



## Owner's Manual

# Heat-Exchanger Unit Heaters

FR (Frost Resistant) & HP (High Pressure) Series Heaters

### APPROVED LOCATIONS

The Forced Air Heaters are CSA listed, certified for the following locations:

Class I, Divisions 1 & 2, Groups C & D;  
Class II, Division 1 & 2, Groups E, F, & G;  
Class III, Division 1 & 2;  
Temperature Code T3B 329°F (165°C)  
(On Applicable Models Only)

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



**This manual covers the installation, maintenance, repair and parts for all FR and HP series heaters.**

## WARNING!

**READ ALL IMPORTANT NOTICES ON PAGE 3.**

**PLEASE ADHERE TO INSTRUCTIONS PUBLISHED IN THIS MANUAL.**

**Failure to do so may be dangerous and may void certain provisions of your warranty.**

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# **HEATER MAINTENANCE CHECKLIST**

For Heat-Exchanger Unit Heaters

Heater Model: \_\_\_\_\_ Serial No.: \_\_\_\_\_

Date of Maintenance: \_\_\_\_\_ Maintenance Done By: \_\_\_\_\_

Comments: \_\_\_\_\_

## **WARNING!**

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

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

- |                 |                                       |                 |  |
|-----------------|---------------------------------------|-----------------|--|
| <b>1. CLEAN</b> | <input type="checkbox"/> Finned Tubes | <b>2. CHECK</b> | <input type="checkbox"/> Motor for smooth, quiet operation           |
|                 | <input type="checkbox"/> Fan          |                 | <input type="checkbox"/> Louvers for proper angle and tightness      |
|                 | <input type="checkbox"/> Fan Guard    |                 | <input type="checkbox"/> Electrical junction box cover for tightness |
|                 | <input type="checkbox"/> Motor        |                 |  |
|                 | <input type="checkbox"/> Louvers      |                 |  |

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

### **ANNUAL** (before heating season)

#### **1. ELECTRICAL**

- ☐ **Check all terminal connections and conductors.** Tighten loose connections. Conductors with damaged insulation must be replaced.

#### **2. MECHANICAL**

- ☐ **Check for fluid leakage.** If any fluid leakage occurs from the heater, remove it from service and have the heat exchanger replaced. A factory supplied heat exchanger can be shipped in less than a week from stock. Refer to the "Repair and Replacement" section for details.
- ☐ **Electrical junction box.** Inside of enclosure must be clean, dry, and free of foreign materials. Cover must be completely on and tight.
- ☐ **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 are not to be closed more than 75° from horizontal.
- ☐ **Check the tightness of all hardware.** All nuts and bolts, including mounting hardware, must be tight.
- ☐ **TURN HEATER MOTOR ON FOR A MINIMUM OF 15 MINUTES.** Check for air exiting heater through louvers and smooth running of fan motor.

# IMPORTANT NOTICES

## **WARNING!**

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

1. Read and follow the instructions in this manual.
2. Heater to be used only in the hazardous locations indicated on the heater's data plate.
3. Heater is for dry indoor use only. Do not immerse in water. Do not store or use in areas exposed to rain or snow.
4. Heater is to be connected and serviced only by a qualified electrician experienced with hazardous location equipment.
5. Installation, piping, and wiring of the heater must adhere to all applicable codes.
6. It is essential that any unit heater that will be used in a hazardous (classified) location is equipped with a electric motor approved for such service, and the temperature of the heat transfer medium is below the ignition temperature of the atmosphere. Refer to applicable electrical codes for additional information.
7. Disconnect heater from power supply at integral disconnect or fuse box before opening enclosures or servicing heater. Lock the switch in the "OFF" (open) position and/or tag the switch to prevent unexpected power application. IF INTEGRAL DISCONNECT IS BEING SERVICED, verify that power has been disconnected at fuse box or main panel. Lock the switch in the "OFF" (open) position and/or tag the switch to prevent unexpected power application.
8. Do not operate heater in atmospheres which are corrosive to steel or aluminum, unless it has been coated with a factory approved protective coating.
9. For steam service use only single-pass models. Refer to model coding (page 7) for number of passes in heat exchanger.
10. Refer to heat exchanger data plate for pressure and temperature limits.
11. 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 "Heater Maintenance Checklist" section for details.
12. Use factory approved replacement parts only.
13. If there are any questions or concerns regarding the heater, contact the factory. Refer to the last page of this manual for details.
14. HVAC fluids must be non-flammable, non-compressible, non-explosive & non-toxic.
15. Do not operate the heater with any of the louvers fully closed or overriding their stops.
16. Do not operate heater in ambient temperatures above 104°F (40°C).
17. See applicable electrical codes for seal requirements in field installed conduits. Factory installed conduits require no further sealing.
18. Base of the heater is to be mounted a minimum of 7.9 ft (2.4 m) above the floor. Refer to the "Installation" section for details.
19. Working fluid temperature must not exceed 200°C (392°F) to ensure compliance with temperature code.

**WARRANTY WILL BE VOID  
IF INSTRUCTIONS ARE NOT FOLLOWED**

## **INSTALLATION**

### **DESCRIPTION**

Two basic types of Ruffneck™ Heat Exchanger configurations are available from CCI Thermal Technologies Inc.:

**FR (Frost Resistant) Series** - for steam service only, up to 100 psi (690 kPa) on select models

**HP (High Pressure) Series** - for steam and liquid service up to 400 psi (2,700 kPa) on select models

### **LOCATION OF HEATERS**

The following guidelines have been established by CCI Thermal Technologies Inc. to ensure that you properly locate the heaters in your building. These are only suggestions, and variations may be deemed necessary depending on application.

1. When occupant comfort is the major objective, heaters should be positioned so that the airflow is directed to areas of highest heat loss (i.e., doorways, windows and outside walls).
2. For personnel comfort, a less turbulent and more even air distribution is required. To achieve this effect a larger quantity of smaller unit heaters should be installed.
3. When equipment protection is of utmost concern, heaters should be positioned so that the airflow is directed towards the equipment.
4. In very large areas, arrangement of heaters should be such that the air will exit from one heater and be projected towards the inlet, or back, of another heater. A rotational airflow will result, with air circulation in the central area of the building.

5. When arranging heaters, check the fan throws for the heaters being mounted (see table below). Although it is not generally required that the fan throws reach the next heater, air circulation must be sufficient to prevent cold spots from occurring.
6. Do not install heaters such that airflow is blocked or impeded by equipment or walls.
7. For warehouses or large workshops, it may be acceptable to use fewer, but larger, heaters mounted well above floor level. It has to be recognized, however, that only the largest heaters have long fan throw distanced.

