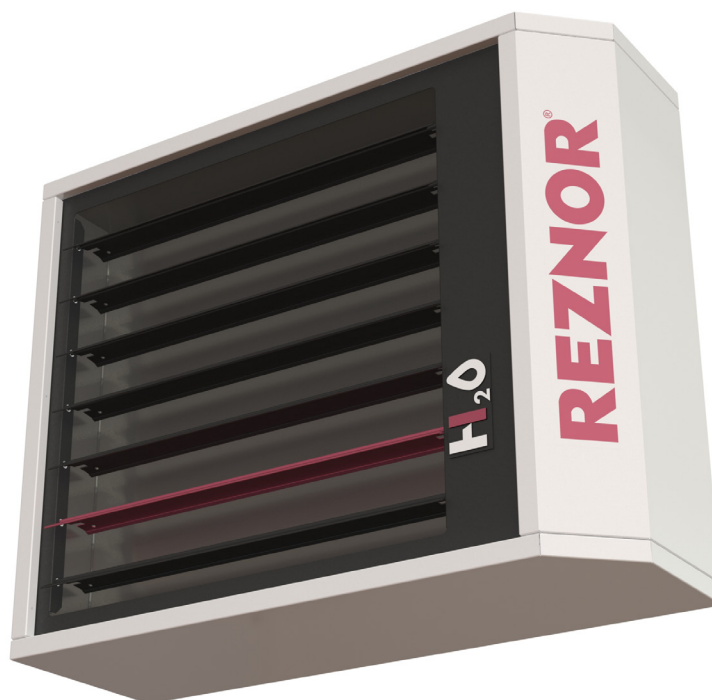


HYDRONIC UNIT HEATER INSTALLATION, OPERATION, AND MAINTENANCE

MODEL UWS



⚠ WARNING ⚠

- Be sure to read and understand the installation, operation, and maintenance instructions in this manual.
- Installation should be done by a qualified agency in accordance with these instructions. The qualified service agency installing this heater is responsible for the installation.
- This appliance is not intended for use by persons with reduced physical, sensory, or mental capabilities or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- Children should be supervised to ensure that they do not play with the appliance.
- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- Do not remove safety labels. If they are unreadable, contact an authorized distributor for replacement labels.
- The heat exchanger coils must be protected against freezing.

DO NOT DESTROY. PLEASE READ CAREFULLY. KEEP IN A SAFE PLACE FOR FUTURE REFERENCE.

TABLE OF CONTENTS

GENERAL INFORMATION	2
Important Safety Information	2
Warranty	3
Certification	3
Installation Codes	3
Unit Location	3
Mounting Height	4
Weights	4
Clearances	4
Dimensions	5
INSTALLATION	6
Unpacking and Inspection	6
Pre-Installation Checklist	6
Heater Suspension	7
Piping Connections	7
Electrical Connections	8
CONTROLS	9
Fan Speed Control	9
Fan Motor	9
Thermostat	9
OPERATION	9
Pre-Startup Checklist	9
Startup	9
MAINTENANCE	10
Service Checklist	10
Fan and Motor Assembly Maintenance	10
TROUBLESHOOTING	11
INSTALLATION RECORD (TO BE COMPLETED BY INSTALLER)	12

GENERAL INFORMATION

- This unit heater has been tested for capacity and efficiency so as to provide many years of safe and dependable comfort providing it is properly installed and maintained. With regular maintenance, this unit will operate satisfactorily year after year. Abuse, improper use, and/or improper maintenance can shorten the life of the appliance and create unsafe hazards.
- To achieve optimum performance and minimize equipment failure, it is recommended that periodic maintenance be performed on this unit. The ability to properly perform maintenance on this equipment requires certain tools and mechanical skills.
- This unit heater is operated with hot water, produced by a boiler, that flows through the heat exchanger.

Important Safety Information

Please read all information in this manual thoroughly and become familiar with the capabilities and use of your appliance before attempting to operate or maintain this unit. Pay attention to all dangers, warnings, cautions, and notes highlighted in this manual. Safety markings should not be ignored and are used frequently throughout to designate a degree or level of seriousness.

