COOPER

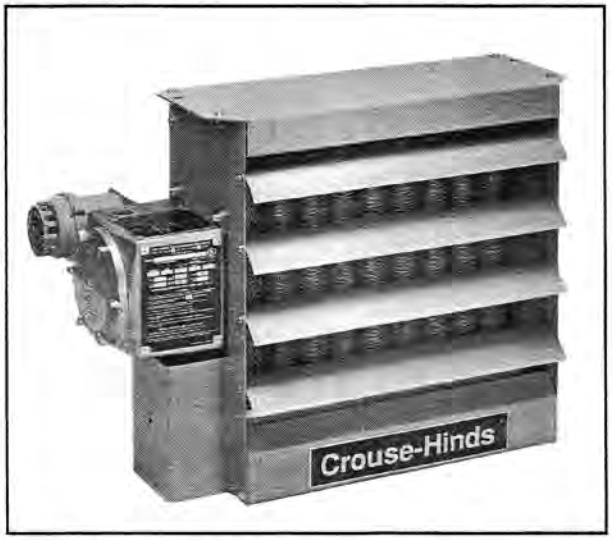
Crouse-Hinds

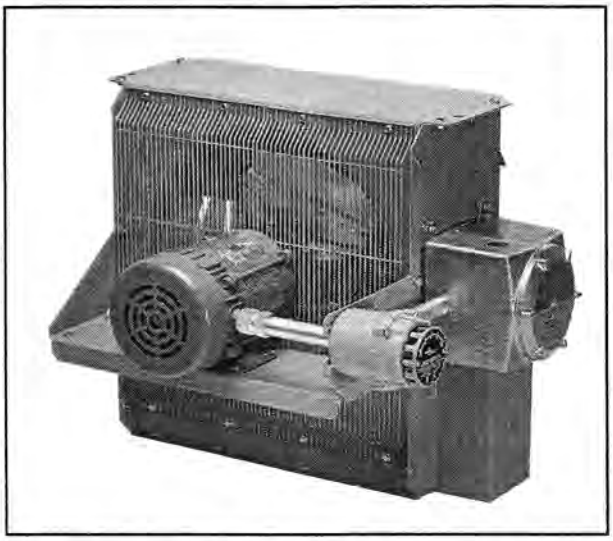
IF 1300
August, 1995

Instruction Manual

EXH4 Series

Electric Air Heaters with Evacuated Core for Hazardous Locations





This manual covers the installation, maintenance, repair and parts for 50Hz and 60Hz Crouse-Hinds EXH412, EXH416, and EXH420 models.

APPROVED LOCATIONS

Crouse-Hinds **EXH4** Series Electric Air Heaters for Hazardous Locations are UL listed or CSA certified for the following locations:

Class I, Divisions 1 & 2, Group D;
Class II, Division 1, Groups E, F, & G;
Class II, Division 2 , Groups F & G;
or
Class I, Divisions 1 & 2, Groups C & D;
Class II, Divisions 1 & 2, Groups F & G.

For details of hazardous locations with potential for explosion, refer to the National Electrical Code articles 500-516 or Canadian Electrical Code, Part 1, Section 18.

MODEL CODING

EXH4 20 - 480 3 60 - 30

- 30 — KILOWATT RATING
- 60 — HERTZ
- 3 — PHASE
- 480 — VOLTAGE
- 20 — FAN SIZE (INCHES)
- EXH4 — MODEL SERIES

LISTED

WARNING !

READ ALL IMPORTANT NOTICES ON PAGE 3.

CERTIFIED

Crouse-Hinds Division, Cooper Industries
Box 4999, Syracuse, NY, 13221 USA Tel:(315) 477-7000

EXH4 HEATER MAINTENANCE CHECKLIST

Photocopy this page for reuse.

Heater Model: _____ Serial No.: _____

Date of Maintenance: _____ Maintenance Done By: _____

Comments: _____

_____

WARNING

Disconnect heater from the power supply before opening enclosures or servicing heater. Lock the switch in the "OFF" (open) position and/or tag the switch to prevent unexpected power application. This heater should only be serviced by personnel with heating and hazardous location equipment experience.

PERIODIC *(before and as required during heating season)*

1. **CLEAN**
   - ❑ Finned tubes
   - ❑ Fan
   - ❑ Fan guard
   - ❑ Motor
   - ❑ Louvers

   Remove dust using compressed air.
   Do not spray with water or solvents.

2. **CHECK**
   - ❑ Motor for smooth quiet operation.
   - ❑ Louvers for proper angle and tightness.
   - ❑ All explosion-proof covers for tightness.

ANNUAL *(before heating season)*

1. ELECTRICAL

- ❑ **Check all terminal connections and conductors.** Tighten loose connections. Conductors with damaged insulation must be replaced.
- ❑ **Inspect contactor contacts.** If badly pitted, burned or welded shut, replace with factory supplied contactor.
- ❑ **Check fuses.** Fuse rating and type are on printed circuit board. Correct fuse must be in the active fuse clip. It is recommended that a spare fuse be stored in the spare fuse clip.
- ❑ **Check all explosion-proof conduits.** Replace damaged conduits. To ensure 5 turns of engagement, threaded ends of conduits must protrude a minimum of 1/16" (1.6mm) into enclosures.

2. MECHANICAL

- ❑ **Check for fluid leakage.** The heater core is vacuum charged and contains ethylene glycol which is **poisonous.** If any fluid leakage occurs from the heater, disconnect it from the power supply and have the core replaced. A factory supplied exchange core can be shipped immediately from stock. Refer to the "Repair and Replacement" section for details.
- ❑ **Check all enclosures.** Inside of enclosures must be clean, dry, and free of foreign materials. Threaded covers must be completely on and hand tight.
  Note: Enclosure joints are metal to metal. Do not use gasket material or sealant in joints. A grease is applied to the joints at the factory and should be left in place.
- ❑ **Check motor shaft bearing play.** Replace motor if play is excessive, or if motor does not run quietly and smoothly. Motor bearings are permanently lubricated.
- ❑ **Check fan.** Replace immediately if cracked or damaged.
- ❑ **Check louvers.** Louver screws should be tight. Louvers shall not be fully closed or override stops.
- ❑ **Check the tightness of all hardware.** All nuts and bolts, including mounting hardware, must be tight.
- ❑ **Turn heater on for a minimum of 15 minutes.** Check for warm air exiting heater through louvers. Crackling or pinging noises within heater during start-up are normal.

IMPORTANT NOTICES

WARNING

Read and adhere to the following. Failure to do so may result in severe or fatal personal injury.

1. Read and follow the instructions in this manual.
2. Heater is to be used only in atmospheres having an ignition temperature higher than the heater's maximum rated operating temperature as shown on the heater data plate. Refer to applicable electrical codes for additional information.
3. Heater to be used only in the hazardous locations indicated on the heater data plate.
4. Heater is to be connected and serviced only by a qualified electrician experienced with hazardous location equipment.
5. Installation and wiring of the heater must adhere to all applicable codes.
6. Before opening any enclosures, disconnect the heater from the power supply. Lock the switch in the "OFF" (open) position and/or tag the switch to prevent unexpected power application.
7. This heater is equipped with a single bimetal overtemperature high-limit. It is of the automatic reset type and therefore the heater may restart without warning. The heater is not to be operated with the high-limit disabled or disconnected from the control circuit.
8. Operate the heater only while permanently mounted in an upright position. Refer to the "Installation - Mechanical" section for details.
9. Heater must be kept clean. When operating in a dirty environment, regularly clean the finned tubes, fan, and fan guard. Follow the recommended maintenance procedures. Refer to the "EXH4 Heater Maintenance Checklist" section for details.
10. The heater core is vacuum charged and contains ethylene glycol which is poisonous. If any fluid leakage occurs from the heater, disconnect it from the power supply and have the core replaced with a factory supplied core. Refer to the "Repair and Replacement" section for details.
11. Do not operate the heater with any of the louvers fully closed or overriding stops.
12. Do not operate the heater in atmospheres corrosive to steel or aluminum.
13. Use factory approved replacement parts only.
14. Conduit seals are not required in the heater's factory installed conduits. See applicable electrical codes for seal requirements in field installed conduits.
15. Crackling or pinging noises within the heater core during start up may occur. This is normal.
16. Air discharge near the bottom of the heater may be warmer than the top. This is normal.
17. If there are any questions or concerns regarding the heater, contact the factory. Refer to the back cover of this manual for details.