## FAN THROWS FOR RUFFNECK™ HEAT-EXCHANGER UNIT AIR HEATERS

<u>MODEL</u>	<u>MOTOR HP</u>	<u>RPM</u>	<u>THROW IN FEET</u>
FR/HP - 12	1/2	1725	40
FR/HP - 16	1/2	1725	60
FR/HP - 20	1/2	1725	65
FR/HP - 24	1/2	1725	70
FR/HP - 30	3/4	1140	70
FR/HP - 36	1 1/2	1725	60

## NOISE LEVELS

Where personnel inhabit a room or building for long periods of time, and local ambient noise levels are low, the noise from the heaters has to be considered. Typically, the smaller the heater the lower the noise level will be. The largest heaters that move large volumes of air are noticeably noisier than units handling low volumes of air.

## MEASURED SOUND LEVELS OF RUFFNECK™ HEAT-EXCHANGER AIR UNIT HEATERS

### SOUND LEVEL dBA

<u>MODEL</u>	<u>REAR</u>	<u>FRONT</u>
FR/HP - 12	61	61
FR/HP - 16	70	70
FR/HP - 20	66	66
FR/HP - 24	74	74
FR/HP - 30	74	74
FR/HP - 36	76	76

**Note:**

Sound levels were measured at a distance of 15 feet with louver blades horizontal and sound meters on centre line of heater (i.e., in line with motor/fan shaft).

## MOUNTING

Although Ruffneck™ Unit Heaters are designed to be installed in an upright and level position, they may be installed in other positions. However, for steam service the inlet must be above the outlet and the bottom of the core must drain toward the outlet. They are designed to be suspended from the top of the cabinet either with two or four (depending on model) 5/8" NC bolts screwed into internally threaded holes provided in the cabinet top panel. It is essential that adequate structural support be provided for installation.

Basic Mounting Kits (BMK), Hanging Mounting Kits (HMK), Swivel Hanging Mounting Kits (SHMK) or Wall Mounting Kits (WMK) are available for Ruffneck™ heaters. If the strength of the structure is not adequate to support the units, a suitable alternative such as the Ruffneck™ Pipe Mounting Kit (PMK) would be recommended to ensure safe and proper operation. The HMK is the only suitable mounting kit for the 30" and 36" heater models.

Where heaters are installed in applications that are of a relocating or transportable nature such as land or offshore drilling rigs, an adequate mounting structure should be supplied to withstand all probable load conditions. Such load conditions should recognize abuse situations such as truck off-loading impacts, etc. It is recommended that lock washers be used beneath the bolt heads for these installations.

Heaters may be mounted at any reasonable height above floor level depending on the purpose of the heater. When equipment is placed in a seldom occupied building, the heaters may be placed at a low level. When heaters are required to ensure personnel comfort, they should be mounted overhead. Typically, mounting heights range from 7 1/2 feet to 12 feet. Heaters CSA certified must be mounted at a minimum height of 7.9 ft (2.4 m) above the floor. All Ruffneck™ heaters have louvers installed that allow air flow to be directed from horizontal to 60 degrees or greater downward deflection. Louvers should never be set to within less than 15 degrees of the closed position.

## CLEARANCES FOR MAINTENANCE

It is important to provide adequate clearance around the heater for servicing. Allow enough space to permit easy fan or motor replacement. Do not position the back of the fan motor against a surface, as air for the cooling fan will be blocked. It is advisable to leave at least 2" clearance between the rear of the motor and the nearest obstruction. For easy removal of the heat exchanger core assembly, it is important to leave clearance beneath the heater equal to the height of the heater cabinet plus two inches.

## PIPING APPLICATIONS

The following piping application and arrangements are only suggestions. Since it is impractical to cover all possible applications, please refer to detailed piping references for more information.

Below are suggested piping arrangements.

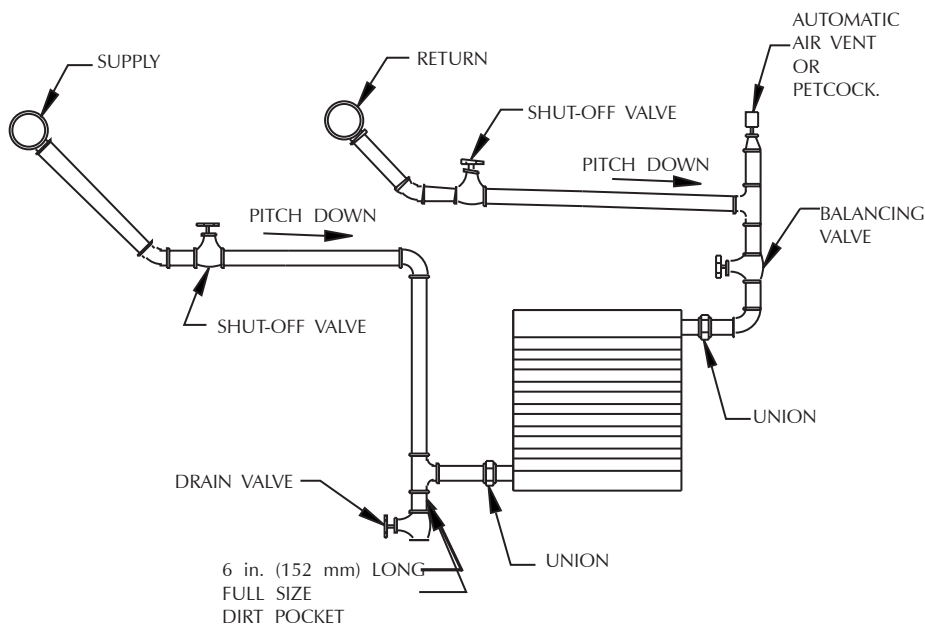


FIG.1  
UNIT HEATER  
CONNECTIONS TO  
OVERHEAD  
FLUID MAINS

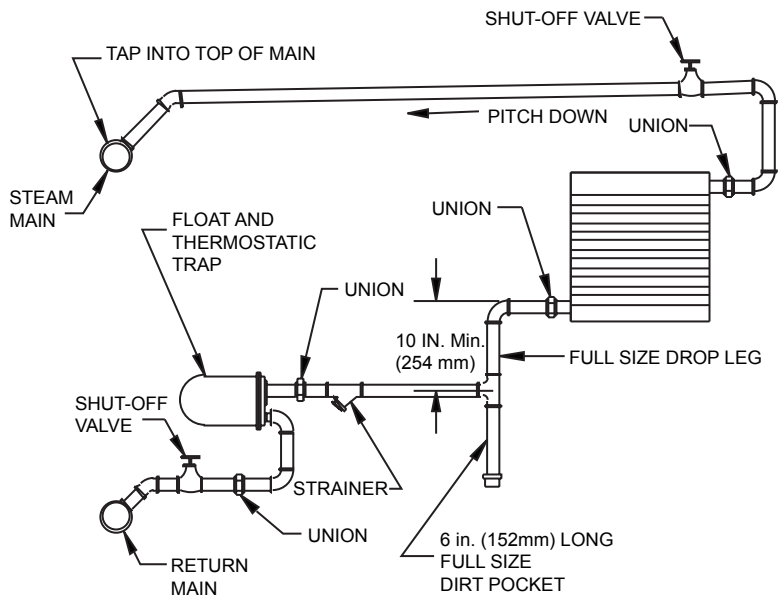
### NOTES:

1. Do not use with fluids corrosive to steel
2. Install using proper piping practices.

Fluid temperature not to exceed 200°C (392°F) for use in hazardous locations. Use supply wire suitable for 90°C (194°F), cable entries suitable for IP 54 and use in hazardous locations.