DANGER: A danger statement describes a potentially hazardous situation that if not avoided, will result in severe personal injury or death and/or property damage.

WARNING: A warning statement describes a potentially hazardous situation that if not avoided, can result in severe personal injury and/or property damage.

CAUTION: A caution statement describes a potentially hazardous situation that if not avoided, can result in minor or moderate personal injury and/or property damage.

NOTE: A note provides important information that should not be ignored.

⚠ CAUTION ⚠

To prevent damage to the unit or to its internal components, it is recommended that two wrenches be used when loosening or tightening nuts. Do not over tighten!

Warranty

NOTE: The standard unit heater warranty covers only original defects and does not cover the repairs resulting from a water condition such as corrosion or scale. It is up to you and is your sole responsibility to ensure that a proper water treatment and maintenance program is correctly followed at all times.

Refer to the limited warranty form in the literature bag provided with the unit. The warranty is void if:

- Wiring is not in accordance with the diagram furnished with the heater.
- The air delivery system is modified.
- Improper water conditions result in excessive corrosion or leaks.

Certification

These unit heaters are listed by Intertek for use in the US and Canada at elevations up to 10,000 feet (3,000 meters).

Installation Codes

These units must be installed in accordance with local building codes. Local authorities having jurisdiction should be consulted before installation is made to verify local codes and installation procedure requirements.

Unit Location

⚠ CAUTION ⚠

- **Do not locate the heater where it may be exposed to water spray, rain, or dripping water.**
 - **To prevent damage from water freezing inside the heater, ensure that the installation location is in an area where the ambient temperature is maintained at >32°F (>0°C).**
-

For best results, the heater should be located with certain rules in mind:

- Heaters should always be arranged to blow toward or along exposed wall surfaces, if possible. Where two or more heaters are installed in the same room, a general scheme of air circulation should be maintained for best results.
- Suspended heaters are most effective when located as close to the working zone as possible, and this fact should be kept in mind when determining the mounting heights to be used. However, care should be exercised to avoid directing the discharged air directly on the room occupants.
- Partitions, columns, counters, or other obstructions should be taken into consideration when locating the heater so that a minimum quantity of airflow will be deflected by such obstacles.
- When heaters are located in the center of the space to be heated, the air should be discharged toward the exposed walls. In large areas, heaters should be located to discharge air along exposed walls with extra units provided to discharge air in toward the center of the area.

GENERAL INFORMATION—CONTINUED

Mounting Height

WARNING

If touched, the internal heater surfaces that are accessible from outside the heater will cause burns. Suspend the heater a minimum of 5 feet (1.6 meters)—for unit sizes 10/15–44/62—or 8 feet (2.5 meters)—for unit sizes 62/77–159/191—above the floor.

In general, the heater should be located 6–14 feet (1.8–4.3 meters) above the floor. At those points where infiltration of cold air is excessive, such as at entrance doors and shipping doors, it is desirable to locate the heater so that it will discharge directly toward the source of cold air from a distance of 15–20 feet (4.6–6.1 meters).

Table 1. Minimum Mounting Height

Unit Size (MBTUh)	
10/15, 15/21, 22/31, 32/45, 44/62	62/77, 83/104, 110/137, 159/191
Accessibility to General Public	
Accessible	Non accessible
Feet (Meters)	
5 (1.6)	8 (2.5)

Weights

Table 2. Weights

Unit Size (MBTUh)								
10/15	15/21	22/31	32/45	44/62	62/77	83/104	110/137	159/191
Pounds (kg)								
30 (14)	39 (18)	43 (20)	52 (24)	66 (30)	88 (40)	91 (42)	117 (54)	142 (65)

Clearances

The unit must be located so that the clearances listed in [Table 3](#) are provided for with regards to inspection and service and for proper spacing from combustible construction. Clearance to combustibles is defined as the minimum distance from the heater to a surface or object for which it is necessary to ensure that a surface temperature of 90°F (50°C) above the surrounding ambient temperature is not exceeded.