WARRANTY WILL BE VOID IF INSTRUCTIONS ARE NOT FOLLOWED

INSTALLATION

The installation instructions provide a general guideline for the installation and wiring of the heater. Installation and wiring of the heater must adhere to all applicable codes.

MECHANICAL

LOCATION

1. Heaters should be installed such that:
   a. there are no obstructions that may impede the heater's air inlet or discharge,
   b. the air discharge is directed into open areas and not at occupants,
   c. the air discharge is not directed at a thermostat,
   d. the air discharge is directed across areas of heat loss, such as doors and windows (see Figure 1),
   e. the air discharge is directed along and at a slight angle towards exterior walls (see Figure 1),
   f. if equipment freeze protection is of importance, direct air discharge at equipment, and
   g. air discharge streams support each other and create a circular air flow. It is not required that the heater's air throw reaches the next heater (see Figure 1).

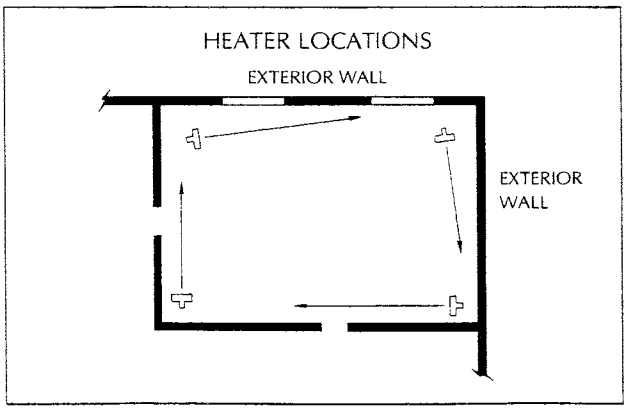


FIGURE 1

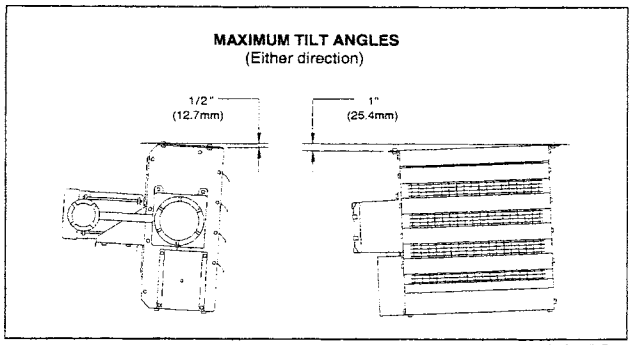


FIGURE 2

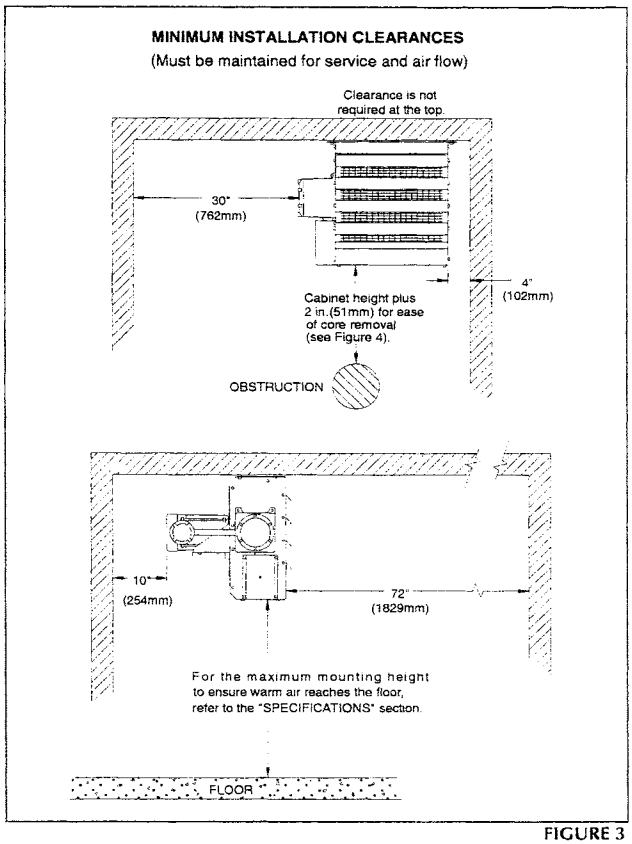


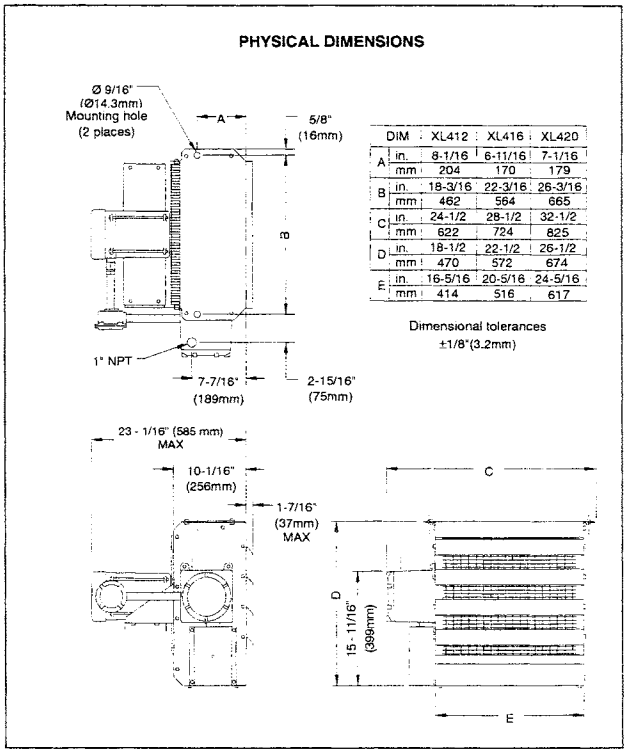
FIGURE 3

MOUNTING

1. The heater must be permanently mounted in a level, upright position for operation. See Figures 2, 3, and 4 for maximum tilt angles, installation clearances, and physical dimensions.

   For ease of installation, a variety of mounting kits are available from the factory.

2. The mounting structure must be strong enough to:
   a. support the heater's weight, refer to the "Specifications" section,
   b. provide sufficient stiffness to prevent excessive vibration, and
   c. withstand abusive situations such as transportable installations.



DIM		XL412	XL416	XL420
A	in.	8-1/16	6-11/16	7-1/16
	mm	204	170	179
B	in.	18-3/16	22-3/16	26-3/16
	mm	462	564	665
C	in.	24-1/2	28-1/2	32-1/2
	mm	622	724	825
D	in.	18-1/2	22-1/2	26-1/2
	mm	470	572	674
E	in.	16-5/16	20-5/16	24-5/16
	mm	414	516	617

FIGURE 4

ELECTRICAL

WARNING

Disconnect the power supply before installation of the heater. Lock the switch in the "OFF" (open) position and/or tag the switch to prevent unexpected power application. Installation and wiring of the heater must adhere to all applicable codes.

GENERAL

1. Use only copper conductors and approved explosion-proof means of wiring to make connections to the heater. Refer to the "Technical Data" table and heater data plate for conductor rating.

2. External overcurrent protection is required. Refer to the "Technical Data" table and heater data plate for voltage, frequency, amperage, and phase. Supply voltage is to be within 10% of the data plate voltage.

FIELD WIRING

1. Supply conductors, ground conductor, and room thermostat conductors (see point 2, page 5) pass through the 1" NPT opening (see Figure 5) and are to be wired into the control enclosure (see Figure 6).

