWG)	1 to 2.5 (18 to 14)					
	Tightening torque	Nm (lb-in)	0.8 (7)					

References: page B11/10
Dimensions, mounting: page B11/42
Schemes: page B11/43

Characteristics

Electrical characteristics of power circuit

Relay type			LR9D01	LR9D02	LR9D08	LR9D32	LR9D110S
Tripping class	Conforming to IEC/EN 60947-4-1		5, 10, 20, 30				
	Conforming to UL 60947-4-1, CSA C22.2 n° 60947-4-1		10, 20, 30				
Rated insulation voltage (Ui)	Conforming to IEC 60947-4-1	**V AC**	1000				
Rated operational voltage (Ue)	Conforming to IEC 60947-4-1	**V AC**	690				
	Conforming to UL/CSA	**V AC**	600				
Rated impulse withstand voltage		**kV**	6				
Frequency limits	Of the operating current	**Hz**	50…60				
Setting range		**A**	0.1...0.5	0.4...2	1.6...8	6.4...32	22...110
Power circuit connections	Wire size - 1 or 2 conductors	**mm² (AWG)**	1 to 16 (14 to 6)				4 to 50 (10 to 1/0)
	Tightening torque	**Nm (lb-in)**	3.1 (28)				9 (80)

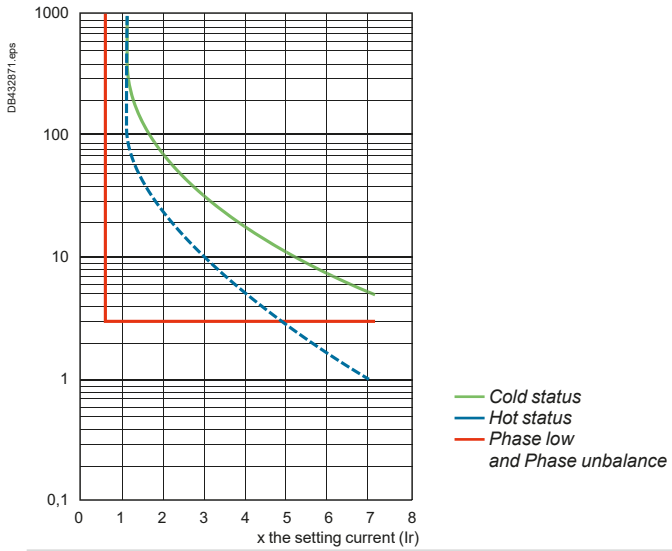
Operating characteristics

Consumption		**mW**	< 300
Tripping thresholds	Conforming to IEC 60947-4-1	**A**	1.25 In
Sensitivity to phase unbalance	Conforming to IEC 60947-4-1		Phase difference > 40%, tripping in 3 s
Current setting ratio			5:1
Automatic reset time		**min.**	1.5…4

LR9D01, 02, 08, 32, LR9110S tripping curves

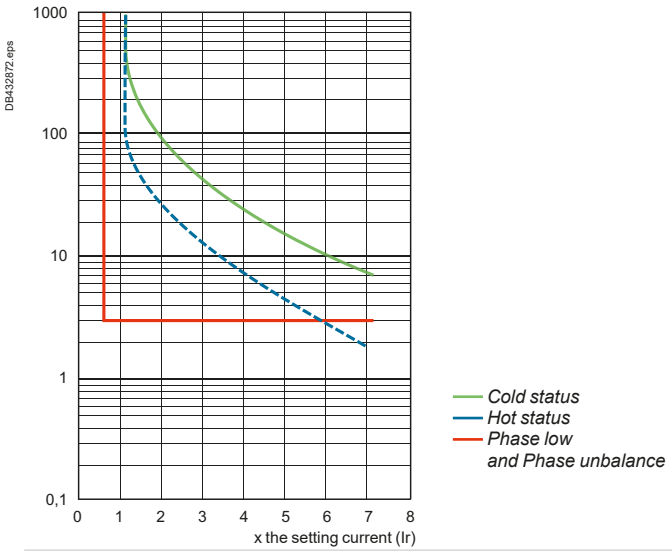
Class 5 Trip curve

Tripping time in seconds



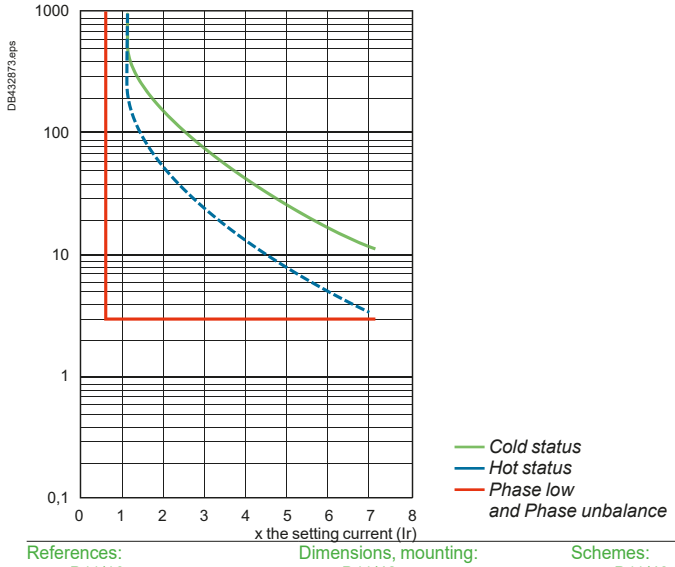
Class 10 Trip curve

Tripping time in seconds



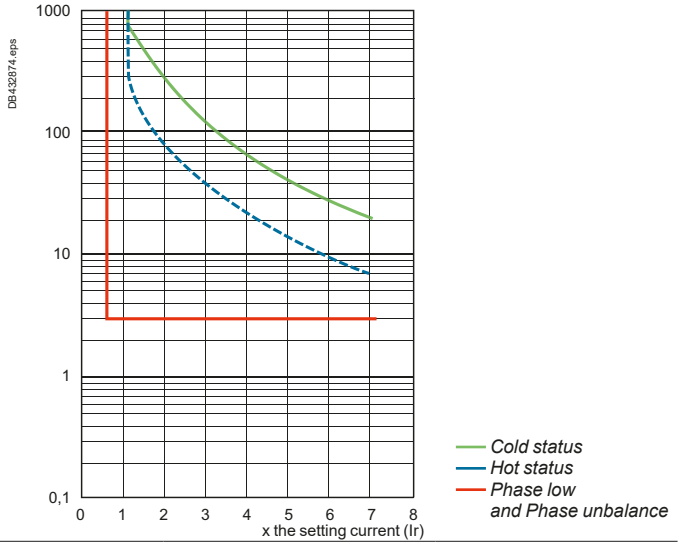
Class 20 Trip curve

Tripping time in seconds



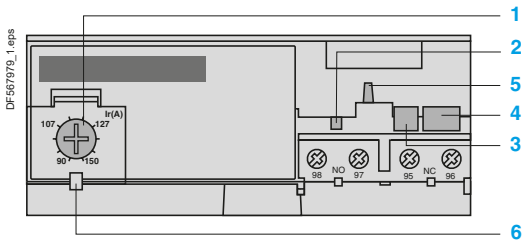
Class 30 Trip curve

Tripping time in seconds

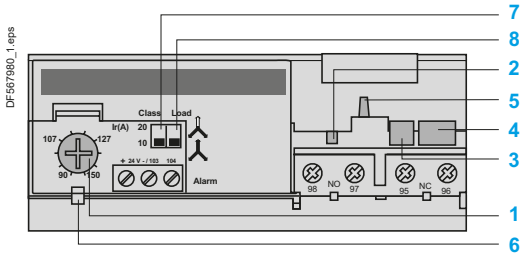


References: page B11/10
Dimensions, mounting: page B11/42
Schemes: page B11/43

Characteristics



LR9D5367…D5569



LR9D67 and D69

Description: LR9D5367...LR9D5569, LR9D67, LR9D69

These electronic thermal overload relays are designed for use with contactors LC1D115 and D150.

In addition to the protection provided by TeSys D thermal overload relays (see page B11/31), they offer the following special features:
- protection against phase imbalance
- choice of starting class
- protection of unbalanced circuits
- protection of single-phase circuits
- alarm function to avoid tripping by load shedding.

1 Adjustment dial Ir.
2 Test button.
3 Stop button.
4 Reset button.
5 Trip indicator.
6 Setting locked by sealing the cover.
7 Class 10/class 20 selector switch.
8 Selector for balanced load /unbalanced load

Environment

Relay type			LR9D5367...LR9D5569, LR9D67, LR9D69
Conforming to standards			IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.4
Product certifications			UL, CSA, CCC, ABS, BV, DNV-GL
Degree of protection	Conforming to IEC 60529		IP 20 on front panel with protective covers **LA9D11570●** or **D11560●**
Climatic withstand			according to IACS E10
Ambient air temperature around the device (Conforming to IEC 60255-8)	Storage	**°C**	- 40…+ 85
	Normal operation	**°C**	- 20…+ 55 (1)
Maximum operating altitude	Without derating	**m**	2000
Operating positions without derating	In relation to normal vertical mounting plane		Any position
Shock resistance	Permissible acceleration conforming to IEC60028-2-27		13 gn - 11 ms
Vibration resistance	Permissible acceleration conforming to IEC 60068-2-6		2 gn - 5…300 Hz
Dielectric strength at 50 Hz	Conforming to IEC 60947-4-1	**kV**	6
Surge withstand	Conforming to IEC 61000-4-5	**kV**	6
Resistance to electrostatic discharge	Conforming to IEC 61000-4-2	**kV**	8
Immunity to radiated radio-frequency disturbances	Conforming to IEC 61000-4-3	**V/m**	10
Immunity to fast transient currents	Conforming to IEC 61000-4-4	**kV**	2
Electromagnetic compatibility	EN 50081-1 and 2, EN 50082-2		Meets requirements

Electrical characteristics of auxiliary contacts

Conventional thermal current		**A**	5					
Max. sealed consumption of the operating coils of controlled contactors (Occasional operating cycles of contact 95-96)	a.c. supply	**V**	24	48	110	220	380	600
		VA	100	200	400	600	600	600
	d.c. supply	**V**	24	48	110	220	440	–
		W	100	100	50	45	25	–
Protection against short-circuits	By gG or BS fuses or by circuit breaker **GB2**	**A**	5					
Cabling Flexible cable without cable end	1 or 2 conductors	**mm²**	Minimum c.s.a.: 1 Maximum c.s.a.: 2.5					
	Tightening torque	**Nm**	1.2					

(1) For operating temperatures up to 70 °C, please consult your Regional Sales Office.

References: page B11/10
Dimensions, mounting: page B11/42
Schemes: page B11/43

Characteristics

Electrical characteristics of power circuit

Relay type			LR9D5367...LR9D5569, LR9D67, LR9D69
Tripping class	Conforming to IEC/EN 60947-4-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1		10 or 20
Rated insulation voltage (Ui)	Conforming to IEC 60947-4-1	**V**	1000
	Conforming to UL, CSA	**V**	600
Rated impulse withstand voltage (Uimp)		**kV**	8
Frequency limits	Of the operating current	**Hz**	50…60 (1)
Setting range	Depending on model	**A**	60…150
Power circuit connections	Width of terminal lug	**mm**	20
	Clamping screw		M8
	Tightening torque	**N.m**	18

Operating characteristics

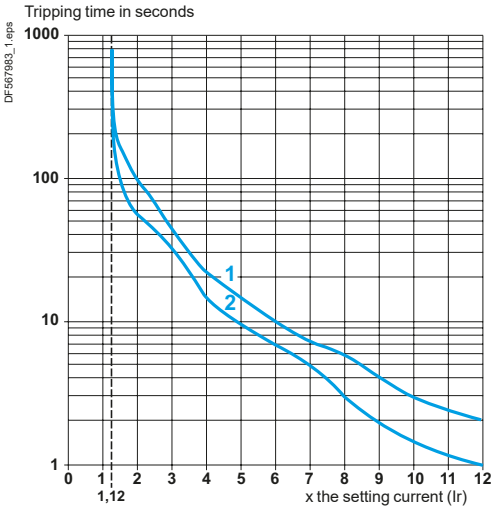
Temperature compensation		**°C**	- 20…+70
Tripping thresholds	Conforming to IEC 60947-4-1		
	Alarm	**A**	1.05 ±0.06 In
	Trip	**A**	1.12 ±0.06 In
Sensitivity to phase failure	Conforming to IEC 60947-4-1		Tripping in 4 s ±20 % in the event of phase failure

Alarm circuit characteristics

Rated supply voltage	d.c. supply	**V**	24
Supply voltage limits		**V**	17…32
Current consumption	No-load	**mA**	≤ 5
Switching capacity		**mA**	0…150
Protection	Short-circuit and overload		Self protected
Voltage drop	Closed state	**V**	≤ 2.5
Cabling	Flexible cable without cable end	**mm²**	0.5…1.5
Tightening torque		**N.m**	0.45

(1) For other frequencies and for applications involving the use of these overload relays with soft starters or variable speed drives, please consult your Regional Sales Office.

LR9D5367...LR9D5569, LR9D67, LR9D69 tripping curves



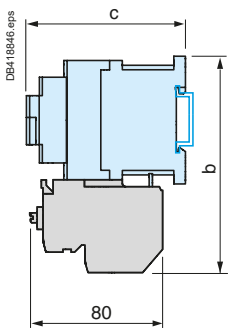
Average operating time related to multiples of the setting current

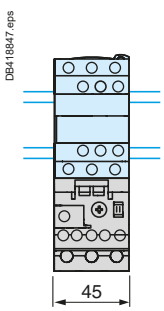
1 Cold state curve
2 Hot state curve

References: page B11/10
Dimensions, mounting: page B11/42
Schemes: page B11/43

Dimensions, mounting

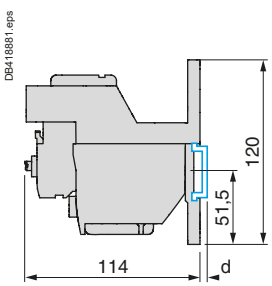
LR9D01, 02, 08, 32

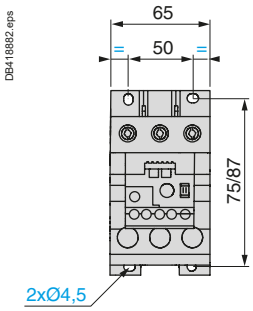




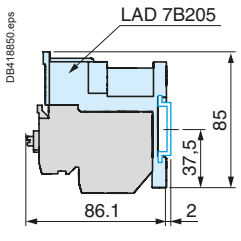
LC1	D09...D18	D25...D38
b	130	140
c	See pages B8/65 and B8/66	

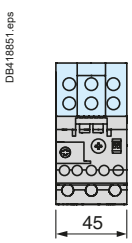
LR9D110S

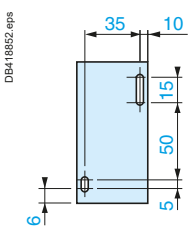




LR9D01...32

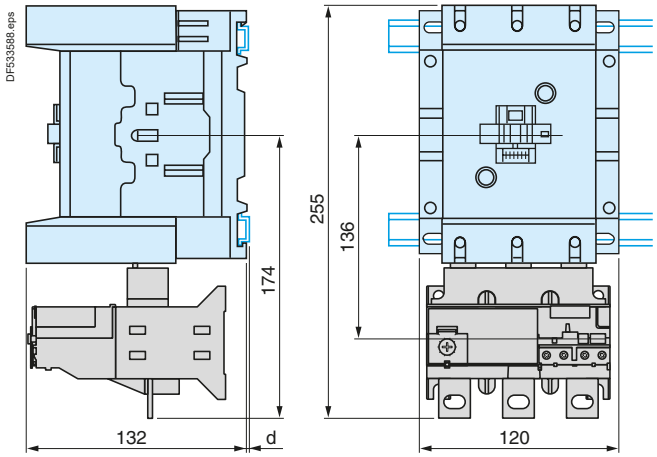






LR9D53●●, LR9D55●●, LR9D67, LR9D69

Direct mounting beneath contactors LC 1D115 and D150



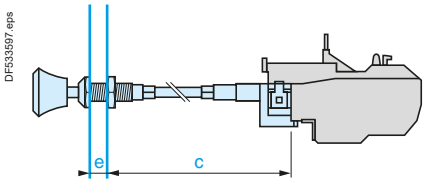
AM1	DP200 and DR200	DE200 and ED●●●
d	2.5	10.5

LR9D

"Reset" by flexible cable

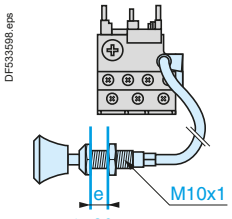
LA7D305 and LAD7305

Mounting with cable straight



e: up to 20 mm / c: up to 550 mm

Mounting with cable bent

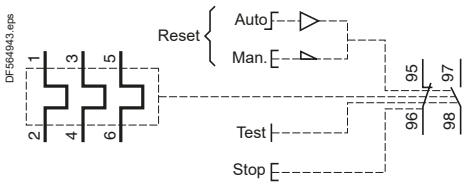


e: up to 20 mm

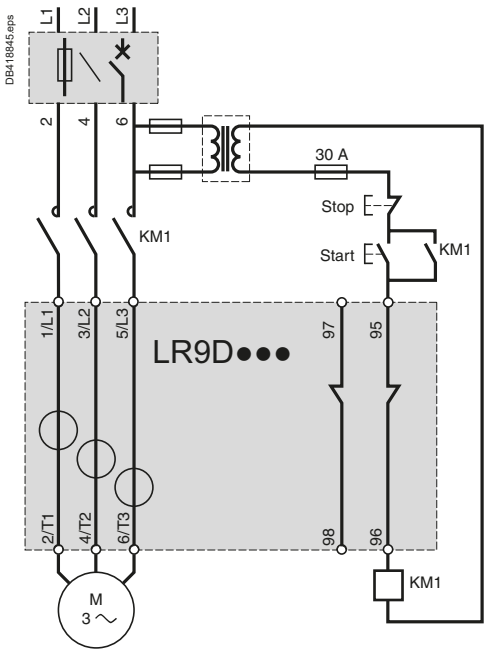
Ref.
Overload relays

Schemes

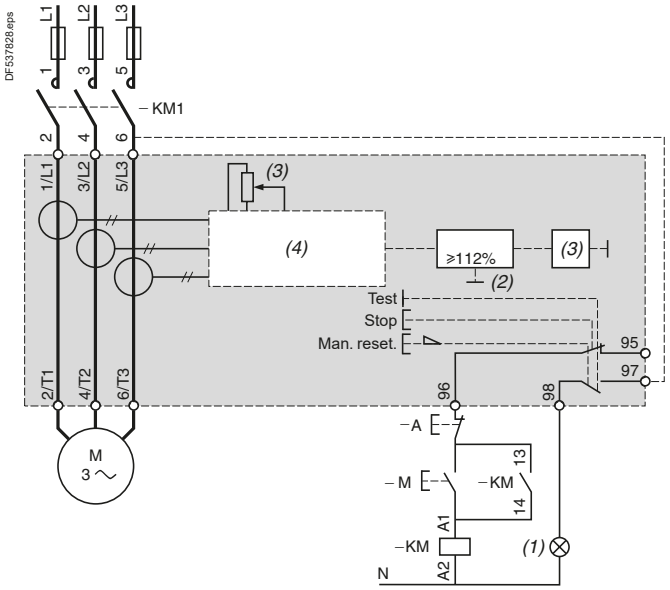
LR9D01, 02, 08, 32, LR9D110S



LR9D01, 02, 08, 32, LR9 D110S

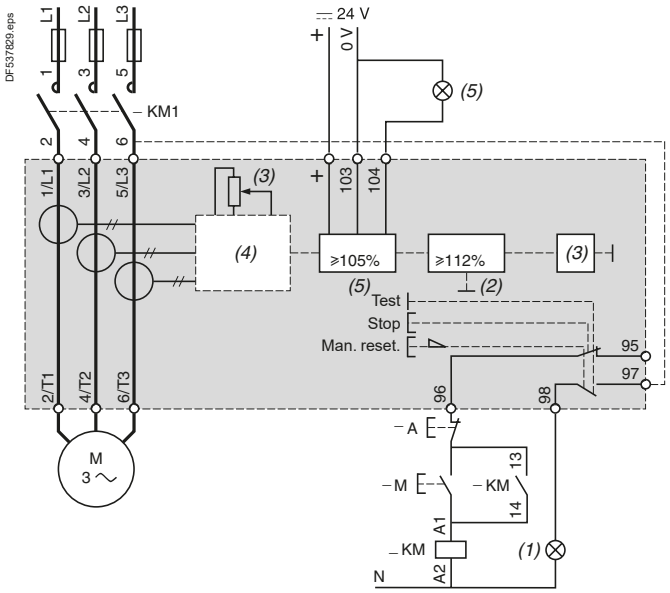


LR9D5●●●



(1) Tripped.
(2) Overload.
(3) Setting current.
(4) Specialised circuit.

LR9D67 and LR9D69



(1) Tripped.
(2) Overload.
(3) Setting current.
(4) Specialised circuit.
(5) Alarm.

References:
page B11/10
Characteristics:
pages B11/38 to B11/41
Dimensions:
page B11/42

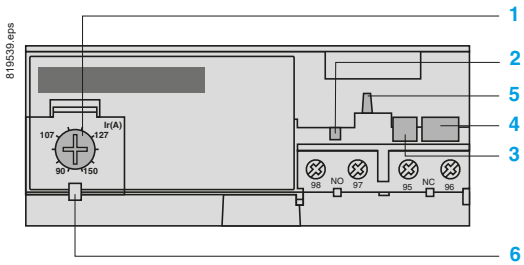
Introduction

TeSys LR9F electronic protection relays are especially suited to the operating conditions of motors.
They provide protection against:
- thermal overload of 3-phase or single-phase balanced or unbalanced circuits;
- phase failure and large phase unbalance,
- protracted starting times,
- prolonged stalled rotor condition.

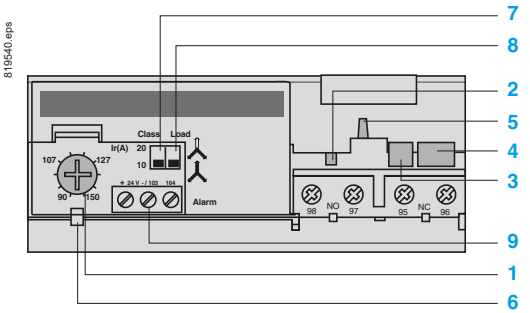
LR9F electronic protection relays are mounted directly below an LC1 F type contactor. They cover a range from 30 to 630 A, in eight ratings.
The settings can be locked by sealing the transparent protective cover.
A reset button is mounted on the front of the relay.
Two versions are available:
- simplified version: class 10: LR9F●3●●, class 20: LR9F●5●●,
- complete version: class 10, 10 A or class 20, selectable, conforming to EN 60947-4-1: LR9F●●.

This latter version includes an alarm function which makes it possible to forestall tripping by load shedding.

Simplified version: class 10 or 20



Complete version: class 10, 10 A or class 20, selectable, and alarm circuit



1 Ir adjustment dial
2 Test button
3 Stop button
4 Reset button
5 Trip indicator
6 Setting locked by sealing the cover
7 Class 10/class 20 selector switch
8 Selector switch for balanced load /unbalanced load
9 Alarm circuit

Ref.
Overload relays

Characteristics

Environment

Conforming to standards			IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.4
Product certifications			UL, CSA, CCC, ABS, BV, DNV-GL
Degree of protection	Conforming to VDE 0106		IP 20
	Conforming to IEC 60529		IP 20 on front of relay with accessories **LA9F103** or **LA7F70●**, see page B11/14
Climatic withstand			according to IACS E10
Ambient air temperature around the device (conforming to IEC 60255-8)	Storage	**°C**	-40…+85
	Normal operation	**°C**	-20…+55 (1)
Maximum operating altitude	Without derating	**m**	2000
Operating positions without derating	In relation to normal vertical mounting plane		Any position
Shock resistance	Permissible acceleration conforming to IEC 60068-2-7		13 gn - 11 ms
Vibration resistance	Permissible acceleration conforming to IEC 60068-2-6		2 gn - 5 to 300 Hz
Dielectric strength at 50 Hz	Conforming to IEC 60947-4-1	**kV**	6
Surge withstand	Conforming to IEC 61000-4-5	**kV**	4
Resistance to electrostatic discharge	Conforming to IEC 61000-4-2	**kV**	8 (in air) 6 (in indirect mode)
Resistance to radiated radio-frequency disturbance	Conforming to IEC 61000-4-3	**V/m**	10
Resistance to fast transient currents	Conforming to IEC 61000-4-4	**kV**	2
Electromagnetic compatibility	EN 50081-1 and 2, EN 50082-2		Conforming

(1) For operating temperatures up to 70 °C, please consult your Regional Sales Office.

Ref.

Overload relays

References:
pages B11/11 to B11/14

Dimensions, schemes:
pages B11/48 and B11/49

Characteristics

Electrical characteristics of power circuit

Relay type			LR9	F5●57, F57	F5●63, F63 F5●67, F67F5●69, F69	F5●71, F71	F7●75, F75 F7●79, F79	F7●81, F81
Rated insulation voltage (Ui)	Conforming to IEC 60947-4-1		**V**	1000				
Rated impulse withstand voltage (Uimp)	Conforming to IEC 60947-1		**kV**	8				
Rated operational current (Ie)			**A**	30 to 630				
Short-circuit protection and coordination				See pages: A6/11, A6/12, A6/15 and A6/16				
Frequency limits	Of the operating current		**Hz**	50…60. For other frequencies, please consult your Regional Sales Office (1)				
Power circuit connections	Width of terminal lug		**mm**	20	25	25	30 **LR9F7●75** and **LR9F75** 40 **LR9F7●79** and **LR9F79**	40
	Clamping screw			M6	M8	M10	M10	M12
	Tightening torque		**N.m**	10	18	35	35	58

Auxiliary contact electrical characteristics

Conventional thermal current		**A**	5		
Short-circuit protection	By gG or BS fuses or by circuit-breaker **GB2CD10**	**A**	5		
Control circuit connections	Flexible cable with cable end			**Min.**	**Max.**
		1 conductor	**mm²**	1 x 0.75	1 x 2.5
		2 conductors	**mm²**	2 x 1	2 x 1.5
	Flexible cable without cable end	1 conductor	**mm²**	1 x 0.75	1 x 4
		2 conductors	**mm²**	2 x 1	2 x 2.5
	Solid cable	1 conductor	**mm²**	1 x 0.75	1 x 2.5
		2 conductors	**mm²**	2 x 1	–
	Tightening torque		**N.m**	1.2	

Maximum sealed current consumption of the coils of associated contactors (occasional operating cycles of contact 95-96)	a.c. supply	**V**	24	48	110	220	380	600
		VA	100	200	400	600	600	600
	d.c. supply	**V**	24	48	110	220	440	–
		W	100	100	50	45	25	–

(1) For applications involving the use of these overload relays with soft starters or variable speed drives, please consult your Regional Sales Office.

Ref.

