September, 2006

INSTALLATION INSTRUCTIONS
vertical deflector blades horizontal steam/hot water unit heaters
model series HSB/HC/WTC/WSC

Model Sizes 18 & 24

1. Removal of horizontal deflector blades (Figure 1).
   a. Push horizontal deflector blade against coil spring until it is compressed.
   b. While coil spring is compressed, pop out deflector blade from opposite end.
2. Mounting flange installation (Figure 3).
   Using the mounting flanges as templates, drill holes in top and bottom unit casing and fasten with sheet metal screws (by others) as shown in Figure 3.
3. Replacement of horizontal deflector blades (Figure 1).
   a. Replace coil spring on horizontal deflector blade (the spring should be located so that it is on the left side when facing unit. The blade should curve downward with the rounded edges facing outward).
   b. Insert left tab of horizontal deflector blade (with coil spring intact) into hole and compress coil spring.
   c. Insert other tab into hole on opposite side of unit heater.
4. Vertical deflector blade installation (Figure 3).
   a. Insert the support rod through the holes provided in the mounting flanges. Secure this support with the acorn push nuts provided.
   b. Assemble the coil spring provided to the straight end of each deflector blade and insert the ends of the blades with the coil springs into holes in mounting flanges. Push the deflector blade until the beveled end slips into the hole of the opposite mounting flange.

Model Sizes 33 thru 193

1. Removal of horizontal deflector blades (Figure 1).
   a. Push horizontal deflector blade against coil spring until it is compressed.
   b. While coil spring is compressed, pop out deflector blade from opposite end.
2. Vertical deflector blade installation (Figure 2).
   a. Place coil spring on bottom end of the vertical deflector blade.
   b. Insert bottom tab of vertical deflector blade (with coil spring intact) into the embossed hole provided on the bottom unit baffle.
   c. Push deflector blade against coil spring until it is compressed.
   d. Insert top tab of vertical deflector into hole provided in upper unit baffle (if correctly inserted the deflector blade will be straight up and down and can be turned from side to side).
3. Replacement of horizontal deflector blades (Figure 4).
   a. Replace coil spring on horizontal deflector blade (the spring should be located so that it is on the left side when facing unit. The blade should curve downward with the rounded edges facing outward).
   b. Insert left tab of horizontal deflector blade (with coil spring intact) into hole and compress coil spring.
   c. Insert other tab into hole on opposite side of unit heater.

