

INSTALLATION AND SERVICE MANUAL

electric unit heaters

models VE and PTE

Model VE



Model PTE



WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death, and could cause exposure to substances which have been determined by various state agencies to cause cancer, birth defects or other reproductive harm. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.

IMPORTANT

The use of this manual is specifically intended for a qualified installation and service agency. A qualified installation and service agency must perform all installation and service of these appliances.

FOR YOUR SAFETY

The use and storage of gasoline or other flammable vapors and liquids in open containers in the vicinity of this appliance is hazardous.

Inspection On Arrival

1. Inspect unit upon arrival. In case of damage, report immediately to transportation company and your local Modine sales representative.
2. Check rating plate on unit and motor to verify that power supply and motor specification requirements meet available electric power at the point of installation.
3. Inspect unit received for conformance with description of product ordered (including specifications where applicable).

General Information

Installation and wiring of these electric unit heaters must conform to all applicable local codes and the National Electric Code. Wiring of these electric unit heaters should only be performed by a qualified electrician.

These electric unit heaters are Listed by Underwriters Laboratories, Inc. Representative samples of this product have been evaluated by UL and meet the applicable U.S. and Canadian safety standards with components as furnished.

All replacement parts and controls are proprietary in that they have all been designed, tested, and approved for the particular application to insure both physical fit and electrical performance. Any substitution of parts or controls not approved by Modine will be at installer's risk. For replacement parts, submit the unit heater model number, power code, control code and serial number shown on the rating plate attached to the unit.

Do not remove outlet fan guard from vertical electric unit heaters except to service the unit.

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SPECIAL PRECAUTIONS / IMPORTANT INSTRUCTIONS

SPECIAL PRECAUTIONS / IMPORTANT INSTRUCTIONS

THE INSTALLATION AND MAINTENANCE INSTRUCTIONS IN THIS MANUAL MUST BE FOLLOWED TO PROVIDE SAFE, EFFICIENT AND TROUBLE-FREE OPERATION. IN ADDITION, PARTICULAR CARE MUST BE EXERCISED REGARDING THE SPECIAL PRECAUTIONS LISTED BELOW. FAILURE TO PROPERLY ADDRESS THESE CRITICAL AREAS COULD RESULT IN PROPERTY DAMAGE OR LOSS, PERSONAL INJURY, OR DEATH. THESE INSTRUCTIONS SUBJECT TO ANY MORE RESTRICTIVE LOCAL OR NATIONAL CODES.

HAZARD INTENSITY LEVELS

1. **DANGER:** Indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.
2. **WARNING:** Indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.
3. **CAUTION:** Indicates a potentially hazardous situation which, if not avoided, MAY result in minor or moderate injury.
4. **IMPORTANT:** Indicates a situation which, if not avoided, MAY result in a potential safety concern.

DANGER

Appliances 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. Ensure that the supply voltage to the appliance, as indicated on the serial plate, is not 5% greater than the rated voltage.
4. When servicing or repairing this equipment, use only factory-approved service replacement parts. A complete replacement parts list may be obtained by contacting Modine Manufacturing Company. Refer to the rating plate on the appliance for complete appliance model number, serial number, and company address. Any substitution of parts or controls not approved by the factory will be at the owner's risk.
5. Do not operate any heater if it malfunctions. Disconnect power at service panel and have heater inspected by a qualified installation and service agency.

CAUTION

1. All literature shipped with this unit should be kept for future use for servicing or service diagnostics. Do not discard any literature shipped with this unit.
2. Be sure no obstructions block air intake or discharge of the appliance.
3. Do not install appliance outdoors.
4. Do not install VE type unit heaters closer than 18 inches from ceiling and 24 inches horizontally from combustible materials in any direction. PTE units must be at least 24 inches from ceiling and 18 inches horizontally from nearest enclosure. The bottom of the unit must be at least 8 feet above the floor.
5. The bottom of the appliance must be at least 8 feet above the floor.
6. Do not attach duct work, air filters, or polytubes to any appliance.
7. Ensure that the supply voltage to the appliance, as indicated on the serial plate, is not 5% less than the rated voltage.
8. Do not reuse any electrical component which has been wet. Such component must be replaced.

9. **SAVE THESE INSTRUCTIONS**

IMPORTANT

To check most of the Possible Remedies in the troubleshooting guide listed in Table 9.1, refer to the applicable sections of the manual.

SI (METRIC) CONVERSION FACTORS

To Convert	Multiply By	To Obtain
"W.C.	0.249	kPa
°F	(°F-32) x 5/9	°C
Btu	1.06	kJ
Btu/ft ³	37.3	kJ/m ³
Btu/hr	0.000293	kW
CFH (ft ³ /hr)	0.000472	m ³ /min
CFH (ft ³ /hr)	0.0000787	m ³ /s
CFM (ft ³ /min)	0.0283	m ³ /min
CFM (ft ³ /min)	0.000472	m ³ /s

To Convert	Multiply By	To Obtain
feet	0.305	m
Gal/Hr.	0.00379	m ³ /hr
Gal/Hr.	3.79	l/hr
gallons	3.79	l
Horsepower	746	W
inches	25.4	mm
pound	0.454	kg
psig	6.89	kPa
psig	27.7	"W.C.

INSTALLATION

Locating Unit Heaters

In locating heaters, consider general space-heating requirements of the area. Unit heaters should be located so that exposed walls are blanketed with warm air. In multiple unit installations, arrange units so that the air discharge pattern of one unit overlaps the next unit thus encompassing the area (See Fig. 3.1 & 3.2). Interference of air streams by columns, beams, partitions or other obstructions should be avoided as much as possible.

Figure 3.1 - Typical Unit Locations for Horizontal Air Delivery

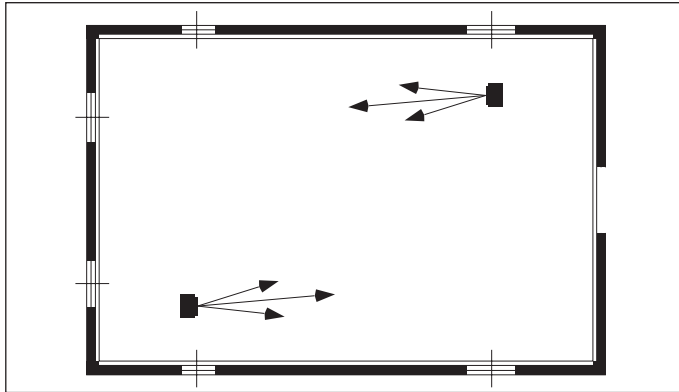
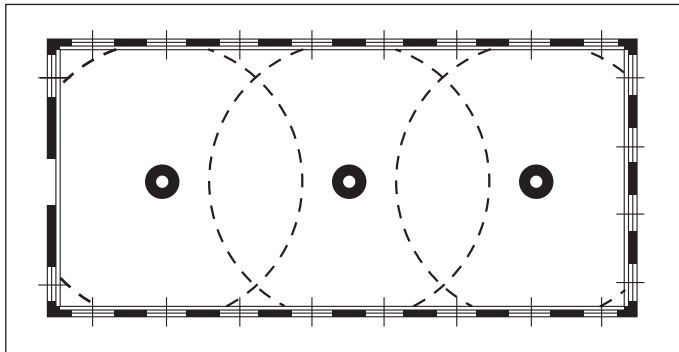