Overload relays

References:
pages B11/11 to B11/14

Dimensions, schemes:
pages B11/48 and B11/49

Life Is On Schneider Electric

Characteristics

Operating characteristics

Tripping class	Conforming to IEC 60947-4-1			10 and 20
Temperature compensation			°C	-20…+70
Reset				Manual on front of relay
Fault indication				On front of relay
Test function				On front of relay
Stop function				Actuation of N/C contact, without affecting N/O contact
Tripping thresholds	Conforming to IEC 60947-4-1	Alarm	A	1.05 ± 0.06 In
		Tripping	A	1.12 ± 0.06 In
Sensitivity to phase failure	Conforming to IEC 60947-4-1			Tripping in 4 s ± 20 % in the event of phase failure
Adjustment (nominal motor current)				Setting dial on front of relay
Security sealing				Yes

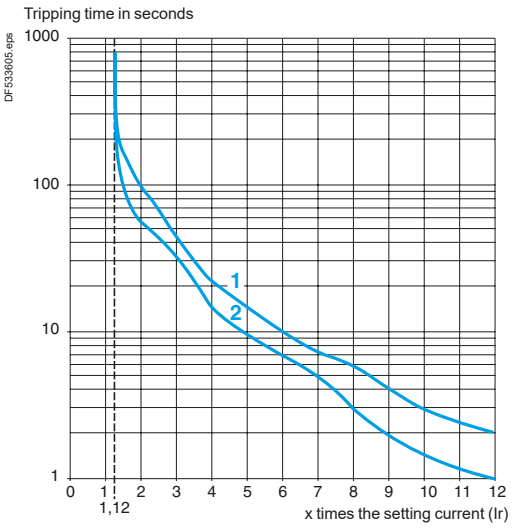
Alarm circuit characteristics

Rated supply voltage	d.c. supply	V	24
Supply voltage limits		V	17…32
Current consumption	No-load	mA	≤ 5
Switching current		mA	0…150
Protection	Short-circuit and overload		Auto-protected
Voltage drop	Closed state	V	≤ 2.5
Connection	Flexible cable without cable end	mm^2	0.5…1.5
Tightening torque		N.m	0.45

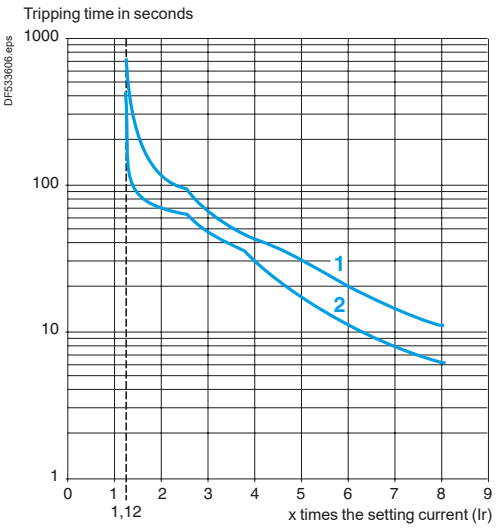
LR9F tripping curve

Average operating times depending on multiples of the setting current

Class 10



Class 20



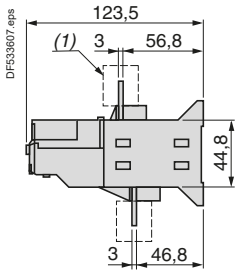
1 Cold state curve
2 Hot state curve

References:
pages B11/11 to B11/14

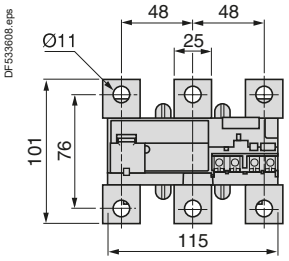
Dimensions, schemes:
pages B11/48 and B11/49

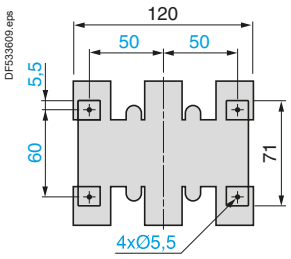
Dimensions

Common side view

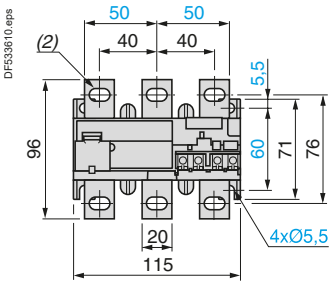


LR9F5●71, F71





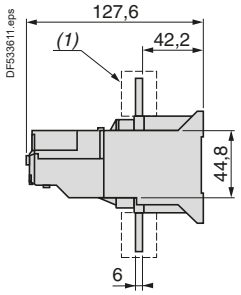
LR9F5●57, F5●63, F5●67, LR9F5●69, F57, F63, F67, F69



*(1) Terminal shroud **LA9F70●***

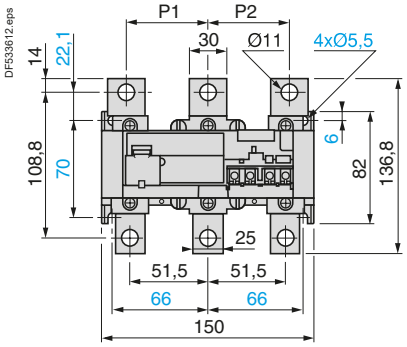
*(2) 6.5 x 13.5 for **LR9F5●57** and **F57**. 8.5 x 13.5 for **LR9F5●63**, **F5●67**, **F5●69**, **F63**, **F67**, **F69***

Common side view



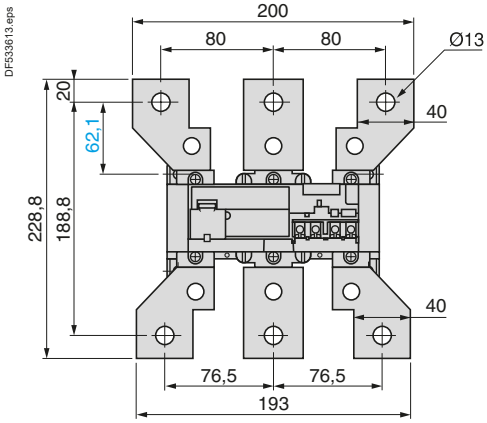
*(1) Terminal shroud **LA9F70●***

LR9F7●75, F7●79, F7●81, LR9F75, F79, F81

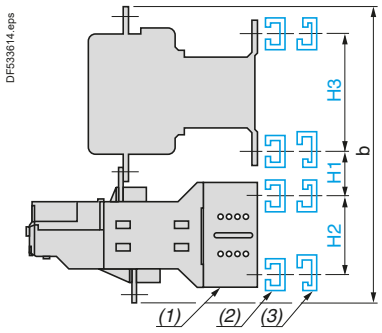


	P1	P2
LR9F7●75, F75	48	48
LR9F7●79, F7●81, F79, F81	55	55

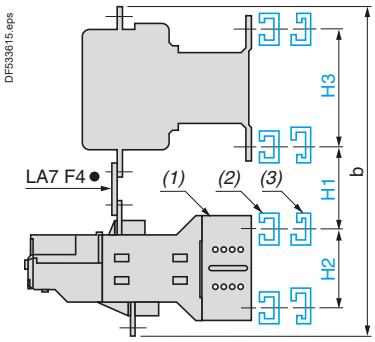
LR9F7●81 (for mounting beneath LC1F630 and F800), LR9F81



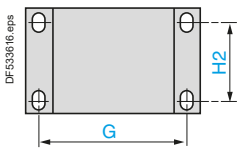
Direct mounting beneath contactor LC1F



Mounting beneath contactors: reversing LC2F or star-delta LC3F



Mounting plate for LR9F



LA7	G
F901	145
F902	190

Contactors LC1	With LR9 relays	b	H1	H2	H3
F115	F5●57, F5●63, F5●67, F5●69, F57, F63, F67, F69	240	30	50	120
F150	F5●57, F5●63, F5●67, F5●69 F57, F63, F67, F69	246	30	50	120
F185	F5●57, F5●63, F5●67, F5●69 F57, F63, F67, F69	250	30	50	120
F225	F5●71, F71	273	40	50	120
	F7●75, F7●79, F75, F79	308	50	58	120
F265	F5●71, F71	279	40	50	120
	F7●75, F7●79, F75, F79	314	60	58	120
F330	F7●75, F7●79, F75, F79	317	60	58	120
F400	F7●75, F7●79, F7●81, F75, F79, F81	317	60	58	180
F500	F7●75, F7●79, F7●81, F75, F79, F81	346	70	58	180
F630, F800	F7●81, F81	510	110	58	180

*(1) Relay mounting plate **LA7F90●**, see page B11/14.*
*(2) **AM1EC** or **AM1DF** for **LC1F115** to **F630** and **LC1F800.***

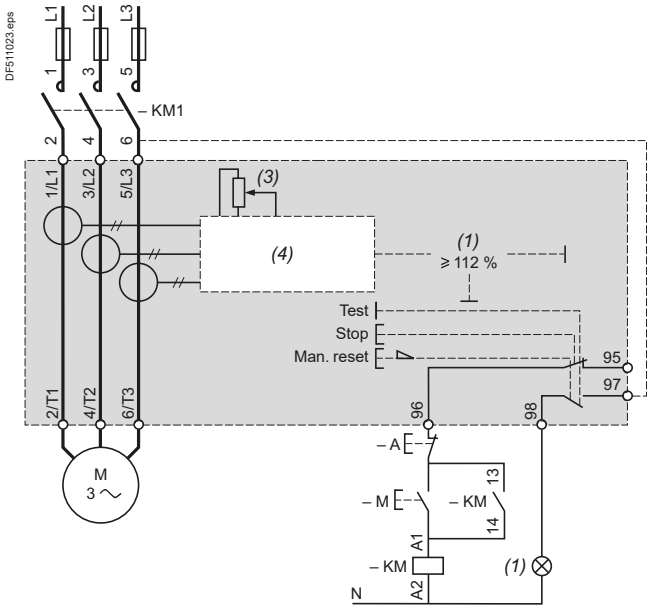
Contactors LC1	With LR9 relays	b	H1	H2	H3
F115	F5●57, F5●63, F5●67, F5●69, F57, F63, F67, F69	279	60	50	120
F150	F5●57, F5●63, F5●67, F5●69 F57, F63, F67, F69	283	60	50	120
F185	F5●57, F5●63, F5●67, F5●69 F57, F63, F67, F69	285	60	50	120
F225	F5●71, F71				
	F7●75, F7●79, F75, F79	360	100	58	120
F265	F5●71, F71	332	90	50	120
	F7●75, F7●79, F75, F79	363	100	58	120
F330	F7●75, F7●79, F75, F79	364	100	58	120
F400	F7●75, F7●79, F7●81, F75, F79, F81	364	100	58	180
F500	F7●75, F7●79, F7●81, F75, F79, F81	390	110	58	180
F630, F800	F7●81, F81	509	120	58	180

*(3) **DZ5MB** for **LC1F115** to **F400.***

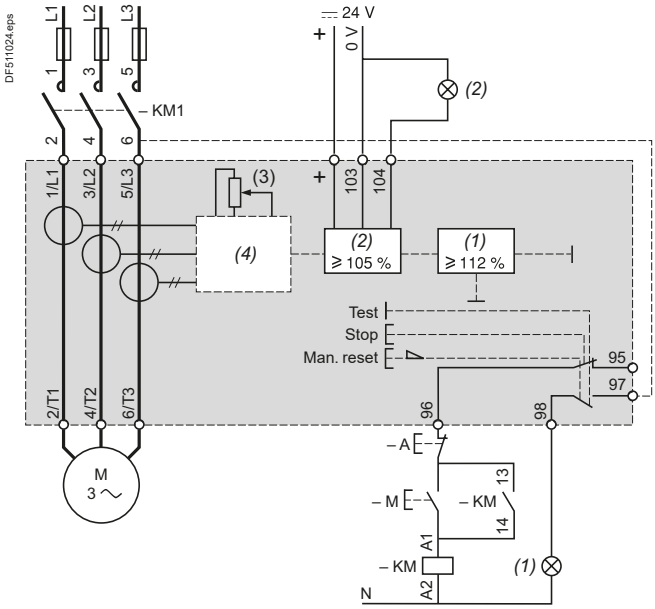
References:
pages B11/11 to B11/14
Characteristics:
pages B11/44 to B11/47
Schemes:
page B11/49

Schemes

LR9F5●57…F7●81



LR9F57…F81 (with alarm)

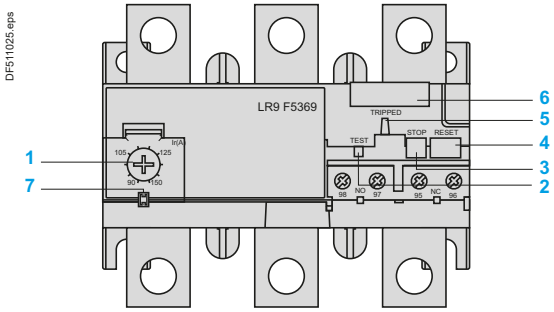


(1) Tripped on thermal overload.
(2) Overheating alarm.
(3) Setting current.
(4) Specialised circuit.

Setting-up the special functions of TeSys LR9F thermal overload relays

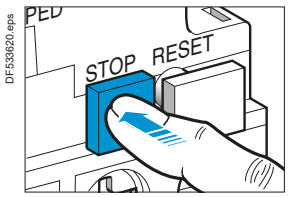
Setting the relay

- Lift the transparent cover **7** to gain access to the various settings.
- Adjustment is achieved by turning dial **1** which is graduated directly in Amperes.
- The setting can be locked by sealing the cover **7**.



"Stop" function 3

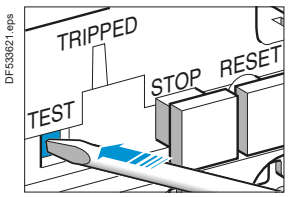
Stop



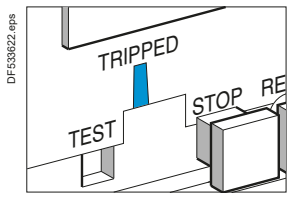
- The "Stop" function is obtained by pressing the red "STOP" button **3**.
- Pressing the Test button:
  - actuates the N/C contact,
  - has no effect on the N/O contact.
- The "STOP" button can be locked by fitting a "U" clip (reference: **LA7D901**).

"Test" function 2

Test



Trip indicator



- The "Test" function is obtained by pressing the red "TEST" button **2** with a screwdriver.
- Operation of the "TEST" button simulates tripping of the relay and:
  - actuates both the N/O and N/C contacts,
  - actuates the trip indicator **5**.

References:
pages B11/11 to B11/14
Characteristics:
pages B11/44 to B11/47
Dimensions:
page B11/48

Characteristics

Introduction

The RM1XA electromagnetic relay detects over current peaks in excess of the maximum permissible current value. It is designed for the protection of circuits which are not subject to current peaks (starters, resistors) or for controlling starting peaks on slip ring motors.

It trips instantaneously and is not suitable for frequent operation (12 operating cycles per hour). It can withstand a continuous current equivalent to 1.25 times the minimum setting current.

Environment characteristics

Conforming to standards		IEC/EN 60947-4-1
Ambient air temperature around the device	**°C**	Storage: - 60…+ 70 Operation: - 40…+ 60
Maximum operating altitude	**m**	2000
Operating position		± 15° in relation to normal vertical mounting position

Electrical characteristics of power circuit

Maximum rated operational voltage	**V**	∼ or ⎓ 600
Frequency limits of the rated operational current	**Hz**	0…60

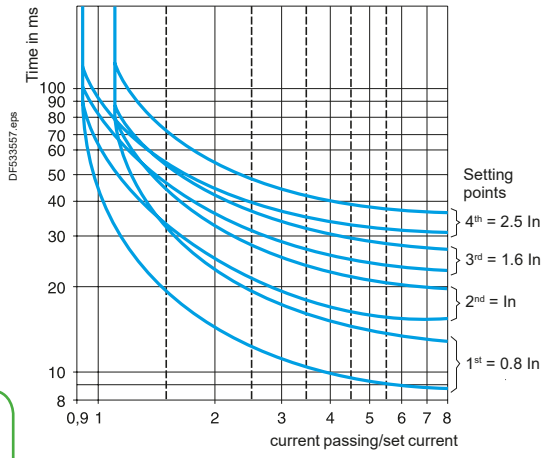
Electrical characteristics of auxiliary contacts

Conventional thermal current			**A**	10				
Occasional making and breaking capacities	a.c. supply	Voltage	**V**	48	110	220	380	600
		Power (1)	**VA**	4000	12 000	17 000	22 000	–
	d.c. supply	Voltage	**V**	48	110	220	440	600
		Power (2)	**W**	240	200	190	180	180

(1) Circuit such as the electromagnet of a contactor - cos φ inrush: 0.7 and cos φ sealed: 0.4.
(2) Circuit such as an electromagnet without economy resistor ; time constant varying from 20 ms for 5 W to 200 ms for 100 W or more.

Operating times

Operating times: because of the numerous applications for RM1 XA over current relays, it is not possible to give precise operating times. The curves shown are therefore purely indicative.



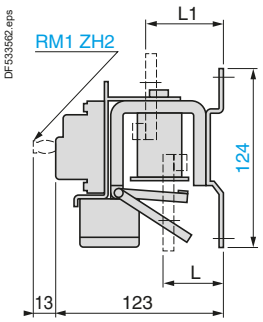
References:
pages B11/15 and B11/16
Dimensions:
page B11/51
Schemes:
page B11/51

Dimensions, schemes

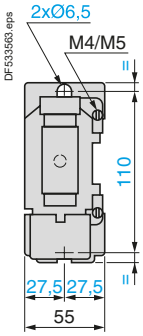
Dimensions

RM1XA●●●, RM1XA●●●1

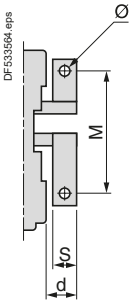
Common side view



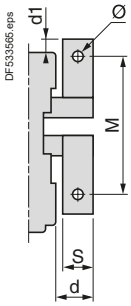
RM1XA001…XA040 RM1XA0011…XA0401



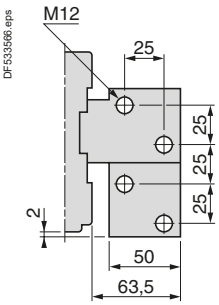
RM1XA063, XA100 and XA315 RM1XA0631, XA1001 and XA3151



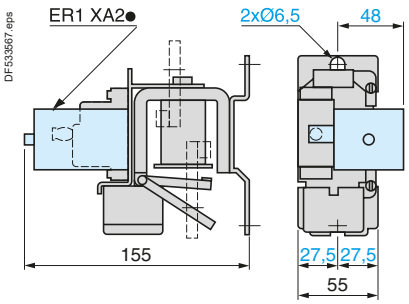
RM1XA160, XA200, and XA500 RM1XA1601, XA2001, and XA5001



RM1XA101, RM1XA1011



RM1XA●●●1 with electrical reset ER1XA2●

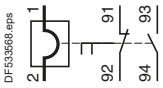


RM1	d	d1	M	L	L1	S	Ø
XA 063	20.5	–	83	25	40	15	M6
XA 100	20.5	–	87	25	40	20	M8
XA 160	27.5	5.5	94	25	40	25	M8
XA 200	27.5	5.5	94	25	40	25	M8
XA 315	35.5	–	74	44	55	30	M10
XA 500	40.5	7	84	44	55	40	M10
XA 101	–	–	–	37	64	–	–

Schemes

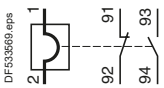
RM1XA●●●1

Latching



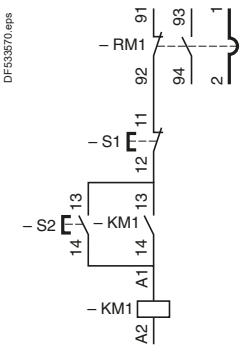
RM1XA●●●

Non-latching

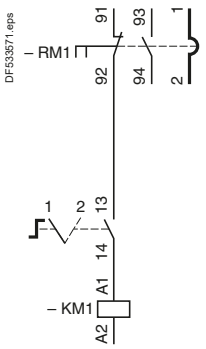


RM1XA

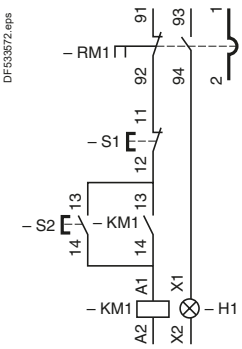
3-wire control (without mechanical latching)



2-wire control (with mechanical latching)



3-wire control (with "trip" signal)



References:
pages B11/15 and B11/16

Characteristics:
page B11/50

Application

LT3S● thermistor protection units continuously monitor the temperature of the machines to be protected (motors, generators, etc.) by means of PTC thermistor probes embedded in the machine windings.

If the nominal operating temperature of the probes is reached, they convert the rapid increase in resistance into a switching function which can be used to switch off the machine or signal a fault (see paragraph relating to thermistor probes below).

Accidental breaks in the supply circuits of the thermistors are also detected.

Electromagnetic compatibility

Conforming to “Electromagnetic compatibility” directive.
Conforming to standard IEC/EN 61000-6-2.

Resistance to electrostatic discharge (conforming to IEC 61000-4-2)	**Level 3**
Resistance to fast transients (conforming to IEC 61000-4-4)	**Level 3**
Susceptibility to electromagnetic fields (conforming to IEC 61000-4-3)	**Level 3**
Surge resistance 1.2/50 - 8/20 (conforming to IEC 61000-4.5)	**Level 4**
Immunity to microbreaks and voltage drops (IEC 61000-4-11)	
Suitable for use with variable speed controllers	

Thermistor probes

Range of most commonly used PTC thermistor probes:
from 90 to 160 °C, in steps of 10 °C.
Curve R = f (θ), characteristic of a PTC thermistor probe, is defined by standard IEC 60947-8.

The choice of PTC thermistor probe to be incorporated in the motor winding depends on the insulation class, the type of motor and the most suitable location for the probe. This choice is usually made by the motor manufacturer or the motor rewinder, who have all the necessary information.

Application example

Insulation class of rotating machines conforming to IEC 60034-11 (S1 duty)	NOT Nominal operating temperature	Temperature at which rapid increase in resistance occurs Probes used for Alarm	Fault
	°C	**°C**	**°C**
A	100	100	100
B	110	110	120
E	120	120	130
F	140	140	150
H	160	160	170

(1) PTC: Positive Temperature Coefficient.

Ref.
Overload relays

References:
pages B11/17 and B11/18
Dimensions, schemes:
pages B11/56 and B11/57

Characteristics

Protection unit type				LT3SE	LT3SA	LT3SM
Reset method				Automatic	Automatic	Manual/Automatic
Fault indication				–	On front panel of unit and remote	On front panel of unit and remote
Fault test				–	–	By pushbutton on front panel of unit
Probe interchangeability				Label "Mark A" to IEC 60034-11	Label "Mark A" to IEC 60034-11	Label "Mark A" to IEC 60034-11
Environment						
Conforming to standards				IEC 60947-8	IEC 60947-8	IEC 60947-8
Product certifications				UL, CSA		
Degree of protection				IP 20 conforming to IEC 60529		
CE marking				LT3S● protection units have been designed to comply with the basic recommendations of European directives relating to low voltage and EMC. Therefore LT3S● products bear the European Community CE mark.		
Ambient air temperature around the device	Storage Conforming to IEC 60068-2-1 and 2-2		°C	- 40…+ 85		
	Operation		°C	- 25…+ 60		
Maximum operating altitude	Without derating			2000 m		
	With derating			Up to 3000 m, the maximum permissible ambient air temperature for operation (60 °C) must be reduced by 5 °C per additional 500 m above 1500 m		
Vibration resistance	Conforming to IEC 60068-2-6			2.5 gn (2…25 Hz) 1 gn (25…150 Hz)		
Shock resistance	Conforming to IEC 60068-2-27			5 gn (11 ms)		
Operating positions without derating	In relation to normal vertical mounting plane			Any position		
Power supply circuit characteristics						
Rated control circuit voltage (Uc)	∼ 50/60 Hz	Single voltage	V	115 or 230	–	400
	0.85…1.1 Uc	Dual voltage	V	–	115/230	115/230. 24/48
	∼ 50/60 Hz 0.85…1.1 Uc	Multivoltage	V	–	24…230	24…230
	⎓	Single voltage	V	24	–	–
	0.8…1.25 Uc	Dual voltage	V	–	24/48	24/48
	0.85…1.1 Uc	Multivoltage	V	–	24…230	24…230
Average consumption	Sealed	∼	VA	< 2.5	< 2.5	< 2.5 except (400 V: 2.7)
		⎓	W	< 1	< 1	< 1

(1) PTC: Positive Temperature Coefficient.

References: pages B11/17 and B11/18
Dimensions: page B11/56
Schemes: pages B11/56 and B11/57

Characteristics

Control circuit characteristics

Protection unit type				LT3SE		LT3SA		LT3SM	
Resistance	Tripping		Ω	2700…3100		2700…3100		2700…3100	
	Reset		Ω	1500…1650		1500…1650		1500…1650	
Maximum number of probes fitted in series (2)	Probes ⩽ 250 Ω at 25°			6		6		6	
Voltage at terminals in the thermistor circuit	Normal operation (R = 1500 Ω)		**V**	< 2.5		< 2.5		< 2.5	
	Conforming to IEC 60034-11 (R = 4000 Ω)		**V**	< 7.5		< 7.5		< 7.5	
Thermistor probe short-circuit detection	Operating threshold		Ω	–		< 20		< 20	
Connection of probes to the LT3	Distance		**m**	300	400		500		1000 (3)
	Minimum c.s.a. of conductors		**mm²**	0.75	1		1.5		2.5

Electrical characteristics of the output relay contacts

Contact type	Single voltage or dual voltage		1 N/C	1 N/C + 1 N/O	1 N/C + 1 N/O
	Multivoltage		–	2 C/O	2 C/O
Rated insulation voltage		**V**	∼ 500		
Maximum operational voltage		**V**	∼ 250 (∼ 400 V for **LT3SM00V**)		
Rated impulse withstand voltage	Uimp	**kV**	2.5		
Conventional thermal current		**A**	5		
Operational power	At 220 V	**VA**	100 for 0.5 million operating cycles		
Breaking capacity	In cat. AC-15 120 V	**A**	6		
	250 V	**A**	3		
	In DC-13 24 V	**A**	2		
Cabling (cage type connector) for flexible or solid cable	Without cable end	**mm²**	2 x 1…1 x 2.5		
	With cable end	**mm²**	1 x 0.75…2 x 2.5		
Tightening torque		**N.m**	0.8		

Thermistor probe characteristics

Probe type			DA1TT●●●	DA1TS●●●
Conforming to standards			IEC 60034-11. Mark A	
Resistance	At 25 °C	Ω	3 x 250 in series	250
Rated operational voltage (Ue)	Per probe	**V**	⎓ 2.5 V max	⎓ 2.5 V max
Rated insulation voltage (Ui)		**kV**	2.5	1
Insulation			Reinforced	Reinforced
Length of connecting cables	Between probes	**mm**	250	–
	Between probe and motor terminal plate	**m**	1	1

(1) PTC: Positive Temperature Coefficient.
(2) Provided that the total resistance of the probe circuit is less than 1500 Ω at 20 °C.
(3) For distances greater than 500 m take cabling precautions (twisted shielded pairs).

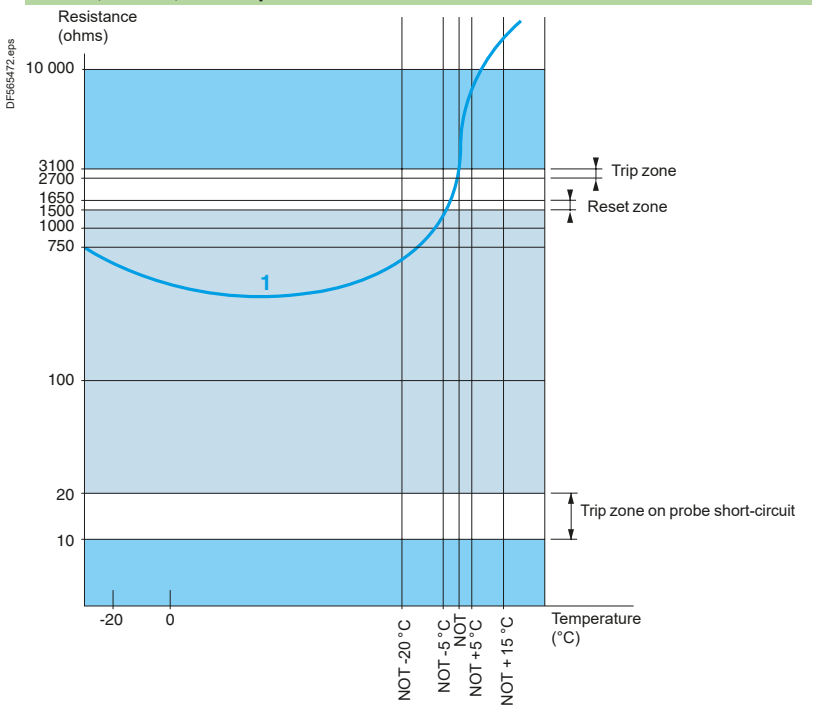
Ref.
Overload relays

References: pages B11/17 and B11/18
Dimensions: page B11/56
Schemes: pages B11/56 and B11/57

LT3S protection unit/thermistor probe combination

Guaranteed operating zones: examples with 3 probes type DA1TT●●● (250 Ω at 25 °C) in series, conforming to standard IEC 60034-11, Mark A.