Figure 1
Detaching Horizontal Blades

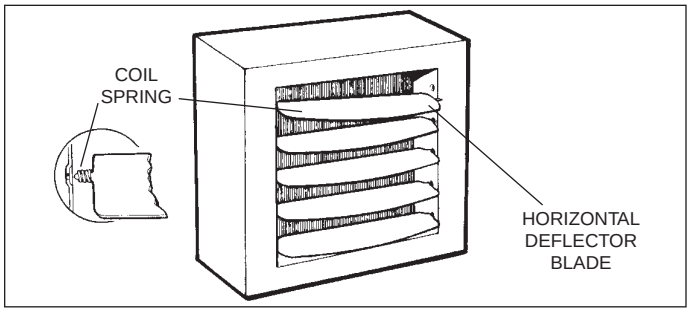


Figure 2
Vertical Blades Installed

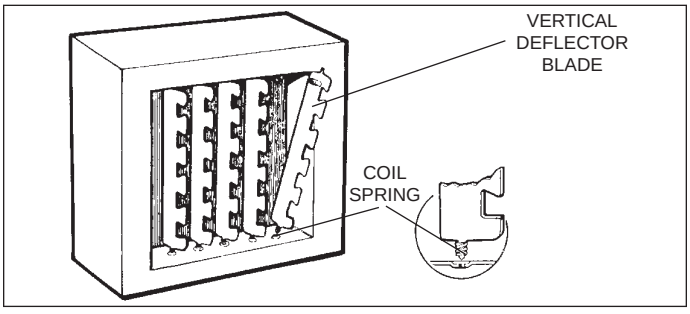


Figure 3
Horizontal and Vertical Blades Installed
Model Sizes 18 & 24

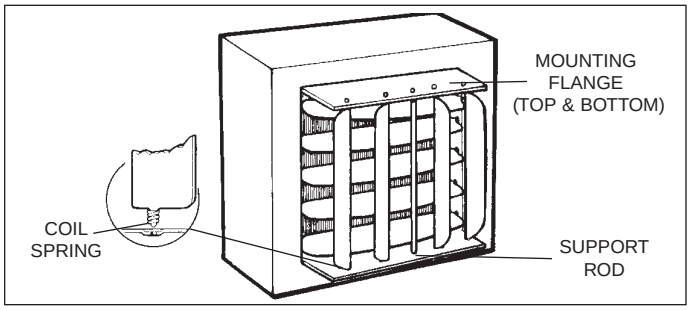
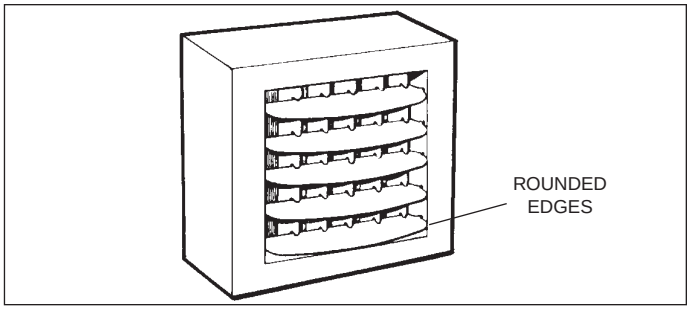


Figure 4
Horizontal and Vertical Blades Installed
Model Sizes 33 thru 193



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8/06 - Litho in USA

September, 2006

INSTALLATION INSTRUCTIONS
solid-state speed controller steam/hot water unit heaters

DANGER

Appliances with Power Code 01 must not be installed where they may be exposed to a potentially explosive or flammable atmosphere.

⚠ WARNING

1. Disconnect power supply before making wiring connections to prevent electrical shock and equipment damage.
2. All appliances must be wired strictly in accordance with wiring diagram furnished with the appliance. Any wiring different from the wiring diagram could result in a hazard to persons and property.
3. All wiring must be done with wiring material having a temperature rating of at least 105°C.

IMPORTANT

The use of this manual is specifically intended for a qualified installation and service agency and is to be used in conjunction with the unit heater installation and service manual. All installation and service of these units must be performed by a qualified installation and service agency. Manuals may contain excerpts from component supplier literature adapted for these products. Any accompanying component supplier literature is for general information.

⚠ CAUTION

Do not reuse any electrical component which has been wet. Such component must be replaced.

Application

For remote control of air delivery volume, solid-state speed controllers are available for steam/hot water unit heaters, models HS/HSB/HC and WTC/WSC, sizes 18 through 108 with 115V/60Hz/1ph, Power Code 01 motors. The controller adjusts motor input voltage to maintain speed regulation at any setting between “High” and “Low”. The control is rated for 5.0 Amps.

Installation and Wiring Connections

1. The speed controller must be field mounted to a standard 2” x 4” junction box.
2. Disconnect power supply before making wiring connections to prevent electrical shock and equipment damage.
3. Installation of wiring must conform with local building codes, or in the absence of local codes, the National Electric Code ANSI/NFPA 70 - Latest Edition. Unit must be electrically grounded in conformance to this code. In Canada, wiring must comply with CSA C22.1, Electrical Code.
4. The unit must be wired strictly in accordance with the wiring diagram furnished with the unit. Any wiring different from the wiring diagram could result in a hazard to persons and property. See Figure 2.1 or 2.2 for the applicable wiring diagram, by unit heater motor size.

Operation Check

1. Once the unit, thermostat, and speed controller have been installed, set the thermostat to the lowest setting and the speed controller to minimum speed.
2. Turn on the power to the system.
3. Adjust the thermostat above room temperature. The motor should start on low speed. If the motor does not start, two possible reasons are:
   a. Check power supply and wiring to ensure the unit is wired properly and the power turned on.
   b. The speed controller has a factory-set minimum set point. If the unit motor does not start at this minimum set point, the minimum set point may be adjusted. See step 4 for instructions.
4. Adjust the speed controller to select the desired fan speed. If a larger speed range is required, the factory-set minimum set point can be adjusted as outlined in the following steps. Note that on new motors, bearings may be slightly tight until motor is “broken-in”. Do not adjust speed controller below minimum speed level until motor has experienced some running time.

a. Remove the speed adjustment knob.