Figure 3.2 - Typical Unit Locations for Vertical Delivery



Unit Mounting

⚠ CAUTION

1. Do not install VE type unit heaters closer than 18 inches from ceiling and 24 inches horizontally from combustible materials in any direction. PTE units must be at least 24 inches from ceiling and 18 inches horizontally from nearest enclosure. The bottom of the unit must be at least 8 feet above the floor.
2. The bottom of the appliance must be at least 8 feet above the floor.
3. Do not attach duct work, air filters, or polytubes to any appliance.

Height at which unit heaters are installed is critical. Maximum mounting heights for vertical units are listed in Table 3.1. Maximum mounting heights for PTE units are listed in Figure 4.2. The maximum mounting height for any unit is that height above which the unit will not deliver heated air to the floor. The maximum mounting heights must not be exceeded in order to assure maximum comfort.

If necessary, select the correct deflector assembly to accommodate the area being covered. Note the louver deflector data in the table is listed with louvers fully open and with adjusting vanes set at a 45-degree angle. For these deflectors, vane adjustment provides a greater spread but requires a lower mounting height. As indicated, truncone deflectors allow the lowest mounting height and provide the widest heat spread.

Figure 3.3 - Vertical Delivery Heat Spread/Throw

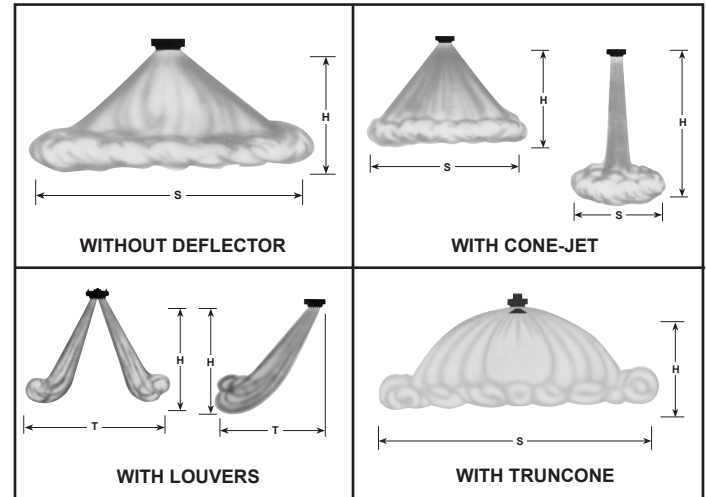


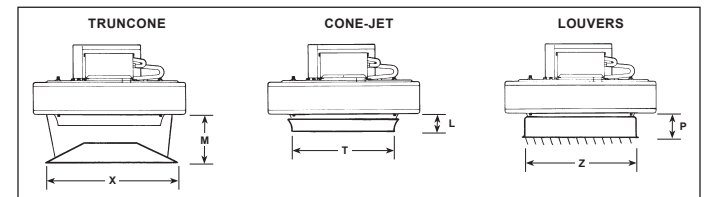
Table 3.1 - Maximum Mounting Heights/Spreads (feet) ①

Model	Vertical Delivery							
	No Deflector		Truncone		Cone Jet		Louvers	
	H	S	H	S	Blades Open	Blades 45°	Blades Open	Blades 45°
VE50	13	20	9	24	18	23	15	13
VE75	11	17	8	20	15	20	13	11
VE100	12	18	8	22	17	22	14	12
VE150	17	26	11	30	23	30	20	17
VE200	20	30	13	36	27	35	23	20
VE250	17	26	11	31	23	31	20	18
VE300	20	31	15	36	28	36	24	21
VE400	18	27	13	32	24	32	21	18
VE500	16	24	12	29	22	29	19	16

① The maximum mounting heights consider air delivery to be from the bottom of the unit to the floor based on conditions in Table 6.2. Refer to Figure 3.3.

It is recommended that adequate service access in excess of 18 inches be provided for the motor and fan.

Figure 3.4 - Vertical Deflector Dimensions



If an optional air deflector has been furnished for vertical units it is always shipped separately and may be attached to the unit before suspension. Louvers on horizontal units may also be added and positioned before installation. Refer to the latest revision of 75-550 for installation instructions for the optional air deflector assemblies.

Table 3.2 - Vertical Deflector Dimensions (inches)

Model No.	Truncone		Cone-Jet		Louvers	
	M	X	L	T	P	Z
VE50-VE250	12 1/2	22	6 1/2	18 7/8	6 1/2	16 7/8
VE300-VE-500	12 1/2	27	7 1/2	24 3/4	7 1/2	19 3/4

INSTALLATION

Figure 4.1 - Vertical Model VE with Cone Jet Accessory Installed

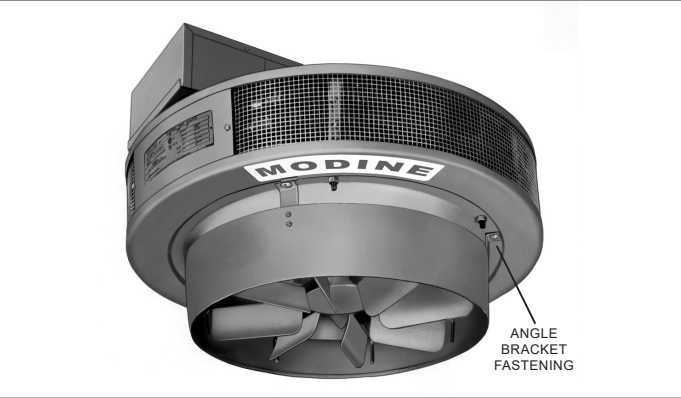
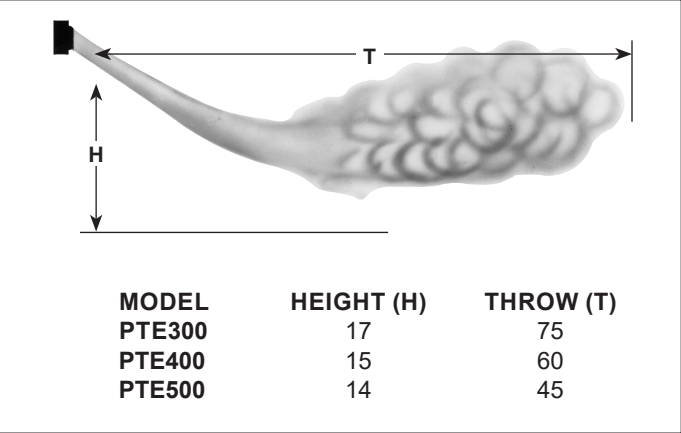