LT3SE, LT3SA, LT3SM protection units



1 3 probes type DA1TT●●● (250 Ω at 25 °C) in series.

NOT: Nominal Operating Temperature

Protection unit tripped.

Protection unit reset.

(1) PTC: Positive Temperature Coefficient.

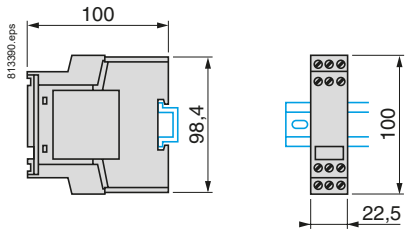
Ref.
Overload relays

References:
pages B11/17 and B11/18
Dimensions:
page B11/56
Schemes:
pages B11/56 and B11/57

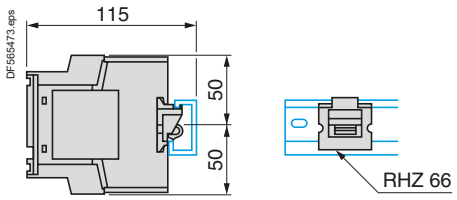
Dimensions

LT3SE, SA, SM

Mounting on ⊥ rail AM1 DP200



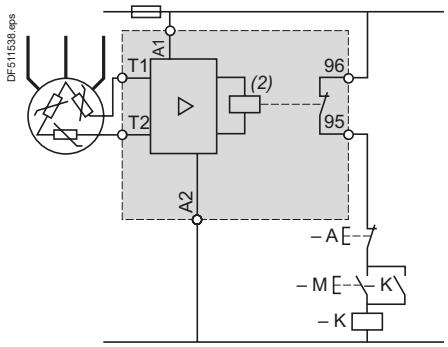
Mounting on 1 ⊔ rail
(with adapter RHZ 66)



Schemes for "no fault" operation

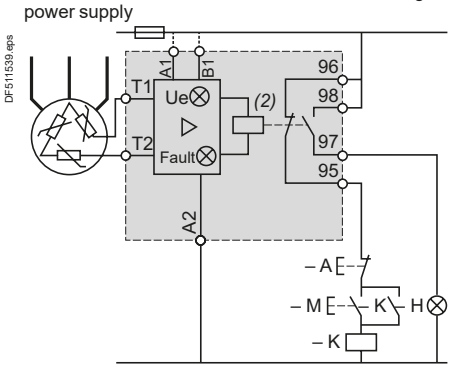
LT3SE00BD (24 V DC), LT3SE00F (115 V AC), LT3SE00M (230 V AC)

Without fault memory

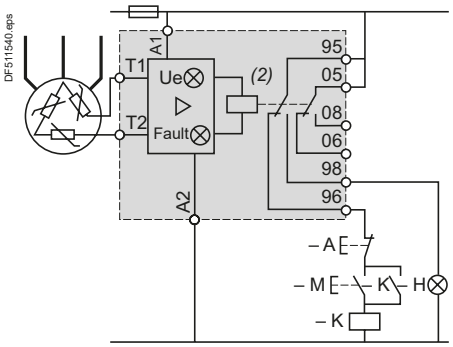


LT3SA00ED (24/48 V DC), LT3SA00M (115/230 V AC)

Refer to chart for use of A1/B1 terminal according power supply

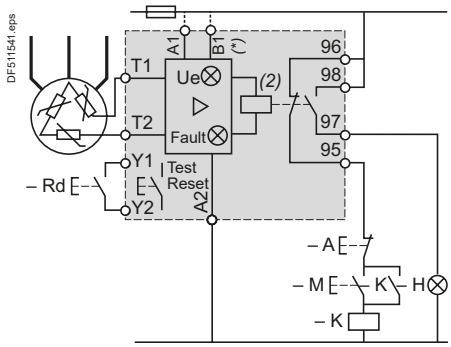


LT3SA00MW (24 to 230V AC/DC)

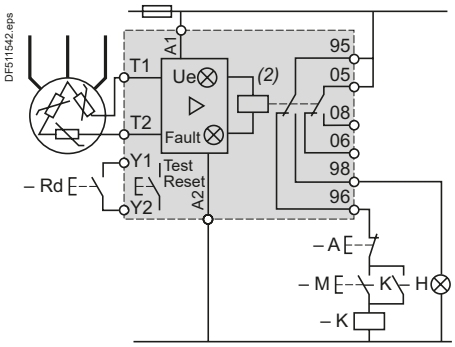


LT3SM00E (24/48V AC), LT3SM00ED (24/48V DC), LT3SM00M (115/230 V AC), LT3SM00V (400V AC)

Refer to chart for A1 - A2 - B1 supply terminals to be used



LT3SM00MW (24 to 230 V AC/DC)



*(*) no B1 terminal on **LT3SM00V** (400V AC).*

LT3SA, LT3SM - dual voltage and 400 V - power terminal assigment

LT3SA00ED, LT3SM00ED	**24 V DC**	**48 V DC**
Terminals	B1(+) A2 (0V)	A1(+) A2 (0V)
LT3SA00M, LT3SM00M	**115 V AC**	**230 V AC**
Terminals	A1-B1	A1-A2
LT3SA00M, LT3SM00M	**-**	**400 V AC**
Terminals	-	A1-A2

Setting-up

Cabling

It is inadvisable to use the same multi-core cable for the thermistor probe circuit and the power circuit. This is especially important for long cable runs.
If it is impossible to comply with the above recommendation, a pair of twisted conductors must be used for the thermistor probe circuit.

Testing the insulation of the line connecting the thermistors to the LT3S unit

Before carrying out this test, short-circuit all the terminals of the LT3S protection unit.
Measure the insulation value between these terminals and earth using a megger or a flash tester, progressively increasing the voltage to the value defined by the standards.

Checking the PTC thermistor probes for correct operation

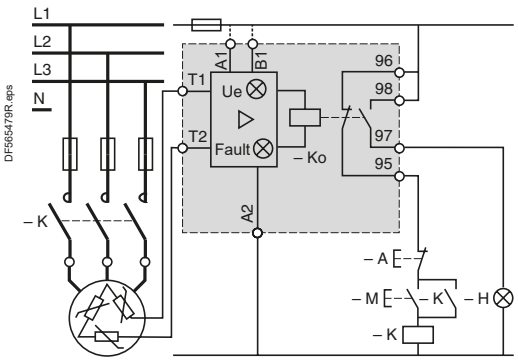
With the machine stopped, in the cold state and after having taken all the necessary safety precautions:
- disconnect the line linking the thermistors to the LT3S protection unit, at the terminals of the machine being protected: motor, etc.,
- using an ohmmeter with a voltage rating less than or equal to 2.5 V, measure the resistance of the probe circuit at the machine terminals,
- depending on the number and type of thermistors connected in series, check that their resistance value at 25 °C is correct.

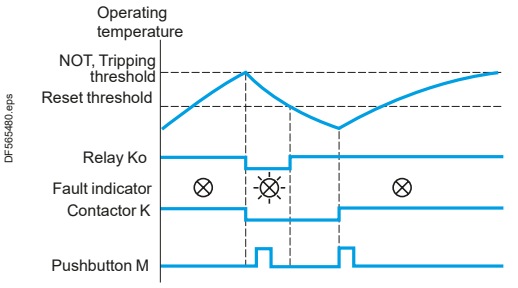
Example: motor fitted with 3 PTC thermistor probes with a resistance ≤ 250 Ω at 25 °C.
Any value higher than 250 x 3 = 750 Ω indicates a problem.

(1) PTC: Positive Temperature Coefficient.
(2) Relay energised: the contacts are shown in the "operating" position.

References:
pages B11/17 and B11/18

Characteristics:
pages B11/52 to B11/55





LT3SA protection units

Starting

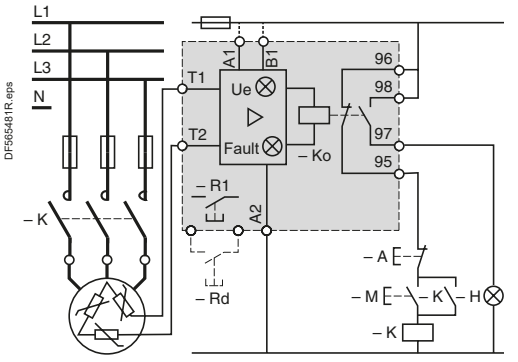
The LT3SA is normally energised and its internal relay is in the pre-energised position.
The motor is started by operating pushbutton M automatically held in by K (3-wire control circuit).

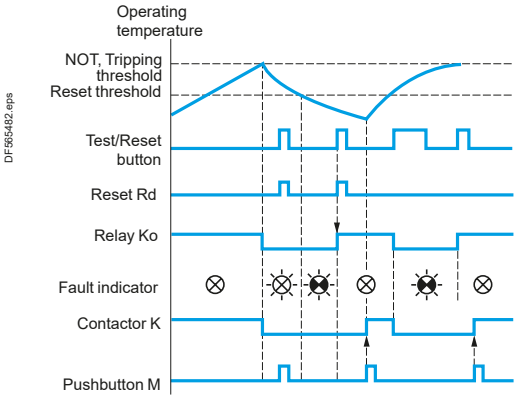
Thermal fault

The strong increase in resistance of the PTC probes at the moment their temperature reaches the nominal operating temperature (NOT) is detected by the LT3SA unit and causes the relay to drop out; indicator H comes on, as does the built-in indicator on unit LT3SA.
Contactor K drops out and pressing button M has no effect.

Reset

As the motor cools, it reaches the reset threshold, 2 to 3 °C below the nominal operating temperature.
The relay resets and the motor can be started by pressing button M.





LT3SM protection units

Operation is very similar to that described above, except for the following:

Reset

After tripping on thermal fault and cooling to the reset threshold, the Test/RESET button on the unit (R1) or a remote reset button (Rd) must be pressed to energise the relay.

The fault is therefore memorised, even though the temperature of the probes has dropped to well below the reset threshold.

Signalling circuit

As the relay is fitted with 2 separate contacts, the signalling voltage may be different from the contactor control voltage.

Test

Pressing the Test/RESET button simulates a fault and causes the relay to drop out: the FAULT indicator comes on, as does the remote signalling indicator. The unit is reset by pressing the Test/RESET button again.

(1) PTC: Positive Temperature Coefficient.

References:
pages B11/17 and B11/18
Characteristics:
pages B11/52 to B11/55

Introduction

PB111974.eps



LR97D

PB111927.eps



LT47

LR97D and LT47 electronic over current relays have been developed to satisfy machine protection requirements.
These relays have definite time characteristics: current threshold and time based function.
They are particularly recommended for providing mechanical protection on machines with high resistive torque, high inertia and with strong probability of jamming under steady state conditions.
They can be used for motor protection in the case of long starting times or frequent starting.
The LR97D relay also incorporates two fixed time protection functions, one of 0.5 seconds against locked rotor and one of 3 seconds against phase failure.
LR97D and LT47 can be used to provide mechanical shock protection. In this case, setting the O-Time knob to minimum will ensure tripping in 0.3 seconds.
TeSys LR97D is designed to be directly connected downstream of the TeSys D contactor.
TeSys LT47 provides two current transformers, to be crossed by the motor power cables.

Applications

LR97D and LT47 relays are particularly suitable for the following machines:
■ Monitoring function for excessively long starting time on machines with a risk of difficult starting:
□ Machines with high resistive torque, high inertia machines.
■ Monitoring of machines during steady state operation: overtorque detection function
□ Machines with strong risk of jamming, machines with torque build-up over time,
□ Mechanical failure monitoring,
□ Faster detection of malfunctioning on machines where the motor is oversized in relation to its thermal protection I^2t.
■ Motor protection for specific applications:
□ Machines with long starting times,
□ Machines with high on-load factor: more than 30 to 50 starts/hour,
□ Machine with fluctuating load from a steady state, where the thermal image of a thermal overload relay (thermal memory) is unsuitable in relation to actual overheating of the motor.

Examples of machines:
□ Conveyors, crushers and mixers,
□ Fans, pumps and compressors,
□ Centrifuges and spin-dryers,
□ Presses, shearing machines, saws, broaching machines, sanders and lifting hoists.

Operation

Because of their two separate time settings, LR97D and LT47 relays can be combined with the motor-starter function:
D-Time: starting time, O-Time: trip time during steady state.
The D-Time function is only available during the motor starting phase. During this phase the overload detection function is inhibited in order to allow starting. Under steady state conditions, when the motor current is greater than the setting current due to an overload or single-phasing, the red LED lights up and the internal relay switches its contact after a time preset by the O-Time knob.
The red LED stays on, indicating that the relay has tripped.

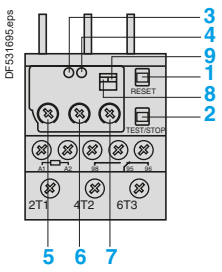
The relays are simple to set, in 5 easy steps:
- Adjust the 3 knobs to maximum (Load, D-Time and O-Time),
- Adjust the D-Time knob to the value corresponding to the motor starting time.
- When the motor reaches steady state, adjust the Load knob (turn the knob counter-clockwise until the red LED starts to flicker).
- Slowly turn the Load knob clockwise until the LED goes out.
- Set the required tripping time, using the O-Time knob.

Description

Description

LR97D●●●●●

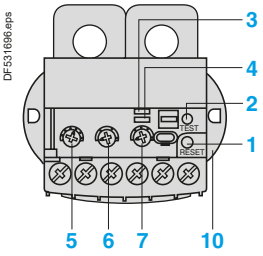
DF531695.eps



1 RESET knob
2 TEST/STOP knob
3 Ready/Run Indicator
4 Relay tripped indicator
5 Current setting
6 Adjustment of starting time

LT47●●●●●

DF531696.eps



7 Adjustment of tripping time
8 Manual/Auto adjustment
9 Single-phase/3-phase adjustment
10 Retractable fixing lugs

Status signalling

LR97D●●●●●

To assist fast diagnostics, two LEDs (one green and one red) allow signalling of the operating status:

DF563948.eps

Status			LED signal	
			Green LED	Red LED
Voltage			On	Off
Starting				
Steady state			On	Off
Overload			On	
Trip	Over-current		Off	On
	Rotor locked		Off	
	Phase fail-ure	L1	Off	
		L2	Off	
		L3	Off	

LT47●●●●●

DF563947.eps

Condition	LED signal	
	Green LED	Red LED
Voltage	On	Off
Starting		
Steady state	On	Off
Overload	On	
Trip	Off	On

References: page B11/19
Dimensions, mounting: page B11/62
Schemes: page B11/62

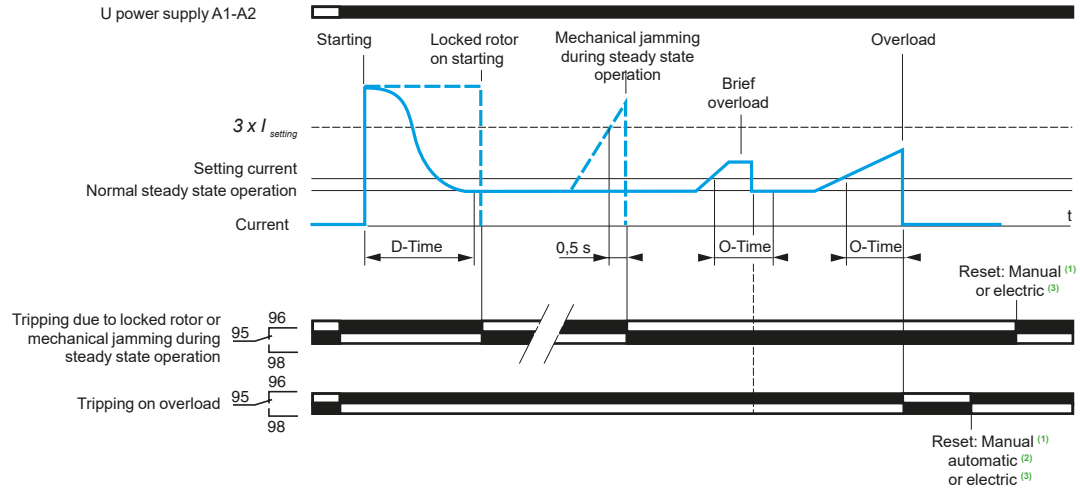
Characteristics

Curves

LR97D

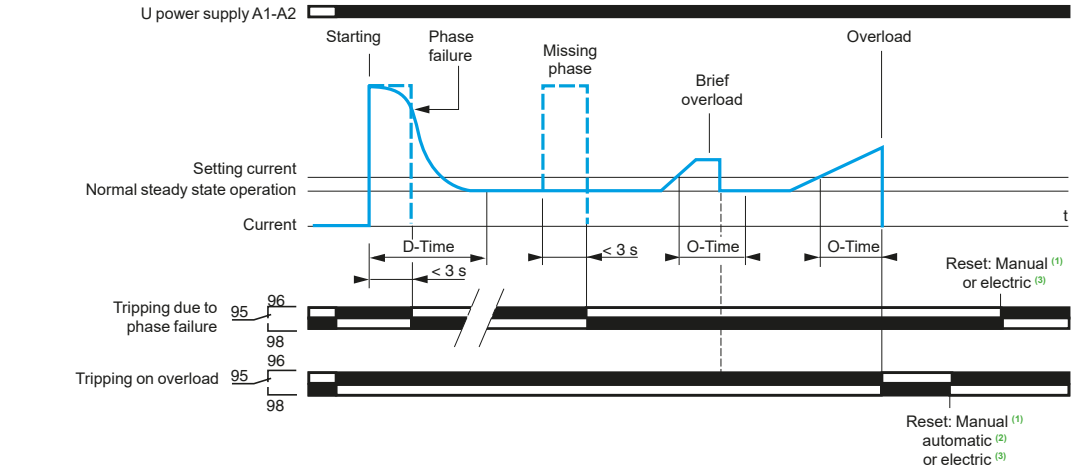
Overload protection
Protection against locked rotor and mechanical jamming under steady state conditions

DF53221B.eps



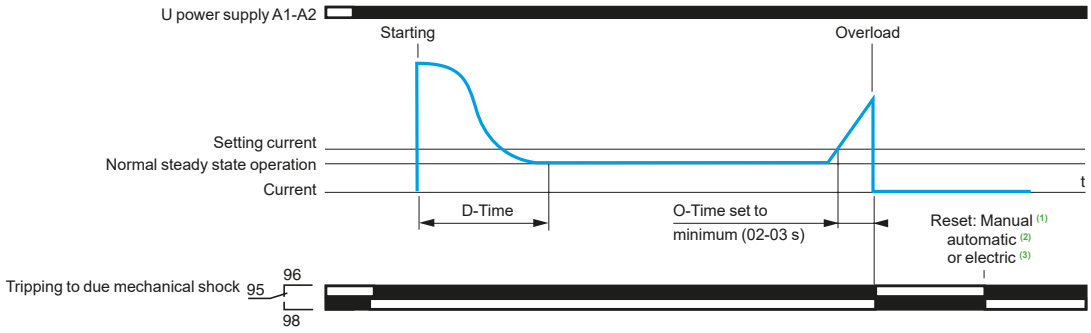
Overload protection
Protection against phase failure during starting and during steady state operation

DF53221B.eps



Mechanical shock protection

DF532220.eps



(1) By Reset button.
(2) Fixed time of 120 s. Selectable by dip switch. Function not available in the event of tripping due to locked rotor/mechanical jamming (I> 3 x I setting) or phase failure.
(3) By brief interruption of power supply, minimum 0.1 s.

References: page B11/19
Dimensions, mounting: page B11/62
Schemes: page B11/62

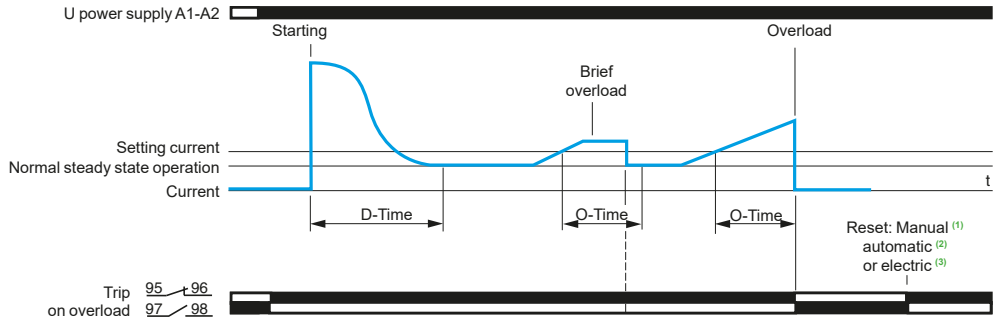
Characteristics

Curves

LT47

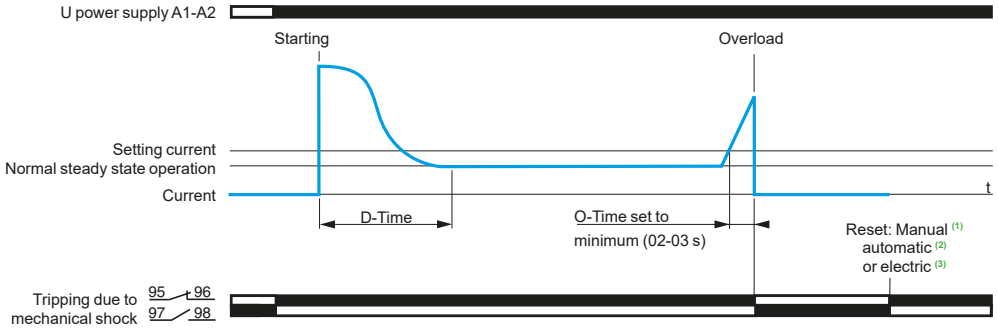
Overload protection

DF532221.eps



Mechanical shock protection

DF532222.eps



(1) By Reset button.
*(2) Only available on version with automatic reset (**LT47●●●●A**). Time adjustable from 1 to 120 s with the R-Time knob.*
(3) By brief interruption of power supply, minimum 0.1 s.

Characteristics

Environment

Relay type			LR97D●●●●●	LT47●●●●●
Conforming to standards			IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.5	IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.5
Product certifications			UL, CSA, CCC, EAC	UL, CSA, CCC, EAC
Degree of protection	Conforming to IEC 60529		IP 20 (front face)	IP 20 (front face)
Ambient air temperature around the device	Storage	**°C**	- 30…+ 80	- 30…+ 80
	Normal operation without derating (IEC 60947-4-1)	**°C**	- 25…+ 60	- 25…+ 60
Maximum operating altitude		**m**	2000	2000
Operating positions without derating	In relation to normal vertical mounting plane		Any position	Any position
Shock resistance	Permissible acceleration conforming to IEC 60068-2-27		15 gn - 11 ms	15 gn - 11 ms
Vibration resistance	Permissible acceleration conforming to IEC 60068-2-6		4 gn	4 gn
Dielectric strength at 50 Hz	Conforming to IEC 60947-4-1	**kV**	2	2
Surge withstand	Conforming to IEC 61000-4-5	**kV**	6	6
Resistance to electrostatic discharge	In open air	**kV**	8 (level 3)	8 (level 3)
	In direct mode	**kV**	6 (level 3)	6 (level 3)
Immunity to radiated radio-frequency disturbance		**V/m**	10 (level 3)	10 (level 3)
Immunity to fast transient currents		**kV**	2	2
Conducted emissions	Conforming to EN 55011		Class A	Class A
Conducted HF disturbance	Conforming to EN 61000-4-6	**V**	10	10

References: page B11/19
Dimensions, mounting: page B11/62
Schemes: page B11/62

Characteristics

Auxiliary contact characteristics

Relay type				LR97D●●●●●				LT47●●●●●			
Contact type				1 NO/NC				1 N/O + 1N/C			
Conventional thermal current			A	3				3			
Maximum hold consumption of controlled contactor coils (occasional operating cycles of contact 95-96)	Conforming to IEC 60947		V	∼ 24	∼ 48	∼ 110	∼ 220	∼ 24	∼ 48	∼ 110	∼ 220
			VA	70	140	360	360	70	140	360	360
			V	⎓ 24	⎓ 48	⎓ 110	⎓ 220	⎓ 24	⎓ 48	⎓ 110	⎓ 220
			W	55	55	28	28	55	55	28	28
Short-circuit protection	By gG, BS fuses. Maximum rating or GB2 circuit breaker		A	3				3			
Connection by cable or lug-clamps											
Flexible cable without cable end	1 or 2 conductors	Min.	mm²	1 x 0.75				1 x 1			
		Max.	mm²	2 x 2.5				2 x 2.5			
Flexible cable with cable end	1 or 2 conductors	Min.	mm²	1 x 0.34				1 x 1			
		Max.	mm²	1 x 1.5 + 1 x 2.5				2 x 2.5			
External Ø of lugs			mm	7				7			
Ø of screw			mm	M3				M3.5			
Tightening torque			N.m	0.6…1.2				0.8...1.7			

Electrical characteristics of power circuit

Relay type				LR97D015●● to LR97D25●●	LR97D38●●	LT47●●●●●
Setting range	Depending on model		A	0.3…38		0.5…60
Tripping class				Adjustable		Adjustable
Rated insulation voltage (Ui)	Conforming to IEC 60947-4-1		V	690		690
	Conforming to UL, CSA		V	600		600
Rated impulse withstand voltage (Uimp)			kV	6		6
Frequency limits	Of the operating current		Hz	50…60		50…60
Connection by cable or lug-clamps						
Flexible cable without cable end	1 conductor	Min.	mm²	1.5	2.5	–
		Max.		10	10	–
Flexible cable with cable end	1 conductor	Min.	mm²	1	1	–
		Max.		4	6	–
External Ø of lugs			mm	10	12	–
Ø of screw			mm	M4	M4	–
Tightening torque			N.m	2	2	–

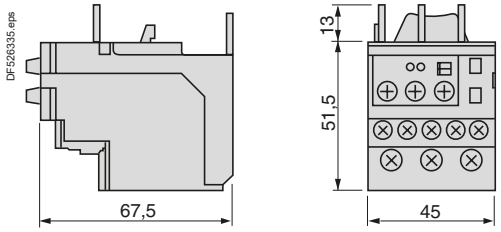
Operating characteristics

Relay type				LR97D●●●●●		LT47●●●●S		LT47●●●●A
Adjustment	Current		A	"Load" knob		"Load" knob		"Load" knob
	Time	D-time knob	s	0.5…30		0.5…30		–
		O-time knob	s	0.2/0.3…10		0.2/0.3…10		0.2/0.3…30
		R-time knob	s	–		–		1…120
Reset	Manual			Reset button		Reset button		Reset button
	Automatic			120 s fixed		–		R-time knob: 1-120 s
	Electrical			By interruption of power supply (minimum 0.1 s)		By interruption of power supply (minimum 0.1 s)		By interruption of power supply (minimum 0.1 s)
Protection functions				**On starting**	**Steady state**	**On starting**	**Steady state**	–
Overload $I_{max} > I_{setting}$	Tripping			Inhibited during D-time	After O-time	Inhibited during D-time	After O-time	After O-time
Locked rotor, mechanical jamming $I > 3 \times I_{setting}$	Tripping			After D-time	< 0.5 s	Inhibited during D-time	After O-time	After O-time
Sensitivity to phase failure	Tripping			< 3 s	< 3 s	Inhibited during D-time	After O-time	After O-time
Status and fault signalling (see table page 24517/2)				2 LEDs		2 LEDs		2 LEDs
TEST/STOP function	Test			No load		No load		No load
	Stop			Under load		Under load		Under load
Sealing				Yes		Yes		Yes

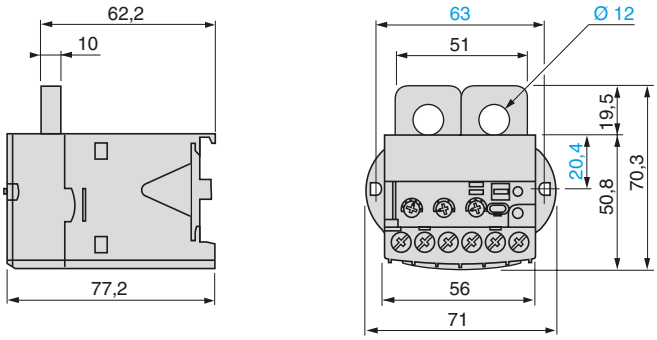
References: page B11/19
Dimensions, mounting: page B11/62
Schemes: page B11/62

Dimensions

LR97D●●●●



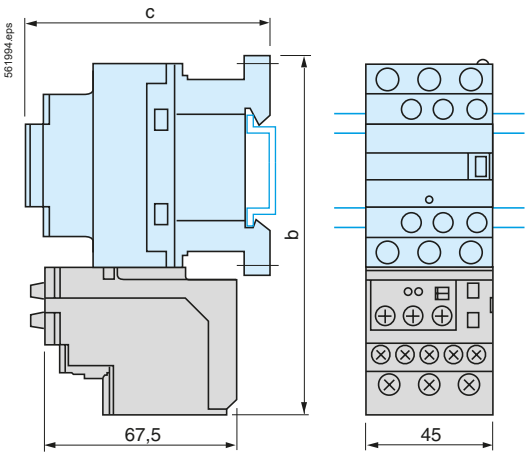
LT47●●●●



Mounting

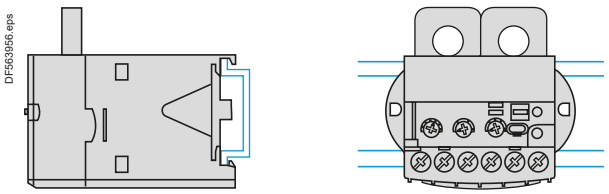
LR97D●●●●

Direct mounting beneath the contactor



LC1	D09…D18	D25…D38
b	123	137
c	See pages B8/76 and B8/77	

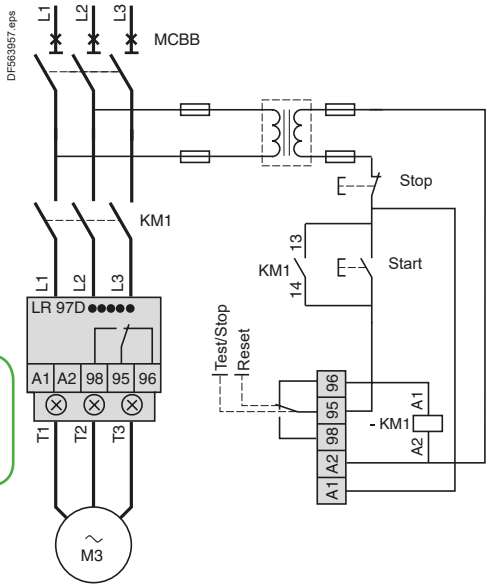
LT47●●●●



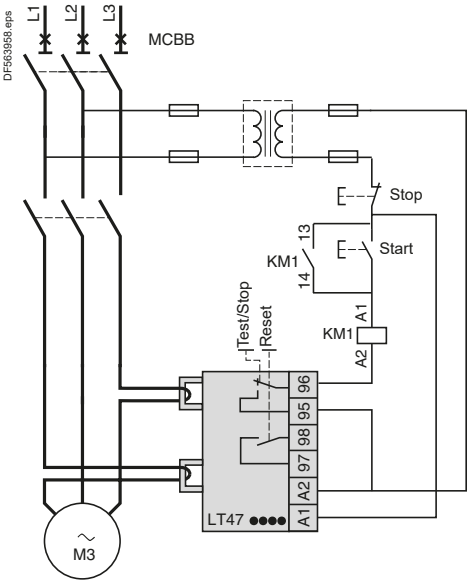
Note: Can be mounted on ⊔ rail.

