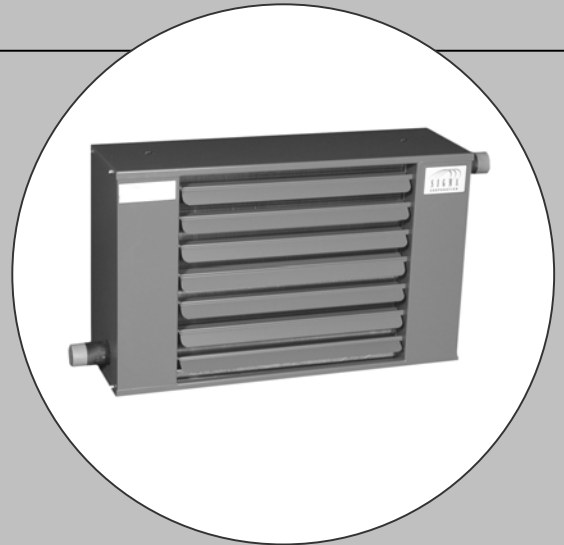


# Unit Heaters

Installation and Operation Manual



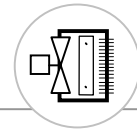
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### INSTALLER'S RESPONSIBILITY

This equipment has been inspected, tested and shipped free of defects. However, it is the installer's responsibility to check for loose wires, leaks, or loose fasteners, and correct any problem that may be found. Inspect the equipment immediately when received to determine if there is any damage from shipment. First, check for visible damage to the unit. Turn the fan by hand to determine if any damage has occurred. If any damage has been found, the receiver should note the damage on the bill of lading and immediately file a claim with the transport company.

It is the equipment owner's responsibility to provide any scaffolding or other apparatus to allow service or periodic maintenance to this equipment.

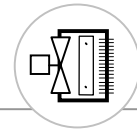
**Warning:** Improper installation, adjustment, alteration, service, or maintenance can cause damage, injury, or death. Read this manual thoroughly before installing, operating, or servicing.

### INSTALLATION

**Warning:** Disconnect all power, steam, or water supplies before installing or servicing the unit. Do not depend on a thermostat or other switch as sole means of disconnecting power. Always disconnect power at the main breaker.

**Caution:** Insure that all power sources conform to the requirements of the unit heater or damage to the unit will result. All external wiring and piping must conform to the local and national codes.





## UNIT MOUNTING

Install unit heaters to meet Occupational Safety and Health Act (OSHA). Unit heaters mounted less than 8 feet (2.4 meters) above the floor must be equipped with an optional fan guard that meets OSHA requirements. Ensure that all hardware used in the suspension of each unit heater is more than adequate. Failure to do so may result in extensive property damage, severe personal injury, or death.

Suspension nuts are provided on the top of all models. Support rods should be installed so that they support the total weight of the unit heater to assure that no strain is placed on the supply and return piping. Provisions for removal of the unit from the suspension rods may be desirable for future servicing. Otherwise, the provision of sufficient clearance around the unit heater for future maintenance and servicing is required.

**Note:** Increasing clearance distances may be necessary if there is any possibility of distortion or discoloration of adjacent materials.

**Important:** Unit heaters must be hung level from side to side, and front to back. Failure to do so will result in poor performance and/or premature failure of the unit.

It is assumed that the type of system to be used has been selected by the design engineer. The diagrams shown in the manual are for different types of steam or hot water systems.

It is important that the system be kept clean and free of foreign substances, such as excessive joint materials, etc.

For steam systems it is recommended that the unit be mounted level for proper condensate drainage. Swing joints should be used in piping, and piping should be pitched down so condensate can drain freely.

Isolators are not required, but may be desirable for some applications. Refer to dimensional drawings for unit weights.

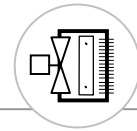
Hanging hardware is not included with the unit (to be field supplied).

Place unit heaters at points of greatest heat loss. Blanket outside doorways and provide ample coverage of window areas. Keep the unit heaters away from objects that will impede the full and natural air delivery of the units.

## PIPING

Refer to the appropriate model dimensional drawing to determine the piping connection type, size, and location. Follow standard practices and codes when installing piping. Provide swing joints for expansion purposes, unions and shut-off valves for servicing purposes, as well as valves and traps for control purposes. Refer to Typical Piping Connections Diagrams for details.