Figure 4.2 - Horizontal Delivery with Louver Deflectors (Models PTE300, PTE400, PTE500)

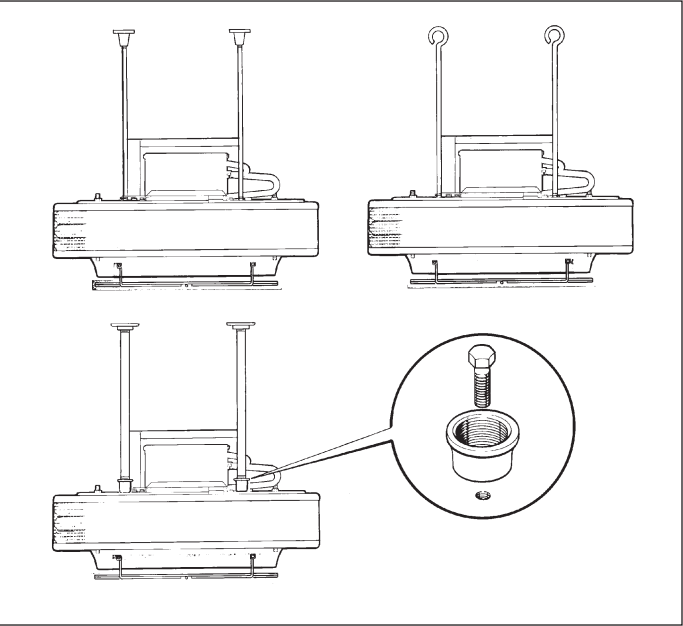


Be sure the means of suspension is adequate to support the weight of the unit. For proper operation, the unit must be installed in a level horizontal position. Clearances to combustibles as specified above must be strictly maintained. Do not install unit heater above the maximum mounting height shown in Table 3.1 for VE models or Figure 3.4 for PTE models or below eight feet.

Model VE Unit Suspension

There are four tapped holes (1/2"-13) in the top of the unit for unit suspension. Unit suspension can be made with threaded rods, pipes, or ceiling hanger brackets furnished by others. See Figure 4.3.

Figure 4.3 - Unit Suspension Method of Vertical Delivery Units



NOTE: A pipe hanger adapter kit is available as an accessory from Modine. The kit consists of two drilled 3/4" I.P.S. pipe caps and two 1/2"-13 x 1 3/4" cap screws to facilitate threaded-pipe suspension. Two kits are required to pipe-mount a vertical unit.

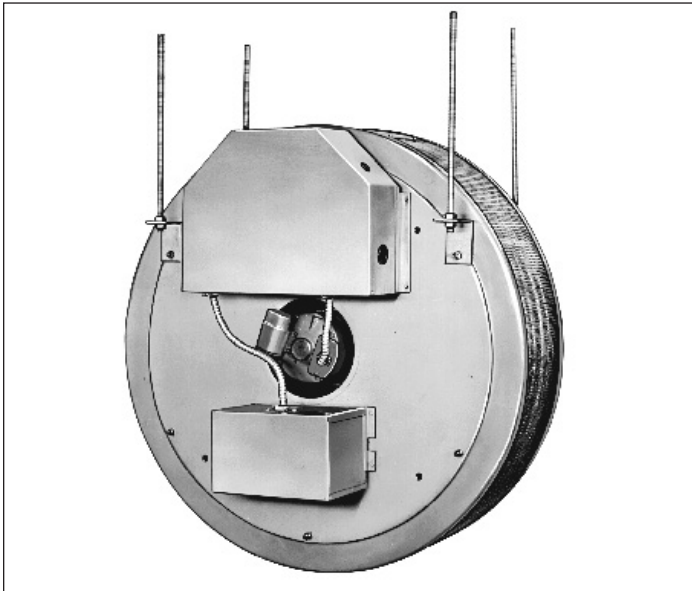
Model PTE Unit Suspension

Model PTE electric heaters are provided with four hanger brackets for installation with four ceiling suspension rods (5/8-inch diameter), furnished by others. Refer to Figures 4.4 and 5.1.

Figure 4.4 - Ceiling-mounted Model PTE

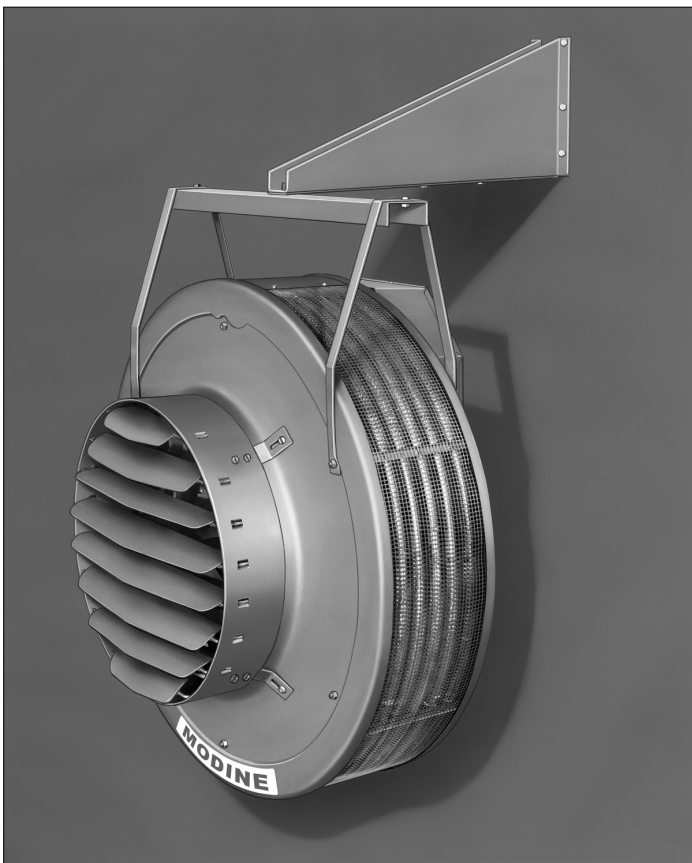


Figure 5.1 - Rear view of Model PTE



For easier installation of PTE model electric unit heaters, where ceiling suspension is not feasible, a wall-mounting bracket kit is available. The bracket saves installation time, has a built-in wall clearance, and provides an inexpensive and convenient wall-mounting method. The one-point suspension, shown above, permits swiveling the unit 180 degrees horizontally for most effective air direction. Refer to separate bulletin included in the kit for bracket assembly and installation. Refer to Figure 4.2 for maximum mounting heights. Minimum mounting height is eight feet.