Table 3. Clearances to Combustibles

Heater Surface	Minimum Clearance (Inches (mm))
Top, bottom, sides	0 (0)
Rear (from fan motor)	18 (457)

Dimensions

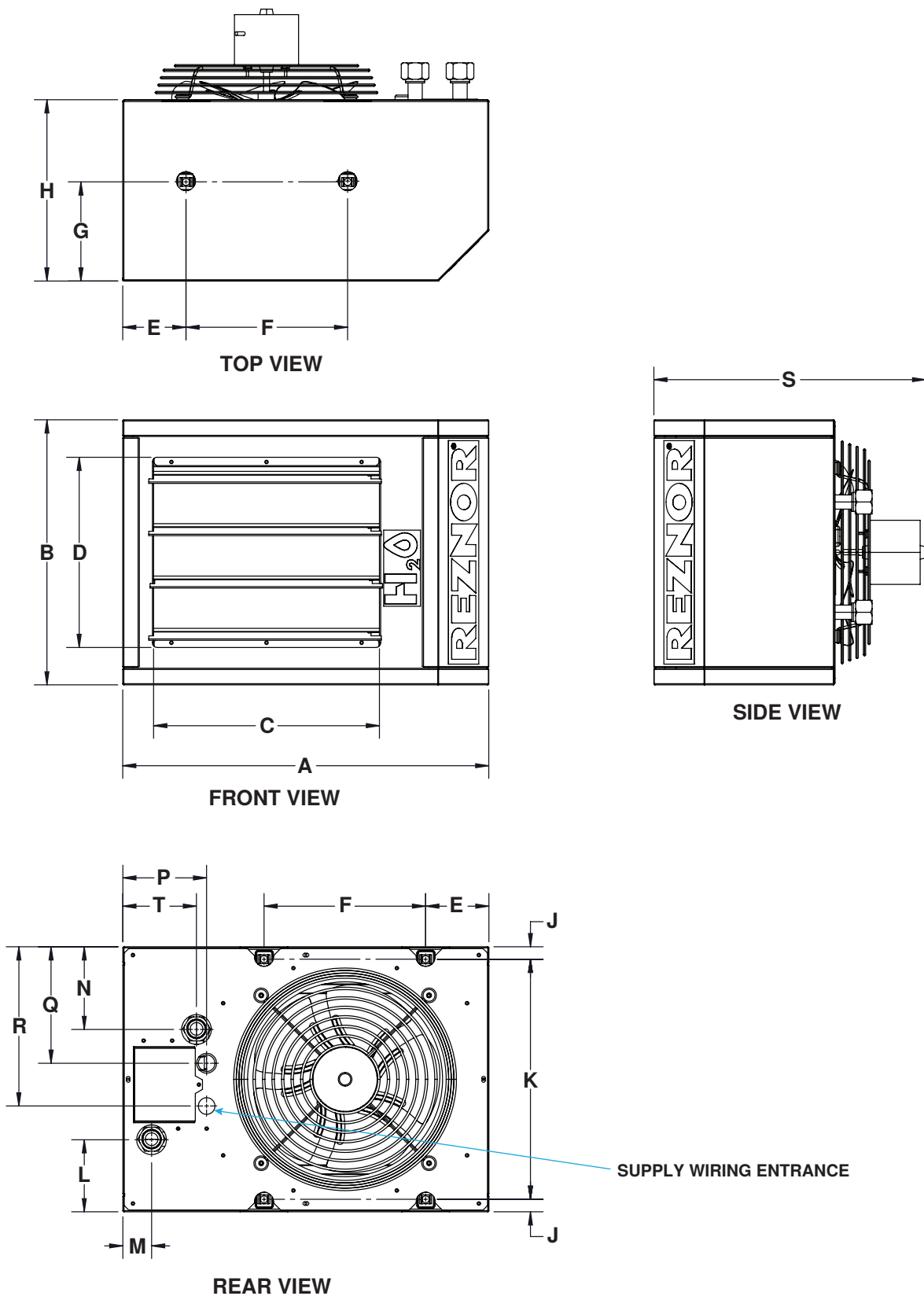


Figure 1. Dimensions (Refer to [Table 4](#))