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.

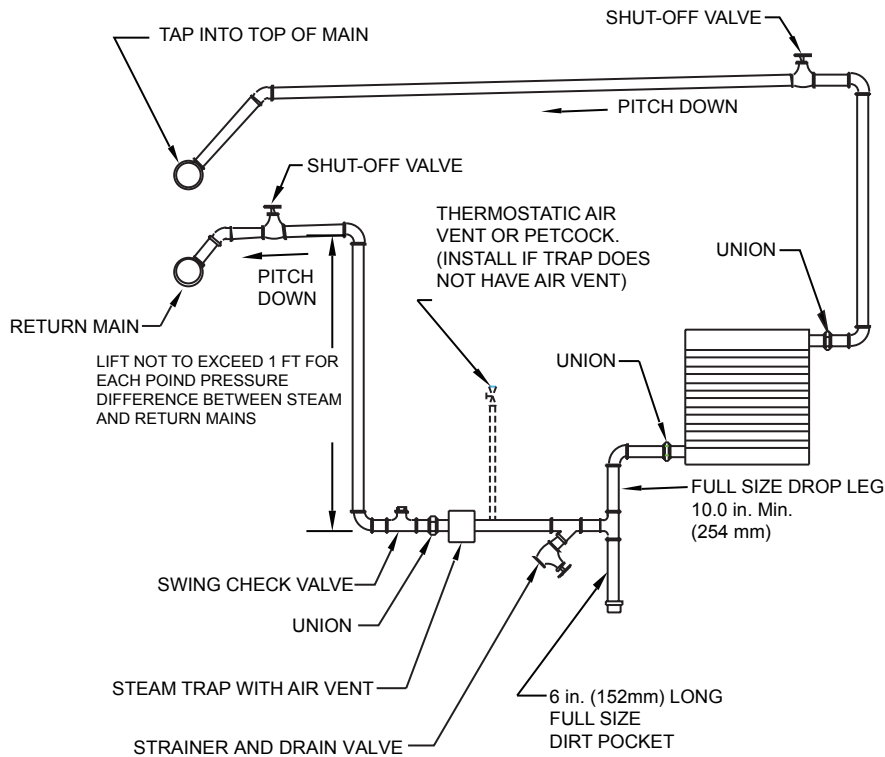
Installer to provide certified Ex "d" sealing fittings and stopping boxes for the same gas groups as the apparatus.



**FIG.2**  
UNIT HEATER CONNECTION  
FOR LOW-PRESSURE STEAM,  
OPEN GRAVITY OR VACUUM  
RETURN SYSTEM

**NOTES:**

1. For medium to high-pressure systems a bucket or float trap must be used.
2. Do not use with fluids corrosive to steel.
3. Install using proper piping practices
4. In horizontal pipe runs, use eccentric reducers only.
5. Use a properly sized steam trap.



**FIG.3**  
UNIT HEATER CONNECTIONS  
TO OVERHEAD STEAM AND  
RETURN MAINS

**NOTES:**

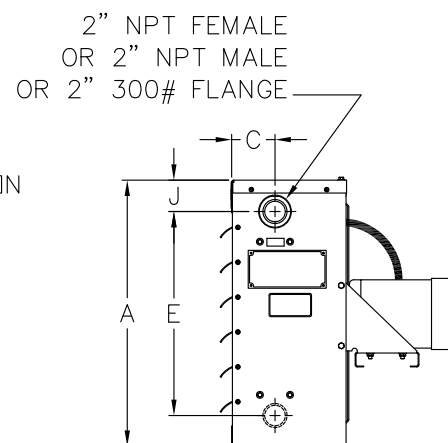
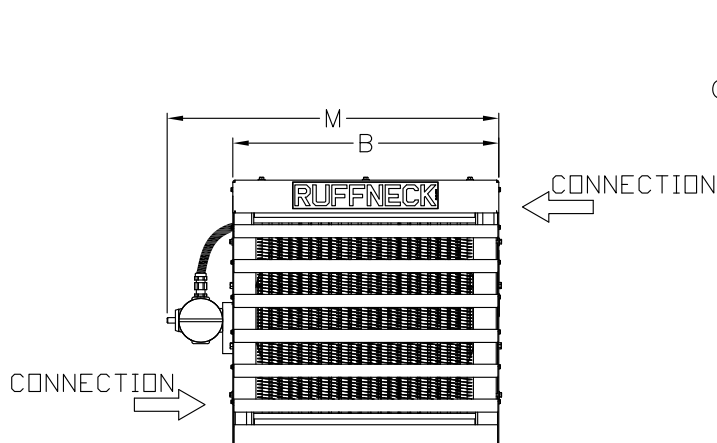
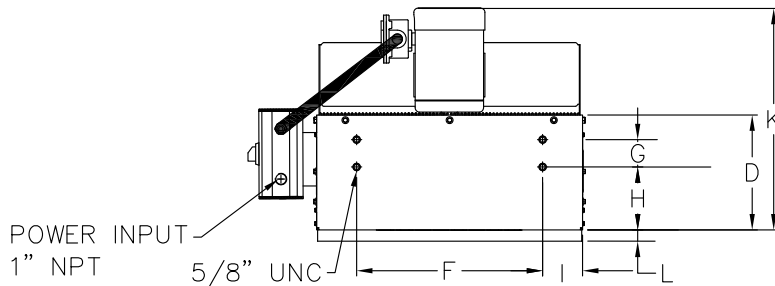
1. This piping arrangement is only for two-position-type control. Modulating steam control may not provide sufficient pressure to lift condensate to return main.
2. Do not use with fluids corrosive to steel.
3. Install using proper piping practices.
4. In horizontal pipe runs use eccentric reducers only.
5. Use a properly sized steam trap.