Figure 5.2 - Wall-mounted Model PTE



DIMENSIONAL/PERFORMANCE DATA

**Figure 6.1 - Outline Dimensions, VE Models
(models VE50 thru 250 shown)**

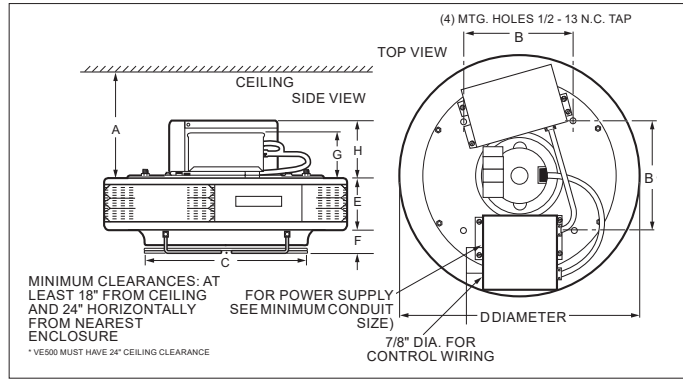


Figure 6.2 - Outline Dimensions, PTE Models

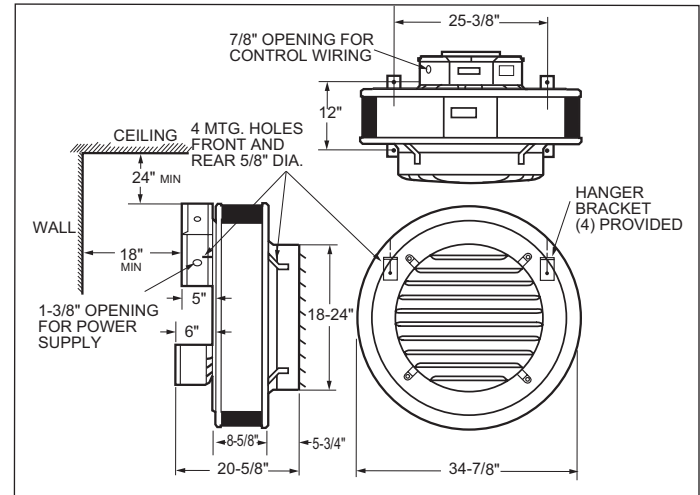


Table 6.1 - Outline Dimensions (inches)

Model	A	B	C	D	E	F	G	H	Fan Dia	Approx. Shipping Wt. - lbs.
VE50	18	11 3/8	14 1/2	24 7/8	4 1/4	3 1/2	4 3/4	6 1/4	14	62
VE75	18	11 3/8	14 1/2	24 7/8	4 1/4	3 1/2	4 3/4	6 1/4	14	64
VE100	18	11 3/8	14 1/2	24 7/8	5	3 1/2	4 3/4	6 1/4	14	66
VE150	18	11 3/8	14 1/2	24 7/8	5	3 1/2	4 3/4	6 1/4	14	70
VE200	18	11 3/8	14 1/2	24 7/8	5	3 1/2	4 3/4	6 1/4	14	72
VE250	18	11 3/8	14 1/2	24 7/8	5	3 1/2	4 3/4	6 1/4	14	73
VE300	18	18 3/8	19 1/2	34 7/8	8 5/8	2 1/4	4 3/4	6 1/4	19	122
VE400	18	18 3/8	19 1/2	34 7/8	8 5/8	2 1/4	4 3/4	6 1/4	19	125
VE500	18	18 3/8	19 1/2	34 7/8	8 5/8	2 1/4	4 3/4	6 1/4	19	129

Table 6.2 - Performance Data (Models VE, PTE)

Model	Heating Capacity		Air Delivery Data (No Deflector) ①				
	KW	BTU/HR	Outlet CFM	Outlet Vel. (FPM)	Temp. Rise °F	Heat Spread (Ft)	Max. Mtg. Ht. (Ft)
VE50	5.0	17,100	800	700	21	20	13
VE75	7.5	25,600	800	700	31	17	11
VE100	10	34,100	940	820	36	18	12
VE150	15	51,200	1340	1170	38	26	17
VE200	19	64,900	1600	1400	41	30	20
VE250	25	85,400	1600	1400	55	26	17
PTE/VE300 2-stage	30	102,000	2575	1240	40	31②	20②
PTE/VE400 2-stage	40	137,000	2575	1240	54	27②	18②
PTE/VE500 2-stage	50	171,000	2575	1240	70	24②	16②

① With 70°F ambient air and heating at full capacity
② See Figure 4.2 for PTE mounting height and heat throw

Table 6.3 - Motor Specifications

Model	HP	Voltage	Phase	Hertz	RPM	Type W/TOL	Bearing Type
VE50-100	1/15	208-230	1	60	1050	Totally Enclosed Shaded Pole	Sleeve
VE150-250	1/8 or 1/11	208-230	1	60	1725	Enclosed Air Over	Ball
VE/PTE300-500	1/6	208-230	1	60	1075	Enclosed Air Over	Ball

INSTALLATION-ELECTRICAL CONNECTIONS

Wiring

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

CAUTION

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

All wiring must be done in accordance with the National Electric Code, latest edition, (NFPA No. 70). Canadian electrical code C22.1 applies in Canada. All internal wiring has been completed at the factory. Provide electric service from a fused disconnect switch to the power terminal block in the power junction box on the unit heater. Wiring must be Type TW insulation for 60°C (140°F) or better for Models VE50 thru VE250. Use type THW insulation for 75°C (167°F) for Models VE and PTE 300, 400 500. Appliance wiring diagrams are located inside the power junction box cover.

Make connections strictly in accordance with wiring diagram furnished with unit. Any wiring differing from this diagram may be hazardous to persons and property.

Any damage to, or failure of Modine units caused by incorrect wiring of the units is not covered by Modine's standard warranty.

The location of a remote thermostat should be determined by the heating requirements and mounted on an inside wall approximately 5 feet above the floor. It must not be located where it would be affected by direct heat from the unit or other sources, or drafts from frequently opened doors or windows. See instructions packed with thermostat. The unit may also be controlled by a remote, manual on-off switch.