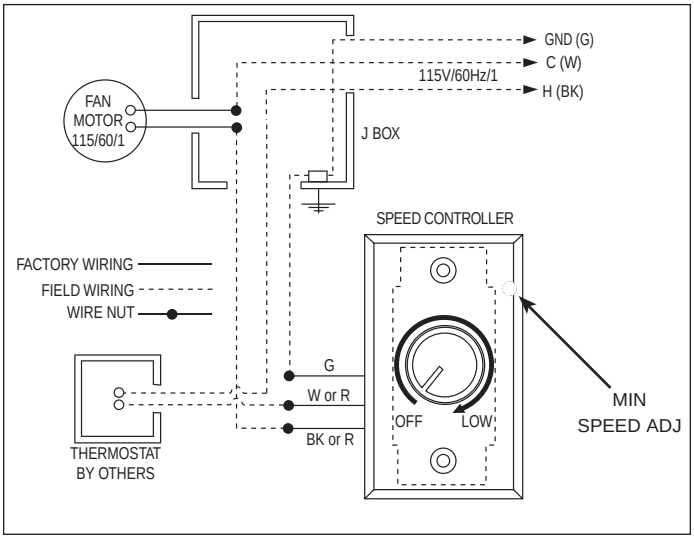
b. Remove the two screws that hold the faceplate to the speed controller to remove the faceplate.

c. On the front upper right-hand corner of the speed controller, there is a screw labeled MIN SPEED ADJ (see Figure 2.1 or 2.2). With a small screwdriver, rotate counter-clockwise to increase minimum speed or clockwise to decrease the minimum speed. Motor will operate from this minimum speed to full speed.

d. Replace the faceplate, screws, and knob

Figure 2.1

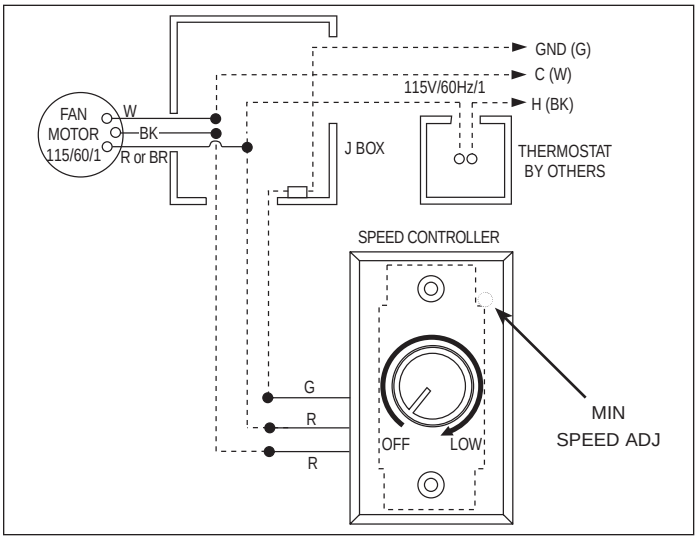
Wiring Diagram - 1/60 HP, 1/25 HP, 1/12 HP Motors



SPEED CONTROL CANNOT BE USED TO TURN UNIT ON/OFF FOR 3-LEAD MOTORS. A THERMOSTAT OR DISCONNECT SWITCH MUST BE USED.

Figure 2.2

Wiring Diagram - 1/8 HP Motors



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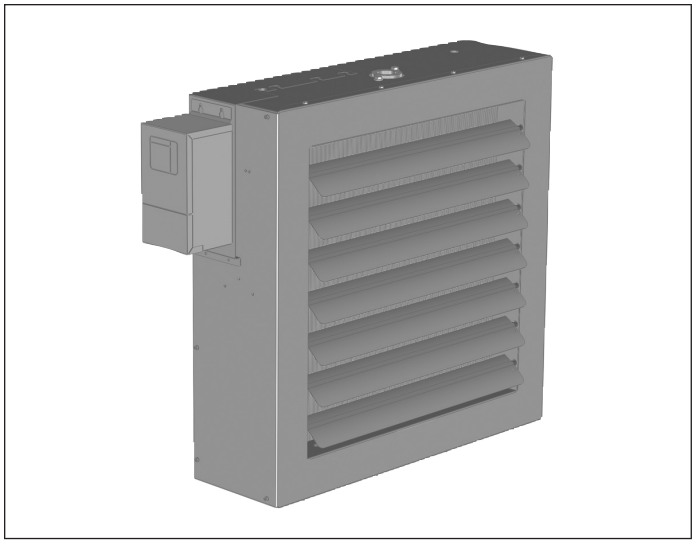
8/06- Litho in USA

September, 2006

INSTALLATION
Step Down Transformer Kit
models HSB/HC, V/VN, PT/PTN, WTC/WSC, WVC/WVN, WPC/WPN
manufactured after September 1, 2005



⚠ WARNING

1) Disconnect power supply before making wiring connections to prevent electrical shock and equipment damage.
2) All appliances must be wired strictly in accordance with wiring diagram furnished with the appliance. Any wiring different from the wiring diagram could result in a hazard to persons and property.
3) Any original factory wiring that requires replacement must be replaced with wiring material having a temperature rating of at least 105°C.
4) Ensure that the supply voltage to the appliance, as indicated on the serial plate, is not 5% greater than rated voltage.