### COIL OPERATION

Maximum working pressure is 250 psig at 300°F water temperature. Recommended Maximum of 75 psig for horizontal and 15 psig for vertical unit heaters for saturated steam applications. Higher operating temperatures and pressures require non-standard coils.

### UNIT OPERATION

Most basic unit heater systems are controlled by a room thermostat. Install thermostat on an inner wall or column to achieve optimum control of that area. Set thermostat for desired temperature.

For steam systems, a low temperature set-point limit could be used to prevent the fan from blowing cold air when there is no steam passing through the coil.

Small hot water systems could have the circulating pump controlled directly by the room thermostat. Large systems may use zone valves to control individual unit heaters where constant water circulation is used on the pain system.

A louvered cone air diffuser is available as an optional accessory for vertical unit heaters.

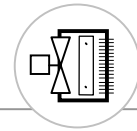
### MAINTENANCE

**Warning:** Disconnect all power, steam or water supplies before installing or servicing the unit. Do not depend on a thermostat or other switch as sole means of disconnecting power. Always disconnect power at the main breaker.

**Caution:** Allow rotating fans to stop before servicing to avoid serious injury to fingers and hands.

**Motor Lubrication.** Standard motors are pre-lubricated and normally are not equipped with grease fittings. For motors that are equipped with grease fittings, contact the local motor manufacturer service facility to obtain information on the grease or oil type, and the method and frequency of lubricating. The frequency of lubricating will depend on operating conditions and length of running time.





### CLEANING

For cleaning or maintenance purposes, the fan-motor assembly can be removed from the unit heater. The unit casing, fan, diffuser, and coil should be cleaned thoroughly once each year. The heating performance and air throw depend on cleanliness of the coil and fan blades.

When cleaning the fan-motor assembly, wipe all excess dirt or lubricant from the motor casing. Buildup on the motor casing will cause it to run hot and eventually cause inconvenience or discomfort due to random automatic thermal overload shut down, or could cause internal motor damage. Note: standard unit heater motors have integral automatic thermal overload protection.

Clean the coil by loosening dirt with a brush on the fan side of the coil, then operate the unit allowing the fan to blow the loosened dirt through the unit. Use high pressure air or steam on the coil away from the fan.

Use a damp cloth to clean the casing, fan blades, or diffuser. If rust spots are found on the casing, they should be cleaned and repainted.

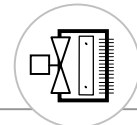
Tighten the fan guard, motor frame and fan bolts. Check the fan for clearance in the panel orifice and free rotation.

The heater system should be checked once per year by a qualified technician. All maintenance and service information should be recorded.

**TABLE 1 TROUBLE-SHOOTING CHART**

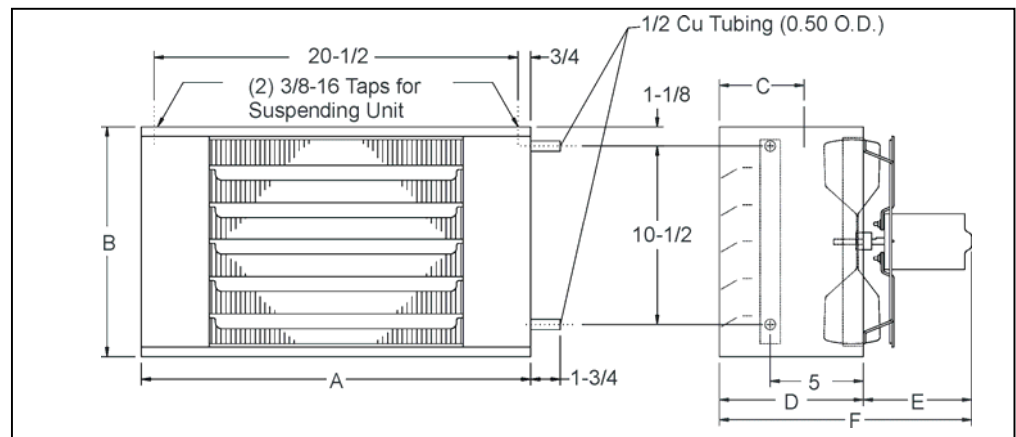
SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
Leaking Coil	<ol style="list-style-type: none"> <li>1. Frozen coil</li> <li>2. Defective coil</li> <li>3. Corrosion</li> <li>4. Leak in joint</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace coil.</li> <li>2. Replace coil.</li> <li>3. Replace coil.</li> <li>4. Braze joint if joint is exposed where leak has occurred.</li> </ol>
Poor output on steam	<ol style="list-style-type: none"> <li>1. Check for air in coil</li> <li>2. Lint on coil fins</li> </ol>	<ol style="list-style-type: none"> <li>1. Repair or replace thermostatic air vent.</li> <li>2. Clean coil and fins. Check filter and clean.</li> </ol>
Poor output on steam or hot water	<ol style="list-style-type: none"> <li>1. No circulation of water through coil</li> <li>2. Short cycling of motor</li> <li>3. Backward rotating motor</li> </ol>	<ol style="list-style-type: none"> <li>1. Check circulation pump. Check for blocked tubes.</li> <li>2. Check voltage and correct. Remove and service motor to confirm if automatic overload needs repair.</li> <li>3. Change direction of motor rotation to by making appropriate wiring changes as recommended by the motor manufacturer.</li> </ol>
Noisy or vibrating unit	<ol style="list-style-type: none"> <li>1. Damaged fan</li> <li>2. Dirty fan</li> </ol>	<ol style="list-style-type: none"> <li>1. Change fan.</li> <li>2. Clean fan.</li> </ol>