Control wiring should be No. 14 AWG (American Wire Gauge.)

All 480 volt and 600 volt, three-phase units have built-in transformers and fuses to stepdown voltage and protect motor and control circuit.

Fuse blocks with fuses are factory-installed on all 480 volt and 600 volt, 3-phase units to protect motor control and motor transformer.

All contactor coils are rated at 208-240 volts.

Models VE and PTE 300,400, 500 with 480 volt and 600 volt, 3-phase power supply are wired for two-stage control as standard equipment and have two contactors.

Figure 7.1 - Power junction box, Models VE50 thru VE250

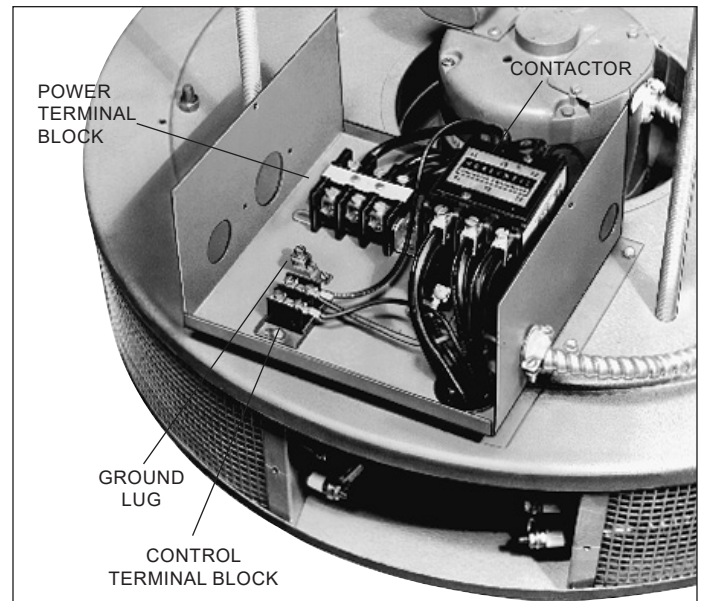
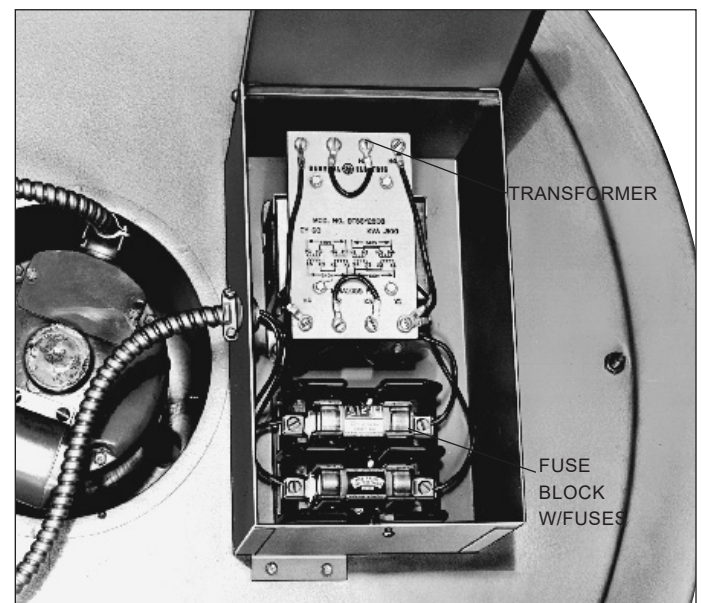


Figure 7.2 - Transformer and Fuse Box



INSTALLATION

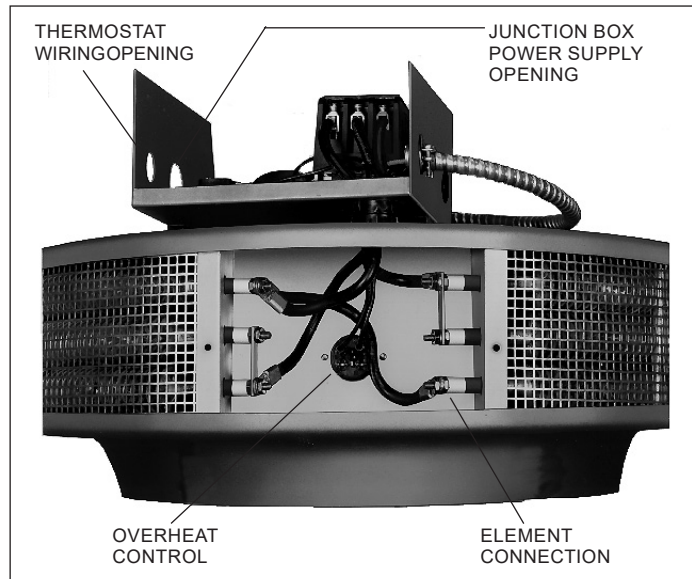
Table 8.1 - Wiring Data, Vertical Units

Model No.	Power Code	Power Supply
VE50	12	240/1
	31	208/3
	32	240/3
	33	480/3
	34	600/3
VE75	12	240/1
	31	208/3
	32	240/3
	33	480/3
	34	600/3
VE100	12	240/1
	31	208/3
	32	240/3
	33	480/3
	34	600/3
VE150	31	208/3
	32	240/3
	33	480/3
	34	600/3
VE200	32	240/3
	33	480/3
	34	600/3
VE250	33	480/3
	34	600/3
PTE/VE300	33	480/3
	34	600/3
PTE/VE400	33	480/3
	34	600/3
PTE/VE500	33	480/3
	34	600/3

Table 8.2 - Power Junction Box Useful Volumes

Model	Volume
VE50 thru 100	3,029 cm ³
VE150 thru 250	2,883 cm ³
VE/PTE300 thru 500	9,570 cm ³