⚠ CAUTION

Ensure that the supply voltage to the appliance, as indicated on the serial plate, is not 5% less than the rated voltage.

IMPORTANT

The use of this manual is specifically intended for a qualified installation and service agency. All installation and service of these units must be performed by a qualified installation and service agency. These manuals may contain excerpts from component supplier literature adapted for Modine products. Any accompanying component supplier literature is for general information.

Special Precautions

1) Installation of wiring must conform with local building codes, or in the absence of local codes, the National Electric Code ANSI/NFPA 70 - Latest Edition. Unit must be electrically grounded in conformance to this code. In Canada, wiring must comply with CSA C22.1, Part 1, Electrical Code.
2) Disconnect supply voltage.
3) Verify electrical system supply voltage to ensure it matches the accessory transformer primary voltage rating.
4) Verify that the unit heater supply voltage listed on the serial plate is 115 Volts, 60 Hertz, 1 Phase.
5) Verify that the accessory transformer is correctly sized for the unit type, size, and supply voltage. The accessory item codes and kVA sizes are shown in Table 1.1.

Table 1.1
Transformer Accessory Item Codes and Ratings

		Supply Voltage					
		200V/60Hz/ 1 or 3 phase		230/460V/ 60Hz/3 phase		575V/60Hz/ 3 phase	
Model	Size	Item Code	kVA	Item Code	kVA	Item Code	kVA
HSB/HC, WTC/WSC	18-63	48094	0.50	48099	0.25	48108	0.25
	86-121			48100	0.50	48109	0.50
	165-193	48095	1.00	48101	0.75	48110	0.75
	258-340			48102	1.00	48111	1.00
V/VN, WVC/WVN	42-59	48096	0.50	48103	0.25	48112	0.25
	78-139			48104	0.50	48113	0.50
	161-212	48097	1.00	48105	0.75	48114	0.75
	247-333			48106	1.00	48115	1.00
PT/PTN, WPC/WPN	279-333	48098	1.00	48107	1.00	48116	1.00

Transformer to Mounting Bracket Installation

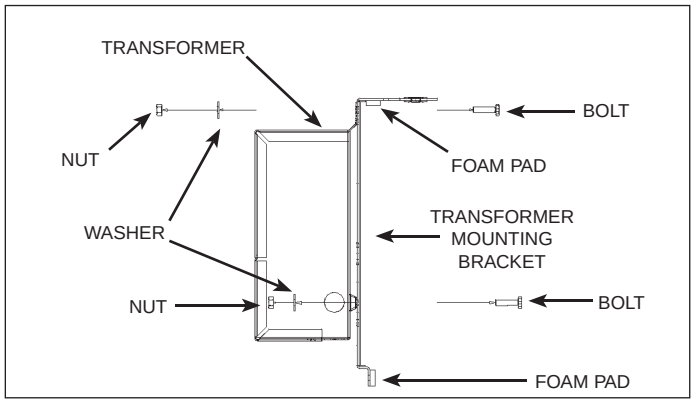
1) Review Table 2.1 to identify if the transformer accessory requires a factory supplied bracket to mount the transformer to the unit heater (on some models, the transformer mounts directly to the heater without the use of an extra bracket). If a bracket is not required, skip to the section titled, **"Mounting the Transformer Accessory to the Unit Heater"**.

Table 2.1
Transformer Accessory Mounting Method

		Supply Voltage					
		200V/60Hz/ 1 or 3 phase		230/460V/ 60Hz/3 phase		575V/60Hz/ 3 phase	
Model	Size	Item Code	Mount	Item Code	Mount	Item Code	Mount
HSB/HC, WTC/ WSC	18-63	48094	Bracket	48099	Direct	48108	Direct
	86-121			48100	Bracket	48109	Bracket
	165-193	48095	Bracket	48101	Bracket	48110	Bracket
	258-340			48102		48111	
V/VN, WVC/ WVN	42-59	48096	Bracket	48103	Direct	48112	Direct
	78-139			48104	Bracket	48113	Bracket
	161-212	48097	Direct	48105	Direct	48114	Direct
	247-333			48106		48115	
PT/PTN, WPC/WPN	279-333	48098	Bracket	48107	Bracket	48116	Bracket

2) Mount the Transformer to the mounting bracket using the ¼"-20 cap screws and ¼" nuts provided. Cap screws must be inserted from the back of the mounting bracket and into the transformer mounting holes as shown in Figure 1.1.