# PHYSICAL DIMENSIONS

DIM in (mm)	FR/HP12	FR/HP 16	FR/HP 20	FR/HP 24	FR/HP 30	FR/HP 36
A	16 5/6 (415)	20 5/16 (516)	24 5/6 (618)	28 3/8 (720)	34 7/16 (874)	42 5/8 (1083)
B	16 3/8 (416)	20 5/6 (517)	24 5/16 (618)	28 1/4 (718)	34 5/16 (872)	42 5/8 (1083)
C	4 (102)	4 (102)	4 (102)	4 5/8 (118)	5 11/16 (145)	5 1/2 (140)
D	9 3/4 (248)	9 3/4 (248)	10 1/2 (267)	11 13/16 (300)	13 3/4 (350)	23 5/8 (600)
E	12 5/8 (320)	15 1/2 (394)	19 1/2 (495)	23 7/16 (596)	29 1/2 (750)	37 3/8 (950)
F	11 (280)	15 (381)	17 (432)	19 11/16 (500)	25 9/16 (650)	29 1/2 (750)
G	N/A	1 3/4 (44)	2 1/2 (63)	2 3/4 (70)	3 1/8 (80)	3 1/8 (80)
H	6 3/4 (172)	5 3/4 (147)	5 3/4 (146)	6 11/16 (170)	7 1/2 (190)	9 7/16 (240)
I	2 5/8 (68)	2 5/8 (68)	3 5/8 (93)	4 5/16 (109)	4 3/8 (111)	6 7/16 (163)
J	1 7/8 (48)	2 3/4 (70)	2 7/8 (73)	3 (76)	3 1/8 (80)	3 (76)
K* (MAX)	21 1/4 (540)	21 1/4 (540)	22 7/16 (570)	23 5/8 (600)	25 3/16 (640)	34 5/8 (880)
L (MAX)	1 5/8 (42)	1 5/8 (42)	1 5/8 (42)	1 5/8 (42)	1 7/8 (47)	1 3/4 (45)
M	24 3/8 (619)	28 5/16 (720)	32 5/16 (821)	36 1/4 (921)	42 5/16 (1075)	50 5/8 (1286)
Core weight lbs (Kg)	27 (12)	38 (17)	48 (22)	91 (41)	121 (55)	175 (79)
Unit weight lbs (Kg)	80 (36)	100 (45)	126 (57)	191 (87)	286 (130)	444 (202)
Shipping weight lbs (Kg)	132 (60)	148 (67)	174 (79)	214 (97)	321 (146)	526 (239)

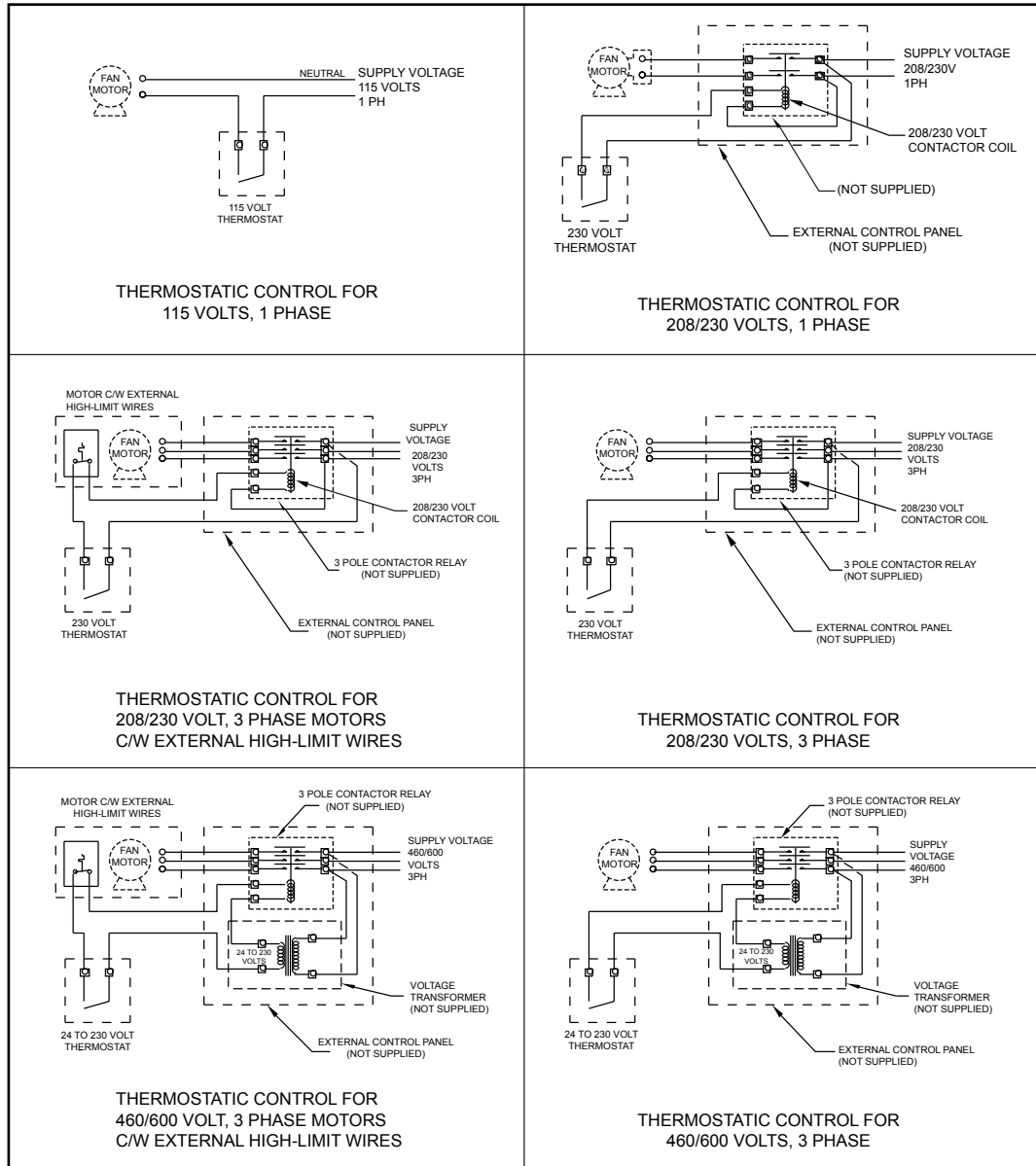
## Note:

\*May vary with motor used.