Figure 8.3 - Side terminal Box, Models VE50 thru VE250



Summer/Winter Switch

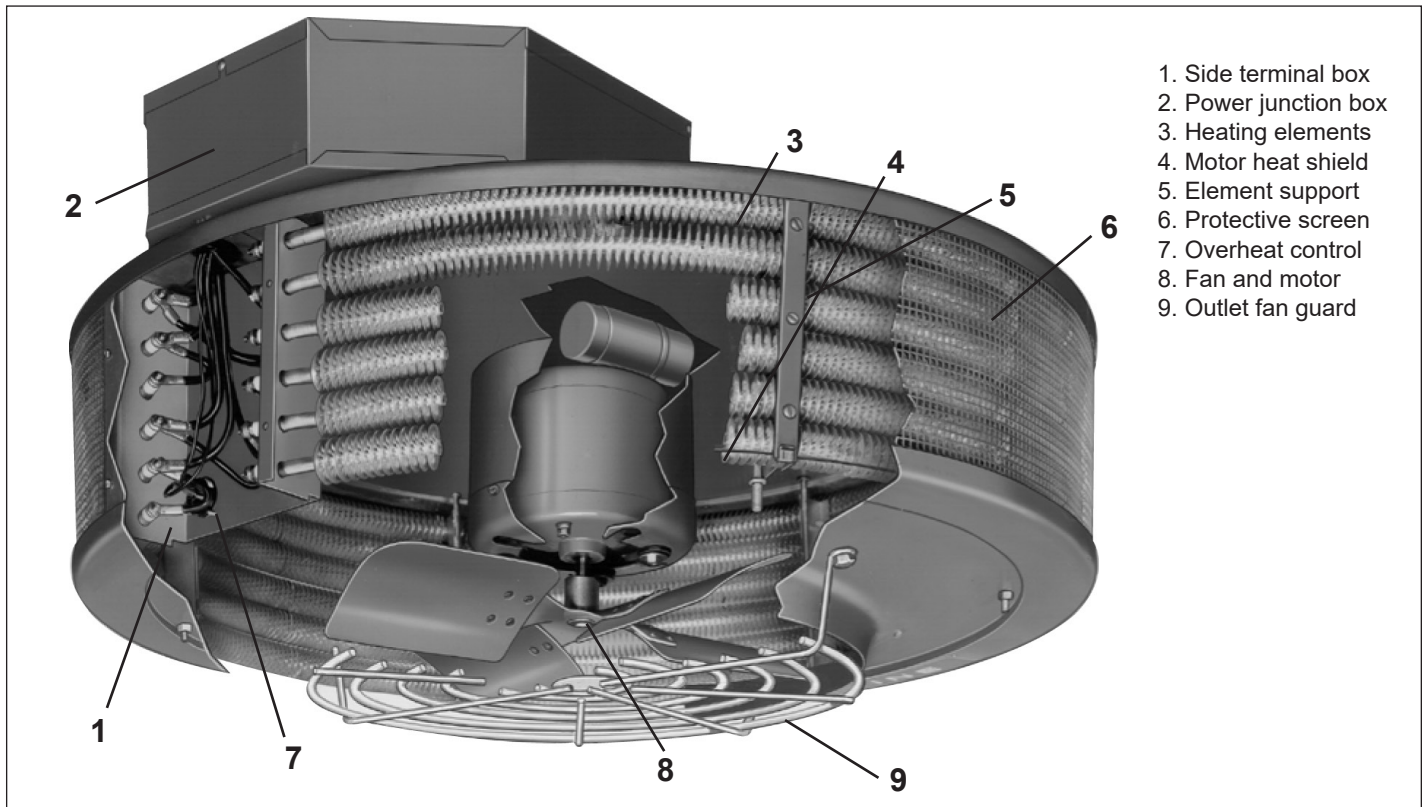
To allow a choice of fan operation of the electric unit heater for heating and/or ventilation, a summer/winter toggle switch kit is available for field installation. In the winter position the thermostat will cycle the fan on and off with the heating elements. In the summer position the fan runs continuously for ventilation while the heating elements are controlled by the thermostat. This position can also be used in winter to reduce ceiling air stratification and reduce ceiling heat loss. Refer to separate bulletin included in the kit for installation and wiring.

Low-Voltage Control

Low-voltage control is available for field installation on vertical electric unit heaters. The control permits use of a low-voltage thermostat that can also provide closer temperature control. Models VE and PTE 300, 400, 500 cannot operate in two stages with this control and a low-voltage thermostat, but will respond with full operation of all elements.

OPERATION

Figure 9.1 - Cutaway of Electric Unit Heater



Operating Sequence

The operation of Modine electric unit heaters is governed by an electrical contactor which is controlled by a thermostat. The contactor completes the electric circuit to the heating elements when the thermostat "calls" for heat. The fan motor is also activated when the thermostat "calls" for heat.

When the thermostat is satisfied, the fan motor stops and the contactor opens the circuit to the heating elements.

Prior to Operation

Although this unit has been inspected and tested at the factory, the following procedures should be performed to assure proper on-site operation.

1. Check fan clearance. Fan should not contact casing or fan guard when spun by hand.
2. Check all electrical connections to be sure they are secure, and in accordance with the wiring diagram.
3. Check firmness of unit suspension. Tighten all fasteners, if necessary.
4. Make sure fuses are installed in units that require them.

Safety Devices

The overheat control, (See Figure 9.1), will interrupt power to the unit contactor in the event of overheating. It is a single-pole single-throw switch, with an automatic reset. The switch will permit the motor to continue operation and cool the heater while power to the elements is interrupted. **This overheat control should operate only when something is seriously wrong with the unit. When this control operates, correct the difficulty immediately or serious and permanent damage may result.**

The motor for the circulating air fan has internal thermal overload protection. If for any reason, the motor overheats, the thermal protector will shut it off. The motor will re-start automatically when it has cooled.

Initial Start-Up

1. Adjust room thermostat above room temperatures.
2. Turn on power to the unit.
3. Adjust the air deflector (if provided) for desired heat distribution.
4. Run the unit through several cycles by raising and lowering the thermostat setting to assure proper sequence of operation. For Models VE and PTE300, 400, 500 with two-stage thermostats, check operation on both states. Three elements should heat up during first stage operation when temperature falls. As additional heat is required the remaining three elements will be energized until the thermostat high-stage setting is satisfied. The unit will automatically shut off when the low-stage thermostat setting is satisfied.

GENERAL MAINTENANCE



WARNING

1. When servicing or repairing this equipment, use only factory approved service replacement parts. A complete replacement parts list may be obtained by contacting Modine Manufacturing Company. Refer to the rating plate on the unit for complete unit substitution of parts or controls not approved by the factory will be at the owner's risk.
2. Do not operate any heater if it malfunctions. Disconnect power at service panel and have heater inspected by a qualified installation and service agency.

General Maintenance

Unit heaters, like other electrical and mechanical equipment, will give lasting trouble-free service if properly cared for. Observance of a few simple periodic procedures will insure their satisfactory operation.

Under average conditions, it is recommended that unit heaters be inspected before every heating season... more often in locations where air is contaminated with corrosive fumes, dust, soot, or oil spray. To perform routine maintenance:

1. Disconnect power supply to the unit.
2. Open junction box doors at top of unit and inspect unit contactors, fuses, transformer, and tighten connections if necessary.
3. Open side terminal box by removing panel at side of unit and check element connections and the over-heat control switch.
4. Check motor mounting from bottom of unit. Check fan for proper clearance, free rotation, and firm connection to motor shaft. Remove air deflectors (if provided) for access



CAUTION

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

NOTE: To check most of the Possible Remedies in the trouble-shooting guide listed in Table 11.1, refer to the applicable sections of the manual.