Figure 1.1
Transformer to Mounting Bracket Installation

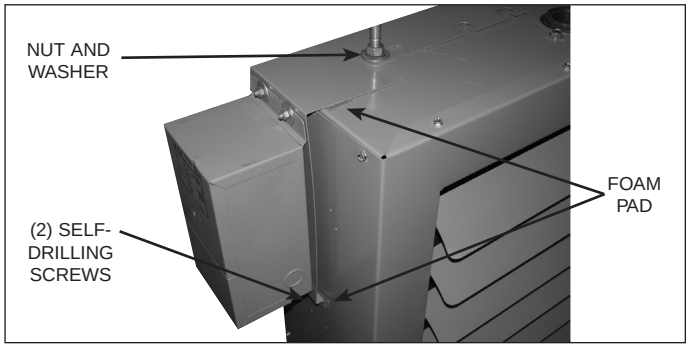


Mounting the Transformer Accessory to the Unit Heater

For HSB/HC, WTC/WSC Models Bracket Mount:

1) Mount the transformer/mounting bracket assembly on the left side of the unit heater (as viewed from the front, air blowing toward you) by slipping the bracket over the unit-mounting rod. Tighten the unit mounting rod jam nut onto the transformer mounting bracket (see Figure 2.1).
2) Insert the foam pad between the bottom of the mounting bracket and the unit heater side panel as shown in Figure 2.1. Use two #10-24x½" self-drilling screws to fasten the transformer mounting bracket to the unit heater side panel, using the side panel screw locating dimples.

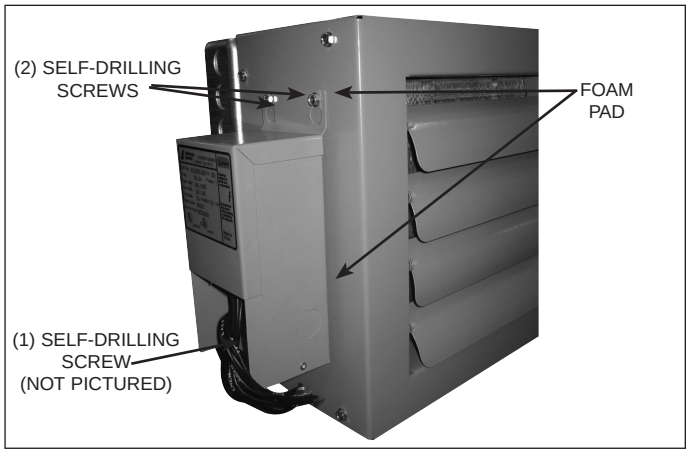
Figure 2.1
HSB/HC, WTC/WSC Model Bracket Mounted Transformer



For HSB/HC, WTC/WSC Models Direct Mount:

1) Insert the foam pad between the integral top transformer mounting bracket and the unit heater side panel as shown in Figure 2.2. Use two #10-24x½" self-drilling screws to fasten the transformer to the unit heater side panel, using the side panel screw locating dimples.
2) Insert the foam pad between the back of the transformer j-box and the unit heater side panel as shown in Figure 2.2. From within the transformer j-box, use one #10-24x½" self-drilling screw to fasten the transformer to the unit heater side panel, using the side panel screw locating dimples.

Figure 2.2
HSB/HC, WTC/WSC Model Direct Mounted Transformer



For V/VN, PT/PTN, WVC/WVN, WPC/WPN Models Bracket Mount:

1) The transformer/mounting bracket assembly is mounted on the top of the casing for V/VN,WVC/WVN models and the back of the casing for PT/PTN, WPC/WPN models. The top for V/VN,WVC/WVN and back for PT/PTN, WPC/WPN is identified as the casing side opposite the side of leaving airflow with the fan guard.
2) Insert one foam pad between the bottom of the mounting bracket and the unit heater casing panel as shown in Figure 3.1. Insert the remaining foam pad between the mounting foot of the bracket and the unit heater casing panel, as indicated in Figure 3.1(but not shown). On PT/PTN, WPC/WPN units, use two 5/16" nuts with lock washers to fasten the transformer mounting bracket to the existing threaded studs on the unit heater. See Figure 3.2.
3) On V/VN,WVC/WVN units, use three #10-24x½" self-drilling screws to fasten the transformer bracket to the unit heater casing panel. See Figure 3.1. On PT/PTN, WPC/WPN units, use two #10-24x½" self-drilling screws to fasten the transformer bracket to the unit heater casing. See Figure 3.2.