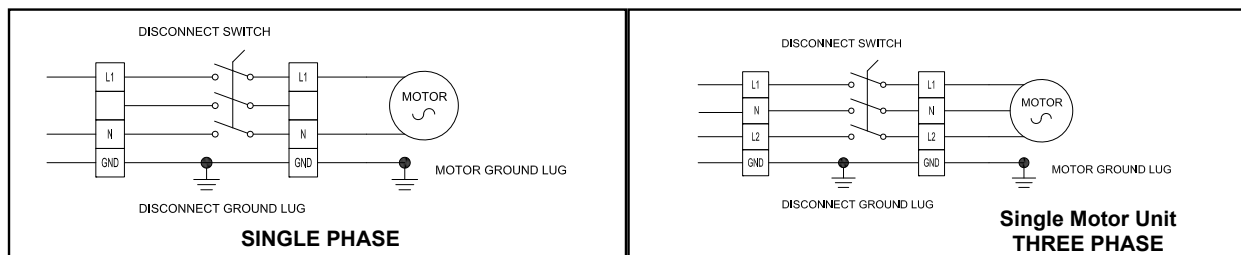


# ELECTRICAL WIRING

Ruffneck™ fan-forced unit heaters and heat exchangers may be thermostatically controlled if required. Usually the flow of heat transfer fluid is allowed to pass through the heat exchanger without interruption. The fan motor, in such cases, shuts on and off by an electrical thermostat. Airflow through the heater is thus controlled. A small amount of heat will radiate from the heat exchanger when the fan is inoperative but this is usually tolerable. Absolute control of heat output from the heat exchanger would require that steam or flow of hot liquid to the heat exchanger be shut off. Such control of the heat transfer medium is possible by thermostatic valve control, separately or in combination with thermostatic fan control. Typically a manual shut-off valve is placed in the steam or liquid line for control purposes.



## WIRING DIAGRAM FOR BUILT-IN DISCONNECT SWITCH HEATERS



### Note:

- Installation must comply with local electrical code.
- For internal wiring of control devices and starters, consult device manufacturer.
- The thermostat must have an electrical rating equal to or exceeding the HP, line voltage and current expected.
- For wiring of fan motor, refer to diagram on the motor name plate.
- Some motors may be equipped with external high-limit wires. These wires must be connected in series with the motor control circuit. (see appropriate diagrams above)



# **REPAIR AND REPLACEMENT PROCEDURES**

## **WARNING!**

**Disconnect heater from power supply before servicing or repairing 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 equipment experience. Some components of this heater are heavy and assistance will be required to remove them.**

## **CORES**

1. Remove the bottom cover which is attached with #10 screws and 1/4" bolts.
2. Take out the four 1/4" or 5/16" bolts on each side of the cabinet.
3. When removing the core assembly, it will usually be necessary to have assistance in order to handle it safely. In some instances, dismantling the complete heater from support structure may be advisable to allow core assembly removal at ground or bench level.

## **REMOVAL OF FAN, FAN GUARD OR MOTOR**

(All models except FR/HP 36)

1. Remove the #10 screws that attach the fan guard to the cabinet.
2. Remove the motor, fan and fan guard together by removing the four 5/16" carriage bolts and nuts that attach the motor to the motor bracket.
3. Before removing the fan from the motor shaft, measure the distance between the fan hub and the motor end face. Make a note of this dimension to permit installation of the fan in the correct position at reassembly. The fan guard must first be positioned over the motor shaft before the fan is installed on the shaft

## **FR/HP 36 FAN GUARD**

The fan guard consists of a removable upper panel and a frame bolted to the heater cabinet. For most service procedures it is necessary only to remove the upper removable panel. In cases where the complete fan guard is to be removed, assistance will be required due to its size and weight. To remove the complete fan guard:

1. Disconnect the wiring from the motor.
2. Remove the bolts fastening the fan guard to the cabinet and slide the fan guard past the motor.

## **V-BELT-SERVICE - REMOVAL, INSTALLATION AND TENSIONING**

1. Remove upper fan guard panel.
2. Slide motor mount up to relieve the tension to the v-belt and remove the v-belt.
3. Before installing a new v-belt, ensure that the sheaves are properly aligned. (See Drive Sheave Section)
4. Install the new v-belt and tension it by sliding the motor mount down until the v-belt will only move 10 to 16 mm (3/8 to 5/8 in.) when 68N (15 lbs) of force are applied to the belt midway between the sheaves. Ensure that the motor is level and then tighten the bolts fastening the motor mount to the drive frame.
5. Replace upper fan guard panel.
6. After a few days of operation the new v-belt will seat-in and may require adjustment.

## **FAN MOTOR - REMOVAL AND INSTALLATION**

1. Remove bolts holding motor to the motor mount.
2. Remove the two piece fan guard assembly.
3. Lift the motor assembly off the motor mount.
4. Before removing the fan, measure and record the location of the fan hub on the motor shaft. If fan is difficult to remove, use a gear puller on the fan hub.
5. To reassemble, position fan on motor shaft, and tighten set screws.
6. Place motor assembly onto motor mount, and fasten the fan guard to cabinet.

## **DRIVE SHEAVES - REMOVAL AND INSTALLATION**

1. The sheaves on the fan motor and fan drive may be removed by removing the cap screws from the bushings.
2. Thread the cap screws into the threaded removal holes and progressively tighten the cap screws until the sheave and bushing are loose and slide off the shaft.
3. To install; first slide the sheave with the bushing and cap screws in place onto the shaft. Align the sheaves.
4. Tighten the cap screws alternately until a torque of 10.8Nm (8ft.-lbs) is achieved. DO NOT over torque, damage may result.

## **DRIVE FRAME - REMOVAL**

1. Remove the complete fan guard assembly as described in the Fan Guard section.
2. Support the fan drives frame, then remove the bolts fastening it to the heater. Lower frame from the heater.

## **FAN SHAFT BEARINGS - REMOVAL AND INSTALLATION**

The ball bearings used on the FR/HP-36 heaters are of the extended inner ring type, which use an eccentric self-locking collar for a positive locking action of the shaft.