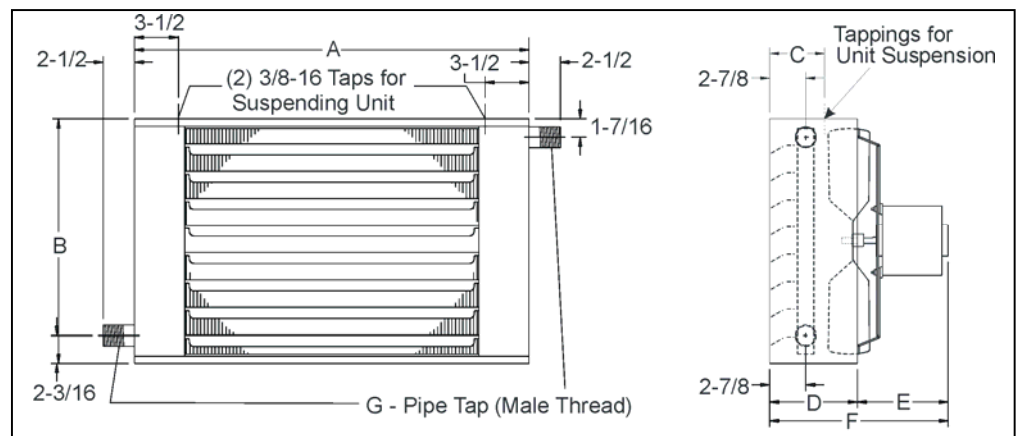
**FIGURE 1**

**DIMENSION DIAGRAM FOR HORIZONTAL UNIT HEATER WITH SERPENTINE COIL (30-H & 40-H)**



**FIGURE 2**

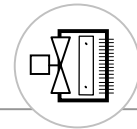
**DIMENSION DIAGRAM FOR HORIZONTAL UNIT HEATER WITH MULTI-CIRCUITED COIL (47-H TO 245-H)**