Figure 3.1
V/VN, WVC/WVN Model Bracket Mounted Transformer

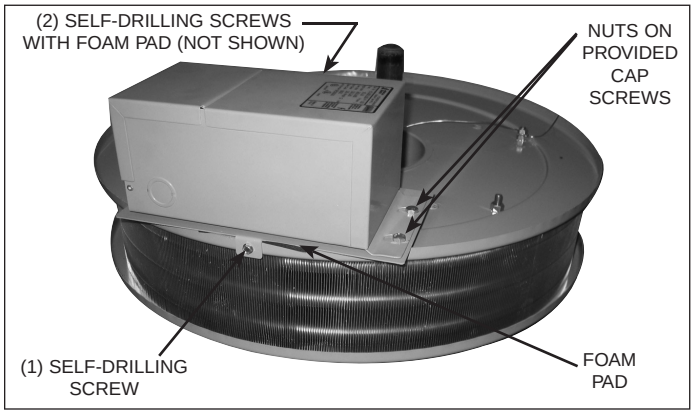
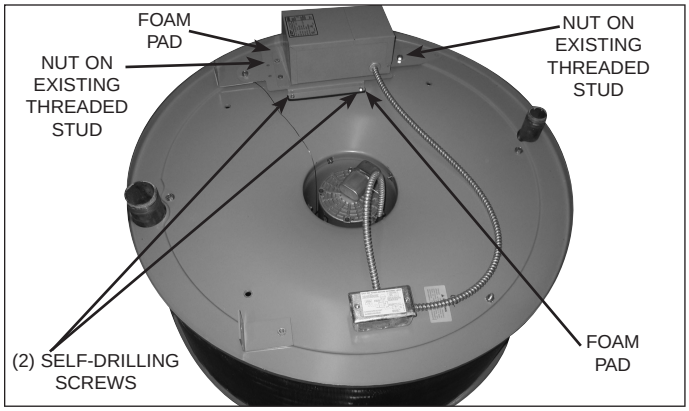


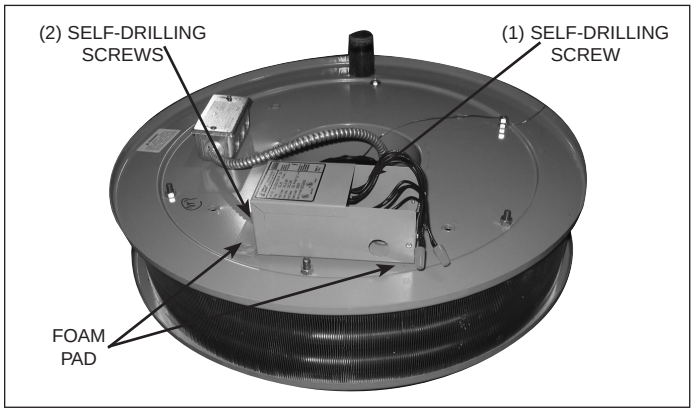
Figure 3.2
PT/PTN, WPC/WPN Bracket Mounted Transformer



For V/VN, WVC/WVN Models Direct Mount:

1) Insert the foam pad between the integral top transformer mounting bracket and the top of the casing for V/VN, WVC/WVN models. The top for V/VN, WVC/WVN is identified as the casing side opposite the side of leaving airflow with the fan guard.
2) Use two #10-24x½" self-drilling screws to fasten the transformer to the unit heater casing panel, using the casing panel screw locating guide holes.
3) Insert the foam pad between the back of the transformer j-box and the unit heater casing panel as shown in Figure 3.3. From within the transformer j-box, use one #10-24x½" self-drilling screw to fasten the transformer to the unit heater casing panel, using the casing panel screw locating guide hole.