Schemes

LR97D●●●●



LT47●●●●



References: page B11/19

Characteristics: pages B11/58 to B11/61

Part C

COMPONENTS FOR MOTOR MANAGEMENT SYSTEMS

TeSys U, T
Motor management



C1/1

TeSys™ island
Digital management



C2/1

TeSys U Motor management controller
TeSys T Motor management system

TeSys U Motor management system

Type of product	Range	Pages
TeSys U Motor controller		C1/2
Current transformers for TeSys U motor controller	From 30 to 800 A	C1/2
Type 2 coordination table for assemblies of: ■ circuit breaker + contactor + TeSys U controller + current transformer ■ fuses + contactor + TeSys U controller + current transformer		C1/3

TeSys T Motor management system

Controllers with Modbus, or CANopen, Devicenet, Profibus, Ethernet TCP/IP communication port		C1/4
Extension modules		C1/5
HMI terminal and cables		C1/5
Accessories		C1/6

Technical Data for Designers C1/13

Product references

PB121437.eps



LUTM + LUCMT1BL + LUTC●●

PB121438.eps



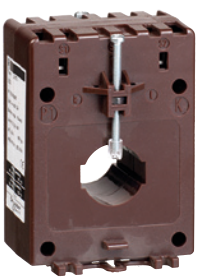
LUTM10BL

PB121439.eps



LUCMT1BL

PB108391.eps



LUTC●●●●

References

Control bases (auxiliary supply voltage ⎓ 24 V)

Connection		For use with contactor	Reference	Weight
Current transformers	Control			kg
Screws	Screws	LC1D●●	**LUTM10BL**	0.800
		LC1F●●●	**LUTM20BL**	0.800

Control units

Description	Class	For motor type	Setting range	Reference	Weight kg
Advanced	10	3-phase	0.35…1.05	**LUCBT1BL**	0.140
	20	3-phase	0.35…1.05	**LUCDT1BL**	0.140
Multifunction	5 to 30	3-phase	0.35…1.05	**LUCMT1BL**	0.175

Current transformers

Operating current		Reference	Weight
Primary	Secondary		kg
30	1	**LUTC0301**	0.550
50	1	**LUTC0501**	0.330
100	1	**LUTC1001**	0.450
200	1	**LUTC2001**	0.590
400	1	**LUTC4001**	0.870
800	1	**LUTC8001**	1.210

Function modules and communication modules

The TeSys U controller is compatible with the modules listed below:
- ■ Thermal overload alarm module LUFW10,
- ■ Motor load indication module LUFV2,
- ■ Communication modules:
- □ Modbus (LULC033),
- □ CANopen (LULC08),
- □ DeviceNet (LULC09),
- □ Advantys STB (LULC15).

Note: *Communication modules* ***LULC07*** *(Profibus DP),* ***ASILUFC5*** *and* ***ASILUFC51*** *(AS-Interface) are not compatible with the* TeSys U *controller.*
Module ***LUFW10*** *is only compatible with control units* ***LUCBT1BL*** *and* ***LUCDT1BL****.*

Characteristics: pages C1/14 to C1/17
Dimensions, mounting: page C1/18
Schemes: page C1/19

Life Is On Schneider Electric

Product references

Combinations providing type 2 coordination

With Circuit breaker

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 400/415 V		Circuit breaker			Contactor	TeSys U controller	Current transformers
PkW	IeA	Reference	Rating A	Irm (1) A	Reference (2)	Reference	Reference
18.5	35	**GV3L40**	40	560	**LC1D50A**	**LUTM + LUC●**	**3 x LUTC0501**
22	41	**GV3L50**	50	700	**LC1D50A**	**LUTM + LUC●**	**3 x LUTC1001**
30	55	**GV3L65**	65	910	**LC1D65A**	**LUTM + LUC●**	**3 x LUTC1001**
37	66	**GV4L80**	80	1040	**LC1D80**	**LUTM + LUC●**	**3 x LUTC1001**
45	80	**NSX100HMA**	100	1300	**LC1D95**	**LUTM + LUC●**	**3 x LUTC1001**
55	97	**NSX160HMA**	150	1350	**LC1D115**	**LUTM + LUC●**	**3 x LUTC2001**
75	132	**NSX160HMA**	150	1800	**LC1D150**	**LUTM + LUC●**	**3 x LUTC2001**
90	160	**NSX250HMA**	220	2200	**LC1F185**	**LUTM + LUC●**	**3 x LUTC2001**
110	195	**NSX250HMA**	220	2640	**LC1F225**	**LUTM + LUC●**	**3 x LUTC4001**
132	230	**NSX400HMA**	320	3200	**LC1F265**	**LUTM + LUC●**	**3 x LUTC4001**
160	280	**NSX400HMA**	320	4160	**LC1F330**	**LUTM + LUC●**	**3 x LUTC4001**
200	350	**NSX630HMA**	500	5000	**LC1F400**	**LUTM + LUC●**	**3 x LUTC4001**
220	385	**NSX630HMA**	500	5500	**LC1F400**	**LUTM + LUC●**	**3 x LUTC4001**
250	430	**NSX630HMA**	500	6000	**LC1F500**	**LUTM + LUC●**	**3 x LUTC8001**

With fuses

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 400/415 V		Switch-disconnector fuse	aM fuses		Contactor	TeSys U controller	Current transformers
PkW	IeA	Reference	Size	Rating A	Reference (2)	Reference	Reference
18.5	35	**GS●F**	14 x 51	40	**LC1D40A**	**LUTM + LUC●**	**3 x LUTC0501**
22	41	**GS●J**	22 x 58	50	**LC1D50A**	**LUTM + LUC●**	**3 x LUTC1001**
30	55	**GS●J**	22 x 58	80	**LC1D80**	**LUTM + LUC●**	**3 x LUTC1001**
37	66	**GS●J**	22 x 58	100	**LC1D80**	**LUTM + LUC●**	**3 x LUTC1001**
45	80	**GS●J**	22 x 58	100	**LC1D95**	**LUTM + LUC●**	**3 x LUTC1001**
55	97	**GS●L**	T0	125	**LC1D115**	**LUTM + LUC●**	**3 x LUTC2001**
75	132	**GS●L**	T0	160	**LC1D150**	**LUTM + LUC●**	**3 x LUTC2001**
90	160	**GS●N**	T1	200	**LC1F185**	**LUTM + LUC●**	**3 x LUTC2001**
110	195	**GS●N**	T1	250	**LC1F225**	**LUTM + LUC●**	**3 x LUTC4001**
132	230	**GS●QQ**	T2	315	**LC1F265**	**LUTM + LUC●**	**3 x LUTC4001**
160	280	**GS●QQ**	T2	400	**LC1F330**	**LUTM + LUC●**	**3 x LUTC4001**
200	350	**GS2S**	T3	500	**LC1F400**	**LUTM + LUC●**	**3 x LUTC4001**
220	385	**GS2S**	T3	500	**LC1F400**	**LUTM + LUC●**	**3 x LUTC4001**
250	430	**GS2S**	T3	500	**LC1F500**	**LUTM + LUC●**	**3 x LUTC8001**
315	540	**GS2S**	T3	630	**LC1F630**	**LUTM + LUC●**	**3 x LUTC8001**

(1) Irm: setting current of the magnetic trip.
(2) For reversing operation, replace the prefix LC1 with LC2.

Motor management devices

Characteristics: pages C1/14 to C1/17
Dimensions, mounting: page C1/18
Schemes: page C1/19

Product references

PB121434.eps



LTMR08MBD

PB121440.eps



LTMR08CBD

PB121441.eps



LTMR08DBD

PB121442.eps



LTMR08PBD

PB121443.eps



LTMR08EBD

Controllers

Setting range	Control voltage	Current range	Reference
A	V	A	
For Modbus			
8	⎓ 24	0.4...8	**LTMR08MBD**
	∿ 100...240	0.4...8	**LTMR08MFM**
27	⎓ 24	1.35...27	**LTMR27MBD**
	∿ 100...240	1.35...27	**LTMR27MFM**
100	⎓ 24	5...100	**LTMR100MBD**
	∿ 100...240	5...100	**LTMR100MFM**
For CANopen			
8	⎓ 24	0.4...8	**LTMR08CBD**
	∿ 100...240	0.4...8	**LTMR08CFM**
27	⎓ 24	1.35...27	**LTMR27CBD**
	∿ 100...240	1.35...27	**LTMR27CFM**
100	⎓ 24	5...100	**LTMR100CBD**
	∿ 100...240	5...100	**LTMR100CFM**
For DeviceNet			
8	⎓ 24	0.4...8	**LTMR08DBD**
	∿ 100...240	0.4...8	**LTMR08DFM**
27	⎓ 24	1.35...27	**LTMR27DBD**
	∿ 100...240	1.35...27	**LTMR27DFM**
100	⎓ 24	5...100	**LTMR100DBD**
	∿ 100...240	5...100	**LTMR100DFM**
For Profibus DP			
8	⎓ 24	0.4...8	**LTMR08PBD**
	∿ 100...240	0.4...8	**LTMR08PFM**
27	⎓ 24	1.35...27	**LTMR27PBD**
	∿ 100...240	1.35...27	**LTMR27PFM**
100	⎓ 24	5...100	**LTMR100PBD**
	∿ 100...240	5...100	**LTMR100PFM**
For Ethernet TCP/IP (communication protocols: Modbus/TCP and EtherNet/IP)			
8	⎓ 24	0.4...8	**LTMR08EBD**
	∿ 100...240	0.4...8	**LTMR08EFM**
27	⎓ 24	1.35...27	**LTMR27EBD**
	∿ 100...240	1.35...27	**LTMR27EFM**
100	⎓ 24	5...100	**LTMR100EBD**
	∿ 100...240	5...100	**LTMR100EFM**

Filter

Control voltage	Current max	Reference
V	mA	
∿ 150...240	130	**LTM9F**

Characteristics: pages C1/20 to C1/34
Curves: page C1/35
Dimensions, mounting: pages C1/36 to C1/37
Schemes: pages C1/38 to C1/41

Life Is On Schneider Electric

Product references

PB121436.eps



LTMEV40BD

PB121444.eps



LTMCC004

PB112374.eps



LTMCUF

Extension modules (with voltage measurement on the 3 phases)

Input control voltage	Number of inputs	Supply to the electronics	Reference
V			
⎓ 24	4	Via the controller	**LTMEV40BD**
∿ 100…240	4	Via the controller	**LTMEV40FM**

HMI terminals

Description		Supply Voltage	Reference
Operator control unit	Languages: English French Spanish	Supply via the controller	**LTMCU**
Operator control unit with Fast Device Replacement Service (FDR)	Languages: English French Spanish	Supply via the controller	**LTMCUF**
Kit for portable LTM CU			**LTM9KCU**
Magelis compact display.		⎓ 24 V external	**XBTN410**

Description	Number and type of connectors	Length m	Reference
Connecting cables for the LTM CU control unit	2 x RJ45	1	**LTM9CU10**
		3	**LTM9CU30**
Connecting cables for the XBT N410	SUB-D 25-way female RJ45	2.5	**XBTZ938**

Cables

Description	Number and type of connectors	Length m	Reference
Connecting cables For connecting the controller to the extension module	2 x RJ45	0.04	**LTMCC004** (1)
		0.3	**LTM9CEXP03**
		1	**LTM9CEXP10**

Replacement connectors

Description	Number and type of connectors	Reference
Complete set of connectors for controllers and extension modules	10 screw terminals (all network versions included)	**LTM9TCS**
Connector extraction tool		**LTM9TCT** (2)

(1) Sold in lots of 6.
(2) Sold in packs of 3.

Characteristics: pages C1/20 to C1/34
Curves: page C1/35
Dimensions, mounting: pages C1/36 to C1/37
Schemes: pages C1/38 to C1/41

PF526393.eps



LT6CT4001

PB121445.eps



DA1TT●●●

Configuration tools

Description	Composition	Reference	Weight kg
Connection cable for PC	USB to RJ45 cable, lenght 2.5 m	**TCSMCNAM3M002P**	0.200

Current transformers (1)

Operational current		Reference	Weight
Primary	Secondary		
A	A		kg
100	**1** (2)	**LT6CT1001**	0.550
200	**1** (2)	**LT6CT2001**	0.550
400	**1** (2)	**LT6CT4001**	0.550
800	**1** (2)	**LT6CT8001**	0.680

Earth fault toroids (marketed under the Schneider Electric brand)

Rated operational current Ie	Internal Ø of toroid	Reference	Weight
A	mm		kg
Closed toroids, type A			
65	30	**50437**	0.120
85	50	**50438**	0.200
160	80	**50439**	0.420
250	120	**50440**	0.530
400	200	**50441**	1.320
630	300	**50442**	2.230
Split toroids, type OA			
85	46	**50485**	1.300
250	110	**50486**	3.200

PTC thermistor probes (3)

Description	Nominal Operating Temperature (NOT)	Colour	Unit reference (4)
	°C		
Triple probes	90	Green/green	**DA1TT090**
	110	Brown/brown	**DA1TT110**
	120	Grey/grey	**DA1TT120**
	130	Blue/blue	**DA1TT130**
	140	White/blue	**DA1TT140**
	150	Black/black	**DA1TT150**
	160	Blue/red	**DA1TT160**
	170	White/green	**DA1TT170**

(1) The transformers offered for use with TeSys U starters *are suitable. Please consult our "*TeSys U starter-controllers*" catalogue.*
(2) For use with ***LTMR08●●*** *controllers.*
(3) PTC: Positive Temperature Coefficient.
(4) Sold in lots of 10.

Marking accessories (to be ordered separately)

Description	Composition	Height	Unit reference	Weight
		mm		kg
Clip-in markers	Strips of 10 identical numbers (0 to 9) or capital letters (A to Z)	**5**	**NSYTRABF5●** (1)	0.002
		6	**NSYTRABF6●** (1)	0.002

Connection accessories

Description		Length	Reference	Weight
		m		kg
For Modbus connection				
Cables fitted with 2 x RJ45 connectors		0.3	**VW3A8306R03**	0.045
		1	**VW3A8306R10**	0.065
		3	**VW3A8306R30**	0.125
T-junctions		0.3	**VW3A8306TF03**	0.032
		1	**VW3A8306TF10**	0.032
RS 485 line terminator		–	**VW3A8306R**	0.012
For CANopen connection				
Cables		50	**TSXCANCA50**	4.930
		100	**TSXCANCA100**	8.800
		300	**TSXCANCA300**	24.560
IP20 connectors SUB-D 9-way female Line end adapter switch	Elbowed (90°)	–	**TSXCANKCDF90T**	0.046
	Straight	–	**TSXCANKCDF180T**	0.049
	Elbowed (90°) with SUB-D 9-way connector for connection to PC or diagnostic tool	–	**TSXCANKCDF90TP**	0.051
For DeviceNet connection				
Cables		50	**TSXCANCA50**	4.930
		100	**TSXCANCA100**	8.800
		300	**TSXCANCA300**	24.560
For Profibus DP connection (2)				
Cables		100	**TSXPBSCA100**	–
		400	**TSXPBSCA400**	–
Connectors	With line terminator	–	**490NAD91103**	–
	Without line terminator	–	**490NAD91104**	–
	With line terminator and terminal port	–	**490NAD91105**	–
For Ethernet TCP/IP connection				
Shielded twisted pair cables to standard EIA/TIA568				
Cables fitted with 2 x RJ45 connectors for connection to terminal equipment	Straight	2	**490NTW00002**	–
		5	**490NTW00005**	–
		12	**490NTW00012**	–
		40	**490NTW00040**	–
		80	**490NTW00080**	–
Shielded twisted pair cables, UL and CSA 22.1 approved				
Cables fitted with 2 x RJ45 connectors for connection to terminal equipment	Straight	2	**490NTW00002U**	–
		5	**490NTW00005U**	–
		12	**490NTW00012U**	–
		40	**490NTW00040U**	–
		80	**490NTW00080U**	–
Ethernet Connector	Elbowed 180°		**LTM9CE180T** (3)	0.180

(1) When ordering, replace the ● in the reference with the number or letter required.
(2) To order other connectors and cables (UL cables for harsh environments, etc.), please consult our Customer Care Centre.
(3) Sold in packs of 6.

Characteristics: pages C1/20 to C1/34
Curves: page C1/35
Dimensions, mounting: pages C1/36 to C1/37
Schemes: pages C1/38 to C1/41

0.37 to 355 kW at 400/415 V: type 2 coordination

With switch-disconnector, contactor and class 10 controller

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 400/415 V		Switch-disconnector	aM fuses		Contactor	TeSys T controller	External current transformer
P	Ie	Reference (1)	Size	Rating	Reference (2)	Reference	Reference
kW	A			A			
0.37	1.1	GS1DD	10 x 38	2	LC1D09	LTMR08●●	–
0.55	1.5	GS1DD	10 x 38	2	LC1D09	LTMR08●●	–
0.75	1.9	GS1DD	10 x 38	4	LC1D09	LTMR08●●	–
1.1	2.7	GS1DD	10 x 38	4	LC1D09	LTMR08●●	–
1.5	3.6	GS1DD	10 x 38	4	LC1D09	LTMR08●●	–
2.2	4.9	GS1DD	10 x 38	6	LC1D09	LTMR08●●	–
3	6.5	GS1DD	10 x 38	8	LC1D09	LTMR27●●	–
4	8.5	GS1DD	10 x 38	10	LC1D09	LTMR27●●	–
5.5	11.5	GS1DD	10 x 38	16	LC1D12	LTMR27●●	–
7.5	15.5	GS1DD	10 x 38	16	LC1D25	LTMR27●●	–
10	19	GS●F	14 x 51	25	LC1D25	LTMR27●●	–
11	22	GS●F	14 x 51	25	LC1D25	LTMR27●●	–
15	29	GS●F	14 x 51	32	LC1D32	LTMR100●●	–
18.5	35	GS●F	14 x 51	40	LC1D40A	LTMR100●●	–
22	41	GS●J	22 x 58	50	LC1D50A	LTMR100●●	–
30	55	GS●J	22 x 58	80	LC1D65A	LTMR100●●	–
37	66	GS●J	22 x 58	100	LC1D80	LTMR100●●	–
45	80	GS●J	22 x 58	100	LC1D95	LTMR100●●	–
55	97	GS●K	T00	125	LC1D115	LTMR08●●	LT6CT2001
75	132	GS●L	T0	160	LC1D150	LTMR08●●	LT6CT2001
90	160	GS●N	T1	200	LC1F185	LTMR08●●	LT6CT2001
110	195	GS●N	T1	250	LC1F225	LTMR08●●	LT6CT4001
132	230	GS●QQ	T2	315	LC1F265	LTMR08●●	LT6CT4001
160	280	GS●QQ	T2	355	LC1F400	LTMR08●●	LT6CT4001
200	350	GS2S	T3	500	LC1F400	LTMR08●●	LT6CT8001
250	430	GS2S	T3	500	LC1F500	LTMR08●●	LT6CT8001
315	540	GS2S	T3	630	LC1F630	LTMR08●●	LT6CT8001
355	610	GS2V	T4	800	LC1F630	LTMR08●●	LT6CT8001

(1) GS●: GS1 for direct operator, GS2 for external operator.
(2) For reversing operation, replace the prefix LC1 with LC2.

Characteristics: pages C1/20 to C1/34
Curves: page C1/35
Dimensions, mounting: pages C1/36 to C1/37
Schemes: pages C1/38 to C1/41

0.06 to 250 kW at 400/415 V: type 2 coordination

With Circuit breaker, contactor and class 10 controller

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 400/415 V			Circuit breaker	Contactor	TeSys T controller	External current transformer
P	Ie	Icc	Reference	Reference	Reference	Reference
kW	A	kA				
0.06	0.2	130	**GV2L03**	**LC1D09**	**LTMR08●●**	–
0.09	0.3	130	**GV2L03**	**LC1D09**	**LTMR08●●**	–
0.12	0.44	130	**GV2L04**	**LC1D09**	**LTMR08●●**	–
0.18	0.6	130	**GV2L04**	**LC1D09**	**LTMR08●●**	–
0.25	0.85	130	**GV2L05**	**LC1D09**	**LTMR08●●**	–
0.37	1.1	130	**GV2L05**	**LC1D09**	**LTMR08●●**	–
0.55	1.5	130	**GV2L06**	**LC1D09**	**LTMR08●●**	–
0.75	1.9	130	**GV2L07**	**LC1D09**	**LTMR08●●**	–
1.1	2.7	130	**GV2L07**	**LC1D18**	**LTMR08●●**	–
1.5	3.6	130	**GV2L08**	**LC1D18**	**LTMR08●●**	–
2.2	4.9	130	**GV2L10**	**LC1D18**	**LTMR08●●**	–
3	6.5	130	**GV2L14**	**LC1D18**	**LTMR08●●**	–
4	8.5	130	**GV2L14**	**LC1D18**	**LTMR27●●**	–
5.5	11.5	130	**GV2L16**	**LC1D25**	**LTMR27●●**	–
7.5	15.5	50	**GV2L20**	**LC1D25**	**LTMR27●●**	–
9	18.1	50	**GV2L22**	**LC1D25**	**LTMR27●●**	–
11	22	50	**GV2L22**	**LC1D25**	**LTMR27●●**	–
15	29	50	**GV3L32**	**LC1D40A**	**LTMR100●●**	–
18.5	35	50	**GV3L40**	**LC1D50A**	**LTMR100●●**	–
22	41	50	**GV3L50**	**LC1D50A**	**LTMR100●●**	–
30	55	50	**GV3L65**	**LC1D65A**	**LTMR100●●**	–
37	66	70	**GV4LE80S**	**LC1D80**	**LTMR100●●**	–
45	80	70	**NSX100HMA**	**LC1D115**	**LTMR100●●**	–

Characteristics: pages C1/20 to C1/34
Curves: page C1/35
Dimensions, mounting: pages C1/36 to C1/37
Schemes: pages C1/38 to C1/41

Product references

0.06 to 250 kW at 400/415 V: type 2 coordination

With circuit breaker, contactor and class 10 controller

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 400/415 V			Circuit breaker	Contactor	TeSys T controller	External current transformer
P	Ie	Icc	Reference	Reference	Reference	Reference
kW	A	kA				
55	97	50	**NSX160NMA**	**LC1D115**	**LTMR08••**	**LT6CT2001**
55	97	70	**NSX160HMA**	**LC1D115**	**LTMR08••**	**LT6CT2001**
75	132	50	**NSX160NMA**	**LC1D150**	**LTMR08••**	**LT6CT2001**
75	132	70	**NSX160HMA**	**LC1D150**	**LTMR08••**	**LT6CT2001**
90	160	50	**NSX250NMA**	**LC1F185**	**LTMR08••**	**LT6CT2001**
90	160	70	**NSX250HMA**	**LC1F185**	**LTMR08••**	**LT6CT2001**
110	195	50	**NSX250NMA**	**LC1F225**	**LTMR08••**	**LT6CT2001**
110	195	70	**NSX250HMA**	**LC1F225**	**LTMR08••**	**LT6CT2001**
132	230	70	**NSX400HMA**	**LC1F265**	**LTMR08••**	**LT6CT4001**
132	230	130	**NSX400LMA**	**LC1F265**	**LTMR08••**	**LT6CT4001**
160	280	70	**NSX400HMA**	**LC1F330**	**LTMR08••**	**LT6CT4001**
160	280	130	**NSX400LMA**	**LC1F330**	**LTMR08••**	**LT6CT4001**
200	350	70	**NSX630HMA**	**LC1F400**	**LTMR08••**	**LT6CT4001**
200	350	130	**NSX630LMA**	**LC1F400**	**LTMR08••**	**LT6CT4001**
220	388	70	**NSX630HMA**	**LC1F500**	**LTMR08••**	**LT6CT4001**
220	388	130	**NSX630LMA**	**LC1F500**	**LTMR08••**	**LT6CT4001**
250	430	70	**NSX630HMA**	**LC1F500**	**LTMR08••**	**LT6CT8001**
250	430	130	**NSX630LMA**	**LC1F500**	**LTMR08••**	**LT6CT8001**