GENERAL INFORMATION—CONTINUED

Dimensions—Continued

Table 4. Dimensions									
Dimension*	Unit Size (MBTUh)								
	10/15	15/21	22/31	32/45	44/62	62/77	83/104	110/137	159/191
	Inches (mm)								
A	19-1/4 (489)	23-3/4 (603)	24-3/4 (629)	28-3/4 (730)	32-3/4 (832)	38 (965)	41-1/2 (1054)		
B	13-7/8 (352)	17-1/16 (433)	20 15/16 (532)	23-7/16 (595)	27-7/16 (697)	29-7/16 (748)	35-7/16 (900)		
C	12 (305)	15 (381)		20 (508)	22 (559)	24-1/8 (613)	28 (711)	32 (813)	
D	10 (254)	12-7/8 (327)	17 (432)		23-7/8 (606)	24 (610)	26 (660)	31-13/16 (808)	
E**	3-5/16 (84)	4-1/16 (103)	4-9/16 (116)	3-9/16 (90)	4-9/16 (116)		7-9/16 (192)		
F**	8-1/2 (216)	10 (254)	11 (279)	16 (406)	18 (457)	22 (559)	20 (508)		
G	5-1/4 (133)	5-15/16 (151)	6-1/8 (156)	8 (203)					
H		9-1/2 (241)			11-5/8 (295)				
J	5/8 (16)	3/4 (19)	11/16 (17)	13/16 (21)	11/16 (17)				
K**	12-5/8 (321)	15-5/8 (397)	15-11/16 (398)	9-5/16 (237)	22 (559)	26 (660)	28 (711)	34 (864)	
L***	3-1/2 (89)	2-5/8 (67)	5-5/8 (143)	3-7/8 (98)	3-15/16 (100)	3-15/16 (100)	4-15/16 (125)		
M***	1-5/32 (29)	3 (76)	1-7/8 (48)			1-7/8 (48)	3-1/16 (78)	2-15/16 (75)	
N***	4-5/16 (110)	8-3/4 (222)	7-1/16 (179)	6-7/8 (175)	3-7/16 (87)	4-15/16 (125)	3-15/16 (100)	5-15/16 (151)	
P	4 (102)	5 (127)	4-5/8 (117)	5-1/2 (140)	5-3/4 (146)	6-1/2 (165)	5-3/4 (146)		
Q	6-1/8 (156)	3-1/2 (89)	2-1/4 (57)	11-1/16 (281)	9-1/4 (235)	11-1/4 (286)	12-1/4 (311)	15-1/4 (387)	
R	7-15/16 (202)	5-3/4 (146)	4-1/2 (114)	13-5/16 (338)	14-1/4 (362)	16-1/4 (413)	17-1/4 (438)	20-1/4 (514)	
S	14 (356)	16-11/16 (424)	16-9/16 (421)	18-5/8 (473)	17-5/8 (448)	19-13/16 (503)	20-5/8 (524)	20-13/16 (529)	
T**	3-1/2 (89)	5-3/8 (137)	5 (127)	1-13/16 (46)	5-1/16 (129)	7-1/16 (179)	5 (127)	6-1/4 (159)	2-3/4 (70)
*See Figure 1.									
**Heater suspension points (3/8-16 FEM).									
***Piping entrance points.									

INSTALLATION

Unpacking and Inspection

The unit was test-operated and inspected at the factory prior to crating and was in operating condition. If, upon removing it from its crate, the unit has been found to have incurred any damage in shipment, document the damage with the transporting agency and contact an authorized Factory Distributor. If you are an authorized Distributor, follow the FOB freight policy procedures.

Pre-Installation Checklist

- ☐ Check the rating plate for the water and electrical requirements of the heater to ensure that they are compatible with the water and electric supplies at the installation site.
- ☐ Read this manual and become familiar with the installation requirements of your particular heater.
- ☐ If you do not have knowledge of local requirements, check with local agencies who might have requirements concerning this installation.
- ☐ Before beginning, make preparations for necessary supplies, tools, and manpower.
- ☐ Check to see if there are any field-installed options (refer to [Table 5](#)) that need to be assembled/installed prior to unit installation. Ensure that all options ordered are at the installation site. Instructions are in this manual or in the shipped-separate option package.