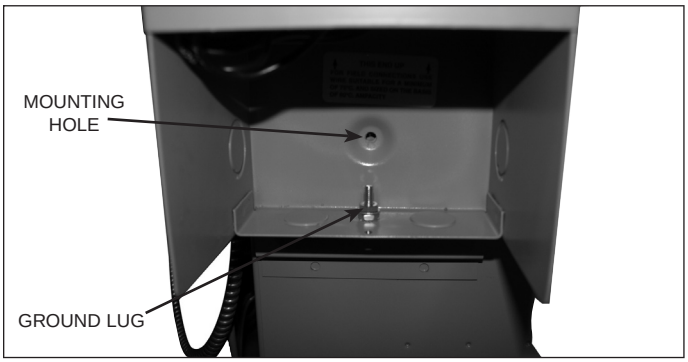
Figure 3.3
V/VN, WVC/WVN Model Direct Mounted Transformer



Wiring the Transformer Accessory to the Unit Heater

1) Install the wiring harness (conduit, connectors and wires) between the transformer junction box and the unit heater junction box.
2) Connect the wiring harness wiring ends in the unit heater junction box as shown in the unit heater wire diagram for 115V single-phase power.
3) Within the transformer junction box, interconnect the transformer secondary leads and wiring harness wiring ends as follows:
   - Transformer wires X1 and X3 are connected to the white harness wire.
   - Transformer wires X2 and X4 are connected to the black harness wire.
4) Connect the incoming electrical power feed line to the transformer junction box with an appropriate box connector.
5) Within the transformer junction box, connect the incoming electrical power feed circuit ground wire to the transformer grounding lug. See Figure 3.4 for location of the ground lug.

Figure 3.4
Transformer Accessory Ground Lug Location



6) Within the transformer junction box, interconnect the transformer primary wires (labeled H1, H2, etc.) and connect the incoming electrical power feed wires as indicated in Table 3.1 for the voltage and transformer manufacturer supplied. The connection charts are also provided on the transformer casing.

Table 3.1
Transformer Accessory Primary Wiring Connections

Primary Voltage	208		240	480	600	
Supplier	Hevi-Duty	Jefferson	All	All	Hevi-Duty	Jefferson
Size	1.0KVA	All	All	All	All	All
Interconnect Primary	H2 to H3	None Required	H1 to H3 H2 to H4	H2 to H3	None Required	
Connect Primary Lines To	H1 & H4	H1 & H2	H1 & H4	H1 & H4	H1 & H2	H1 & H2

7) Turn the power supply on to unit. Verify the voltage from the transformer to unit. Also verify that the unit operates as detailed in the unit Installation and Service Manual, 1-550 or AIR1-550 latest edition.

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8/06 - Litho in USA

75-550.7
5H70798A Rev. G

September, 2006

INSTALLATION INSTRUCTIONS
discharge air deflectors
models V/VN, VE, PT/PTN, WPC/WPN, WVC/WVN

⚠WARNING

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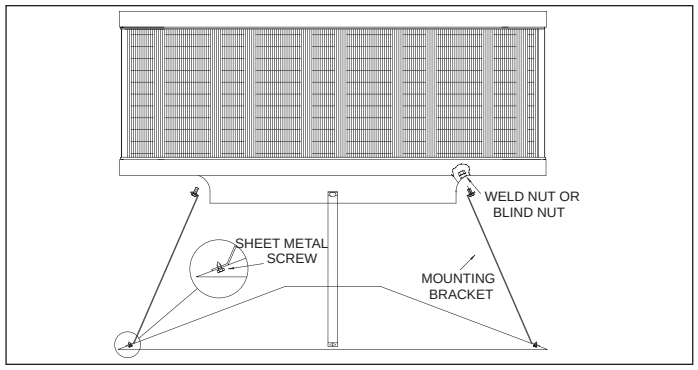
Truncone

Start sheet metal screws into 1/8" hole in mounting bracket. Fasten brackets to bottom cover of unit heater with machine screws through the mounting brackets into the blind nuts. See Figure 1.1.

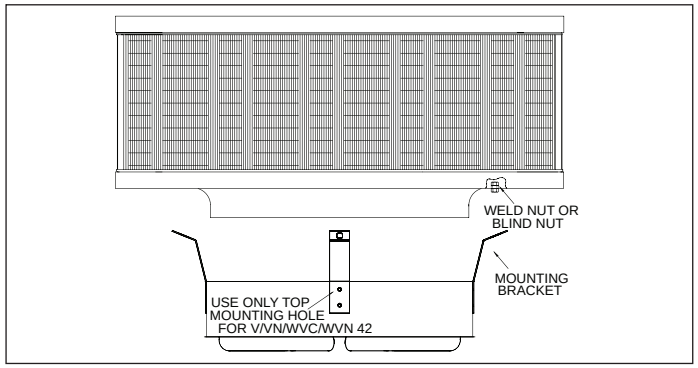
Figure 1.1 - Models V/VN/WVC/WVN 42-610 & VE 50-500



Cone Jet

Fasten cone jet mounting bracket to cone jet with screws. Fasten cone jet to bottom cover with machine screws. See Figure 1.2.