2. Heater may be supplied with a factory installed built-in room thermostat (see Figure 7). On heaters not supplied with this option, it is recommended that a room thermostat be used. When installing a room thermostat for a 600V Groups C, D, F, & G heater, the Motor Temperature High Limit must be connected in series with the control circuit (See Figure 8). On all other heaters, connect the room thermostat conductors to the printed circuit board terminal block marked "TSTAT". Any room thermostat used with this heater must:
    a. be of an explosion-proof type,
    b. be rated 125 V minimum,
    c. have a minimum 2 amp capacity, and
    d. open on temperature rise.

Appropriate room thermostats are available from the factory.

FINAL INSPECTION

1. Before application of electrical power:
    a. check that all connections are secured and comply with the applicable wiring diagram (see Figure 8) and code requirements,
    b. confirm that the power supply is compatible with the data plate rating of the heater,
    c. remove any foreign objects from the heater,
    d. install all covers and verify that all enclosures are well secured, and
    e. ensure that the fan rotates freely. See Figure 5 for proper direction of fan rotation.

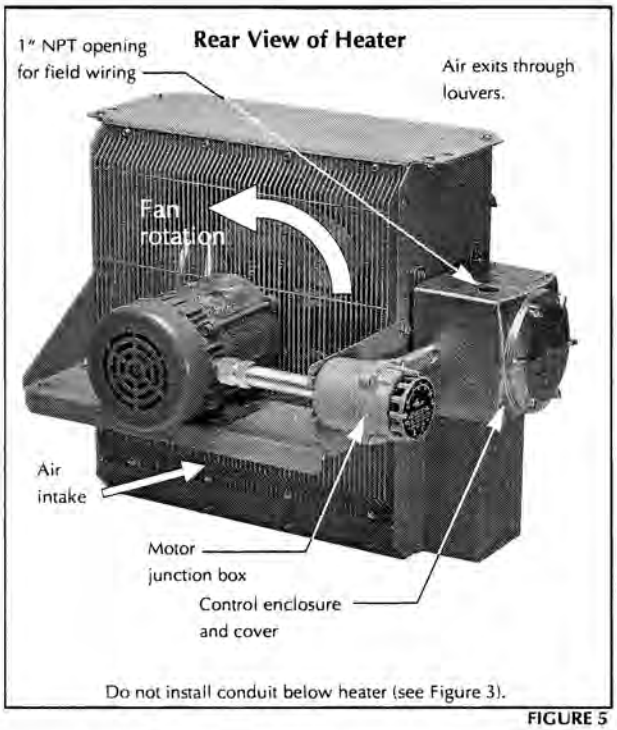


FIGURE 5

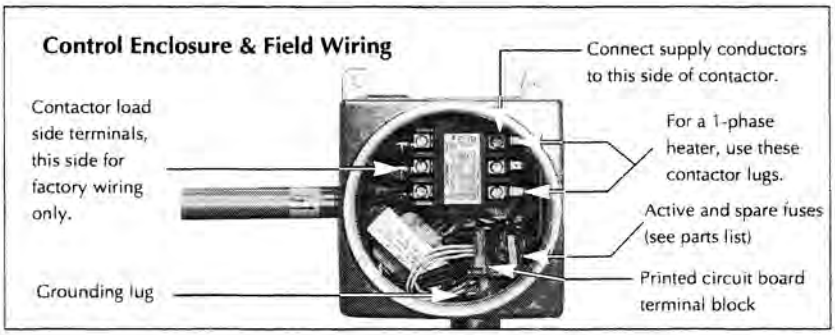


FIGURE 6

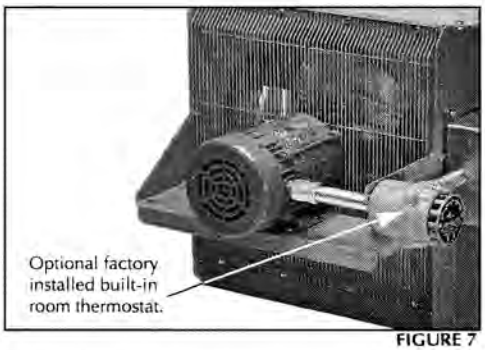
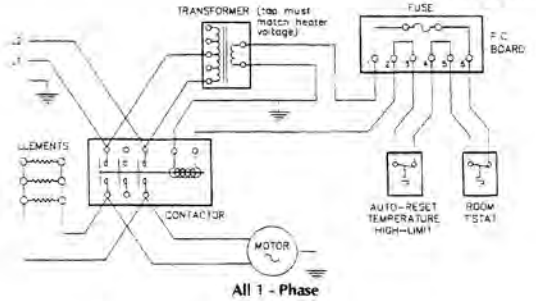
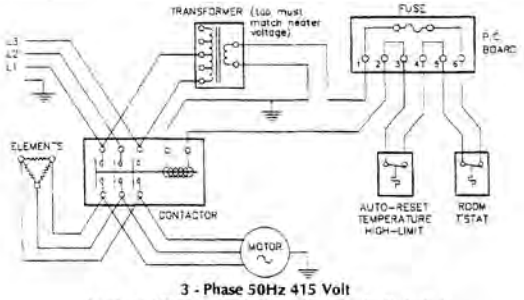


FIGURE 7

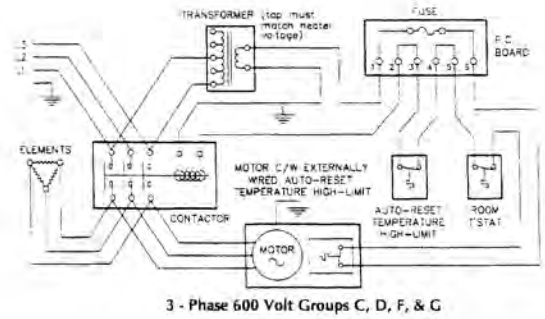
WIRING DIAGRAMS



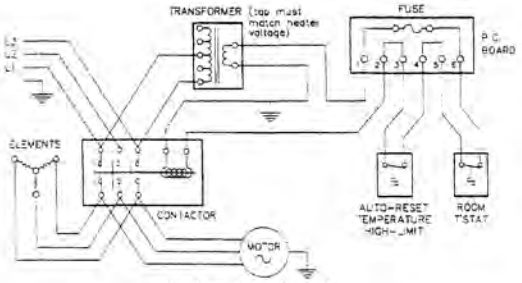
All 1 - Phase



3 - Phase 50Hz 415 Volt
3 - Phase 60Hz *except* 600 Volt Groups C, D, F, & G



3 - Phase 600 Volt Groups C, D, F, & G



3 - Phase 50Hz 380 Volt

FIGURE 8

REPAIR & REPLACEMENT

WARNING
Disconnect power supply before opening enclosures or servicing heater. Lock the switch in the "OFF" (open) position and/or tag the switch to prevent unexpected power application. Heater surfaces may be hot.

1. After repairing any component:
   a. check that electrical connections are correct and secure (see Figure 8),
   b. remove any foreign material from enclosures,
   c. install and secure all covers,
   d. ensure that all fasteners are tight,
   e. remove all foreign objects from heater, and
   f. ensure air exits through louvers and fan rotates counterclockwise when viewed from rear of heater (see Figure 13).

CORE

1. The heater core is vacuum charged and not field repairable.
2. Remove cabinet bottom and element enclosure cover.
3. Disconnect all wires entering element enclosure (see Figure 9).
4. Slightly loosen all cabinet bolts shown in Figure 9, to prevent the core from binding.
5. With an assistant supporting the weight of the core, remove the 3 core mounting bolts. Carefully lower the core out of the cabinet (see Figure 10).
6. To return core, use crate supplied with exchange core to protect the element terminals and plate threads.
7. To reinstall, lift the core up into cabinet while an assistant guides the element wires into the element enclosure conduit.
8. Position the core and tighten the 3 core mounting bolts. Tighten the remaining cabinet bolts.