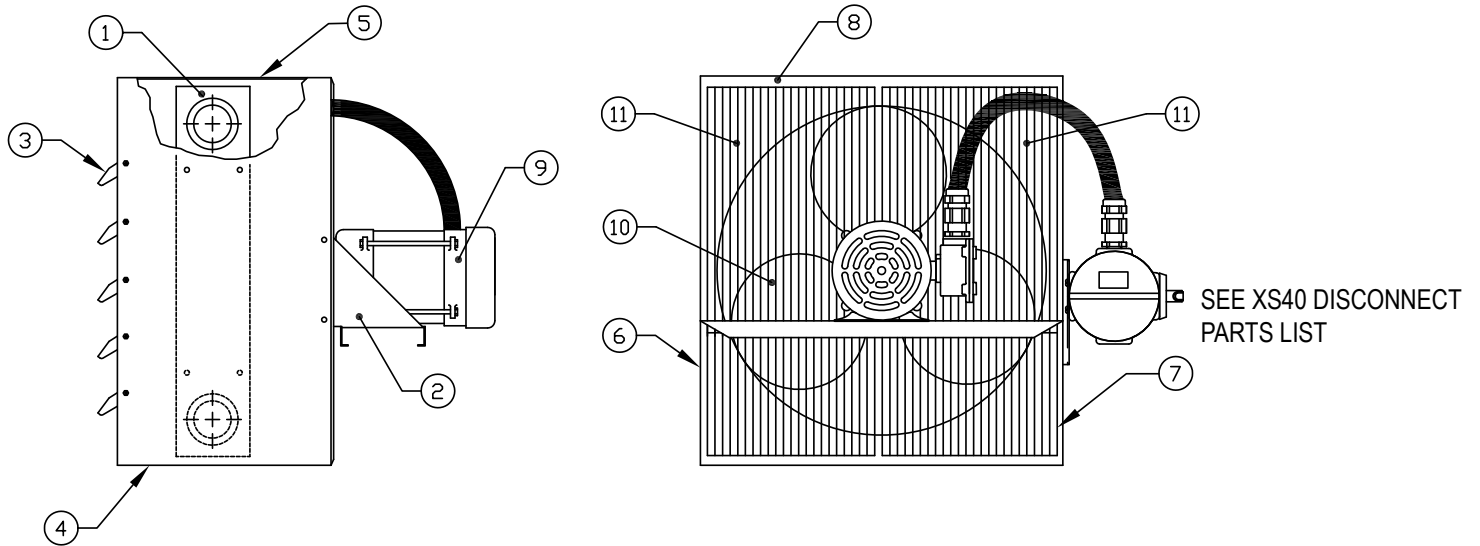
1. The fan shaft bearing may be serviced either on the heater by removing the upper fan guard panel or first removing the whole drive frame from the heater.
2. Remove the v-belt and the drive sheave as described in the appropriate section.
3. Measure and record the distance from the end of the shaft to the bearing housing.
4. Loosen the set screws in the locking collars. Unlock the collars by placing a drift punch in the collar hole and hit the punch opposite to the direction of shaft rotation.
5. Loosen and remove the bolts fastening the bearing to the bearing support and slide bearings off the shaft. NOTE: It may be necessary to file the burr left by the bearings set screws on the shaft, in order to remove the inner bearing.
6. To install new bearings; slide the bearings and locking collars onto the shaft with the locking collars facing each other. Bolt bearings onto the bearing support. Position shaft using the measurement taken in Step 3.
7. Assemble locking collars to the bearing, turning them in the direction of shaft rotation and use a drift punch to tighten the collar in place. Then tighten the set screws in the locking collars.
8. Reassemble the unit, ensuring the sheaves are aligned and the v-belt is tensioned as described in the appropriate sections.

## **FAN - REMOVAL AND INSTALLATION**

1. Remove the fan guard assembly as described in the Fan Guard Section.
2. Remove the drive frame as described in the Drive Frame Section.
3. Remove the set screws on the fan hub and remove the fan from the shaft. NOTE: if the shaft is corroded it may be necessary to replace the shaft.
4. To reassemble, slide the shaft into the fan hub until the end of the hub. Ensure that the two flats on the shaft align with the set screws in the fan hub. Then tighten the fan's set screws.

## PARTS LIST

FR/HP 12, 16, 20, 24 and 30 models

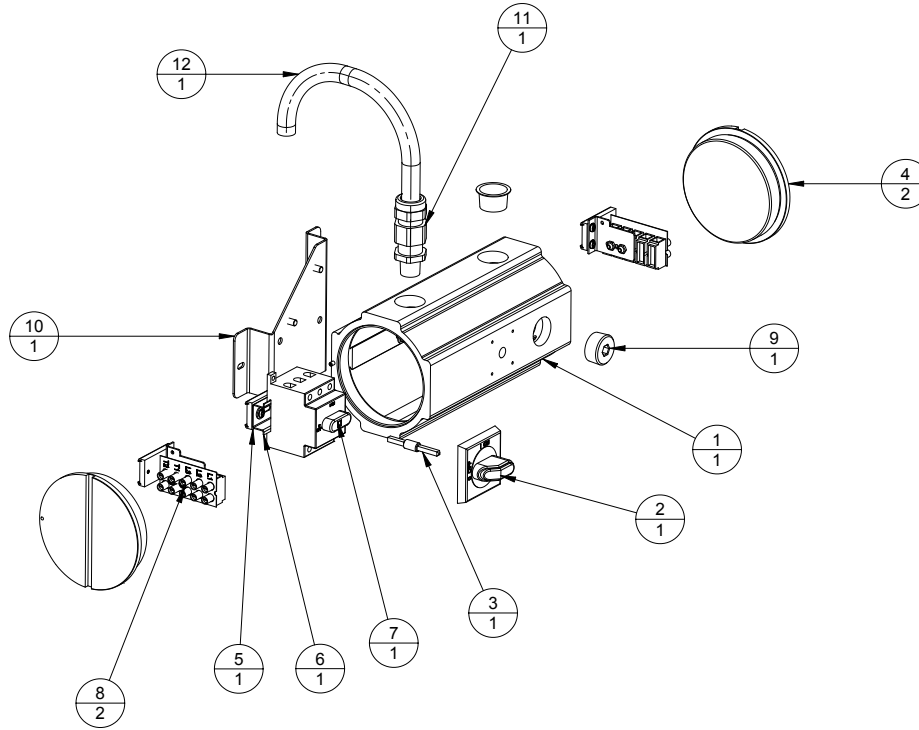


ITEM NO.	PART DESCRIPTION	FR, HP 12		FR, HP 16		FR, HP 20		FR, HP 24		FR, HP 30	
		QTY.	NUMBER	QTY	NUMBER	QTY	NUMBER	QTY	NUMBER	QTY	NUMBER
1	FR1 CORE ASSEMBLY	1	2053	1	2054	1	2055	1	2056	1	2057
1	HP1 CORE ASSEMBLY	1	2051	1	1914	1	1986	1	2042	1	2043
1	HP3 CORE ASSEMBLY	1	2065	1	1936	1	1875	1	2045	1	2047
1	HP5 CORE ASSEMBLY	-	-	1	1983	1	1991	1	2046	1	2048
1	HP7 CORE ASSEMBLY	-	-	-	-	-	-	1	2190	1	2188
2	MOTOR BRACKET	1	1512	1	1217	1	1237	1	1219	1	1280
3	LOUVER BLADE KIT	1	4881	1	4882	1	4883	1	4884	1	4958
4	BOTTOM PANEL	1	7874	1	7868	1	7861	1	7960	1	8391
5	TOP PANEL	1	7875	1	7870	1	7865	1	7961	1	8395
6	RIGHT PANEL	1	7872	1	7866	1	7863	1	7964	1	8393
7	LEFT PANEL	1	7873	1	7867	1	7862	1	7963	1	8394
8	FAN SHROUD	1	7871	1	7869	1	7864	1	7962	1	8392
9	MOTOR	1	**	1	**	1	**	1	**	1	**
10	FAN BLADE	1	11284	1	1378	1	1382	1	1389	1	1386
11	FAN GUARD	2	5456	2	5457	2	5458	2	5459	2	5460

### Note:

\*\* Check motor name plate for voltage, phase, H.P., frame size and service classification.