Substitution table

	Old range LT6P multifunction protection relay			New range TeSys T controllers		
Motor current	Reference	Reference	External current transformer Reference	Reference	Reference	External current transformer Reference
	∼ 100…240 V	⎓ 24 V		∼ 100…240 V	⎓ 24 V	
I < 5 A	LT6P0M005FM	LT6P0M005S144	–	**LTMR08•FM**	**LTMR08•BD**	**–**
5 A < I < 25 A	LT6P0M025FM	LT6P0M025S144	–	**LTMR27•FM**	**LTMR27•BD**	**–**
25 A < I < 100 A	LT6P0M005FM	LT6P0M005S144	LT6CT1001	**LTMR100•FM**	**LTMR100•BD**	**–**
100 A < I < 200 A	LT6P0M005FM	LT6P0M005S144	LT6CT2001	**LTMR08•FM**	**LTMR08•BD**	**LT6CT2001**
200 A < I < 400 A	LT6P0M005FM	LT6P0M005S144	LT6CT4001	**LTMR08•FM**	**LTMR08•BD**	**LT6CT4001**
400 A < I < 800 A	LT6P0M005FM	LT6P0M005S144	LT6CT8001	**LTMR08•FM**	**LTMR08•BD**	**LT6CT8001**

Characteristics: pages C1/20 to C1/34
Curves: page C1/35
Dimensions, mounting: pages C1/36 to C1/37
Schemes: pages C1/38 to C1/41

Life Is On Schneider Electric

0.37 to 400 kW at 690 V: type 2 coordination

With switch-disconnector, contactor and class 10 controller

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3		Switch-disconnector (1)	aM fuses		Contactor	TeSys T controller	External current tranformer
P	Ie	Reference	Size	Rating	Reference	Reference	Reference
kW	A			A			
0.37	0.64	**GS●F**	14 x 51	1	**LC1D09**	**LTMR08●●**	–
0.55	0.87	**GS●F**	14 x 51	2	**LC1D09**	**LTMR08●●**	–
0.75	1.1	**GS●F**	14 x 51	2	**LC1D09**	**LTMR08●●**	–
1.1	1.6	**GS●F**	14 x 51	2	**LC1D09**	**LTMR08●●**	–
1.5	2.1	**GS●F**	14 x 51	4	**LC1D09**	**LTMR08●●**	–
2.2	2.8	**GS●F**	14 x 51	4	**LC1D09**	**LTMR08●●**	–
3	3.8	**GS●F**	14 x 51	6	**LC1D09**	**LTMR08●●**	–
4	4.9	**GS●F**	14 x 51	6	**LC1D09**	**LTMR08●●**	–
5.5	6.7	**GS●F**	14 x 51	8	**LC1D25**	**LTMR08●●**	–
7.5	8.9	**GS●F**	14 x 51	10	**LC1D25**	**LTMR27●●**	–
11	12.8	**GS●F**	14 x 51	16	**LC1D25**	**LTMR27●●**	–
15	17	**GS●G**	T000	20	**LC1D32**	**LTMR27●●**	–
18.5	21	**GS●G**	T000	25	**LC1D32**	**LTMR27●●**	–
22	24	**GS●G**	T000	32	**LC1D40A**	**LTMR27●●**	–
30	32	**GS●G**	T000	40	**LC1D50A**	**LTMR100●●**	–
37	39	**GS●J**	22 x 58	50	**LC1D65A**	**LTMR100●●**	–
45	47	**GS●J**	22 x 58	63	**LC1D80**	**LTMR100●●**	–
55	57	**GS●J**	22 x 58	80	**LC1D115**	**LTMR100●●**	–
75	77	**GS●KK**	T00	100	**LC1D115**	**LTMR100●●**	–
90	93	**GS●KK**	T00	125	**LC1F150**	**LTMR08●●**	**LT6CT2001**
110	113	**GS●KK**	T00	125	**LC1F185**	**LTMR08●●**	**LT6CT2001**
132	134	**GS●L**	T0	160	**LC1F265**	**LTMR08●●**	**LT6CT2001**
160	162	**GS●N**	T1	200	**LC1F265**	**LTMR08●●**	**LT6CT2001**
200	203	**GS●N**	T1	250	**LC1F330**	**LTMR08●●**	**LT6CT4001**
220	224	**GS●QQ**	T2	250	**LC1F400**	**LTMR08●●**	**LT6CT4001**
250	250	**GS●QQ**	T2	315	**LC1F400**	**LTMR08●●**	**LT6CT4001**
290	292	**GS●QQ**	T2	355	**LC1F500**	**LTMR08●●**	**LT6CT4001**
315	313	**GS●QQ**	T2	355	**LC1F500**	**LTMR08●●**	**LT6CT4001**
355	354	**GS2S**	T3	400	**LC1F630**	**LTMR08●●**	**LT6CT4001**
400	400	**GS2S**	T3	500	**LC1F630**	**LTMR08●●**	**LT6CT8001**

(1) GS●: GS1 for direct operator, GS2 for external operator.

Characteristics: pages C1/20 to C1/34
Curves: page C1/35
Dimensions, mounting: pages C1/36 to C1/37
Schemes: pages C1/38 to C1/41

Technical Data for Designers

Contents

TeSys U:
> characteristics ..... C1/14 to C1/17
> dimensions C1/18
> schemes C1/19

TeSys T:
> characteristics ..... C1/20 to C1/34
> curves C1/35
> dimensions ..... C1/36 to C1/37
> schemes ..... C1/38 to C1/41

PB121446.eps



Introduction

Above 32 A, the TeSys U controller provides a motor starter management solution identical to that provided by TeSys U starter-controllers.

Used in conjunction with a short-circuit protection device and a contactor, it provides a motor starter whose functions are the same as those of a TeSys U starter-controller and, in particular, provides the following functions: overload protection, motor starter control and application monitoring.

It consists of a control unit whose adjustment range is compatible with the secondary of current transformers, plus a control base which also allows fitment of a function module or a communication module.

It requires a ⎓ 24 V external power supply.

The secondaries of current transformers, the ⎓ 24 V power supply, the 10 inputs and the 5 outputs are connected by screw terminal block.

PB121450.eps



Application example

Detecting blockage of a rock crusher by monitoring the motor current.

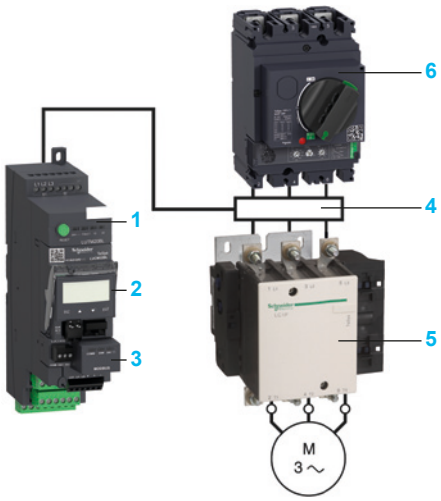
Operating conditions

- Power: 90 kW at 400 V.
- In: 185 A.
- Duty class S1.
- Control circuit voltage: ∿ 230 V
- Control-command by PLC and serial link using the Modbus protocol.

Products used

Description	Item	Quantity	Reference	Page
Controller	1	1	**LUTM20BL**	C1/2 C1/3
Multifunction control unit	2	1	**LUCMT1BL**	A4/12
Modbus communication module	3	1	**LULC033**	A4/27 to A4/31
Current transformer	4	3	**LUTC4001**	C1/2 C1/3
Contactor	5	1	**LC1F185P7**	–
Circuit breaker	6	1	**GV5P150F**	–

PB121437.eps



Functions performed

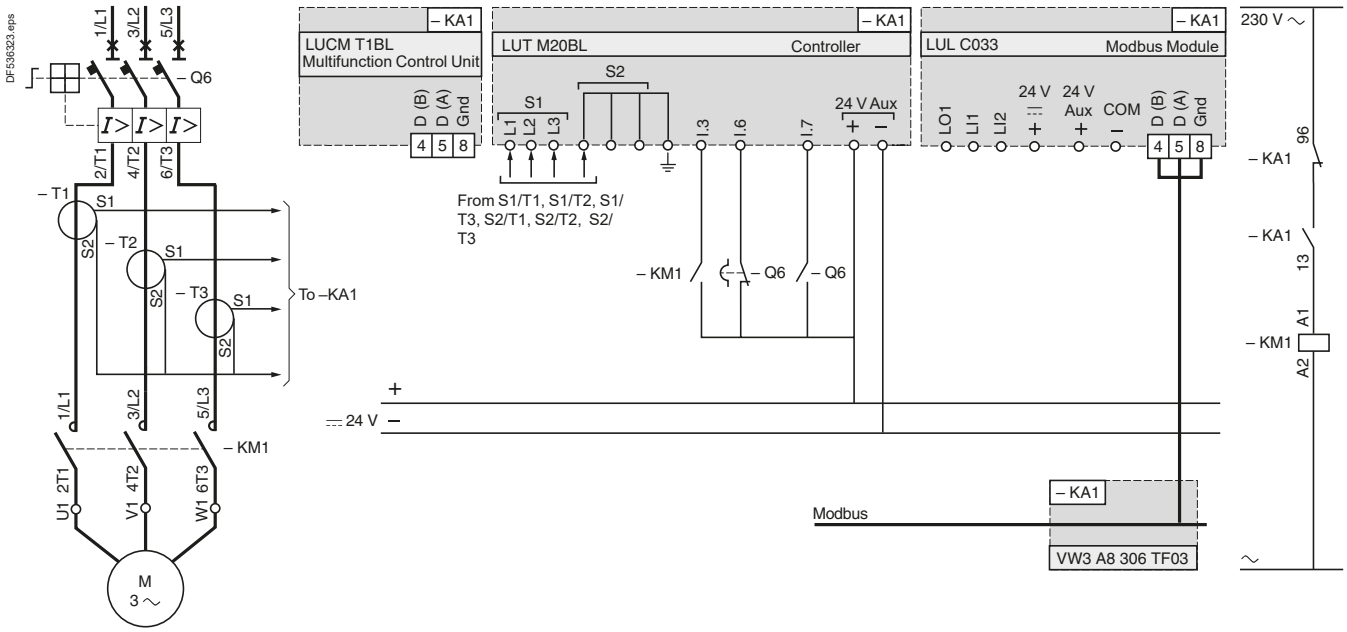
- Short-circuit protection with level of protection of 70 kA at 400V.
- Electronic protection against thermal overloads with an adjustment range of 4.
- Detection of crusher blockage by monitoring the induced overcurrent. To use the "overtorque or jam" function, the following parameters must be entered:
  - ◻ trip: the answer yes/no enables or disables the function,
  - ◻ time before tripping: the time period during which the value of the current must be above the tripping threshold in order to cause tripping (adjustable from 1 to 30 s).
  - ◻ tripping threshold: value as a % of the load current ratio in relation to the setting current. If the ratio remains above this threshold for the time specified in the previous parameter, the product trips (adjustable from 100 to 800 %).

It is possible to set the parameter for an alarm at a preset threshold under the same conditions as above.

References:
pages C1/2 and C1/3
Dimensions, mounting:
page C1/18
Schemes:
page C1/19

Application example

Scheme

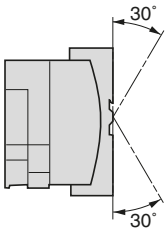
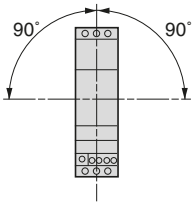


Other functions

The multifunction control unit incorporates other control and protection functions, such as: monitoring and control of phase current, alarm, …
Communication module LUL C033 also provides a programmable output and two programmable inputs.

References:
pages C1/2 and C1/3
Dimensions, mounting:
page C1/18
Schemes:
page C1/19

Environment

Control base and control unit type			LUTM + LUCBT1BL or LUCDT1BL without LULC	LUTM + LUCMT1BL or LULC
Product certifications			UL, CSA, ASEFA	
Conforming to standards			IEC/EN 60947-4-1, UL 508, CSA C22-2 N°14	
Rated insulation voltage of the outputs (Ui)	Conforming to IEC/EN 60947-1, overvoltage category III, degree of pollution: 3	**V**	250	
	Conforming to UL508, CSA C22-2 n°14	**V**	250	
Rated impulse withstand voltage of the outputs (Uimp)	Conforming to IEC/EN 60947-4-1	**kV**	4	
Degree of protection Conforming to IEC/EN 60947-1 (protection against direct finger contact)	Front panel (outside connection zone)		IP 40	
	Front panel and wired terminals		IP 20	
	Other faces		IP 20	
Protective treatment	Conforming to IEC/EN 60068-2-30	**Cycles**	12	
	Conforming to IEC/EN 60068-2-11	**h**	48	
Ambient air temperature around the device	Storage	**°C**	- 40…+ 85	
	Operation	**°C**	- 25…+ 70	- 25…+ 60
Maximum operating altitude		**m**	2000	
Operating positions Without derating	In relation to normal vertical mounting plane			
Flame resistance	Conforming to UL 94		V2	
	Conforming to IEC/EN 60695-2-12	**°C**	960 (parts supporting live components)	
		°C	650	
Shock resistance 1/2 sine wave = 11 ms	Conforming to IEC/EN60068-2-27 (1)		15 gn	
Vibration resistance 5…300 Hz	Conforming to IEC/EN 60068-2-6 (1)		4 gn	
Resistance to electrostatic discharge	Conforming to IEC/EN 61000-4-2	**kV**	In open air: 8 - Level 3	
		kV	On contact: 6 - Level 3	
Resistance to radiated fields	Conforming to IEC/EN 61000-4-3	**V/m**	10 - Level 3	
Immunity to fast transient currents	Conforming to IEC/EN 61000-4-4	**kV**	CT outputs and inputs: 4 - Level 4	
		kV	Inputs and supply: 2 - Level 3	
Immunity to radioelectric fields	Conforming to IEC/EN 61000-4-6	**V**	10	

Control base and control unit relays

			Common mode	Serial mode
Immunity to dissipated shock waves	Conforming to IEC/EN 60947-4-1			
	Output relays / power line	**kV**	4	2
	Inputs	**kV**	2	1
	Serial communication	**kV**	2	–

(1) Without modifying the contact states, in the most unfavourable direction.

References: pages C1/2 and C1/3
Dimensions, mounting: page C1/18
Schemes: page C1/19

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Control circuit supply characteristics

Operational voltage		V	⎓ 20.4…28.8
Power consumption		W	2 max
Associated protection		A	gG fuse. 0.5
Cabling			
Connectors	Pitch	mm	5
Flexible cable without cable end	1 conductor	mm²	0.2…2.5
	2 identical conductors	mm²	0.2…1.5
Flexible cable with cable end			
Without insulated ferrule	1 conductor	mm²	0.25…2.5
	2 identical conductors	mm²	0.25…1
With insulated ferrule	1 conductor	mm²	0.25…2.5
	2 identical conductors (1)	mm²	0.5…1.5
Solid cable without cable end	1 conductor	mm²	0.2…2.5
	2 identical conductors	mm²	0.2…1
Conductor size	1 conductor		AWG24 to AWG12
Tightening torque		N.m	0.5…0.6
Flat screwdriver		mm	3

Input characteristics

Operational voltage	V	⎓ 24
Logic inputs		Logic state 1: I ⩾ 6 mA - 16 V Logic state 0: I ⩽ 1.5 mA - 5 V

Discrete output characteristics

Base controller type			LUTM10BL	LUTM20BL
Type			Single break volt-free contacts	
Load	a.c. supply		C 300	B 300
	d.c. supply		24 V/5 A	24 V/5 A
Permissible power in cat. AC-15	For 500 000 operating cycles	VA	180	500
Permissible power in cat. DC-13	For 500 000 operating cycles	W	30	30
Associated protection		A	gG fuse, 4	gG fuse, 4
Used with contactor type (2)			Control voltage ⎓ 24 V: LP1K, LC1D09…D95. Control voltage ∿ 24…240 V: LC1K, LC1D.	Control voltage ∿ 100…240 V: LC1K, LC1D, LC1F185…F500

Characteristics of external current transformers LUTC●●●1

Precision		Class 5P					
Precision limit factor		10					
Maximum operating temperature	°C	70					
Transformer ratio		30/1	50/1	100/1	200/1	400/1	800/1
Diameter of conductor passage hole	mm	28	22	35	32	–	–
Maximum wire c.s.a.	mm²	30 x 10	30 x 10	40 x 10	65 x 32	38 x 127	53 x 127

(1) Use a double cable end.
(2) For other combinations, use an intermediate relay between the output of controller LUTM and the contactor coil.

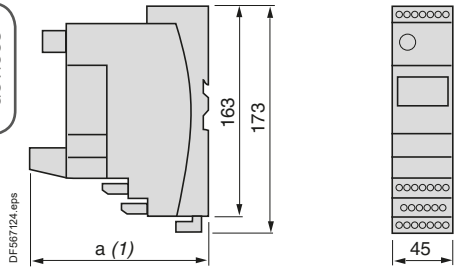
References: pages C1/2 and C1/3
Dimensions, mounting: page C1/18
Schemes: page C1/19

Dimensions, mounting

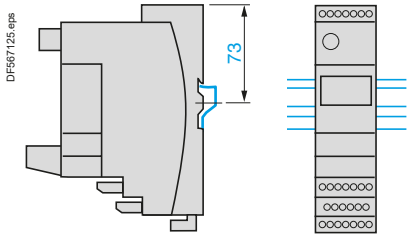
Dimensions, mounting

Controllers

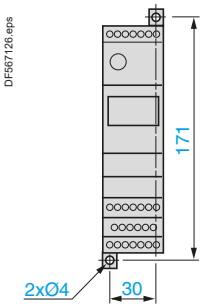
LUTM●0BL



Rail mounting



Rail mounting

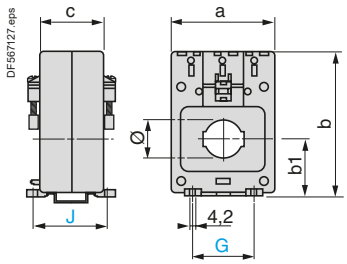


	a
With Modbus module	135
With Advantys STB, CANopen or DeviceNet modules	147

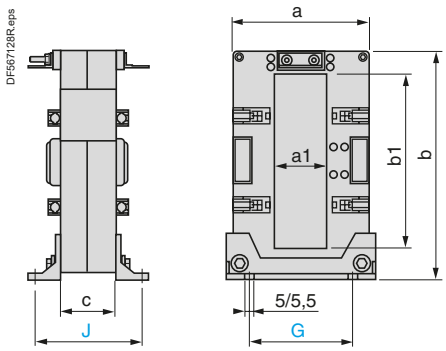
(1) Depth with communication module.

Current transformers

LUTC0301…1001



LUTC2001…8001



LUTC	a	b	b1	c	Ø	G	J
0301	77	107	42.5	46	28	45	54
0501	56	84	31	42	23	45	50
1001	77	107	42.5	46	35	45	54

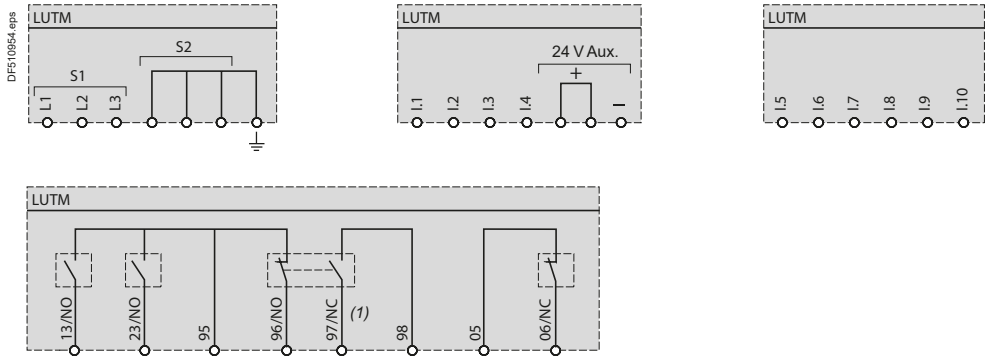
LUTC	a	a1	b	b1	c	G	J
2001	90	32	94	55	40	62	62
4001	99	38	160	127	40	75	65
8001	125	54	160	127	40	100	65

Motor management devices
Ref.

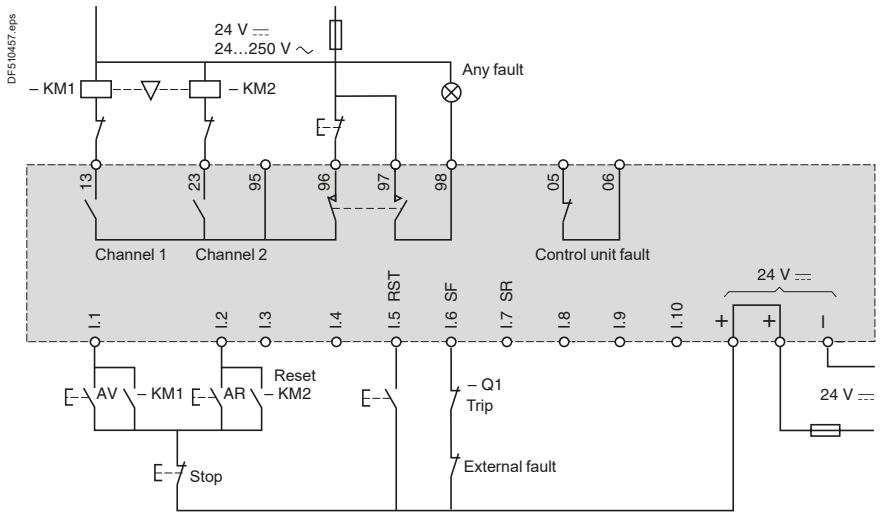
Characteristics: pages C1/14 to C1/17
References: pages C1/2 and C1/3
Schemes: page C1/19

Schemes

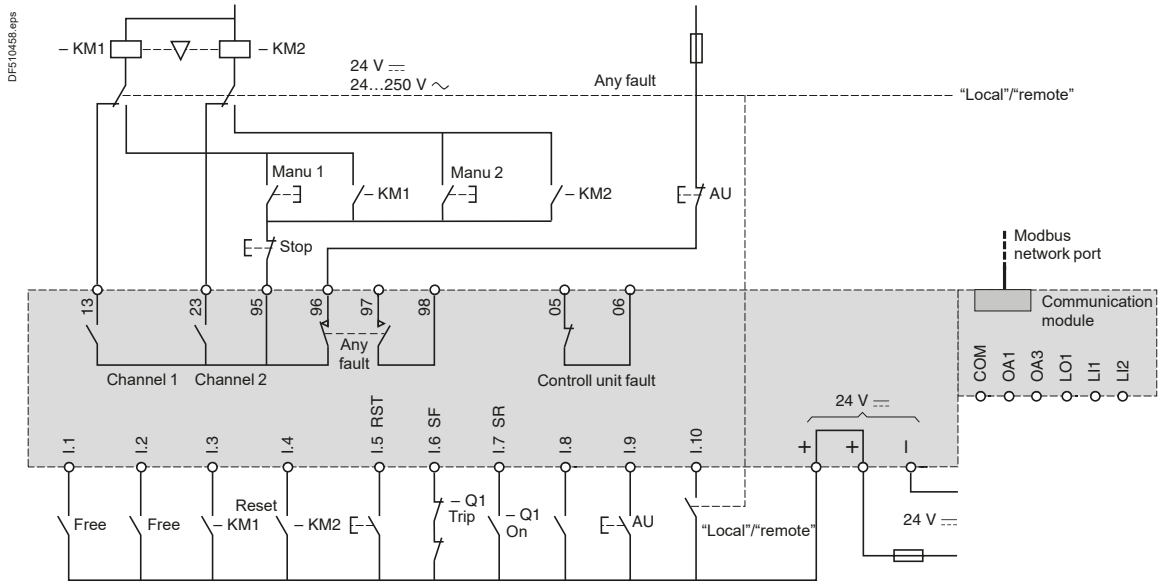
Reversing controller LUTM



3-wire control, pulsed start with maintaining contact

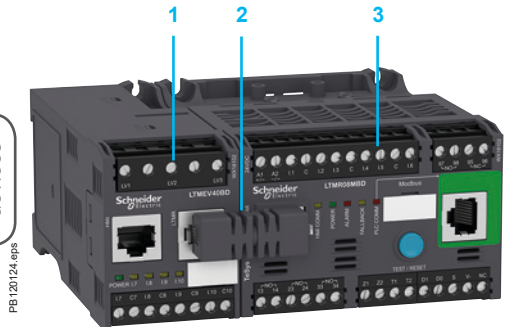


Control for Modbus communication module LULC033



(1) The contacts are represented with controller powered up and not in a fault condition.

Characteristics:
pages C1/14 to C1/17
References:
pages C1/2 and C1/3
Dimensions, mounting:
page C1/18



PB120124.eps

1 LTMEV40BD extension module
2 LTMCC004 2 x RJ45 jumper
3 LTMR08MBD controller

Introduction

TeSys T is a motor management system that provides protection, metering and monitoring functions for single-phase and 3-phase, constant speed, a.c. motors up to 810 A.

Suitable for the harshest applications, this product range offers:
- high-performance multifunction protection, independent of the automation system
- a local HMI control unit for reading, displaying and modifying the parameters monitored, diagnostics, etc.
- configuration using SoMove software
- connection to the automation system via a communication network (selection according to various protocols).

Application

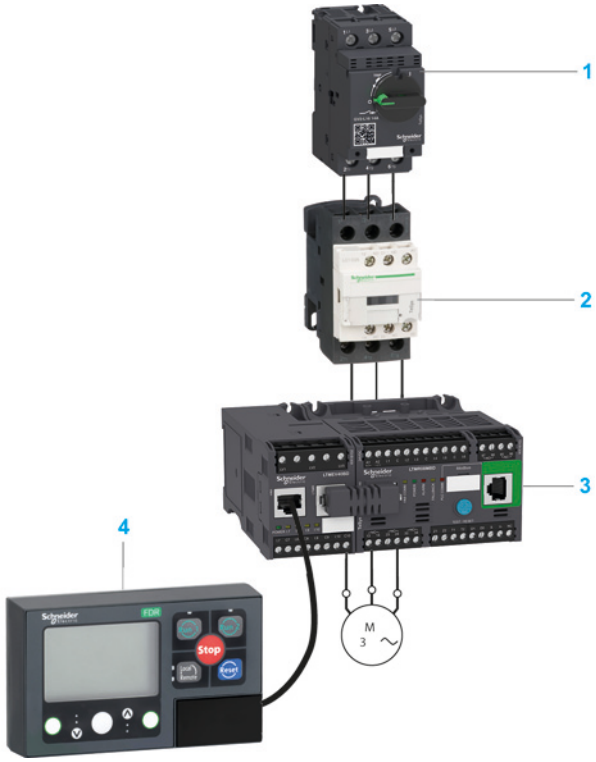
The TeSys T motor management system is used for motor control and protection in harsh industrial applications, in which downtime must be avoided because it is very costly: Oil & Gas, chemical industry, water treatment, metal, minerals and mining, pharmaceutical industry, microelectronics, tunnels, airports etc.

With TeSys T, unexpected stops of a process or manufacturing, associated with a motor, are anticipated via predictive analysis of fault situations. Fault tripping is therefore reduced to a minimum.

Its use in motor control panels makes it possible to:
- increase the operational availability of installations
- improve flexibility from project design through to implementation
- increase productivity by making available all information needed to run the system.

The TeSys motor management system integrates perfectly with Schneider Electric low voltage equipment, such as Okken, Blokset and Prisma.

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1 Magnetic Circuit breaker
2 Contactor
3 Controller with extension module
4 Operator control unit

References: pages C1/4 to C1/11
Curves: page C1/35
Dimensions, mounting: pages C1/36 to C1/37
Schemes: pages C1/38 to C1/41

Characteristics

PB121434.eps



LTMR08MBD

PB121436.eps



LTMEV40BD

PB112374.eps



LTMCUF

Introduction

Composition of the motor management system

The system comprises:
- an LTMR motor management controller
  - with internal current transformer up to 100 A
  - above 100 A, by external current transformer up to 810 A
- an LTME extension module
- an LTMCU operator control unit
- configuration software incorporated in the SoMove software application
- accessories for system set-up.

Communication

The LTMR controller is equipped with a communication interface to allow remote monitoring and control of the motor. All motor information is then available at automation system level.