Table 5. Field-Installed Options	
Option	Description
CD1	Vertical louvers, direct discharge air to provide wider throw pattern
CD2	Downturn nozzle, 25- to 65-degree variable air deflection range
CD3	Downturn nozzle, 50- to 90-degree variable air deflection range
CD4	Downturn nozzle, 25- to 65-degree variable air deflection range with vertical louvers
CD5	Downturn nozzle, 50- to 90-degree variable air deflection range with vertical louvers
CL5C	Single-stage line voltage thermostat
CM1	Thermostat guard and cover
CM3	Bracket assembly for mounting thermostat on unit
CN3F	Remote ON/OFF switch in 2 × 4 box

Heater Suspension

⚠ WARNING ⚠

- Before suspending the unit, check the supporting structure to be used to verify that it has sufficient load-carrying capacity to support the weight of the unit (refer to [Weights](#) section).
- DO NOT add additional weight to a suspended unit.

⚠ CAUTION ⚠

When the heater is lifted for suspension, support the bottom of the heater with plywood or other appropriately-placed material. If the bottom is not supported, damage could occur.

The heater is designed to be suspended for horizontal discharge using two-point suspension or downward discharge using four-point suspension. A 3/8-16 threaded nut retainer is located at each suspension point to suspend the heater using 3/8-16 threaded rods. The recommended maximum rod length is 6 feet (1.8 meters). The length of the threaded rod extending into the heater **MUST NOT** exceed 1/2 inch (13 mm). Ensure that the threaded rods are locked to the heater as shown in [Figure 2](#).

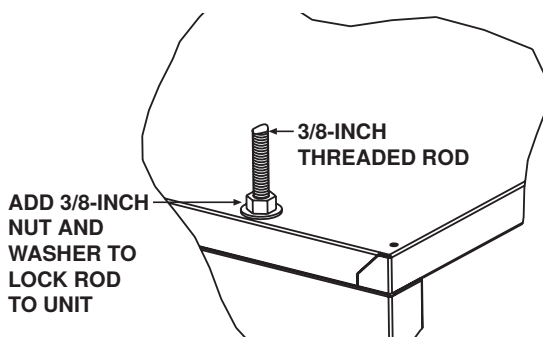


Figure 2. Heater Suspension Using Field-Supplied Threaded Rods

Piping Connections

⚠ WARNING ⚠

- Maximum operating pressure is 150 psi (10 bar, 1,034 kPa). Maximum water temperature is 250°F (121°C). Minimum water temperature is 40°F (4.4°C).
- Flange seals must not be made with rubber or other material that melts easily. In the event of overheated water, rubber seals may melt.
- If the distribution ring of the water is in a lower position than the heater, mount a thermostatic air vent.

INSTALLATION—CONTINUED

Piping Connections—Continued

Connect inlet and outlet piping using approved pipe sealant as shown in [Figure 3](#). Refer to [Table 6](#) for water connection sizes.