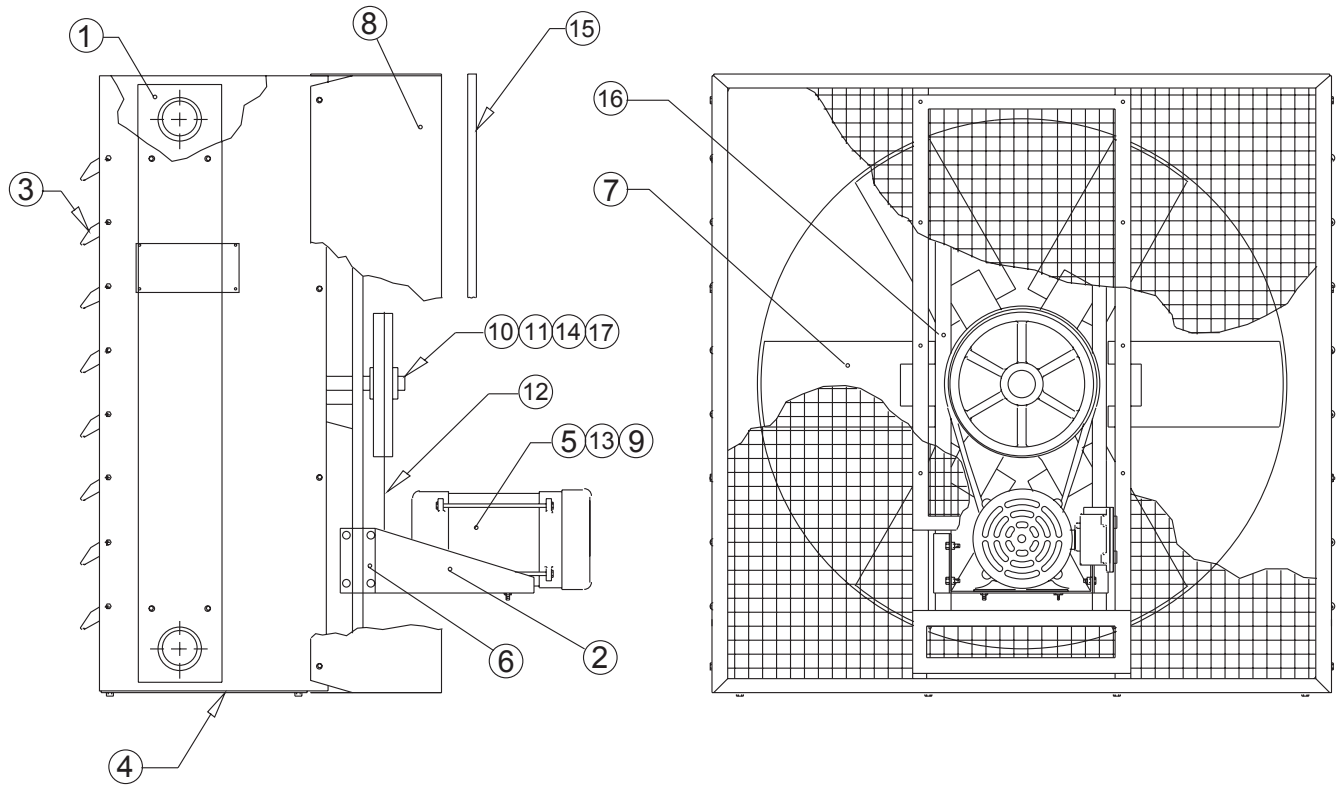
## XS40 Disconnect



ITEM	Part Number	DESCRIPTION	QUANTITY
1	B16229-03	Terminal Box, X-max Series 2	1
2	12147	Disconnect Switch Handle	1
3	12241-02	Operating Shaft	1
4	B12334-01	Terminal Box Cover	2
5	B12676-07	Trolley, Disconnect Switch	1
6	11362	Bracket, Din Rail	1
7	12112	Switch, Disconnect	1
8	B12676-07	Terminal Block Ass'y	2
9	XHP100	Dry Seal Plug 1" NPT	1
10	11650	Mounting Bracket	1
11	Contact Manufacturer	Cable, Teck-90HL	1
12	Contact Manufacturer	Fitting, Teck Cable	1

## PARTS LIST

### FR/HP 36 models



ITEM NO.	PART DESCRIPTION	FR, HP 36	
		QTY.	NUMBER
1	FR1 CORE ASSEMBLY	1	2058
1	HP1 CORE ASSEMBLY	1	2044
1	HP3 CORE ASSEMBLY	1	2049
1	HP5 CORE ASSEMBLY	1	2050
1	HP7 CORE ASSEMBLY	1	2189
2	MOTOR BRACKET	1	3426
3	LOUVER BLADE KIT	1	4959
4	BOTTOM PANEL	1	1233
5	MOTOR	1	**
6	U-CLIPS	2	3444
7	FAN BLADE	1	1395

ITEM NO.	PART DESCRIPTION	FR, HP 36	
		QTY.	NUMBER
8	FAN GUARD FRAME	1	3443
9	TAPER BUSING, DRIVE	1	*
10	DRIVEN SHEAVE	1	1398
11	1" TAPER BUSING, DRIVEN	1	1401
12	V-BELT	1	1402
13	DRIVE SHEAVE	1	1399
14	BEARING 1" PILLOW BLOCK	2	1396
15	FAN GUARD, UPPER PANEL	1	3455
16	FRAME, 36 FAN DRIVE	1	3424
17	SHAFT	1	1268