5. Lubricate motor according to manufacturer's instructions on motor. When no instructions are on motor, oil every two thousand hours of operation with SAE20 oil for normal applications. Adjust oiling according to usage and atmosphere. Some motors do not have oil fitting. These are lubricated for long life and do not require further lubrication.
6. Routine cleaning of the outer unit casing and protective screen is recommended to remove dirt, grease, or corrosive material that may damage finish. Rusted or corroded spots on top or bottom casing should be sanded and repainted.
7. Clean fan blades, elements, and inside casing with either a detergent solution or compressed air. Do not scrape elements.
8. For better element access or for more extensive cleaning of the elements and screen, the screen can be easily removed. Detach side terminal box cover and casing bottom before removing protective screen.

TROUBLESHOOTING

Table 11.1 – Troubleshooting

Problem	Possible cause(s)	Remedy
Unit does not operate	<ol style="list-style-type: none"> 1. Electric circuit in open position 2. Blown fuses in control compartment. 3. Defective or incorrect wiring 4. Defective thermostat or switch 5. Defective or burned out control transformer 	<ol style="list-style-type: none"> 1. a. Turn on switch or move thermostat to higher setting. b. Replace fuse or reset disconnect switch 2. Replace fuses 3. Check wiring and connections. Refer to diagram inside junction box 4. Check continuity with volt-ohmmeter. Replace defective part if necessary 5. Check secondary voltage with voltmeter. Replace if necessary
Fan operates but element does not heat	<ol style="list-style-type: none"> 1. Power interrupted by overheat control 2. Summer-winter switch in summer position 3. Defective or incorrect wiring 4. Blown element fuses 	<ol style="list-style-type: none"> 1. a. Not enough air volume over elements. Louvers must be opened at least 45°. Clean element screen and spiral fins. b. Check motor rpm against nameplate rating. Replace motor if speed too slow. c. Defective limit control. Check wiring and connections. check continuity through control. Replace if necessary. 2. Change switch position 3. Check all wiring and connections. See diagram inside junction box. 4. Replace element fuses
Elements heat but fan does not operate	<ol style="list-style-type: none"> 1. Fan motor failure 2. Summer-winter switch defective or improperly wired 3. Defective or incorrect wiring 	<ol style="list-style-type: none"> 1. a. Check for loose electrical connections. Check wiring with diagram in control compartment b. Repair or replace defective motor. c. Voltage too high or too low. Check voltage with volt-meter. 2. Check for continuity with volt-ohmmeter. Replace if necessary. 3. Check all wiring and connections. See diagram inside junction box
Insufficient heat	<ol style="list-style-type: none"> 1. Too few units for heat loss 2. Unit mounted too high 3. Fan operates backwards 4. Burned out (elements) 	<ol style="list-style-type: none"> 1. Add more units or increase size of units 2. Lower mounting height 3. Repair or replace motor or reverse fan rotation 4. Disconnect internal wiring and check element resistance with ohmmeter

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WARRANTY

This Warranty (the "Warranty") shall apply to Products (as defined below) sold by Modine Manufacturing Company, a Wisconsin corporation ("Seller") to you ("Buyer").

Seller hereby warrants that during the Applicable Warranty Period (as defined below) its Products shall be free from defects in material and factory workmanship under normal use and service, subject to the EXCLUSIONS described below and according to the terms outlined in this Warranty.

If Seller receives written notice of a breach of this Warranty prior to the end of the Applicable Warranty Period (which such notice shall include the model and serial numbers of the Product, as well as the date and a reasonably detailed description of the Product's alleged failure), Buyer shall with Seller's prior written approval, return the applicable Product or component thereof to Seller with shipping charges prepaid; if upon examination by Seller such Product or component thereof is disclosed to have been defective, then Seller will, without charge to Buyer, at Seller's option, either repair the Product, replace defective parts in the Product, or offer an entire replacement unit of the Product; provided that the warranty period for a Product that has been repaired or provided with replacement parts shall not extend beyond the original Applicable Warranty Period, nor shall any replacement parts provided for a Product be under any warranty beyond the original Applicable Warranty Period for the Product; similarly, if Seller provides an entire replacement unit of the Product, the warranty period for the replacement unit is limited to the remainder of the original Applicable Warranty Period. Seller shall have no responsibility for installation, service, field labor, shipping, handling, or other costs or charges, except as expressly provided in this Warranty. Buyer shall have no remedy hereunder for any defective part returned without proper written authorization from Seller, as described above.

For purposes of this Warranty and subject to the exclusions described below, the term "Products" shall mean parts or equipment manufactured by Seller, sold to Buyer pursuant to a purchase contract between Buyer and Seller (most often initiated by a purchase order issued by Buyer and accepted by Seller), and expressly described in such contract. The term "Products" shall not include third-party parts or equipment furnished by Seller, except that, to the extent assignable, Seller will assign to Buyer the benefits (together with all limitations and exclusions) of the third-party manufacturer's warranty for such parts or equipment. This Warranty extends only to the original purchase contract between Buyer and Seller and is nontransferable, except that this Warranty may be assigned to an Authorized End User (as defined below). All replaced parts or equipment shall become Seller's property. For purposes of this Warranty, the term "Applicable Warranty Period" shall mean the warranty period set forth in the table below for each type or class of Product described on the table; provided that, when the Product is to be used as a component part of equipment manufactured by Buyer, the Applicable Warranty Period shall be limited to one (1) year after the date of shipment from Seller, notwithstanding anything in the table below to the contrary. For purposes of this Warranty, the term "Authorized End User" shall mean any third-party that purchases the Product directly or indirectly from Buyer for the Authorized End User's own use upon the first installation of the Product and not for resale.

BUYER HEREBY ACKNOWLEDGES THAT ITS REMEDIES FOR BREACH OF THIS WARRANTY, EXCLUSIVE OF ALL OTHER REMEDIES PROVIDED BY LAW, ARE LIMITED AS DESCRIBED ABOVE.

EXCLUSIONS AND LIMITATIONS: This Warranty is subject to the following exclusions and limitations:

The term "Products" shall not include and this Warranty shall not apply to any of the following items: refrigerant gas, belts, filters, fuses and other items consumed or worn out by normal wear and tear.