TEMPERATURE HIGH-LIMIT

1. Remove temperature high-limit assembly and clean the inside of the thermowell (see Figure11). A clean thermowell will ensure good thermal contact.
2. Use only a factory supplied temperature high-limit to ensure safe operation.
3. Apply a small drop, 3/32" (2mm) diameter, of heat sink compound to the center of the metal cap but do not spread. This is critical for proper thermal contact between the temperature high-limit and the thermowell (see Figure 11).
4. Reinstall the temperature high-limit assembly with the snap ring and spring into the thermowell without damaging the insulating tube. Secure in place with the cotter pin (see Figure 12).

MOTOR, FAN & FAN GUARD

1. Remove bolts holding the motor to the motor mount. On units with a built-in thermostat, remove the bolts on the back of the thermostat enclosure.
2. Remove conduit #1 located between motor junction box and control enclosure by turning it in the direction illustrated (see Figure 13). Note conduits #1

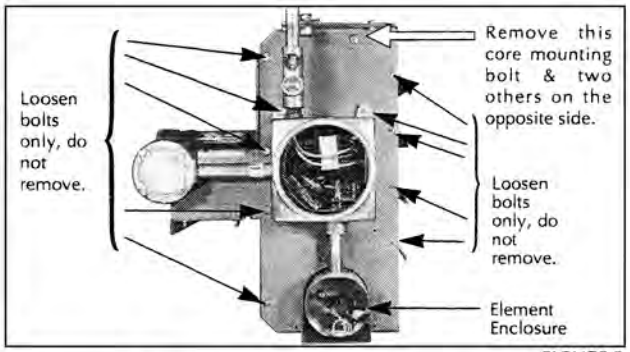


FIGURE 9


FIGURE 10

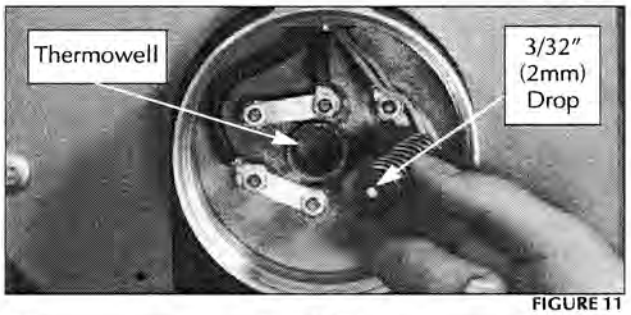


FIGURE 11


FIGURE 12

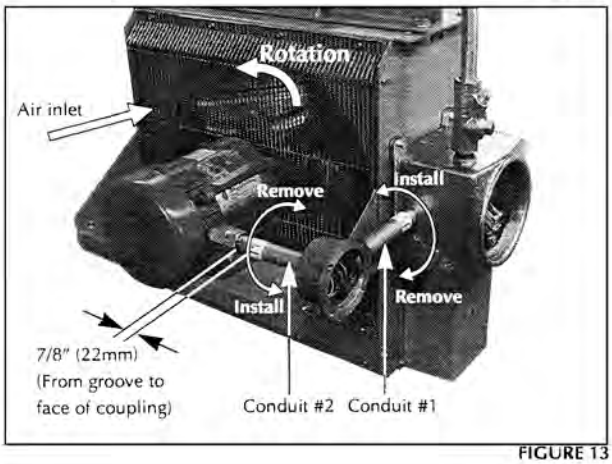


FIGURE 13

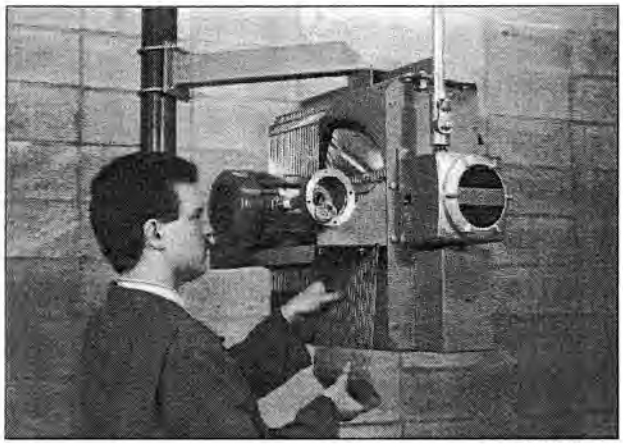


FIGURE 14



FIGURE 15

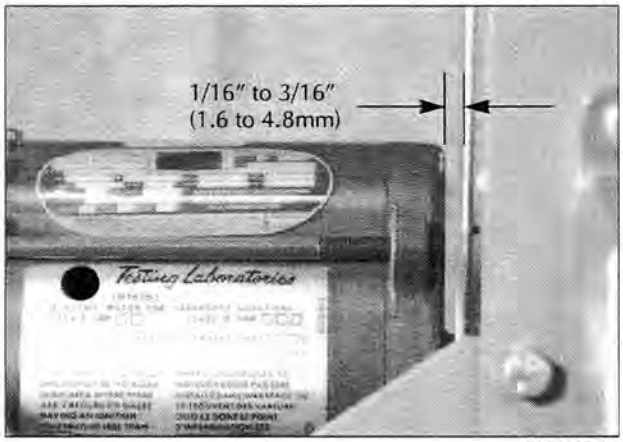


FIGURE 16

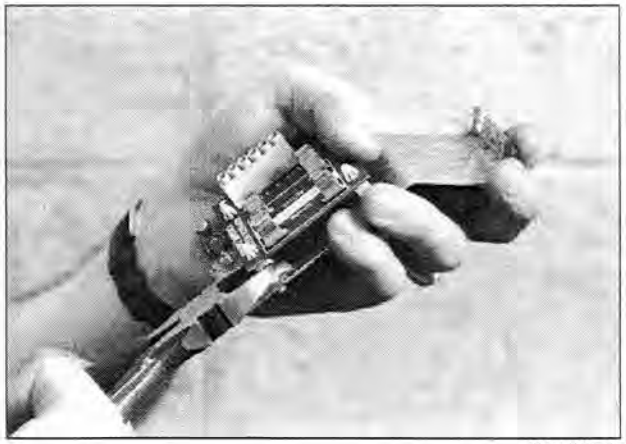


FIGURE 17

and #2 are not interchangeable and have left hand threads on one end, this end is indicated by a machined groove.

3. Remove the 2 piece fan guard assembly (see Figure 14).
4. Lift the motor assembly off the motor mount.
5. Before removing the fan, measure and record the location of the fan hub on the motor shaft (see Figure 15). If difficult to remove, use a gear puller on the fan hub.
6. To reassemble, place motor assembly onto motor mount and fasten the fan guard to cabinet.
7. Simultaneously engage and tighten both ends of conduit #1 into enclosures. Leave a 1/16" to 3/16" (1.6 to 4.8 mm) gap between the motor and fan guard (see Figure 16). Adjust conduit #2 to center the fan in the shroud.
8. To ensure a minimum 5 thread engagement, threaded ends of conduits must protrude a minimum of 1/16" (1.6mm) into enclosures. The groove on conduit #2 must not be more than 7/8" (22mm) from motor coupling (see Figure 13).
9. Bolt motor to motor mount. Manually spin the fan blade to ensure fan rotates freely.
10. Air must exit through louvers and fan must rotate counterclockwise when viewed from rear of heater (see Figure 13).

PRINTED CIRCUIT BOARD

1. After removing the printed circuit board (P.C. Board) bracket assembly from the control enclosure, separate the P.C. Board from the bracket by cutting off the plastic spacers (see Figure 17).
2. Reinstall the P.C. Board onto the mounting bracket using new non-conducting spacers of the same length. Spacers are supplied with a new P.C. Board. Reinstall the control circuit ground wire to the printed circuit board bracket (see Wiring Diagram).

CONTACTOR

1. Loosen, but do not remove contactor mounting screws. Slide contactor off mounting screws.
2. Replace with a factory supplied contactor of the same rating.

TRANSFORMER

1. Replace with a factory supplied transformer of the same rating.
2. On the new transformer, select primary wires to match heater voltage. Ensure that the correct transformer secondary lead is grounded (see Wiring Diagram). Individually terminate all unused wires using closed end connectors.