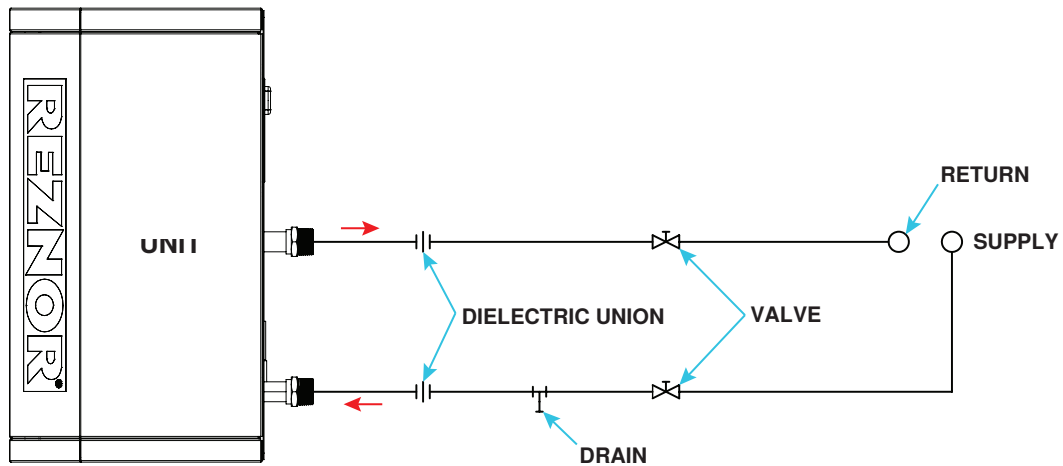


Figure 3. Recommended Piping

Table 6. Water Connection Sizes		
Unit Size (MBTUh)		
10/15, 15/21	22/31, 32/45, 44/62, 62/77, 83/104, 110/137	159/191
Male NPT Connection Size (Inches)		
3/4	1-1/4	1-1/2

Electrical Connections

⚠ CAUTION ⚠

- Ensure that all wiring is in accordance with the wiring diagram provided with the unit.
- All electrical wiring and connections, including electrical grounding **MUST BE** made in accordance with the *National Electric Code* (ANSI/NFPA No. 70, latest edition) or, in Canada, the *Canadian Electric Code* (Part 1, CSA C.22.1). In addition, the installer should be aware of any local ordinances that might apply.
- All external wiring must be within approved conduit and have a minimum temperature rise rating of 140°F (60°C). Conduit must be run so as not to interfere with the heater access panel.

Route the 115V supply wiring and any 115V control wiring through the wiring entrance shown in [Figure 1](#) and make connections inside the electrical compartment. Be sure to close and secure the electrical compartment door.

CONTROLS

Fan Speed Control

The fan speed control (see [Figure 4](#)) is shipped with unit sizes 10/15–83/104 (not used on unit sizes 110/137 and 159/191), but its use and where to mount it is optional. It may be mounted remotely or on the unit using the thermostat bracket kit (option CM3). Ensure that the control is wired in accordance with the wiring diagram provided with the unit.



Figure 4. Fan Speed Control

Fan Motor

The fan motor is equipped with automatic-reset thermal overload protection. If the motor does not run, the cause may be due to improper voltage. Ensure that the correct voltage is available at the motor.

Thermostat

The unit may be controlled by a thermostat—either an optional thermostat (refer to [Table 5](#)) or a field-supplied thermostat that must be field-installed in accordance with the thermostat manufacturer's instructions. Pay particular attention to the requirements regarding the location of the thermostat. Connect the thermostat in accordance with the wiring diagram provided with the unit (refer to [Electrical Connections](#) section).

OPERATION

Pre-Startup Checklist

Check the following **before** startup:

- ☐ Check suspension—unit must be secure and level.
- ☐ Check to ensure that clearances from combustibles are in accordance with [Table 3](#).
- ☐ Check piping for leaks.
- ☐ Check electrical wiring—ensure that all wire gauges are as recommended—service disconnect switch should be used—verify that fusing or circuit breakers are adequate for load use.
- ☐ Check polarity—verify that line voltage exists between all power wires and earth ground.
- ☐ Place literature bag that contains limited warranty form, this manual, and any control or optional information in accessible location near unit.

Startup

Start up the heater as follows:

1. Ensure that water supply and return valves are open.
2. Set thermostat to desired setting.
3. Turn ON electric power to heater.
4. Observe startup sequence: fan is energized until thermostat's call for heat is satisfied.

MAINTENANCE

WARNING

- Ensure that the electric power is OFF and the water supply and return valves are closed before servicing the unit.
- Wait until the housing and piping cool before performing maintenance.
- Eye protection is recommended when cleaning the unit.

CAUTION

- When any service is completed, ensure that the unit is reassembled correctly so that no unsafe conditions are created.
- If any of the original wire supplied with the unit must be replaced, the wiring material must have a temperature rating of at least 220°F (105°C).
- Ensure that all wiring is in accordance with the wiring diagram provided with the unit.
- If replacement parts are required, use only factory-authorized parts.

NOTE: To ensure long life and satisfactory performance, a unit that is operated under normal conditions should be inspected and cleaned at the start of each heating season. If the unit is operating in an area where an unusual amount of dust or soot or other impurities are present in the air, more frequent maintenance is recommended.