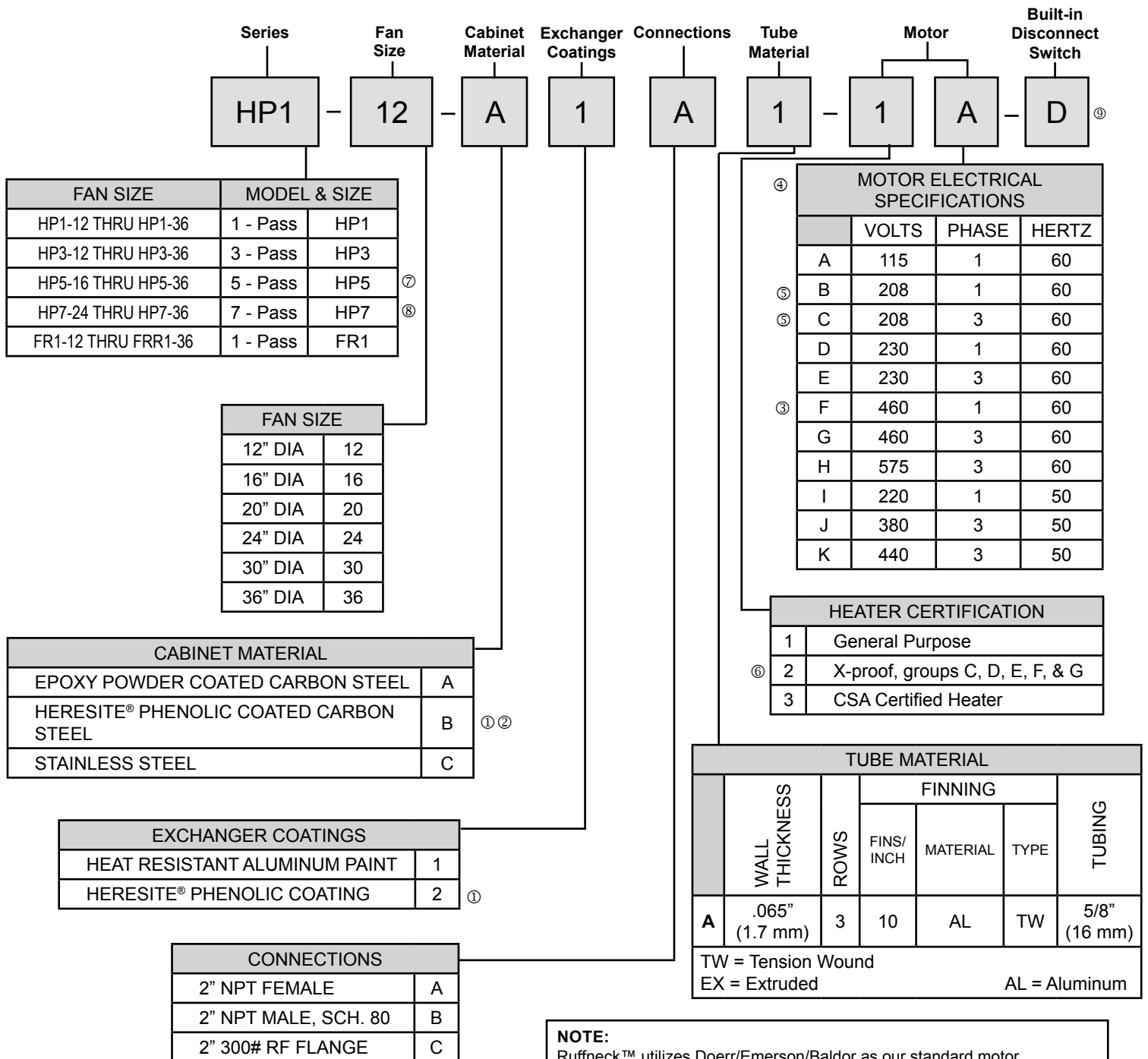
#### Note:

\*Specify shaft diameter when ordering.

\*\* Check motor name plate for voltage, phase, H.P., frame size and service classification.

# FRHP Heat-Exchanger Unit Heaters

## Model Coding



### NOTE:

Ruffneck™ utilizes Doerr/Emerson/Baldor as our standard motor. Specifying any other O.E.M. motor may result in longer lead times. All heat exchangers are registered to C.R.N. OH0224.2C. They are approved for use in all provinces and territories in Canada.

- ① Heresite® coated exchangers and cabinets: contact factory for quote.
- ② Louvres and fan blades are also Heresite® coated.
- ③ Contact factory for shipping lead time.
- ④ Motor designed to be used at rated voltage with tolerances of ±15%.
- ⑤ Motor may be marked 230V, but is suitable for 208V operation.
- ⑥ 460 1 phase motors are only certified for groups D, F & G.
- ⑦ Only available in 16" and larger units.
- ⑧ Only available in 24" and larger units.
- ⑨ Built-in Disconnect only available with CSA certified heaters.

## NOTES

This image shows a full page of blank graph paper. The grid consists of small, equal-sized squares formed by thin black lines. There are no margins, text, or other markings on the page.



Heaters for the Harshest Environments

**5918 Roper Road, Edmonton, Alberta, Canada T6B 3E1**

**Phone: (780) 466-3178 Fax: (780) 468-5904**

**PLEASE ADHERE TO INSTRUCTIONS PUBLISHED IN THIS MANUAL.**

Failure to do so may be dangerous and may void certain provisions of your warranty.

For further assistance, please call:

**24 Hr. Hotline: 1-800-661-8529**

(U.S.A. and Canada)

Please have model and serial numbers available before calling.

**WARRANTY:** Under normal use the Company warrants to the purchaser that defects in material or workmanship will be repaired or replaced without charge for a period of 18 months from date of shipment, or 12 months from the start date of operation, whichever expires first. Any claim for warranty must be reported to the sales office where the product was purchased for authorized repair or replacement within the terms of this warranty.

Subject to State or Provincial law to the contrary, the Company will not be responsible for any expense for installation, removal from service, transportation, or damages of any type whatsoever, including damages arising from lack of use, business interruptions, or incidental or consequential damages.

The Company cannot anticipate or control the conditions of product usage and therefore accepts no responsibility for the safe application and suitability of its products when used alone or in combination with other products. Tests for the safe application and suitability of the products are the sole responsibility of the user.

This warranty will be void if, in the judgment of the Company, the damage, failure or defect is the result of:

- vibration, radiation, erosion, corrosion, process contamination, abnormal process conditions, temperature and pressures, unusual surges or pulsation, fouling, ordinary wear and tear, lack of maintenance, incorrectly applied utilities such as voltage, air, gas, water, and others or any combination of the aforementioned causes not specifically allowed for in the design conditions or
- any act or omission by the Purchaser, its agents, servants or independent contractors which for greater certainty, but not so as to limit the generality of the foregoing, includes physical, chemical or mechanical abuse, accident, improper installation of the product, improper storage and handling of the product, improper application or the misalignment of parts.

No warranty applies to paint finishes except for manufacturing defects apparent within 30 days from the date of installation.

The Company neither assumes nor authorizes any person to assume for it any other obligation or liability in connection with the product(s).

The Purchaser agrees that all warranty work required after the initial commissioning of the product will be provided only if the Company has been paid by the Purchaser in full accordance with the terms and conditions of the contract.

The Purchaser agrees that the Company makes no warranty or guarantee, express, implied or statutory, **(INCLUDING ANY WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE)** written or oral, of the Article or incidental labour, except as is expressed or contained in the agreement herein.

**LIABILITY:** Technical data contained in the catalog or on the website is subject to change without notice. The Company reserves the right to make dimensional and other design changes as required. The Purchaser acknowledges the Company shall not be obligated to modify those articles manufactured before the formulation of the changes in design or improvements of the products by the Company.

The Company shall not be liable to compensate or indemnify the Purchaser, end user or any other party against any actions, claims, liabilities, injury, loss, loss of use, loss of business, damages, indirect or consequential damages, demands, penalties, fines, expenses (including legal expenses), costs, obligations and causes of action of any kind arising wholly or partly from negligence or omission of the user or the misuse, incorrect application, unsafe application, incorrect storage and handling, incorrect installation, lack of maintenance, improper maintenance or improper operation of products furnished by the Company.

**Edmonton**  
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F 281-506-2316

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