FUSE

Replace fuse with one of the same type and rating as indicated on P.C. Board or refer to parts list. An extra fuse should be stored in the clips marked "SPARE".

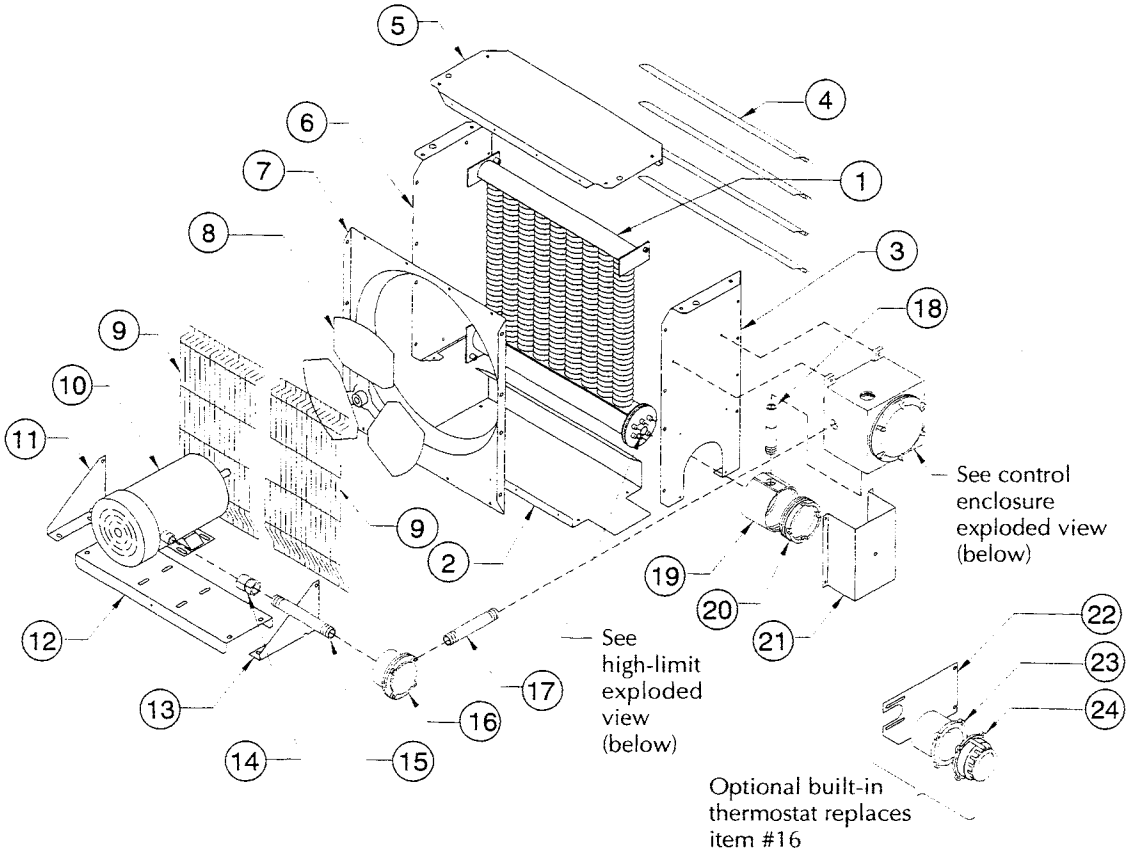
HEATING ELEMENTS

Heating elements are an integral part of the vacuum charged core. A factory exchange core can be shipped immediately from stock. Refer to "Core" section for details.

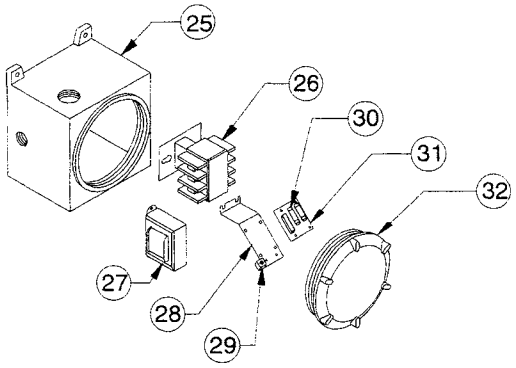
CABINET PANELS

Bolt-on cabinet panels are individually replaceable.

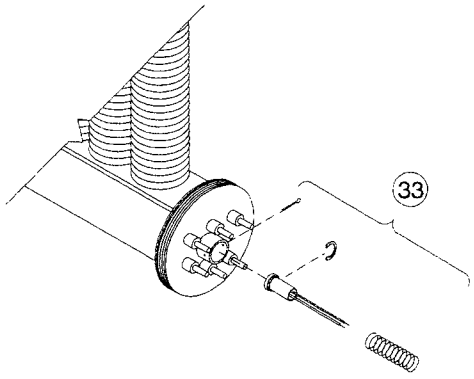
EXH4 EXPLODED VIEW



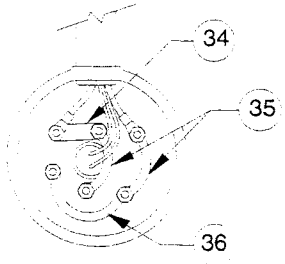
EXH4 CONTROL ENCLOSURE EXPLODED VIEW



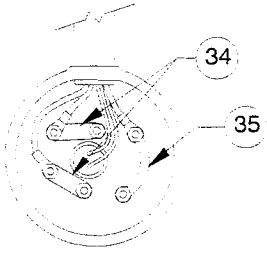
EXH4 HIGH-LIMIT EXPLODED VIEW



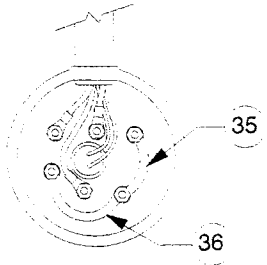
BUS-BAR CONFIGURATION
FOR ALL 1-PHASE



BUS-BAR CONFIGURATION
FOR ALL 3-PHASE (EXCEPT 380 50 HERTZ)