The unit is designed to operate with a minimum of maintenance. However, to ensure long life and satisfactory performance, routine service is recommended. When servicing, follow standard safety procedures and the specific instructions and warnings in this manual.

Service Checklist

The following section is designed to aid a qualified service person in maintaining and servicing this equipment. At a minimum, perform the following annually:

- ☐ Clean all dirt, lint, and grease from fan blade, fan guard, and motor.
- ☐ Replace any parts that do not appear sound.
- ☐ Check for any damaged wiring and replace as necessary.

Fan and Motor Assembly Maintenance

Inspect and clean the motor, fan guard, and blades. Remove any dirt and grease. Take care when cleaning the fan blades so as not to cause misalignment or imbalance. Check to ensure that the hub of the fan blades is secure to the shaft. If necessary, replace the assembly as follows:

1. Turn OFF electric power to unit.
2. Remove access panel and disconnect fan motor wires, capacitor wires at capacitor, and ground screw.
3. Remove assembled parts (fan guard, motor, and fan blade).
4. Disassemble and replace part(s) as needed.
5. Reassemble using replacement part(s) as needed and original parts.
6. Ensure that fan is in proper position on shaft (see [Figure 5](#)) and setscrew is tightened in accordance with torque listed in [Table 7](#).
7. Position assembly on unit and secure fan guard.
8. Rotate fan blade to check for adequate clearance. If adjustment is required, loosen mounting screws, reposition fan guard, and tighten screws to 30 inch-pounds. Repeat until assembly is positioned properly.

9. Reconnect fan motor wires in accordance with wiring diagram.
10. Install access panel.
11. Turn ON electric power to unit and check for proper operation.

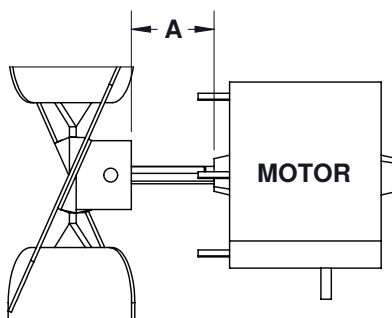


Figure 5. Fan and Motor Spacing (Refer to Table 7)

Table 7. Fan and Motor Assembly Specifications							
Setscrew Torque (Inch-Pounds ±10)							
80		120		130			
Unit Size (MBTUh)							
10/15, 15/21	22/31	32/45	44/62	62/77	83/104	110/137	159/191
Dimension A* (Inches (mm))							
1 (25)	1-1/2 (38)	2-3/8 (60.3)	2-5/16 (59)	2 (51)		1-3/8 (35)	
*See Figure 5 .							

*See [Figure 5](#).

TROUBLESHOOTING

Table 8. Troubleshooting		
Symptom	Probable Cause	Remedy
A. Unit will not start	1. No power to unit	Turn ON power and check supply fuses or circuit breaker
	2. No power to thermostat	Turn up thermostat
		Check control transformer output
	3. No power to fan motor	Tighten connections at motor terminals
	4. Defective fan motor	Replace fan motor
B. No heat (fan operating)	5. Improper thermostat location or adjustment	Refer to thermostat manufacturer's instructions
	1. Defective hydronic coil	Replace hydronic coil
C. Fan motor will not run	2. Improper thermostat location or adjustment	Refer to thermostat manufacturer's instructions
	1. Circuit open	Check wiring and connections
	2. Defective capacitor	Replace capacitor
D. Fan motor cuts out on overload	3. Defective fan motor	Replace fan motor
	1. Low or high voltage supply	Correct electric supply
	2. Defective capacitor	Replace capacitor
	3. Defective fan motor	Replace fan motor
	4. Poor airflow	Clean motor, fan, and fan guard
		Adjust louvers

INSTALLATION RECORD (TO BE COMPLETED BY INSTALLER)

Model	Serial No.	Date of Installation	Notes
	Installer	Distributor	
Name			
Company			
Address			
Phone No.			

For more information on Reznor HVAC products:

- **Contact your local Reznor representative at 1-800-695-1901**
- **Refer to the technical specifications, manuals, and consumer materials found at www.reznorhvac.com**