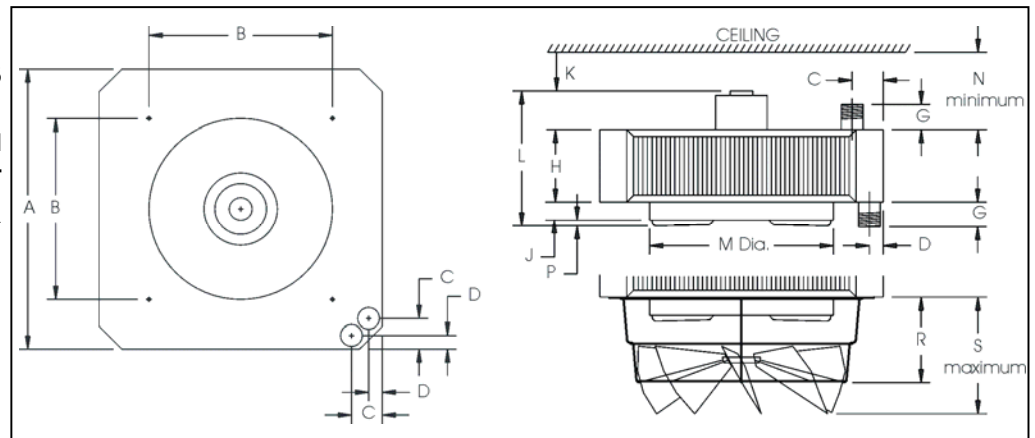
**TABLE 2 HORIZONTAL UNIT HEATER SPECIFICATIONS**

MODEL	FIGURE REF.	DIMENSIONS (IN)							WT (LB)	MAX. MTG. HT (FT)	MAX THROW (FT)	
		A	B	C	D	E	F	G			W/ HORIZ. LOUVERS	W/ VERT. LOUVERS
30-H	1	22	13.5	4.75	8	7.50	15.5	0.50	40	9	18	23
40-H	1	22	13.5	4.75	8	7.50	15.5	0.50	40	10	23	29
47-H	2	27	16.5	5.00	8.5	7.75	16.25	1.25	48	10	23	29
58-H	2	27	16.5	5.00	8.5	9.50	18.0	1.25	48	10	28	35
62-H	2	31.5	19.5	5.625	10	9.50	19.5	1.25	71	10	25	30
84-H	2	31.5	19.5	5.625	10	7.50	17.5	1.50	76	12	32	40
133-H	2	37.0	24.0	5.875	10	7.75	17.75	1.50	108	13	40	50
200-H	2	42.5	28.5	5.50	10	9.50	19.5	1.50	148	15	50	64
245-H	2	46.5	31.5	5.50	10	9.50	19.5	1.50	172	16	54	68





**FIGURE 3**  
**DIMENSION DIAGRAM**  
**FOR VERTICAL**  
**UNIT**  
**HEATER**



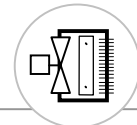
**TABLE 3**      **VERTICAL UNIT HEATER SPECIFICATIONS**

MODEL	DIMENSIONS (IN)								
	A	B	C	D	E	F	G	H	J
40-V	18.5	10	2.625	1.25	1.5	3/8-16 UNC	2.75	6.125	1.25
50-V	18.5	10	2.625	1.25	1.5	3/8-16 UNC	2.75	6.125	1.25
54-V	22	13	2.625	1.25	1.5	3/8-16 UNC	2.75	6.125	1.5
67-V	22	13	2.625	1.25	1.5	3/8-16 UNC	2.75	6.125	1.5
78-V	26.5	16	2.625	1.25	1.5	3/8-16 UNC	2.75	7.625	1.625
100-V	26.5	16	2.625	1.25	1.5	3/8-16 UNC	2.75	7.625	1.625
145-V	30.875	20	3.375	1.5	2	3/8-16 UNC	2.75	7.625	2
210-V	36.875	25	3.375	1.5	2	3/8-16 UNC	2.75	7.625	2.375
300-V	44.125	30	4.125	2	2.5	1/2-13 UNC	3	9.125	3
370-V	44.125	30	4.125	2	2.5	1/2-13 UNC	3	13.625	3
375-V	44.125	30	4.125	2	2.5	1/2-13 UNC	3	9.125	3
480-V	44.125	30	4.125	2	2.5	1/2-13 UNC	3	13.625	3

MODEL	DIMENSIONS (IN)							WT (LB)	MAX. MTG. HT. (FT)	
	K	L	M	N	P	R	S		WITHOUT LOUVER	WITH LOUVER
40-V	3	11.5	12.25	6	1.125	6.25	8.875	49	12	16
50-V	3	11.5	12.25	6	1.125	6.25	8.875	50	17	22
54-V	3	11.875	14.375	6	1.25	7	10	62	13	16
67-V	3	11.875	14.375	6	1.25	7	10	63	19	23
78-V	2	12.25	16.375	7	1	7.25	10.625	85	14	17
100-V	2	12.25	16.375	7	1	7.25	10.625	90	21	25
145-V	2.375	13.5	20.375	7	1.5	9	13.25	118	23	28
210-V	4	15.25	24.5	7	1.25	8.5	11.875	146	26	32
300-V	3	15.875	30.5	7	0.75	9.5	13.75	200	26	32
370-V	1.875	19.25	30.5	7	0.75	9.5	13.75	265	28	34
375-V	4.5	17.375	30.5	8	0.75	9.5	13.75	205	40	48
480-V	2.5	19.875	30.5	8	0.75	9.5	13.75	270	42	52







**FIGURE 4 TYPICAL PIPING CONNECTIONS**