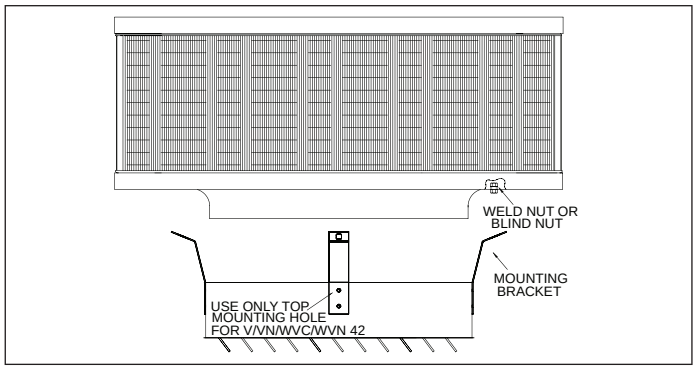
Figure 1.2 - Models V/VN/WVC/WVN 42-610 & VE 50-500



Louver
All Models Except V/PT/WVC/WPC952

Fasten louver mounting brackets to louver with screws. Fasten louver assembly to bottom cover of unit heater with machine screws. Tighten all screws securely. See Figure 1.3.

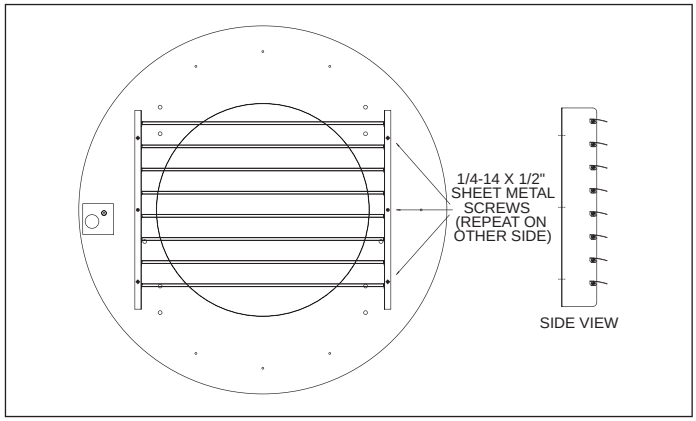
Figure 1.3 - Models V/VN/WVC/WVN 42-610 & VE 50-500



One-Way Louver
Models V/PT/WVC/WPC952 Only

Fasten one-way louver mounting bracket to one-way louver with the screws & nuts. Fasten assembly to unit. It may be necessary to remove the outlet fan guard. See Figure 1.4

Figure 1.4 - Models V/WVC952 and PT/WPC952

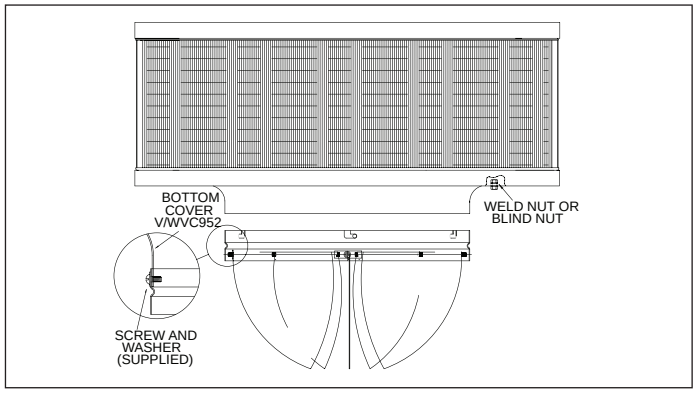


INSTALLATION

Two-Way Louver - Model V/WVC952 Only

Fasten two-way louver mounting bracket to two-way louver with the screws & nuts. Fasten assembly to unit. It may be necessary to remove the outlet fan guard. See Figure 2.1.

Figure 2.1 - Models V/WVC952



NOTE: Some vertical unit heaters will not have weld nuts in the bottom cover. In these cases, insert the blind nuts included in the kit into the holes in the bottom cover from the outside. The air deflector is then mounted to the unit by tightening machine screws through the mounting brackets into the blind nuts.

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