BUS-BAR CONFIGURATION
3-PHASE 380 VOLT 50 HERTZ ONLY



EXH4 PARTS LIST

	PART NUMBER			Please have model and serial number available before calling.
ITEM	EXH412	EXH416	EXH420	DESCRIPTION
1	**	**	**	Core, EXH4
2	3773	3774	3775	Panel, EXH4 Bottom
3	3776	3777	3778	Panel, EXH4 Left Side
4	4075	4076	4077	Louver Kit, c/w Screws
5	3770	3771	3772	Panel, EXH4 Top
6	3779	3780	3781	Panel, EXH4 Right Side
7	3782	3783	3784	Fan Shroud, EXH4
8	2.5 - 5.0 kW: 4022 6.3 - 10 kW: 4023	4024	20.9-30 kW: 4025 35kW: 4026	Fan
9	4078	4079	4080	Fan Guard Kit
10	Groups D, E, F & G 208/240V 60 HZ 1 PH: 1377 220V 50 HZ 1 PH: 1377 c/w 4953 480V 60 HZ 1 PH: 2396 208/240/480V 60HZ 3PH: 1862 380/415V 50 HZ 3 PH: 1862 600V 60HZ 3 PH: 1861 Groups C, D, F & G 208/240V 60HZ 1 PH: 4593 208/240/480V 60HZ 3PH: 4594 600V 60 HZ 3 PH: 4595		Groups D, E, F & G 240/480V 60 HZ 3 PH: 1699 380/415V 50 HZ 3 PH: 1699 600V 60 HZ 3 PH: 2433 Groups C, D, F, & G 240/480V 60 HZ 3 PH: 4596 600V 60HZ 3 PH: 4597	Motor, Explosion-Proof
11	3789	3789	3789	Bracket, EXH4 Motor Mount Right
12	3785	3786	3787	Channel, EXH4 Motor Mount
13	3788	3788	3788	Bracket, EXH4 Motor Mount Left
14	Groups D, E, F, & G: 3737		Groups C, D, F, & G: 4590	Coupling, EXH4 Motor
15	3811	3812	3813	Conduit, EXH4 Motor
16	Groups D, E, F, & G: 3838		Groups C,D, F, & G: 4983 C/W 5027	Enclosure, EXH4 Conduit Junction
17	Groups D, E, F, & G 208/240V 60 HZ 1PH: 3815 220V 50 HZ 1PH: 3815 480V 60 HZ 1PH: 3813 ALL 3PH: 3814 Groups C, D, F, & G ALL: 3815		Groups D, E, F, & G ALL: 3813 Groups C, D, F, & G ALL: 3815	Conduit, EXH4 Control Enclosure
18	3810	3810	3810	Conduit, EXH4 Element Enclosure
19	3793	3793	3793	Enclosure, EXH4 Element
20	3510	3510	3510	Cover, EXH4 Element Enclosure
21	3790	3790	3790	Panel, EXH4 Element Enclosure Guard
22	3791	3791	3791	Bracket, EXH4 Thermostat
23	4983	4983	4983	Enclosure, Thermostat
24	5032	5032	5032	Thermostat, Built-in Kit
25	3524	3525	3526	Enclosure, EXH4 Control
26	**	**	**	Contactor
27	60 HERTZ: 3612		50 HERTZ: 4416	Transformer
28	3809	3809	3809	Bracket, Printed Circuit Board
29	1876	1876	1876	Terminal, 6-14 ga. Screw Lug
30	3519	3519	3519	Fuse, Buss MDQ-1/4 Amp
31	3514	3514	3514	Printed Circuit Board Assembly
32	3516	3516	3516	Cover, EXH4 Control Enclosure
33	4082	4082	4082	EXH4 Temperature High-Limit Kit
34	3816	3816	3816	Bus-Bar, Straight
35	3817	3817	3817	Bus-Bar, Small Curved
36	3818	3818	3818	Bus-Bar, Large Curved

** See technical data table for part numbers. **NOTE:** For items not shown, contact factory

SPECIFICATIONS FOR ALL *60 HZ* MODELS

		EXH412				EXH416		EXH420		
	Nominal kW	**3**	**5**	**7.5**	**10**	**15**	**20**	**25**	**30**	**35**
Max. Altitude	(ft.) (m)	12,000 3,658	8,000 2,438	10,000 3,048	7,000 2,134	10,000 3,048	7,000 2,134	10,000 3,048	7,000 2,134	6,000 1,829
Air Delivery @ 70°F @ 21°C	(CFM) (m^3/hr.)	500 850		850 1444		1750 2973		3600 6116		3950 6711
Horizontal Throw	(ft.) (m)	15 4.6		30 9.1		40 12.2		70 21.3		
Max. Mounting Height (to underside)	(ft.) (m)	7 2.1		10 3.0		10 3.0		20 6.1		
Motor Power	(HP) (kW)	1/4 0.187				1/4 0.187		1/2 0.373		
Fan Diameter	(in.) (mm)	12 305				16 406		20 508		
Net Weight	(lbs.) (kg)	111 50				133 61		154 70		
Shipping Weight	(lbs.) (kg)	151 69				173 79		204 93		
Motor Type		Explosion-proof. Thermally protected. Permanently lubricated ball bearings. 1725 RPM								
Fan		Aluminum blade. Steel spider and hub with 5/8 in. (15.875 mm) bore.								
Fan Guard		Split design with close wire spacing. 1/4 in. (6.3 mm) dia. probe will not enter.								
Mounting Holes		Two 9/16 in. (14.3 mm) diameter holes, at top of heater.								
Heating Elements		Three long-life, low watt-density copper-sheathed elements.								
Temperature High-Limit		Automatic reset type, snap-action bimetal, open on temperature rise. Rated 100,000 cycles at 10 amps, handles 0.128 amps.								
Control Circuit		120 Volts, 0.128 amps, 15VA. (Grounded)								
Optional Built-in Thermostat		Explosion-proof. 36°F to 82°F (2°C to 28°C)								
Control Transformer		Multi-tap primary, 120 V secondary, 25 VA.								
Contactor		40 or 75 amp. Rated 500,000 cycles at maximum capacity, operating at not more than 84% full load. 120 V, 15 VA fuse-protected coil.								
Heat Transfer Fluid		Long life formulated ethylene glycol and water, freeze protected to -49°F (-45°C).								
Cabinet Material		14 ga. (0.075in.) (1.90 mm) steel. Epoxy coated with five-stage pretreatment, including iron phosphate.								
Core		Steel with integral aluminum fins, vacuum charged and hermetically sealed.								
Conduit Material		Heavy walled, 0.122 in. (3.1 mm), steel, cadmium plated.								
Overpressure Protection		Fusible alloy plug 170 psi (1.17 MPa).								
Temperature Code Rating		T3B 165°C (329°F) Class I & II.								
Temperature Limitations		Operational; -49°F to 104°F (-45°C to 40°C). Storage; -49°F to 176°F (-45°C to 80°C), short term to 248°F (120°C).								

SPECIFICATIONS FOR ALL 50 HZ MODELS

		EXH412				EXH416		EXH420	
	Nominal kW	2.5	3.7 & 4.2	6.3 & 7.5	8.4	12.5 & 12.6	14.9 & 16.7	20.9	22.4
Max. Altitude	(ft.) (m)	12,000 3,658	8,000 2,438	10,000 3,048	7,000 2,134	10,000 3,048	7,000 2,134	10,000 3,048	7,000 2,134
Air Delivery @ 70°F @ 21°C	(CFM) (m^3/hr.)	400 679		700 1189		1450 2463		3000 5096	
Horizontal Throw	(ft.) (m)	13 4.0		25 7.6		35 10.7		60 18.2	
Max. Mounting Height	(ft.) (m)	7 2.1		10 3.0		10 3.0		20 6.1	
Fan Diameter	(in.) (mm)	12 305				16 406		20 508	
Net Weight	(lbs.) (kg)	111 50				133 61		154 70	
Shipping Weight	(lbs.) (kg)	151 69				173 79		204 93	
Motor Type		Explosion-proof. Thermally protected. Permanently lubricated ball bearings. 1425 RPM							
Fan		Aluminum blade. Steel spider and hub with 5/8 in. (15.875 mm) bore.							
Fan Guard		Split design with close wire spacing.1/4 in. (6.3 mm) dia. probe will not enter.							
Mounting Holes		Two 9/16 in. (14.3 mm) diameter holes, at top of heater.							
Heating Elements		Three long-life, low watt-density copper-sheathed elements.							
Temperature High-Limit		Automatic reset type, snap-action bimetal, open on temperature rise. Rated 100,000 cycles at 10 amps, handles 0.130 amps.							
Control Circuit		115Volts, 0.130 amps, 15VA. (Grounded)							
Optional Built-in Thermostat		Explosion-proof. 36°F to 82°F (2°C to 28°C)							
Control Transformer		Multi-tap primary, 115 V secondary, 25 VA.							
Contactor		40 or 75 amp. Rated 500,000 cycles at maximum capacity, operating at not more than 84% full load. 115 V, 15 VA fuse-protected coil.							
Heat Transfer Fluid		Long life formulated ethylene glycol and water, freeze protected to -49°F (-45°C).							
Cabinet Material		14 ga. (0.075in.) (1.90 mm) steel. Epoxy coated with five-stage pretreatment, including iron phosphate.							
Core		Steel with integral aluminum fins, vacuum charged and hermetically sealed.							
Conduit Material		Heavy walled, 0.122 in. (3.1 mm), steel, cadmium plated.							
Overpressure Protection		Fusible alloy plug 170 psi (1.17 MPa).							
Temperature Code Rating		T3B 165°C (329°F) Class I & II.							
Temperature Limitations		Operational; -49°F to 104°F (-45°C to 40°C). Storage; -49°F to 176°F (-45°C to 80°C), short term to 248°F (120°C).							