The following networks are available:
- Modbus, CANopen, DeviceNet, ProfiBus DP and Ethernet TCP/IP (with two communication protocols, Modbus/TCP and EtherNet/IP).

TeSys T system functions

Protection functions

- against thermal overload
- against phase imbalance and phase failure
- thermal motor protection via PTC probes
- against phase reversal
- against earth faults
- against long starting times and motor stalling
- against automatic load shedding and restarting
- against load fluctuations (I, U, P)
- against variations of Cos φ (power factor).

Metering functions

- Measurements (rms values):
  - current on the 3 phases
  - voltage on the 3 phases (shedding)
  - motor temperature
  - earth fault.
- Values calculated:
  - average current
  - frequency
  - Cos φ (power factor), power, power consumption...

Motor control functions

A motor managed by TeSys T can be controlled:
- locally, using the logic inputs present on the product, or via the HMI terminal
- remotely, via the network (connection by terminal block or connector except for DeviceNet: terminal block only).

Motor control modes

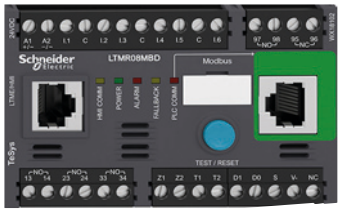
5 predefined motor control modes are incorporated in the controller:
- overload mode: monitoring of motors whose control is not managed by the controller,
- independent mode: starting of non-reversing motors,
- reverser mode: starting of reversing motors,
- 2-step mode: 2-step starting of motors (star-delta, by autotransformer and by resistor),
- 2-speed mode: 2-speed starting of motors (Dahlander, pole changer).

A 6th "Custom" mode is available to allow the user to create a specific motor control mode that is not predefined in the controller.

Statistical and diagnostic functions

- Fault statistics: counters per type of protection and history of the last 5 faults.
- Motor statistics: saving of motor statistics values.
- Diagnosis of faults affecting correct operation of the product.

References: pages C1/4 to C1/11
Curves: page C1/35
Dimensions, mounting: pages C1/36 to C1/37
Schemes: pages C1/38 to C1/41



PB121447.eps

LTMR●●

The LTMR controller

The controller is the central component in the motor management system.
It manages the basic functions such as:
- measurement of 3-phase current via integral current transformers from 0.4 to 100 A (up to 810 A by external current transformers)
- measurement of earth current by external earth fault toroid
- measurement of motor temperature by PTC probe
- inputs and outputs for the various motor control modes, fault management and associated functions.

Characteristics

Supply
2 types of controller power supply are available:
- 24 V⎓
- 100…240 V∿.

Current ranges
3 current ranges allow measurement of motor current from 0.4 to 100 A:
- 0.4…8 A
- 1.35…27 A
- 5…100 A.

For use with external current transformers, choose the 0.4…8 A range (1 or 5 A current transformer secondary).

Inputs
- 6 discrete logic inputs.

Outputs
- 3 relay logic outputs (1N/O).
- 1 relay output for fault signalling (1N/O + 1N/C).

Measurements
- Connections for a temperature probe.
- Connections for an earth fault toroid.

LTME extension module

The extension module adds the following functionalities to the TeSys T controller:
- voltage measurement on the 3 phases. This enables it to calculate numerous engine monitoring parameters (power, frequency, Cos φ…)
- 4 additional inputs.

Characteristics

Inputs
- 4 discrete logic inputs (independent).

Power supplies
- 2 types of power supply for the inputs: 24 V⎓ and 100…240 V∿.
  - A 24 V⎓ expansion module can be assembled with a 24 V⎓ controller or with a 100…240 V∿ controller.
  - A 100…240 V∿ expansion module can be assembled with a 100…240 V∿ controller.

Voltage measurement between phases up to 690 V nominal.

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LTMCU

Human/Machine Interfaces (HMI)

Depending on the application, 2 types of HMI can be used with the LTMR controller.
- ■ The LTMCU operator control unit:
  - □ entirely dedicated to the TeSys T range
  - □ only for control/monitoring of an LTMR controller.
- ■ A Magelis XBTN410 terminal for control/monitoring of 1 to 8 LTMR controllers.

LTMCU operator control unit

Dedicated exclusively to TeSys T controllers, control unit LTMCU makes it possible to:
- ■ configure the parameters of the LTMR controller
- ■ display information on controller configuration and operation
- ■ monitor the alarms and faults generated by the controller
- ■ local control of the motor via the local control interface (keys can be customised). Three different languages can be loaded into the LTMCU controller at the same time.

By default, these 3 languages are:
- ■ LTMCU: English, French and Spanish

Note: *English is the only compulsory language.*

A language download utility (LangTool), together with all the other languages, are available on the website “www.se.com”.
This tool allows the languages present in the LTMCU control unit to be adapted.

The LTMCU HMI control unit has an RJ45 port, protected by a flexible cover to provide a good level of protection (IP54).
This port on the front panel allows connection to a PC, via a connecting cable, in order to use SoMove software.
In this case, the control unit acts as a transmitter and all information can then be viewed in SoMove.
The LTMCU HMI can be used as a portable version by using the separate kit LTM9KCU. This kit consists of two snap-on plastic shells (tool-free mounting) fitted with a simple fixing system that uses magnets for mounting on all types of metal surfaces.

The Magelis XBT N410 HMI terminal

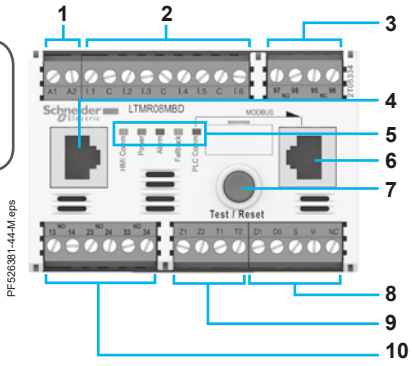
Two applications have been predefined for TeSys T. Depending on the application loaded, the HMI terminal makes it possible to:
- ■ configure and monitor a motor starter (LTM_1T1_V1.dop)
- ■ monitor and modify certain parameters on up to 8 motor starters (LTM_1T8_X_V1.dop) (1).

XBTL1000 programming software is needed for loading applications into the HMI terminal.
These applications are available on the website “www.se.com”.

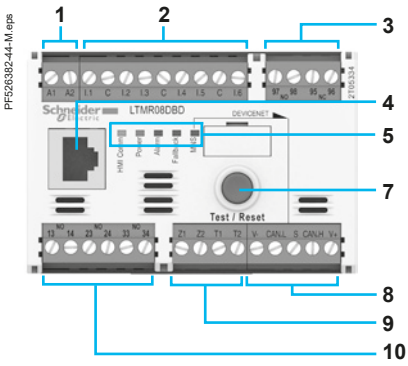
(1) Replace the X with an E for the English version, or an F for the French version.

LTMR controllers

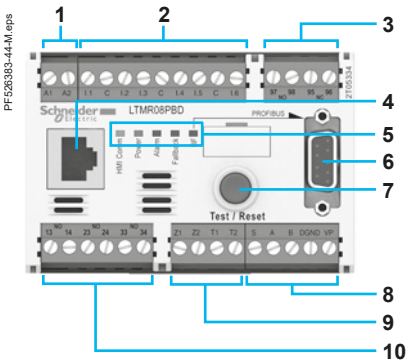
Modbus



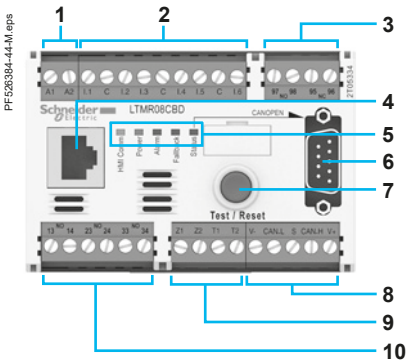
DeviceNet



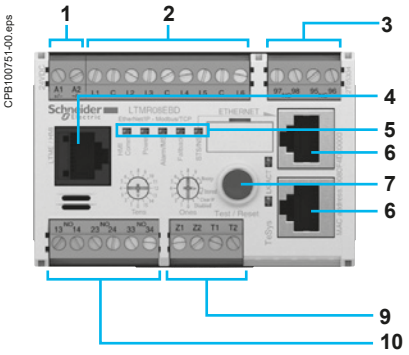
Profibus DP



CANopen



Ethernet TCP/IP (communication protocols: Modbus/TCP and EtherNet/IP)

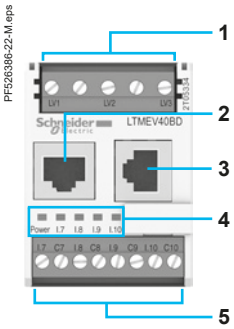


Controllers feature the following on their front panel:

1 Controller power supply.
2 Input connections.
3 Fault outputs (N/O+N/C).
4 Port for connection to the HMI terminal, a PC or an extension module (RJ45).
5 Controller status LEDs.
6 Network port for connection to the network by connector (except DeviceNet) (1).
7 Test/Reset button.
8 Connection to the network by terminal block (except Ethernet TCP/IP).
9 Connection for an earth fault toroid and temperature probes.
10 Outputs for motor control mode function.

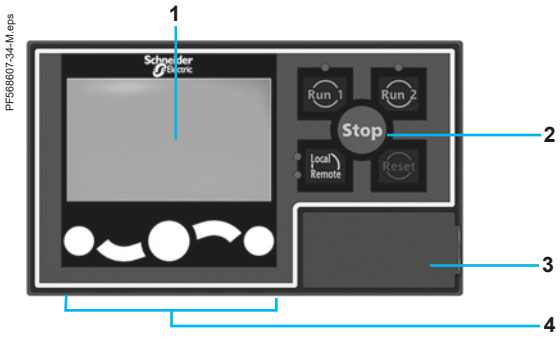
(1) Connection using power extension (daisy-chaining) is possible for Ethernet TCP/IP.

LTMEV40●● extension modules



Extension modules have the following on their front face:
1 Inputs for voltage measurement.
2 Port for connection to the HMI terminal or to the PC.
3 Port for connection to the controller.
4 Extension module status LEDs.
5 Connection of additional inputs.

LTMCU operator control unit



The control unit has the following on its front face:
1 Screen LCD display.
2 Local control interface including control keys and LEDs.
3 RJ45 port on front panel for connection to a PC (protected by a cover).
4 Contextual navigation keys.

References: pages C1/4 to C1/11
Curves: page C1/35
Dimensions, mounting: pages C1/36 to C1/37
Schemes: pages C1/38 to C1/41

Thermal and current protection functions

Functions Description	Setting range	Controller LTMR	Controller and extension module (LTMR + LTME)	Alarm threshold	Fault threshold
Thermal overload: thermal protection of motor by monitoring current consumption	Class: 5, 10, 15, 20, 25, 30. Inverse ther/definite time	■	■	■	■
Motor temperature: thermal monitoring of the motor using temperature probes (winding, paper...). Up to 3 sensors in series.	PTC binary PTC/NTC analogue: 20 …6500 Ohm	■	■	■	■
Phase imbalance: monitors the symmetry of currents. To be used for imbalance < 80 % of the average current (1).	10…70% I average 0.2…20 s	■	■	■	■
Phase failure: monitors the symmetry of currents. To be used for imbalance < 80 % of the average current (1).	0.1…30 s	■	■	■	■
Phase reversal: signals when the phase sequence is different from the defined sequence (motor running).	A-B-C A-C-B	■	■	■	■
Long starting time: monitors the motor starting time	100…800 % of FLC (2) 1…200 s	■	■	■	■
Locked rotor: locking detected by a sudden increase in current after the start phase	100…800 % of FLC (2) 1…30 s	■	■	■	■
Min/max current load limit variations: monitors motor load through variations of current around preset thresholds.	min.: 30…100 % of FLC (2) 1…200 s max.: 20…800 % of FLC (2) 1…250 s	■	■	■	■
Earth fault: signals internal insulation faults, by vectorial summing of external currents, via earth fault toroid.	internal: 50…500 % min FLC (2) 0.5…25 s external: 0.02…21 A 0.1…25 s	■	■	■	■
Frequent starting: Protects the motor against overheating due to frequent starting.	0…999.9 s	■	■		

Voltage and power protection functions

Phase imbalance: monitors the symmetry of voltage between phases. To be used for imbalance < 40 % of the average voltage (3).	3…15 % 0.2…20 s		■	■	■
Phase failure: monitors the symmetry of voltage between phases. To be used for imbalance > 40 % of the average voltage (3).	0.1…30 s		■	■	■
Phase reversal: signals when the phase sequence is different from the defined sequence (motor stopped).	A-B-C A-C-B		■		■
Voltage variations. Min/max voltage limits: monitors voltage variations around preset thresholds.	min.: 70…99 % 0.2…25 s max.: 101…115 % 0.2…25 s		■	■	■
Load shedding: opens outputs O.1 and O.2 if voltage drops below a preset threshold.	68…115 % 1…9999 s		■		
Power variations. Min/max power limits: monitors power variations around preset thresholds.	20…800 % 1…100 s		■	■	■
Variations of Cos φ. Min/max limits of Cos φ: monitors variations of Cos φ around preset thresholds.	0…1 s 1…25 s		■	■	■

■ Function performed.

(1) Average current value measured on the 3 phases.
(2) FLC: Full Load Current (setting current).
(3) Average voltage value measured on the 3 phases.

References: pages C1/4 to C1/11
Curves: page C1/35
Dimensions, mounting: pages C1/36 to C1/37
Schemes: pages C1/38 to C1/41

Characteristics

Motor control functions

Functions	Description	With controller LTMR	With controller LTMR and extension module LTME
Control modes	Local, via terminal block	■	■
	Local, via HMI terminal (1)	■	■
	Remote, via network	■	■
Operating modes	Overload	■	■
	Independent	■	■
	Reverser	■	■
	2-step	■	■
	2-speed	■	■
	"Custom" mode	■	■
Fault management	Manual reset	■	■
	Automatic reset	■	■
	Remote reset	■	■

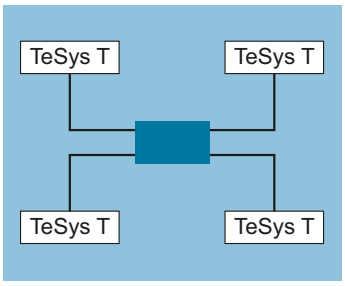
Metering functions and statistics

Functions	Description	Measurement range	With controller LTMR	With controller LTMR and extension module LTME
Measurements (2)	Current/Phase	0.08…1000 A	■	■
	Earth current	0.1633 x CT ratio	■	■
	Average current	0.08…1000 A	■	■
	Current imbalance between phases	0…200 %	■	■
	Thermal capacity level	0…200 %	■	■
	Motor temperature rise	0…6500 Ohm	■	■
	Frequency	0… 100 Hz		■
	Voltage between phases	∼ 0…830 V		■
	Voltage imbalance between phases	0…200 %		■
	Active power	0…6553.5 kW		■
	Reactive power	0…6553.5 kWr		■
	Cos φ (power factor)	0…100		■
	Active power consumption	0…400 kWh		■
	Reactive power consumption	0…400 kWrh		■
Fault statistics	Protection fault counters		■	■
	Protection alarm counters		■	■
	Diagnostic fault counters		■	■
	Motor control function counters		■	■
	Fault history		■	■
Fault diagnostics	Internal watchdog fault		■	■
	Controller internal temperature		■	■
	Temperature sensor connection		■	■
	Current connection		■	■
	Voltage connection			■
	Motor control commands (start, stop, run check back and stop check back)		■	■
	Control configuration checksum		■	■
	Loss of communication		■	■
Motor statistics	Number of motor control commands (O.1/O.2 starts)		■	■
	Operating time		■	■
	Number of starts/hour		■	■
	Last start I max.		■	■
	Duration of last start		■	■
Thermal overload statistics	Time to trip		■	■
	Time to restart		■	■
System operating statistics	Run, ON, Start, alarm, fault.		■	■

(1) HMI: Human Machine Interface.
(2) See measurement details page C1/32.

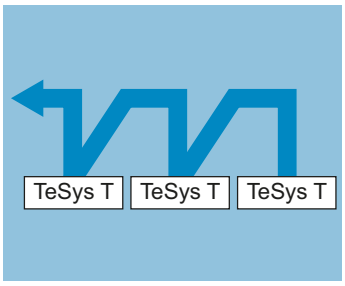
References: pages C1/4 to C1/11
Curves: page C1/35
Dimensions, mounting: pages C1/36 to C1/37
Schemes: pages C1/38 to C1/41

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Star topology

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Daisy chain topology

Star topology

In a star topology, all the peripherals are linked via an intermediate peripheral (hub or switch).

In industrial Ethernet applications, the use of full duplex switches (instead of hubs) as central peripherals is strongly recommended.

Daisy chain topology

Daisy chaining, at bus level, is another connection topology commonly used in industrial automation system networks. The cable segments link several peripherals to each other, constituting the peripheral "section" of the network cable.

Ref.

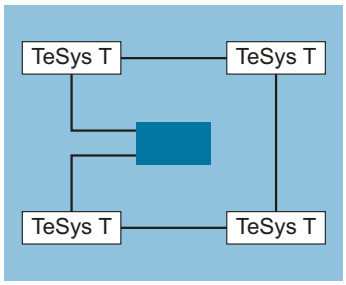
References:
pages C1/4 to C1/11

Curves:
page C1/35

Dimensions, mounting:
pages C1/36 to C1/37

Schemes:
pages C1/38 to C1/41

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Ring topology

Ethernet: different network topologies

Ring topology

In a ring topology, all the peripherals or components of the network infrastructure are connected within a loop.
This type of topology makes it possible to achieve different levels of redundancy of the network.

Ethernet ring

Ethernet rings are generally the main networks in applications where a high level of reliability is required. If a ring topology is required, the switches handling this function must be used.

Redundancy

Redundancy of the network infrastructure is the key to development of applications with high operational reliability.
Implementing a single or double ring architecture makes it possible to provide protection against breaks in network segments.

Single ring

The first level of redundancy can be achieved by installing a single ring.
ConneXium switches can be used to establish main network ring configurations.
The ring is created using RSTP protocol.
If a section of the line fails, the ring structure converts into a line type configuration.

Ethernet: different communication protocols

LTMR controllers communicating over an Ethernet network can communicate either using the Modbus/TCP communication protocol or using the EtherNet/IP communication protocol. Both protocols are loaded in the controller. One must be selected for the operation.

Note: *EtherNet/IP communication protocol is supported by ODVA, also promoter of DeviceNet communication solution. Note that in EtherNet/IP, IP stands for Industrial Protocol.*

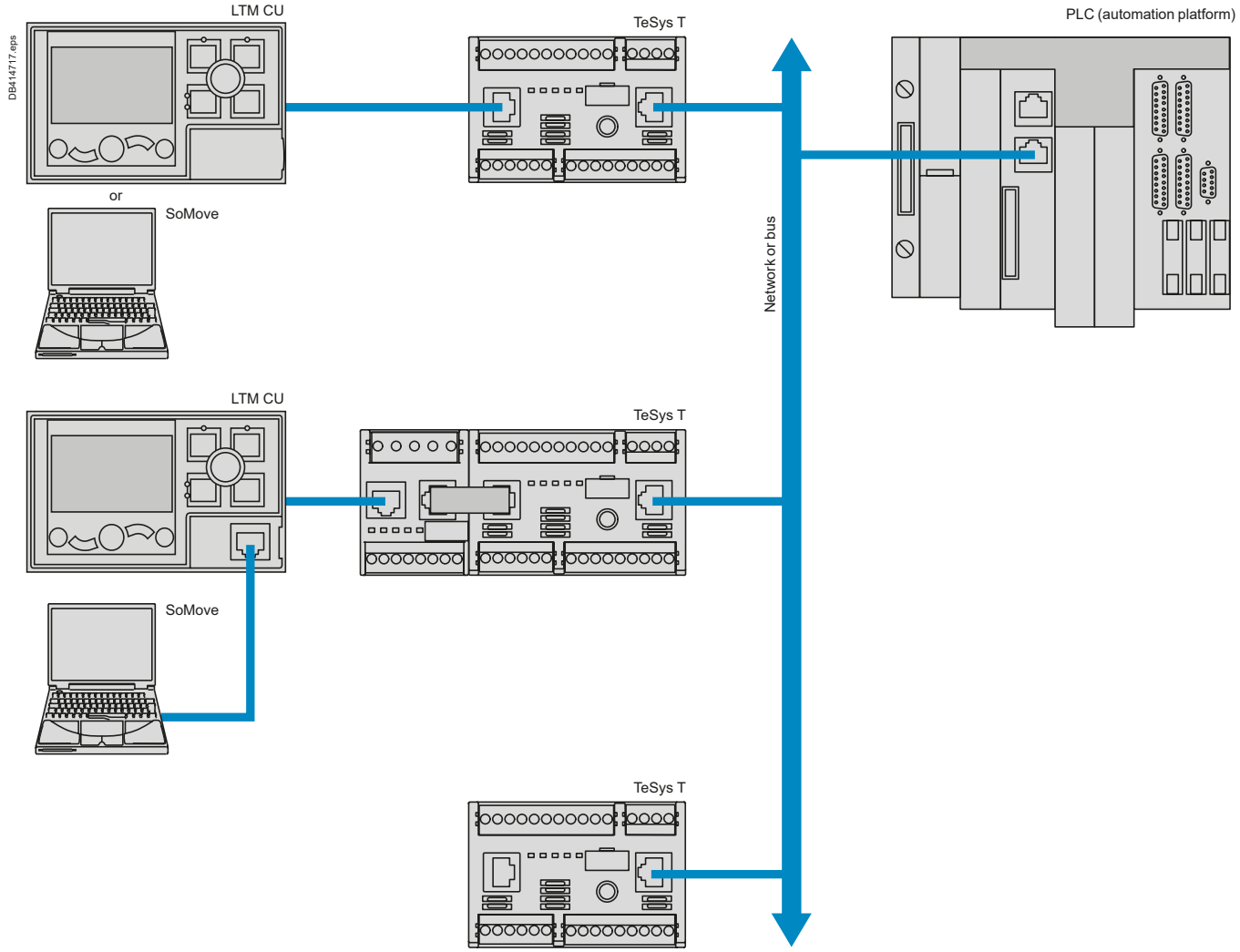
■ IP address Class for Ethernet TCP/IP version: Class A 20 ETH10/100.

Services available on Ethernet TCP/IP version		
	In Modbus/TCP	In Ethernet/IP
Web Server	■	■
Modbus messaging	■	
IO Messaging		■
Explicit Messaging		■
Client FDR	■	■
SNMP network administrator	■	■
RSTP	■	■
Discovery	■	■
Master IP	■	■
Broadcast Storm Protection	■	■

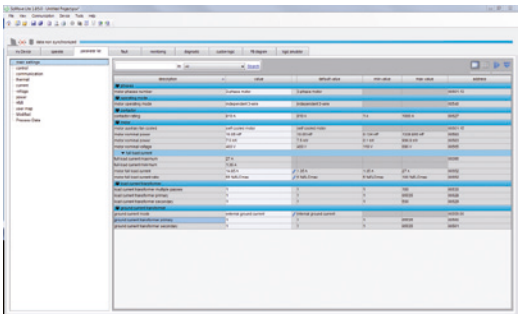
References:
pages C1/4 to C1/11
Curves:
page C1/35
Dimensions, mounting:
pages C1/36 to C1/37
Schemes:
pages C1/38 to C1/41

Life Is On Schneider Electric

Possible configurations and applications



References: pages C1/4 to C1/11
Curves: page C1/35
Dimensions, mounting: pages C1/36 to C1/37
Schemes: pages C1/38 to C1/41



Example of TeSys T *configurator setup screen*

Configuration with SoMove

The TeSys T configurator is incorporated in the SoMove software application, as from version 2.5. (1)
It allows configuration, commissioning and maintenance of motor starters protected by TeSys T.

A library containing predefined motor control mode functions is available in order to:
- allow standardisation
- avoid errors
- reduce motor starter setup times.

5 predefined motor control modes are incorporated in the controller:
- overload mode: monitoring of motors whose control is not managed by the controller
- independent mode: starting of non-reversing motors
- reverser mode: starting of reversing motors
- 2-step mode: 2-step starting of motors (star-delta, by autotransformer and by resistor)
- 2-speed mode: 2-speed starting of motors (Dahlander, pole changer).

By using logic functions, a "Custom" mode makes it possible to:
- easily adapt these predefined motor control mode functions to the specific needs of your applications
- create a link with the motor starter environment or
- create new functions.

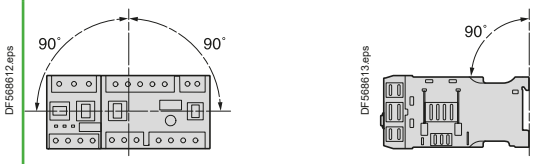
The functions thus defined can be saved and used to build your function library for future applications.
To create special functions, a logic editor is incorporated in the configurator and allows a choice of 2 programming languages:
- function block
- structured text.

(1) An update file is available, free of charge, on the website "www.se.com". It will enable you to take advantage of the latest functions in the TeSys T *motor management system.*

Ref.

Characteristics

Environment

Product type			LTMR controllers		LTMEV40●● extension modules	
Conforming to standards			IEC/EN 60947-4-1, UL60947-4-1A, CSA 22-2 n°60947-4-1, IACS E10			
Product certifications			UL, CSA, CE, CCC, EAC/GOST, RCM/CTIC'K, Atex, Marine (BV, LROS, DNV, RINA, ABS) (1)			
Rated insulation voltage of the outputs (Ui)	Conforming to IEC/EN 60947-1, overvoltage category III, degree of pollution 3	V	690			
	Conforming to UL 508, CSA C222 n° 14	V	690			
Rated impulse withstand voltage (Uimp)	Conforming to IEC/EN 60947-4-1					
	∿ 100…240 V supply, inputs and outputs	kV	4		4	
	⎓ 24 V supply, inputs and outputs	kV	0.8		0.8	
	Communication circuits	kV	0.8		–	
	Current or voltage measurement circuit	kV	6		6	
Short-circuit withstand	Conforming to IEC/EN 60947-4-1	kA	100			
Climatic withstand	Conforming to IEC/EN 60068-2-30		12 x 24 hour cycles			
	Conforming to IEC/EN 60070-2-11	h	48			
Ambient air temperature around the device	Storage	°C	- 40…+80			
	Operation	°C	- 20…+60			
Operating position without dating	In relation to normal vertical mounting plane		±30° in relation to mounting plate, ±90° 			
Flame resistance	Conforming to UL 94	°C	960 (for parts supporting live components)			
	Conforming to IEC/EN 60695-2-12	°C	650 (for other parts)			
Shock resistance (1/2 sine wave, 11 ms)	Conforming to IEC/EN 60068-2-27 (2)		15 gn			
Vibration resistance	Conforming to IEC/EN 60068-2-6 (2) 5…300 Hz		4 gn (plate mounted) 1 gn (mounted on ⊥ rail)			
Resistance to electrostatic discharge	Conforming to IEC/EN 61000-4-2	kV	In open air: 8 - Level 3 On contact: 6 - Level 3			
Immunity to radiated electromagnetic interference	Conforming to IEC 61000-4-3	V/m	10 - Level 3			
Immunity to fast transient bursts	Conforming to IEC 61000-4-4	kV	On supply and relay outputs: 4 - Level 4 Other circuits: 2 - Level 3			
Immunity to radioelectric fields (3)	Conforming to IEC/EN 61000-4-6	V	10 - Level 3			
Immunity to dissipated shock waves	Conforming to IEC/EN 61000-4-5		**Common mode**	**Serial mode**	**Common mode**	**Serial mode**
	Relay outputs and supply	kV	4	2	–	–
	⎓ 24 V inputs	kV	1	1	1	1
	∿ 100…240 V inputs	kV	2	1	2	1
	Voltage inputs	kV	–	–	4	2
	Communication	kV	2	–	2	–
	Temperature sensor (IT1/IT2)	kV	1	0.5	–	–

Altitude derating		**2000 m**	**3000 m**	**3500 m**	**4000 m**	**4500 m**
	Rated operational voltage (Ui)	1	0.93	0.87	0.8	0.7
	Max. operating temperature	1	0.93	0.92	0.9	0.88

(1) Certain certifications are pending; please consult your Customer Care Centre.
(2) Without modifying the contact states, in the most unfavorable direction.
(3) This product has been designed for use in environment A and in B, it may cause unwanted electromagnetic disturbance to other devices, which may require the implementation of adequate mitigation measures.