In addition, this Warranty shall not apply to:

- (1) Products or components thereof that are damaged or adversely affected by conditions beyond Seller's control, including but not limited to polluted or contaminated or foreign matter contained in the air or water utilized for heat exchanger (condenser) cooling or if the failure of the part is caused by improper air or water supply, or improper or incorrect sizing of power supply;
- (2) Any Products or components thereof which have been repaired or altered outside the factory of Seller in any way, or otherwise subject to unauthorized repairs or alterations, so as, in the judgment of Seller, to affect the Product's durability or performance;
- (3) Materials or labor of any kind not furnished by Seller, or any charges for any such labor or materials, whether such labor, materials or charges thereon are due to replacement of parts, adjustments, repairs, or any other work done by any party other than Seller;
- (4) Labor or other costs incurred for diagnosing, repairing, removing, installing, shipping, servicing, or handling of either defective or replacement parts;
- (5) Any Products removed from their original location for reinstallation in another location;
- (6) Any Products or components thereof which have been operated, maintained, or serviced contrary to Seller's written installation, operation, and/or servicing instructions or owner's manual;
- (7) Damages resulting from operation with an inadequate or interrupted supply of air or water;
- (8) Any Products or components thereof which have been subjected to misuse, negligence, faulty installation, improper servicing, accident, excessive thermal shock, excessive humidity, physical damage, impact, abrasion, improper operation, or other operating conditions in excess of or contrary to those for which such equipment was designed;
- (9) With respect to gas-fired or oil-fired units, any Products or components thereof if the input to the Product exceeds the rated input (as indicated on the Product's serial plate) by more than five percent (5%);
- (10) Any Products or components thereof which, in the judgment of Seller, have been installed in a corrosive atmosphere, marine, or coastal application, subjected to corrosive fluids or gases, or damaged or adversely affected by the effects of the physical or chemical properties of water or steam or other liquids or gases used in the Products or any component thereof;
- (11) Damage or failure to start resulting from improper voltage conditions, blown fuses, open circuit breakers, or other

inadequacy or interruption of electrical service or fuel supply; or
 (12) Any Products or components thereof from which the serial number has been altered, defaced or removed.

BUYER AGREES THAT THE WARRANTIES AND REMEDIES DESCRIBED HEREIN ARE THE ONLY WARRANTIES AND REMEDIES PROVIDED BY SELLER WITH RESPECT TO THE PRODUCTS AND TO THE MAXIMUM EXTENT PERMITTED UNDER APPLICABLE LAW SHALL BE IN LIEU OF AND EXCLUSIVE OF ALL OTHER WARRANTIES AND REMEDIES WHATSOEVER, EITHER EXPRESS OR IMPLIED, WHETHER ARISING FROM LAW, COURSE OF DEALING, USAGE OF TRADE, OR OTHERWISE, **INCLUDING BUT NOT LIMITED TO WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND NON-INFRINGEMENT, EACH OF WHICH SELLER HEREBY EXPRESSLY DISCLAIMS.** SELLER NEITHER ASSUMES (NOR HAS AUTHORIZED ANY PERSON TO ASSUME) ANY OTHER WARRANTY OR LIABILITY IN CONNECTION WITH ANY PRODUCTS. REPRESENTATIONS AND CONDITIONS, EXPRESS OR IMPLIED BY STATUTE, TRADE USAGE, OR OTHERWISE, ARE EXCLUDED AND WILL NOT APPLY TO THE PRODUCTS UNDER THIS WARRANTY, EXCEPT FOR WARRANTIES WHICH BY LAW CANNOT BE EXCLUDED

OR LIMITED. Without limiting the foregoing, Seller makes no and specifically disclaims all representations and/or warranties that the Products will detect the presence of, or eliminate, prevent, treat, or mitigate the spread, transmission, or outbreak of any pathogen, disease, virus, or other contagion, including but not limited to COVID 19.
 BUYER AGREES THAT IN NO EVENT WILL SELLER BE LIABLE FOR COSTS OF PROCESSING, LOST REVENUES OR PROFITS, INJURY TO GOODWILL, OR ANY OTHER SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES OF ANY KIND RESULTING FROM THE PURCHASE OF THE PRODUCTS, OR FROM BUYER'S USE OF ANY PRODUCT, WHETHER ARISING FROM BREACH OF WARRANTY, NONCONFORMITY TO ORDERED SPECIFICATIONS, DELAY IN DELIVERY, OR ANY OTHER LOSS SUSTAINED BY THE BUYER.

OPTIONAL SUPPLEMENTAL WARRANTY

Buyer may purchase from Seller a supplemental warranty with respect to Products which shall extend the Applicable Warranty Period as set forth in the express terms and conditions described in the supplemental warranty agreement. Such supplemental warranty terms may include an additional four (4) years on certain compressors, an additional five (5) years "all parts" warranty, an additional four (4) or nine (9) years on certain heat exchangers, and/or such additional supplemental warranty terms as Seller chooses to make available to its customers from time to time.

COMPONENT	APPLICABLE MODELS		APPLICABLE WARRANTY PERIOD (WHICHEVER OCCURS FIRST)	
			Time from Date of First Beneficial Use by Buyer or Authorized End User	Time from Date of Shipment from Seller
Heat Exchangers and/or Coils	Gas Fired Unit Heaters with Tubular Style Heat Exchangers (e.g. HD, HDS, PTX, BTX, etc)	Aluminized or Stainless Steel	10 YEARS	126 MONTHS
	Gas Fired Unit Heaters with Clam-Shell Style Heat Exchangers (e.g. PDP, BDP, etc.)	Aluminized Steel (not in high-humidity applications)	10 YEARS (must be Stainless Steel in high-humidity applications)	126 MONTHS
		Aluminized Steel (in high-humidity applications)	1 YEAR	18 MONTHS
		Stainless Steel	10 YEARS	126 MONTHS
	Low Intensity Infrared Units		5 YEARS	66 MONTHS
	Indoor and Outdoor Duct Furnaces and System Units, Steam/Hot Water Units, Oil-Fired Units, Electric Units, Cassettes, Vertical Unit Ventilators, Geothermal Units		1 YEAR	18 MONTHS
Burners and Elements	Low Intensity Infrared Units		2 YEARS	30 MONTHS
	High Intensity Infrared and Electric Infrared Units		1 YEAR	18 MONTHS
Compressors	Condensing Units for Cassettes		5 YEARS	66 MONTHS
	Vertical Unit Ventilators, Geothermal Units		1 YEAR	18 MONTHS
Sheet Metal Parts	All Products		1 YEAR	18 MONTHS
Components, excluding Heat Exchangers, Coils, Condensers, Burners, Sheet Metal	All Products		2 YEARS	30 MONTHS

As Modine Manufacturing Company has a continuous product improvement program, it reserves the right to change design and specifications without notice.



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