EXH4 TECHNICAL DATA FOR ALL ***CSA*** CERTIFIED ***60 HZ*** MODELS ONLY

MODEL	VOLTAGE (V)	NOMINAL WATTAGE (kW)	PHASE	TOTAL CURRENT (A)	TEMPERATURE RISE °F	TEMPERATURE RISE °C	MAXIMUM FUSE SIZE (A)	CORE PART NUMBER	CONTACTOR PART NUMBER
EXH412-208160-3	208	3	1	14.4	19	10.5	20	4044	3618
EXH412-240160-3	240	3	1	12.5	19	10.5	20	4045	3618
EXH412-208360-3	208	3	3	8.3	19	10.5	15	4044	3618
EXH412-240360-3	240	3	3	7.2	19	10.5	15	4045	3618
EXH412-480160-3	480	3	1	6.3	19	10.5	15	4046	3618
EXH412-480360-3	480	3	3	3.6	19	10.5	15	4046	3618
EXH412-600360-3	600	3	3	2.9	19	10.5	15	4047	3618
EXH412-208160-5	208	5	1	24	31.6	17.6	35	4048	3618
EXH412-240160-5	240	5	1	20.8	31.6	17.6	30	4049	3618
EXH412-208360-5	208	5	3	13.9	31.6	17.6	20	4048	3618
EXH412-240360-5	240	5	3	12	31.6	17.6	20	4049	3618
EXH412-480160-5	480	5	1	10.4	31.6	17.6	15	4050	3618
EXH412-480360-5	480	5	3	6	31.6	17.6	15	4050	3618
EXH412-600360-5	600	5	3	4.8	31.6	17.6	15	4051	3618
EXH412-208160-7.5	208	7.5	1	36.1	27.9	15.5	50	4052	3619
EXH412-240160-7.5	240	7.5	1	31.3	27.9	15.5	40	4053	3618
EXH412-208360-7.5	208	7.5	3	20.8	27.9	15.5	30	4052	3618
EXH412-240360-7.5	240	7.5	3	18	27.9	15.5	25	4053	3618
EXH412-480160-7.5	480	7.5	1	15.6	27.9	15.5	20	4054	3618
EXH412-480360-7.5	480	7.5	3	9	27.9	15.5	15	4054	3618
EXH412-600360-7.5	600	7.5	3	7.2	27.9	15.5	15	4055	3618
EXH412-208160-10	208	10	1	48.1	37.2	20.6	70	4056	3619
EXH412-240160-10	240	10	1	41.7	37.2	20.6	60	4057	3619
EXH412-208360-10	208	10	3	27.8	37.2	20.6	35	4056	3618
EXH412-240360-10	240	10	3	24.1	37.2	20.6	35	4057	3618
EXH412-480160-10	480	10	1	20.8	37.2	20.6	30	4058	3618
EXH412-480360-10	480	10	3	12	37.2	20.6	20	4058	3618
EXH412-600360-10	600	10	3	9.6	37.2	20.6	15	4059	3618
EXH416-240160-15	240	15	1	62.5	27.1	15	80	4061	3619
EXH416-208360-15	208	15	3	41.6	27.1	15	60	4060	3619
EXH416-240360-15	240	15	3	36.1	27.1	15	50	4061	3619
EXH416-480160-15	480	15	1	31.3	27.1	15	40	4062	3618
EXH416-480360-15	480	15	3	18	27.1	15	25	4062	3618
EXH416-600360-15	600	15	3	14.4	27.1	15	20	4063	3618
EXH416-208360-20	208	20	3	55.5	36.1	20.1	70	4064	3619
EXH416-240360-20	240	20	3	48.1	36.1	20.1	70	4065	3619
EXH416-480160-20	480	20	1	41.7	36.1	20.1	60	4066	3619
EXH416-480360-20	480	20	3	24.1	36.1	20.1	35	4066	3618
EXH416-600360-20	600	20	3	19.2	36.1	20.1	25	4067	3618
EXH420-240360-25	240	25	3	60.1	21.9	12.2	80	4068	3619
EXH420-480360-25	480	25	3	30.1	21.9	12.2	40	4069	3618
EXH420-600360-25	600	25	3	24.1	21.9	12.2	35	4070	3618
EXH420-480360-30	480	30	3	36.1	26.3	14.6	50	4071	3619
EXH420-600360-30	600	30	3	28.9	26.3	14.6	40	4072	3618
EXH420-480360-35	480	35	3	42.1	28	15.6	60	4073	3619
EXH420-600360-35	600	35	3	33.7	28	15.6	45	4074	3619

NOTES:

1. Heater is functioning normally if at rated voltage the amp draw is within 10% of the value in this table.
2. Operation at lower voltages will result in reduced heat output and amp draw.

EXH4 TECHNICAL DATA FOR ALL ***CSA*** CERTIFIED
50 HZ MODELS ONLY

MODEL	VOLTAGE (V)	NOMINAL WATTAGE (kW)	PHASE	TOTAL CURRENT (A)	TEMPERATURE RISE °F	TEMPERATURE RISE °C	MAXIMUM FUSE SIZE (A)	CORE PART NUMBER	CONTACTOR PART NUMBER
EXH412-220150-2.5	220	2.5	1	11.4	19.7	11	15	4045	3618
EXH412-220150-4.2	220	4.2	1	19.1	33.2	18.4	25	4049	3618
EXH412-220150-6.3	220	6.3	1	28.6	28.4	15.8	40	4053	3618
EXH412-220150-8.4	220	8.4	1	38.2	37.9	21.1	50	4057	3619
EXH416-220150-12.6	220	12.6	1	57.3	27.5	15.3	80	4061	3619
EXH412-380350-2.5	380	2.5	3	3.8	19.7	11	15	4045	3618
EXH412-380350-4.2	380	4.2	3	6.4	33.2	18.4	15	4049	3618
EXH412-380350-6.3	380	6.3	3	9.6	28.4	15.8	15	4053	3618
EXH412-380350-8.4	380	8.4	3	12.8	37.9	21.1	20	4057	3618
EXH416-380350-12.5	380	12.5	3	19	27.2	15.1	25	4061	3618
EXH416-380350-16.7	380	16.7	3	25.4	36.4	20.2	35	4065	3618
EXH420-380350-20.9	380	20.9	3	31.8	22	12.2	40	4068	3618
EXH412-415350-3.7	415	3.7	3	5.1	29.2	16.2	15	4050	3618
EXH412-415350-7.5	415	7.5	3	10.4	33.9	18.8	15	4058	3618
EXH416-415350-14.9	415	14.9	3	20.7	32.5	18	30	4066	3618
EXH420-415350-22.4	415	22.4	3	31.2	23.6	13.1	40	4071	3618

NOTES:

1. Heater is functioning normally if at rated voltage the amp draw is within 10% of the value in this table.
2. Operation at lower voltages will result in reduced heat output and amp draw.