References: pages C1/4 to C1/11
Curves: page C1/35
Dimensions, mounting: pages C1/36 to C1/37
Schemes: pages C1/38 to C1/41

Controller and extension module characteristics

Product type				Controllers		Extension modules	
				LTMR●●●BD	LTMR●●●FM	LTMEV40BD	LTMEV40FM
Control supply							
Operational voltage (U)	Conforming to IEC/EN 60947-1		V	⎓ 24	∿ 100…240	–	
Resistance to voltage dips	Conforming to IEC/EN 61000-4-11		V	0 for 3 ms 70 % of U for 500 ms		–	
Associated protection			A	gG fuse, 0.5		–	
Operational voltage	Limit values		V	⎓ 20.4…26.24	∿ 93.5…264	–	
Current consumption	50/60 Hz		mA	⎓ 56…127	∿ 8…62.8	–	
Connectors	Pitch		mm	5.08		5.08	
Flexible cable without cable end	1 conductor		mm²	0.2…2.5		0.2…2.5	
	2 identical conductors		mm²	0.2…1.5		0.2…1.5	
Flexible cable with cable end							
Without insulated ferrule	1 conductor		mm²	0.25…2.5		0.25…2.5	
	2 identical conductors		mm²	0.5…1.5		0.5…1.5	
With insulated ferrule	1 conductor		mm²	0.25…2.5		0.25…2.5	
	2 identical conductors		mm²	0.2…1		0.2…1	
Solid cable without cable end	1 conductor		mm²	0.2…2.5		0.2…2.5	
	2 identical conductors		mm²	0.2…1		0.2…1	
Conductor size				AWG24 to AWG14		AWG24 to AWG14	
Tightening torque			N.m	0.5…0.6		0.5…0.6	
Flat screwdriver			mm	3		3	
Input characteristics							
Nominal values	Conforming to IEC/EN 61131-1			Type 1 positive logic (⎓: resistive, ∿: capacitive)			
	Voltage		V	⎓ 24	∿ 100…240	⎓ 24	∿ 100…240
	Current		mA	⎓ 7	∿ 3.1 for 100 V ∿ 7.5 for 240 V	⎓ 7	∿ 3.1 for 100 V ∿ 7.5 for 240 V
Logic inputs	Logic state 1	Voltage	V	15 min	79 < U < 264	15 min	79 < U < 264
		Current	mA	2 min…15 max	2 min at 110 V… 3 min at 220 V	2 min…15 max	2 min at 110 V… 3 min at 220 V
	Logic state 0	Voltage	V	5 max	0 < U < 40	5 max	0 < U < 40
		Current	mA	15 max	15 max	15 max	15 max
Response time	Change to state 1		ms	15	25	15	25
	Change to state 0		ms	5	25	5	25
Output characteristics							
Type				Volt free, single break			
Load	∿			250 V / 5 A B300			
	⎓			30 V / 5 A			
Permissible power in cat. AC-15	For 500 000 operating cycles		VA	480 / Ie max: 2 A			
Permissible power in cat. DC-13	For 500 000 operating cycles		W	30 / Ie max: 1.25 A			
Associated protection			A	gG fuse, 4			
Max. frequency			Hz	2			
Max. operating level			op. cycles/h	1800			
Response time	Change to state 1		ms	10 max			
	Change to state 0		ms	10 max			
Measurement details							
Current				1 % for the 0.4…8 A and 1.35…27 A ranges 2 % for the 5…100 A range			
Voltage				1 % from 100 to 830 V			
Earth fault current	Internal measurement without earth fault toroid			5…15 % for current > 0.1 A in the 0.4…8 A range current > 0.2 A in the 1.35…27 A range current > 0.3 A in the 5…100 A range			
	External measurement with earth fault toroid			< 5 % or 0.01 A			
Temperature measurement				2 %			
Power factor				10 %			
Active and reactive power				15 %			
Internal clock				±30 min / year			

References: pages C1/4 to C1/11
Curves: page C1/35
Dimensions, mounting: pages C1/36 to C1/37
Schemes: pages C1/38 to C1/41

Life Is On Schneider Electric

Characteristics

Bus and network characteristics

Type of bus/network	Modbus	CANopen	DeviceNet	Profibus DP	Ethernet
Physical interface	2-wire RS 485	ISO 11898	ISO 11898	polarised 2-wire RS 485	IEEE 802.3
Addressing	1 to 247	1 to 127	1 to 64	1 to 125	0 to 159 (1)
Transmission speeds	1.2 to 19.2 kb/s	10, 20, 50, 125, 250, 500, 800 and 1000 kb/s + Auto baud	125 to 500 kb/s	9.6 kb to 12 Mb/s	10/100 Mb/s, with automatic recognition
Connections	RJ45/terminal block	9-way SUB-D/ terminal block	Terminal block	9-way SUB-D/ terminal block	RJ45
Cables	2 shielded twisted pairs	4 twisted, shielded wires	4 twisted, shielded wires	2 shielded twisted pairs, type A	2 shielded twisted pairs

LTMCU operator control unit

Environment

Conforming to standards			IEC/EN 61131-2, UL60947-4-1A, CSA 22-2 n°60947-4-1
Product certifications			UL, CSA, CE, EAC/GOST, RCM/CTIC'K
Ambient air temperature around the device	Storage	°C	-40…+80
	Operation	°C	-20…+60
Relative humidity			15…95 % without condensation
Climatic withstand	Conforming to IEC/EN 60068-2-30		12 x 24 hour cycles
Degree of protection	Conforming to IEC 60947-1		IP54
Shock resistance	Conforming to IEC/EN 60068-2-27		15 gn / 11ms
Vibration resistance	Conforming to IEC/EN 60068-2-6 5…300 Hz		4 gn
Flame resistance	Conforming to IEC 60947-1	°C	650
	Conforming to UL 94		V2

Electrical characteristics

Supply to the product			Powered via the controller
Maximum current		mA	140
Maximum power dissipated		W	1
Resistance to electromagnetic discharge	Conforming to IEC/EN 61000-4-2	kV	In open air: 8. Level 3 On contact: 4. Level 3
Immunity to radiated electromagnetic interference	Conforming to IEC/EN 61000-4-3	V/m	10 - Level 3
Immunity to fast transient bursts	Conforming to IEC/EN 61000-4-4	kV	2, shielded access. Level 3
Immunity to radioelectric fields	Conforming to IEC/EN 61000-4-6	V	10. Level 3
Immunity to shock waves	Conforming to IEC/EN 61000-4-5	kV	2, shielded access. Level 3

Physical characteristics

Mounting			Flush mounted
Display			Backlit LCD
Signalling			By 4 LEDs
Cabling			RJ45

(1) For DHCP, stored IP, adressing limited by subnet mask.

References: pages C1/4 to C1/11
Curves: page C1/35
Dimensions, mounting: pages C1/36 to C1/37
Schemes: pages C1/38 to C1/41

Characteristics

LT6CT●●●● external current transformer characteristics

Conforming to standards		IEC 60185, BS 7626			
Precision		Class 5P			
Precision limit factor		15			
Rated insulation voltage (Ui)		690			
Maximum operating temperature	**°C**	50			
Transformer ratio	**A**	100/1	200/1	400/1	800/1
Diameter of conductor passage hole	**mm**	35	35	35	35
Maximum cabling c.s.a.	**mm²**	30 x 10	30 x 10	30 x 10	incorporated (1)

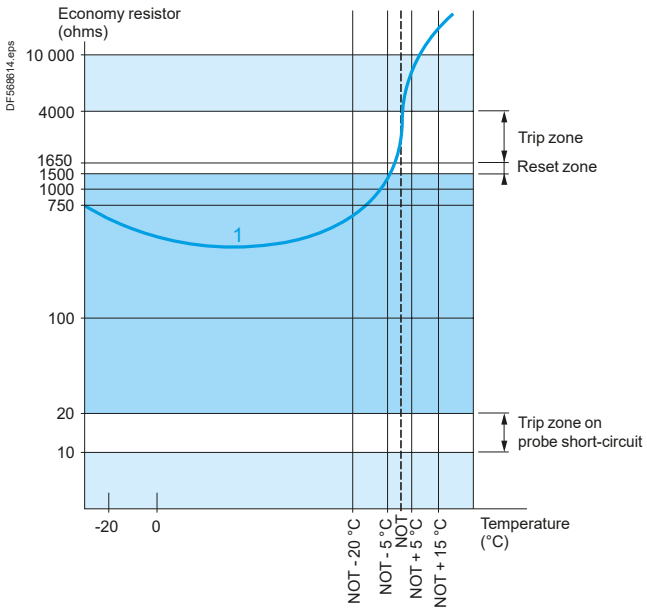
Earth fault toroid characteristics

Toroid type		**50437**	**50438**	**50439**	**50440**	**50441**	**50442**	**50485**	**50486**
Rated insulation voltage Ui	**V**	1000							
Operating temperature	**°C**	- 35…+ 70							
Protection index		IP30 (connections IP20)							
Transformer ratio		1/1000							
Rated operational current Ie	**A**	65	85	160	250	400	630	85	250
Max. conductor c.s.a. per phase	**mm²**	25	50	95	240	2 x 185	2 x 240	50	240

DA1TT●● probe characteristics

Conforming to standards			IEC 60034-11 mark A
Economy resistor	At 25 °C	Ω	3 x 250 in series
Rated operational voltage (Ue)	Per probe	**V**	⎓ 2.5 max
Rated insulation voltage (Ui)		**kV**	2.5
Insulation			Reinforced
Length of connecting cables	Between probes	**mm**	250
	Between probe and motor terminal plate	**m**	1

Guaranteed operating zones: example with 3 probes type DA1TT●●● (250 Ω at 25 °C) in series, conforming to standard EC 60034-11, mark A.



1 3 probes type DA1●●● (250 Ω at 25 °C) in series.

NOT: Nominal Operating Temperature.

Protection unit tripped.

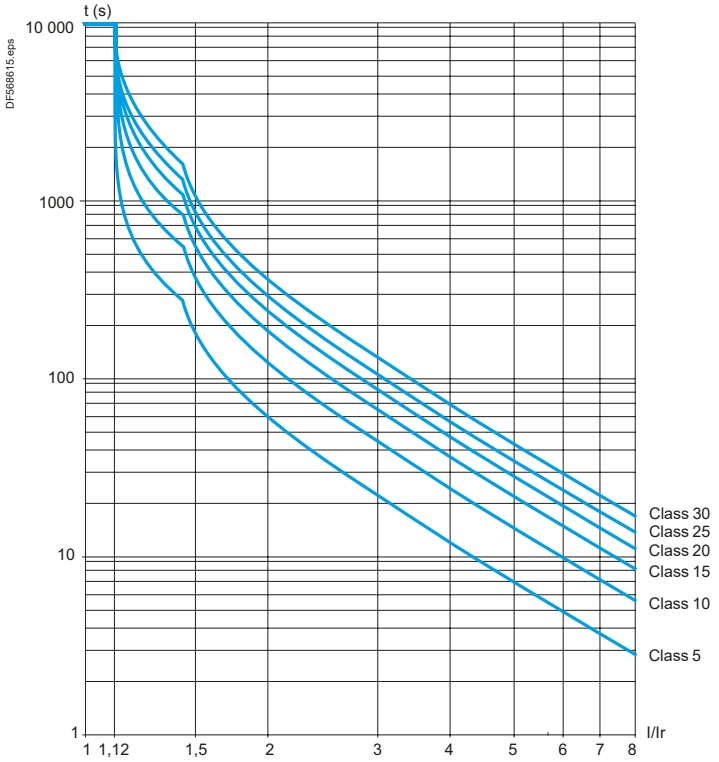
Protection unit reset.

(1) Electrical connection to be made using M10 bolt.

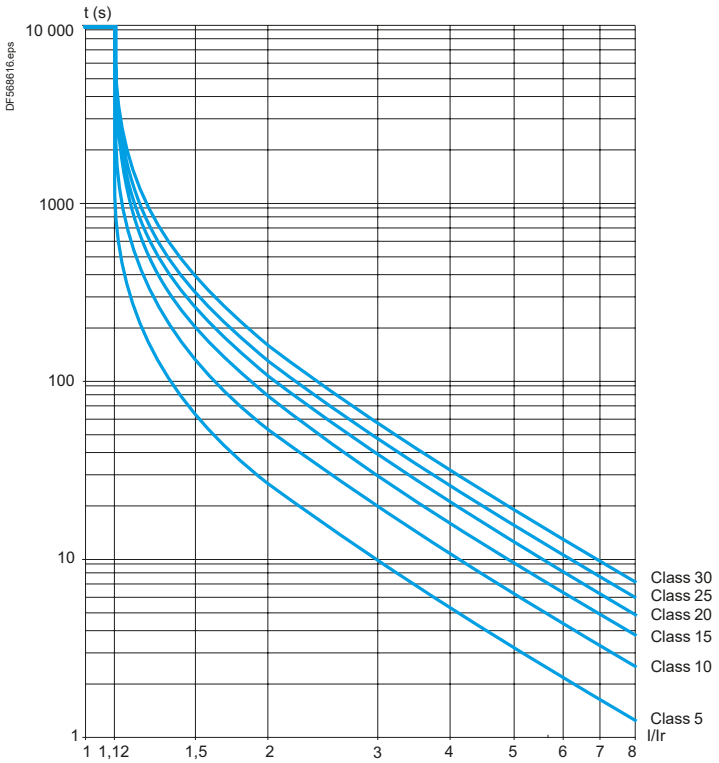
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Tripping curves

Cold state curves

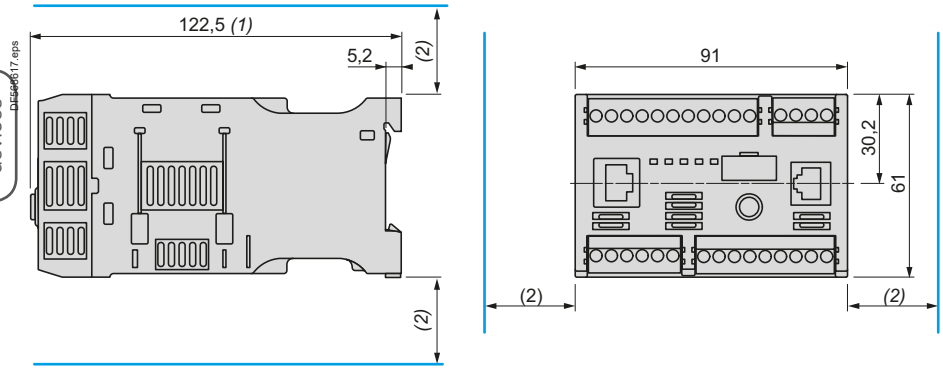


Hot state curves

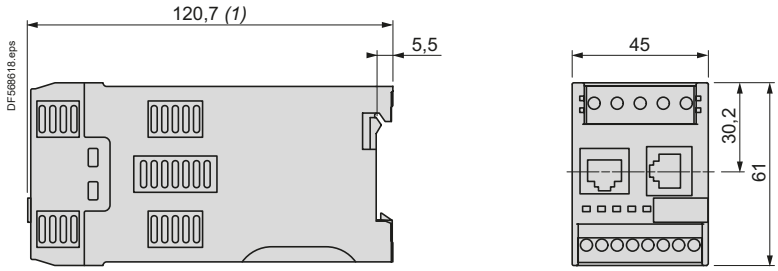


Dimensions, mounting

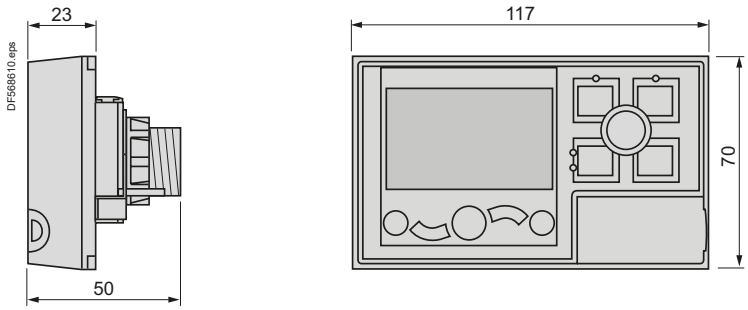
LTMR●● controllers



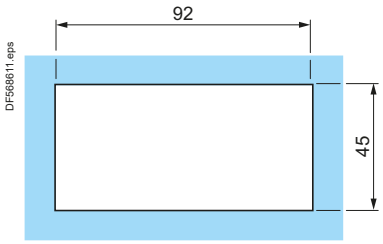
LTMEV40●● extension modules



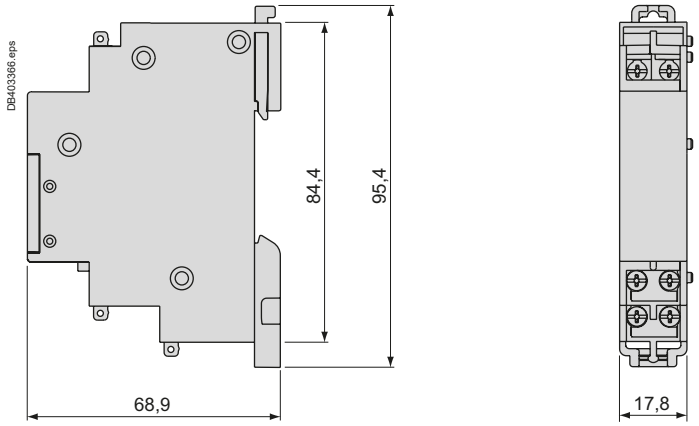
LTMCU operator control unit



Panel mounting, cut-out



LTM9F



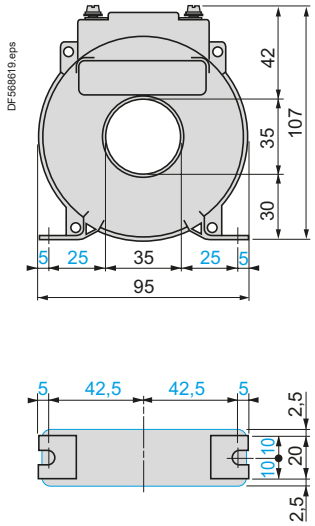
(1) 140 mm with RJ45 connector for connection to extension module and to network,
166 mm with Profibus DP/CANopen connector.
(2) Leave a gap around the device of: 9 mm at 45 °C, 9 to 40 mm from 45 to 50 °C, 40 mm at 60 °C.

References: pages C1/4 to C1/11
Characteristics: pages C1/20 to C1/34
Curves: page C1/35
Schemes: pages C1/38 to C1/41

Dimensions

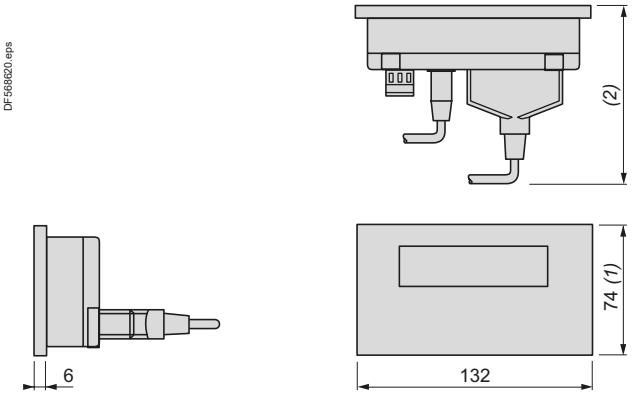
Current transformers

LT6CT



HMI terminal

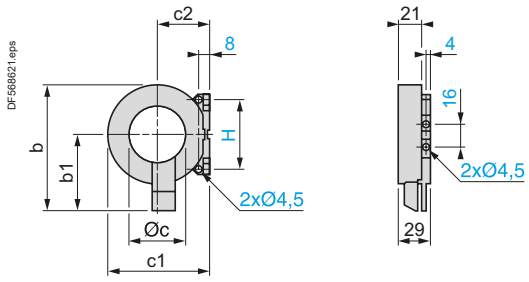
XBTN410



(1) 104 mm with fixing clips (supplied with the product).
*(2) 58 mm with SUB-D 25-way elbowed cable **XBTZ9680** for Twido, TSX Micro and Premium or **XBTZ998** for Advantys STB.*
*104 mm with SUB-D 25-way cable **XBTZ68/Z9681** for Twido, TSX Micro and Premium.*

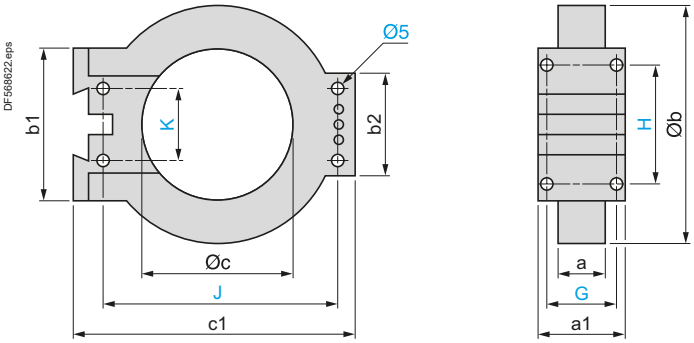
Earth fault toroids

50437 and 50438



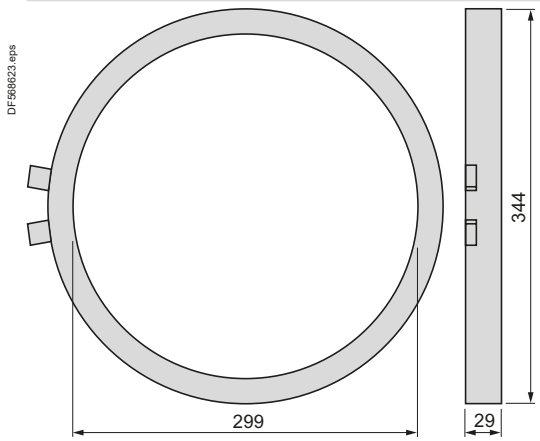
Type	b	b1	Øc	c1	c2	H
50437	83	53	30	60	31	50
50438	109	66	50	87	45	60

50439, 50440 and 50441

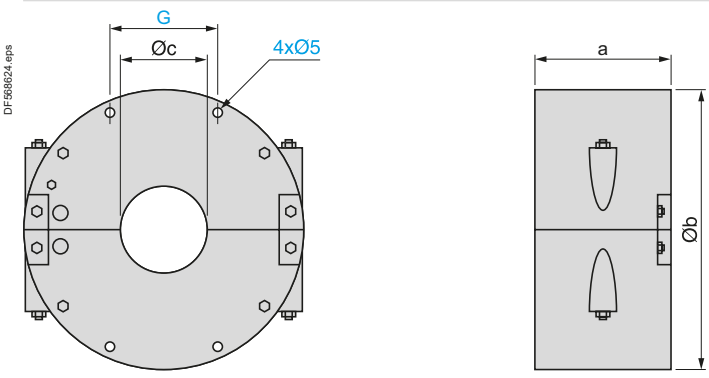


Type	a	a1	Øb	b1	b2	Øc	c1	G	H	J	K
50439	26.5	44	122	80	55	80	150	35	65	126	40
50440	26.5	44	164	80	55	120	190	35	65	166	40
50441	29	46	256	120	90	196	274	37	104	254	60

50442



50485 and 50486

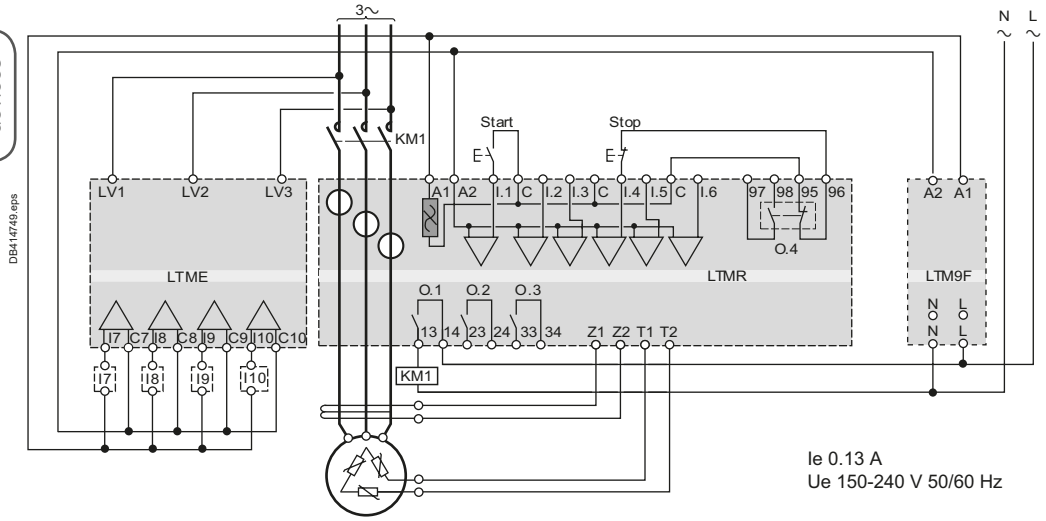


Type	a	Øb	Øc	G
50485	72	148	46	57
50486	78	224	110	76

References: pages C1/4 to C1/11
Characteristics: pages C1/20 to C1/34
Curves: page C1/35
Schemes: pages C1/38 to C1/41

Schemes

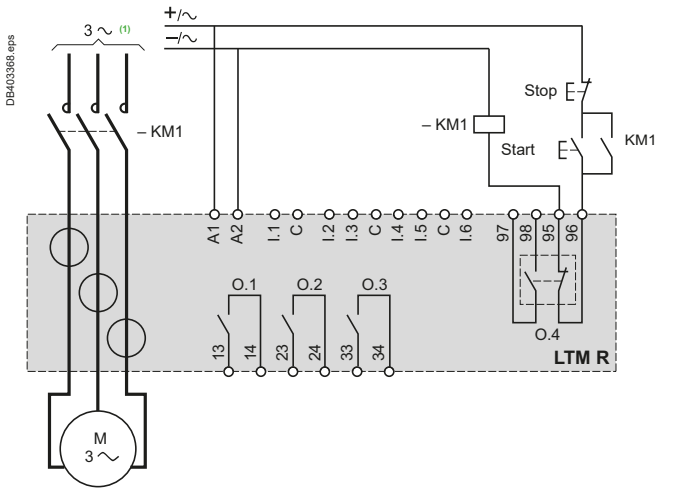
LTMR●●FM wiring with LTM9F filter



Note: *inputs MUST be connected across the common terminals (C).*

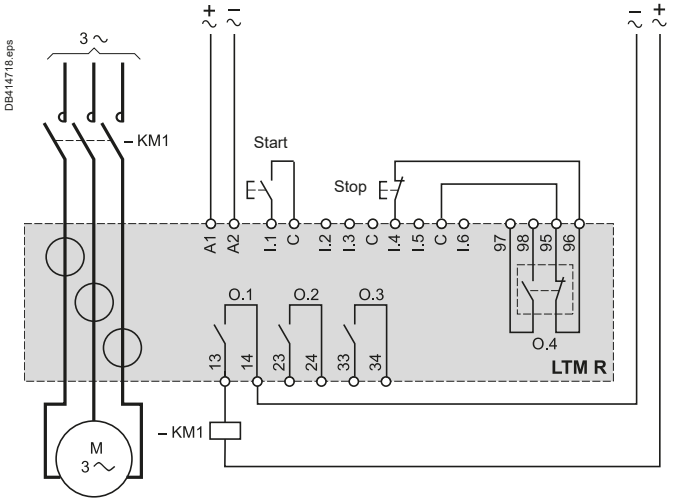
Overload mode

3-wire local-control



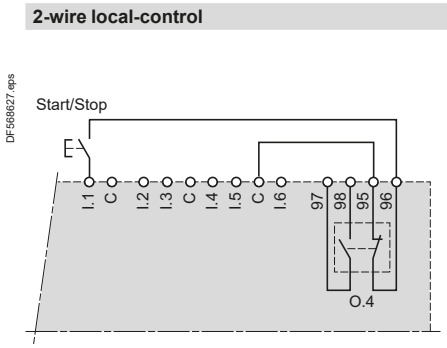
Independent mode

3-wire local-control

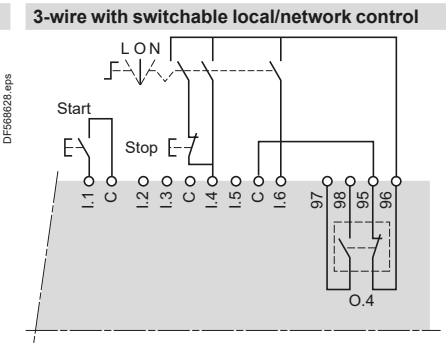


(1) Connection of a single-phase motor is possible. In this case, do not use the central current transformer.