EXH4 TECHNICAL DATA FOR *UL* LISTED 60 HZ, GROUPS *D, E, F,* & *G* MODELS

MODEL	VOLTAGE (V)	NOMINAL WATTAGE (kW)	PHASE	MOTOR CURRENT (A)	HEATER ELEMENT CURRENT (A)	TOTAL CURRENT (A)	MINIMUM CIRCUIT AMPACITY (A)	SUPPLY WIRE SIZE (AWG.)	MAX. CIRCUIT FUSE (A)	TEMPERATURE RISE °F	TEMPERATURE RISE °C	CORE PART NUMBER	CONTACTOR PART NUMBER
EXH412-208160-3	208	3.0	1	2.3	13.0	15.3	19.1	12	20	19.0	10.5	4044	3618
EXH412-240160-3	240	3.0	1	2.3	11.2	13.5	16.9	12	20	19.0	10.5	4045	3618
EXH412-208360-3	208	3.0	3	1.4	7.5	8.9	11.1	14	15	19.0	10.5	4044	3618
EXH412-240360-3	240	3.0	3	1.4	6.5	7.9	9.9	14	15	19.0	10.5	4045	3618
EXH412-480360-3	480	3.0	3	0.7	3.2	3.9	4.9	14	15	19.0	10.5	4046	3618
EXH412-208160-5	208	5.0	1	2.3	22.6	24.9	31.1	8	35	31.6	17.6	4048	3618
EXH412-240160-5	240	5.0	1	2.3	19.6	21.9	27.4	10	30	31.6	17.6	4049	3618
EXH412-208360-5	208	5.0	3	1.4	13.0	14.4	18.1	12	20	31.6	17.6	4048	3618
EXH412-240360-5	240	5.0	3	1.4	11.3	12.7	15.9	12	20	31.6	17.6	4049	3618
EXH412-480360-5	480	5.0	3	0.7	5.7	6.4	8.0	14	15	31.6	17.6	4050	3618
EXH412-208160-7.5	208	7.5	1	2.3	34.6	36.9	46.1	8	50	27.9	15.5	4052	3619
EXH412-240160-7.5	240	7.5	1	2.3	30.0	32.3	40.4	8	45	27.9	15.5	4053	3618
EXH412-208360-7.5	208	7.5	3	1.4	20.0	21.4	26.8	10	30	27.9	15.5	4052	3618
EXH412-240360-7.5	240	7.5	3	1.4	17.3	18.7	23.4	10	25	27.9	15.5	4053	3618
EXH412-480360-7.5	480	7.5	3	0.7	8.7	9.4	11.8	14	15	27.9	15.5	4054	3618
EXH412-240160-10	240	10.0	1	2.3	40.4	42.7	53.4	6	60	37.2	20.6	4057	3619
EXH412-208360-10	208	10.0	3	1.4	26.9	28.3	35.4	8	40	37.2	20.6	4056	3618
EXH412-240360-10	240	10.0	3	1.4	23.3	24.7	30.9	8	35	37.2	20.6	4057	3618
EXH412-480360-10	480	10.0	3	0.7	11.7	12.4	15.5	12	20	37.2	20.6	4058	3618
EXH416-208360-15	208	15.0	3	1.4	40.0	41.4	51.8	6	60	27.1	15.0	4060	3619
EXH416-240360-15	240	15.0	3	1.4	34.6	36.0	45.0	8	45	27.1	15.0	4061	3619
EXH416-480360-15	480	15.0	3	0.7	17.3	18.0	22.5	10	25	27.1	15.0	4062	3618
EXH416-480360-20	480	20.0	3	0.7	23.3	24.0	30.0	10	30	36.1	20.1	4066	3618
EXH420-480360-25	480	25.0	3	1.0	29.1	30.1	37.6	8	40	21.9	12.2	4069	3618
EXH420-480360-30	480	30.0	3	1.0	35.1	36.1	45.1	8	50	26.3	14.6	4071	3619
EXH420-480360-35	480	35.0	3	1.0	41.1	42.1	52.6	6	60	28.0	15.6	4073	3619

NOTES:

1. Minimum conductor size for 30°C (86°F) ambient. Derate conductor for ambient temperature. Use minimum 90°C (194°F) insulation.
2. Heater is functioning normally if at rated voltage the amp draw is within 10% of the value in this table.
3. Operation at lower voltages will result in reduced heat output and amp draw.

EXH4 TECHNICAL DATA FOR *UL* LISTED 60 HZ, GROUPS *C, D, F,* & *G* MODELS

MODEL	VOLTAGE (V)	NOMINAL WATTAGE (kW)	PHASE	MOTOR CURRENT (A)	HEATER ELEMENT CURRENT (A)	TOTAL CURRENT (A)	MINIMUM CIRCUIT AMPACITY (A)	SUPPLY WIRE SIZE (AWG.)	MAX. CIRCUIT FUSE (A)	TEMPERATURE RISE		CORE PART NUMBER	CONTACTOR PART NUMBER
										°F	°C		
EXH412-208160-3	208	3.0	1	2.7	13.0	15.7	19.1	12	20	19.0	10.5	4044	3618
EXH412-240160-3	240	3.0	1	2.7	11.2	13.9	16.9	12	20	19.0	10.5	4045	3618
EXH412-208360-3	208	3.0	3	1.4	7.5	8.9	11.1	14	15	19.0	10.5	4044	3618
EXH412-240360-3	240	3.0	3	1.4	6.5	7.9	9.9	14	15	19.0	10.5	4045	3618
EXH412-480360-3	480	3.0	3	0.7	3.2	3.9	4.9	14	15	19.0	10.5	4046	3618
EXH412-208160-5	208	5.0	1	2.7	22.6	25.3	31.1	8	35	31.6	17.6	4048	3618
EXH412-240160-5	240	5.0	1	2.7	19.6	22.3	27.4	10	30	31.6	17.6	4049	3618
EXH412-208360-5	208	5.0	3	1.4	13.0	14.4	18.1	12	20	31.6	17.6	4048	3618
EXH412-240360-5	240	5.0	3	1.4	11.3	12.7	15.9	12	20	31.6	17.6	4049	3618
EXH412-480360-5	480	5.0	3	0.7	5.7	6.4	8.0	14	15	31.6	17.6	4050	3618
EXH412-208160-7.5	208	7.5	1	2.7	34.6	37.3	46.1	8	50	27.9	15.5	4052	3619
EXH412-240160-7.5	240	7.5	1	2.7	30.0	32.7	40.4	8	45	27.9	15.5	4053	3618
EXH412-208360-7.5	208	7.5	3	1.4	20.0	21.4	26.8	10	30	27.9	15.5	4052	3618
EXH412-240360-7.5	240	7.5	3	1.4	17.3	18.7	23.4	10	25	27.9	15.5	4053	3618
EXH412-480360-7.5	480	7.5	3	0.7	8.7	9.4	11.8	14	15	27.9	15.5	4054	3618
EXH412-240160-10	240	10.0	1	2.7	40.4	43.1	53.4	6	60	37.2	20.6	4057	3619
EXH412-208360-10	208	10.0	3	1.4	26.9	28.3	35.4	8	40	37.2	20.6	4056	3618
EXH412-240360-10	240	10.0	3	1.4	23.3	24.7	30.9	8	35	37.2	20.6	4057	3618
EXH412-480360-10	480	10.0	3	0.7	11.7	12.4	15.5	12	20	37.2	20.6	4058	3618
EXH416-208360-15	208	15.0	3	1.4	40.0	41.4	51.8	6	60	27.1	15.0	4060	3619
EXH416-240360-15	240	15.0	3	1.4	34.6	36.0	45.0	8	45	27.1	15.0	4061	3619
EXH416-480360-15	480	15.0	3	0.7	17.3	18.0	22.5	10	25	27.1	15.0	4062	3618
EXH416-480360-20	480	20.0	3	0.7	23.3	24.0	30.0	10	30	36.1	20.1	4066	3618
EXH420-480360-25	480	25.0	3	1.0	29.1	30.1	37.6	8	40	21.9	12.2	4069	3618
EXH420-480360-30	480	30.0	3	1.0	35.1	36.1	45.1	8	50	26.3	14.6	4071	3619
EXH420-480360-35	480	35.0	3	1.0	41.1	42.1	52.6	6	60	28.0	15.6	4073	3619

NOTES:

1. Minimum conductor size for 30°C (86°F) ambient. Derate conductor for ambient temperature. Use minimum 90°C (194°F) insulation.
2. Heater is functioning normally if at rated voltage the amp draw is within 10% of the value in this table.
3. Operation at lower voltages will result in reduced heat output and amp draw.

COOPER

Crouse-Hinds

Quality from
Cooper Industries

For more information:

If further assistance is required, please contact an authorized Crouse-Hinds Distributor, Crouse-Hinds Sales Office, or:

Crouse-Hinds Customer Service Department,
P.O. Box 4999, Syracuse, New York 13221.
(315) 477-7000 FAX (315)477-5717

All statements, technical information and recommendations contained herein are based on information and tests we believe to be reliable. The accuracy or completeness thereof are not guaranteed. In accordance with Crouse-Hinds "Terms and Conditions of Sale" and since conditions of use are outside our control, the purchaser should determine the suitability of the product for his intended use and assumes all risk and liability whatsoever in connection therewith.

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