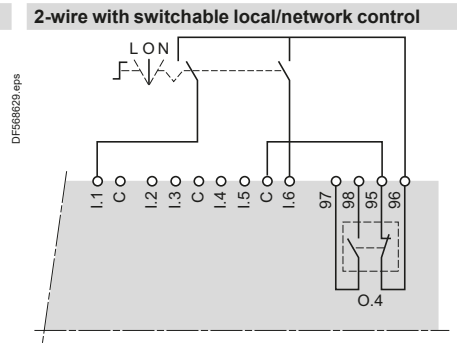
2-wire local-control



3-wire with switchable local/network control



2-wire with switchable local/network control



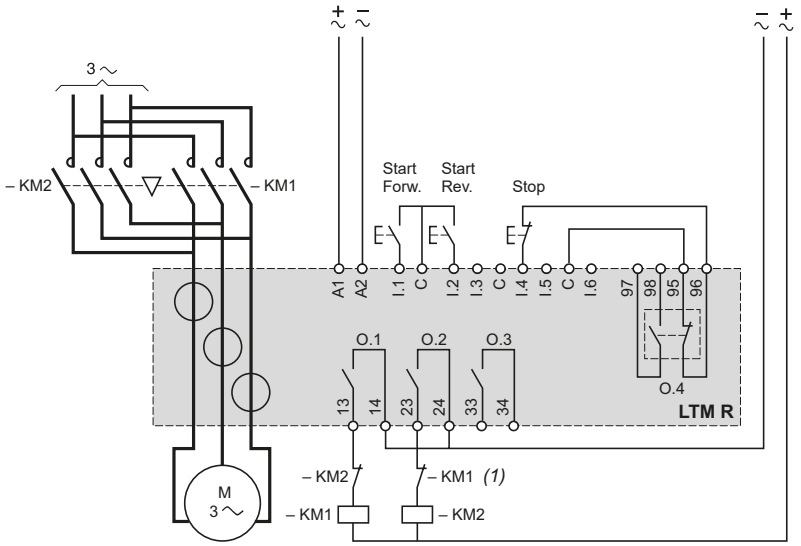
L: Local control
O: Stop
N: Network control

Schemes

Reverser mode

3-wire local-control

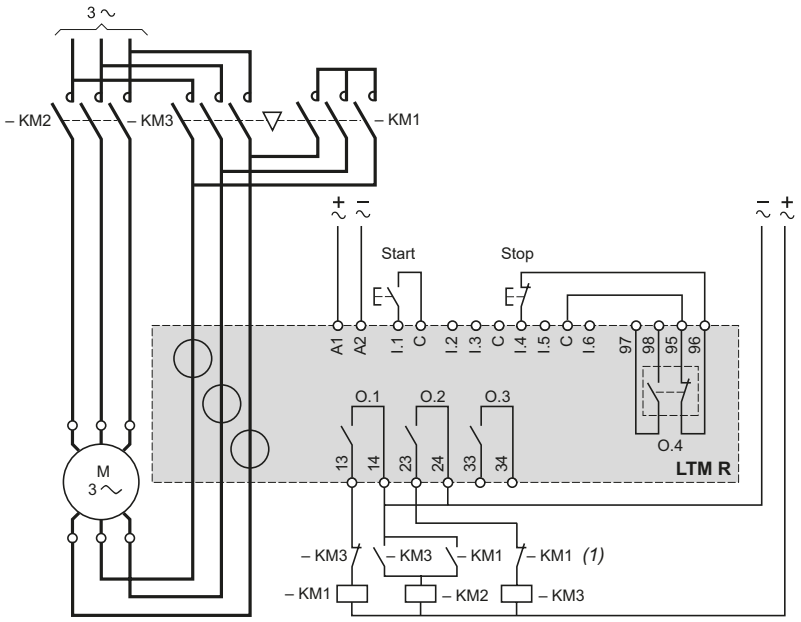
DB414719.eps



2-step mode, star-delta application

3-wire local-control

DB414720.eps



(1) Contacts for interlocking KM1 and KM2 are not obligatory because the controller electronically interlocks outputs O.1 and O.2.

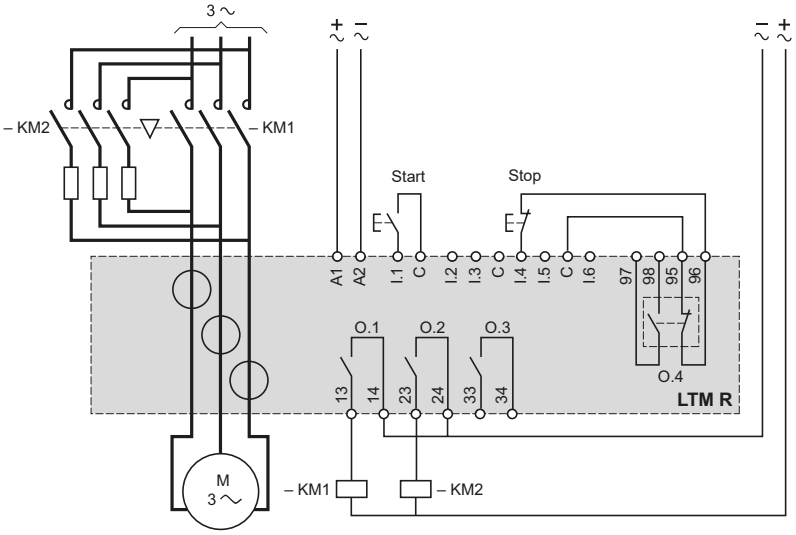
References: pages C1/4 to C1/11
Characteristics: pages C1/20 to C1/34
Curves: page C1/35
Dimensions, mounting: pages C1/36 to C1/37

Schemes

2-step mode, primary resistor application

3-wire local-control

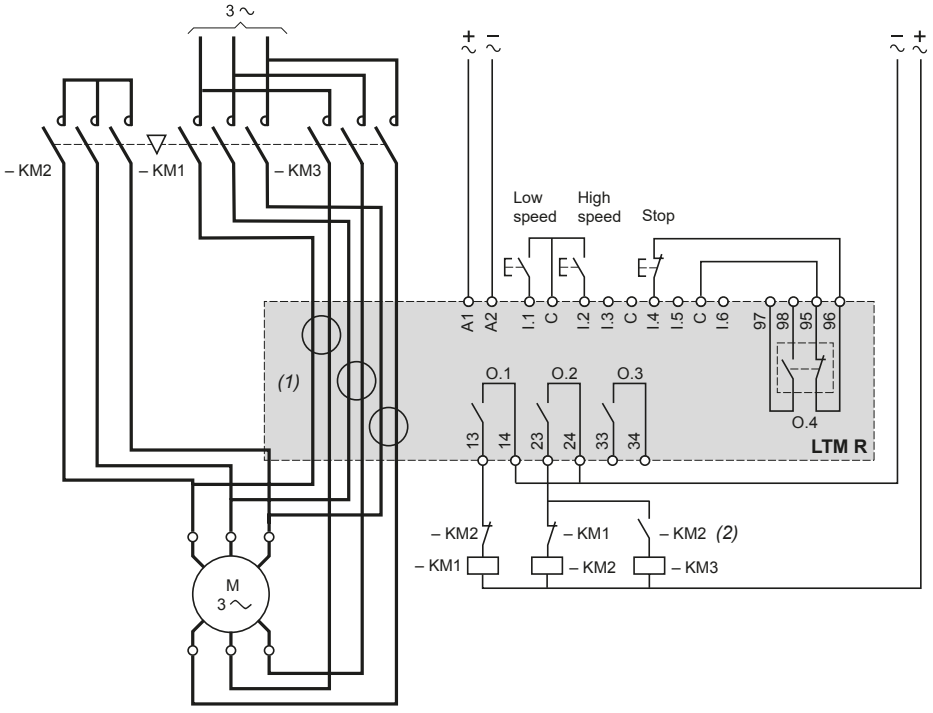
DB414721.eps



2-speed mode, Dahlander application

3-wire local-control

DB418281.eps

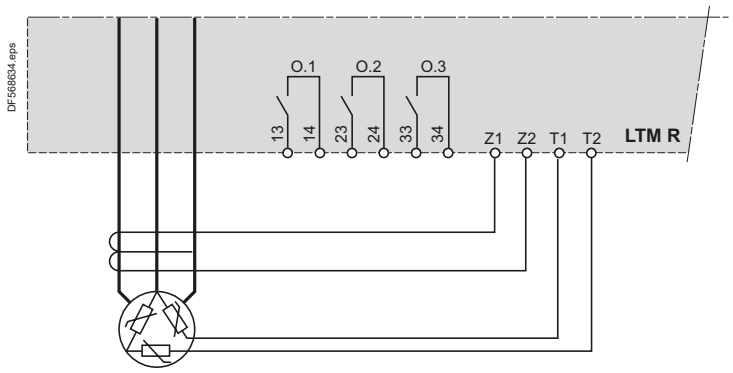


(1) For a Dahlander application, all the power cables must pass through current transformers. The controller can also be placed upstream of the contactor. In this case, and if the Dahlander motor is used in "variable torque" mode, all the cables downstream of the contactors must be of identical size.

(2) Contacts for interlocking KM1 and KM2 are not obligatory because the controller electronically interlocks outputs O.1 and O.2.

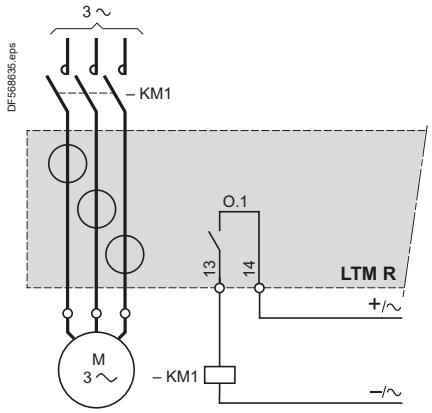
Schemes

Earth fault toroid and motor temperature probe connection

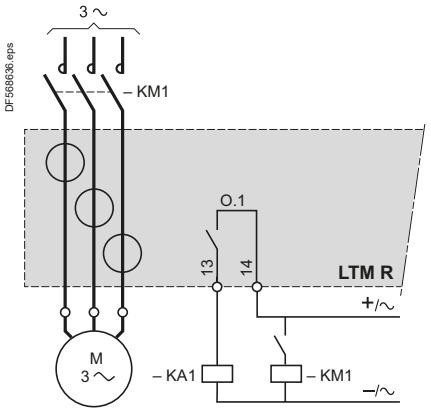


Connection of outputs for motor control mode function

Without intermediate relay



With intermediate relay



References:
pages C1/4 to C1/11
Characteristics:
pages C1/20 to C1/34
Curves:
page C1/35
Dimensions, mounting:
pages C1/36 to C1/37

TeSys™ island
Digital management

TeSys™ island

Type of information		Pages
Introduction Digital multifunctional load management solution		C2/2

Digital multifunctional load management solution

TeSys™ island is designed to switch, protect, and manage motors and other electrical loads up to 80 Amps (AC3) in an electrical control panel.



Dedicated to Control and Monitor Machine and Processes

TeSys™ island is a digital load management solution that makes machines and processes smarter and more reliable.

TeSys™ island is a fully digitized and object-oriented load management system and an Industry 4.0 compliant data provider.

It is reducing time to market and is enabling OEMs to move forward in their Industry 4.0 journey.

Benefits of the object-oriented functional approach

The **TeSys avatar** approach simplifies application and system configuration and reduces engineering tasks. Thus **TeSys™ island** makes the machine engineering and installation phase much faster.

In addition, **TeSys™ island** can be easily integrated into 3rd party automation systems and supports several fieldbuses like EtherNet/IP, Modbus TCP, PROFINET and PROFIBUS.

TeSys™ island gives users access to all relevant load data for advanced system diagnostics.



More information

- Watch videos, read documents and use the product selector online on Schneider Electric website.

TeSys™ island catalog:



> Ref. Document: LVCATISL_EN

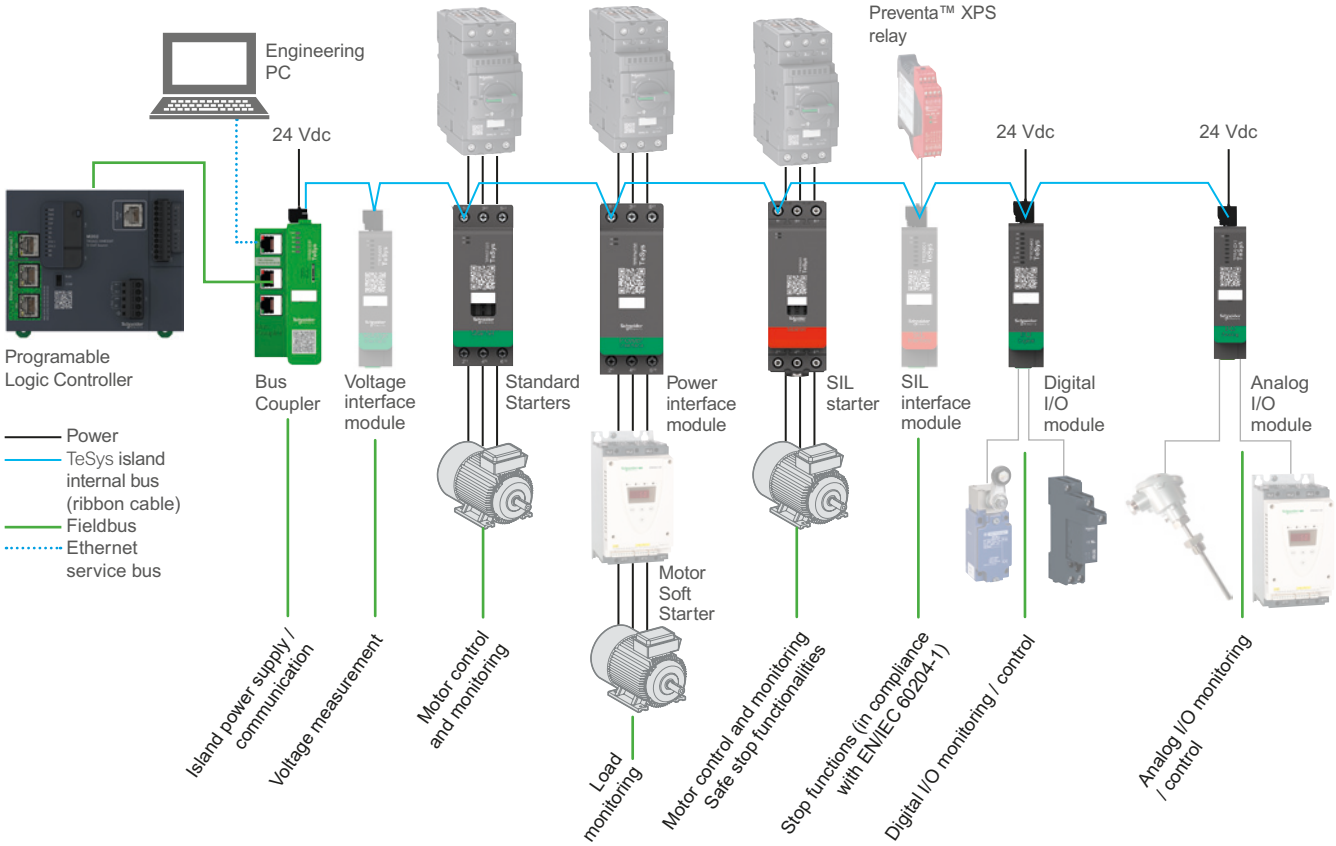
TeSys™ island design guides:

> 8536IB1901: TeSys™ island System Guide
> 8536IB1902: TeSys™ island Installation Guide
> 8536IB1903: TeSys™ island Operating Guide
> 8536IB1904: TeSys™ island Functional Safety (Safe Stop according to EN 61800-5-2) Guide
> 8536IB1905: Third Party Function Block Guide and more.

Main characteristics

- **TeSys™ island** manages motors and other electrical loads up to 80 A (AC-3) / 37 kW/40 hp
- Fieldbus connectivity via bus coupler for EtherNet/IP, Modbus TCP, PROFINET or PROFIBUS
- Availability of all relevant load data like current, power, energy and advanced diagnostic data
- Simplified engineering and commissioning due to **TeSys avatar** objects and dedicated configuration and maintenance tools
- Up to 20 modules on 1 island mounted on DIN rail (up to 112 cm length)
- No control or auxiliary wiring required, thanks to full connectivity over fieldbus
- All adjustments and setting are digitized, no mechanical dials or dip switches
- Limited number of references including 5 starter sizes, digital & analog I/Os and voltage measurement modules
- SIL starter available for integration into functional safety systems according to IEC 61508, IEC 62061 and ISO 13849-1, including TUV certification (Stop 0 and 1 with wiring categories 1 to 2, suitable for PL c, d and SIL level 2)
- Fully complaint to international standards (IEC / UL / CSA 61010, IEC / UL / CSA 60947, GB/T14018)
- Embedded Cybersecurity (Achilles Level 2).

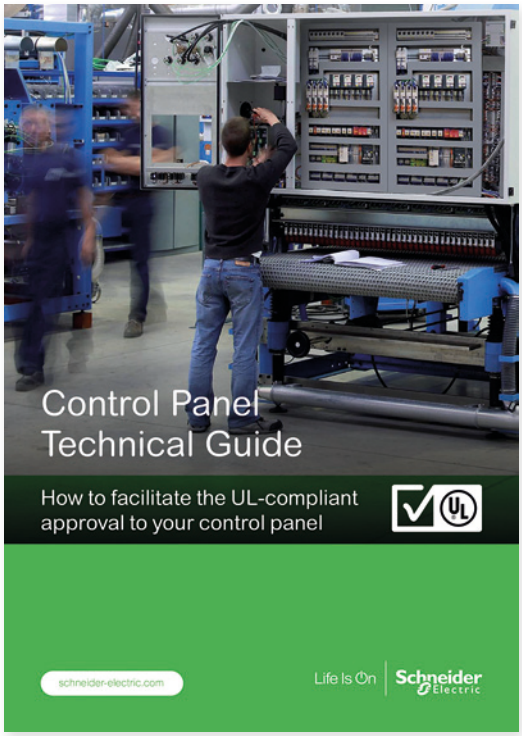
Modular architecture, thanks to **TeSys™** island internal bus



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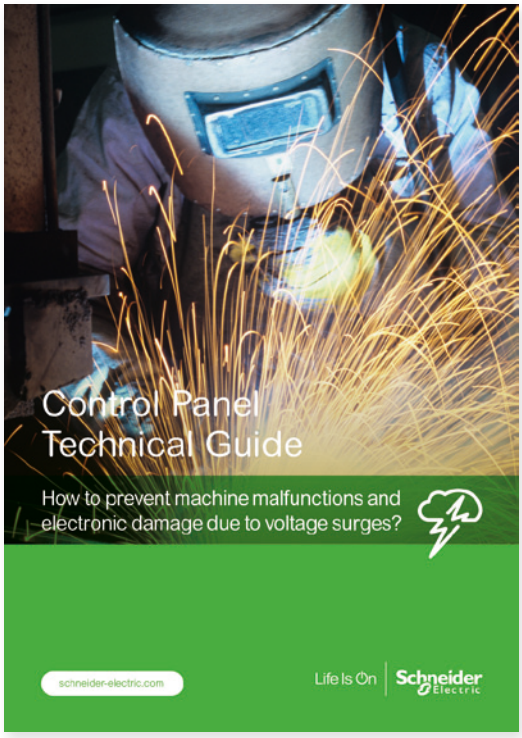
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How to facilitate the UL-compliant approval to your control panel

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How to reduce damage to components through effective thermal management

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How to protect electrical equipment from condensation

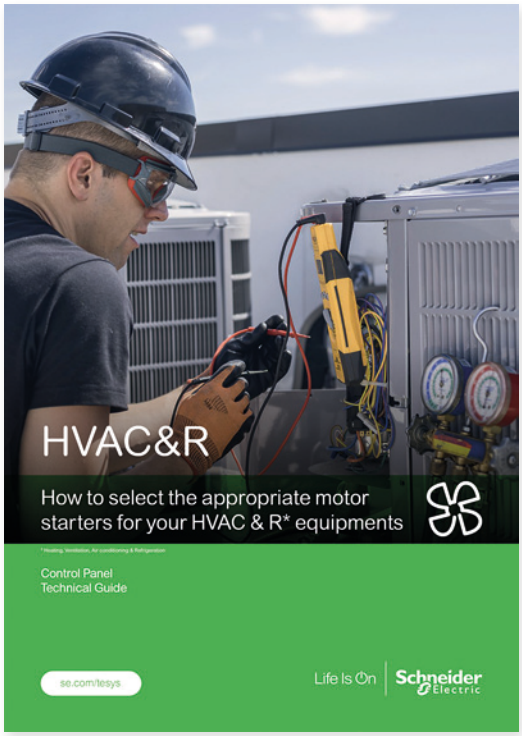
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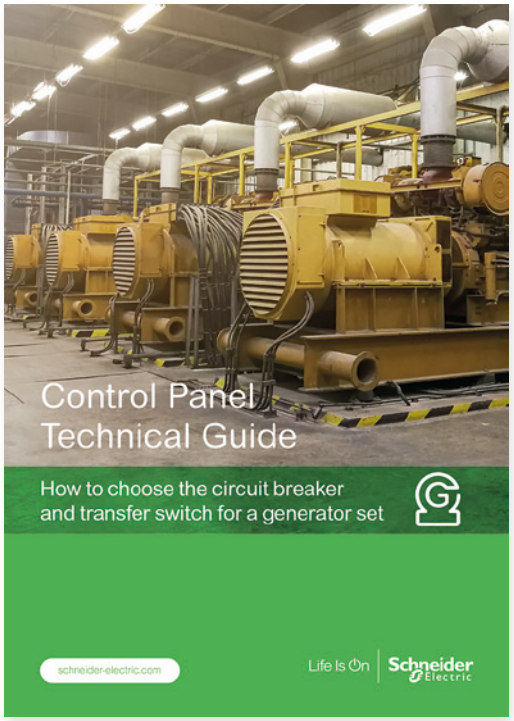


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* Heating, Ventilation, Air conditioning & Refrigeration

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How to choose the circuit breaker and transfer switch for a generator set

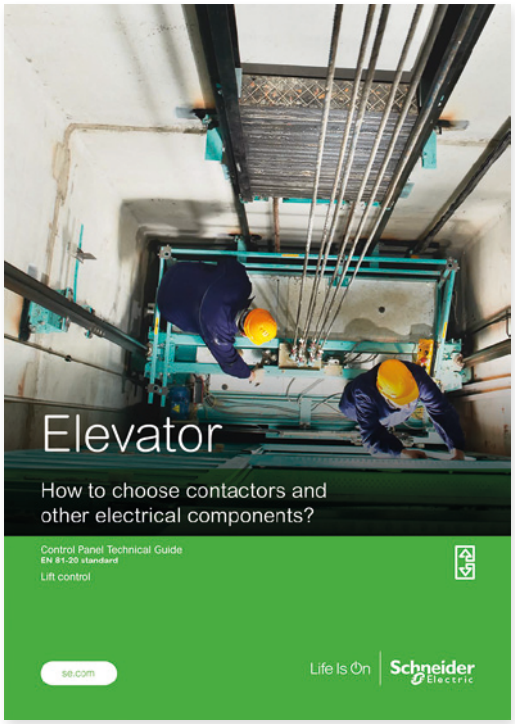
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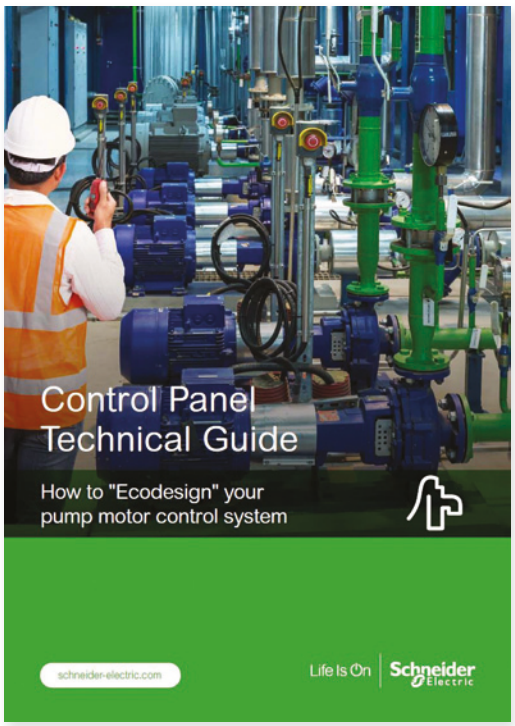


New edition 2020

Elevator
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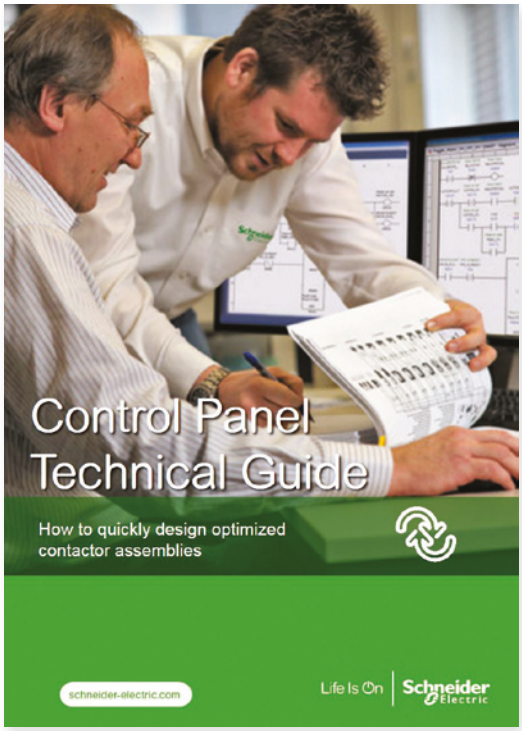
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Catalogues of contactors for specific applications

> For applications requiring components conforming to specific standards with increased severity.

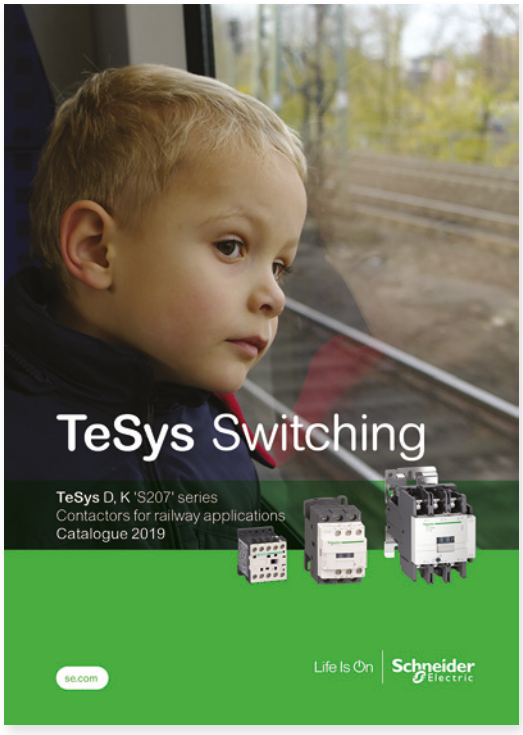
> **TeSys** Switching
TeSys D, K S355 and S207 series contactors are built for these purpose, with new materials.



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Contactors for electrodomestic applications

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