

For Maximum Performance, Comfort, and Heating Efficiency

Model POR unit heaters require fuel oil grade No. 1 or 2, as specified by: (ASTM) D396-73 Standard Specifications for Fuel Oils (American Society for Testing and Materials); or the Canadian Government Specification Board, 3-GP-28. Unit heaters are direct driven propeller fan types equipped with a two-stage fuel unit and designed for the horizontal delivery of heated air. They are available in three model sizes: 100,000, 145,000, and 185,000 Btu per hour outputs. Time-tested and field-proven components are engineered into the design of these compact units which produce comfort heating at the lowest cost through their highly efficient operation. Designed for overhead suspension, models are prewired, fire-tested, and UL-listed.

Modine oil-fired units offer a reliable means of heating, particularly in areas of the country where supplies of other fuels – such as natural gas – may be unavailable, not dependable, or interruptible. They are recommended as replacement of obsolete heaters or for total heating applications in new buildings. Whatever the need for selecting oil-fired unit heaters, you can rely upon Modine units to deliver maximum comfort and heating efficiency.

Modine Oil-Fired Unit Heater Benefits

Long life is due in part to the roll-formed design of the heat exchanger. Stresses caused by thermal expansion and contraction usually concentrate in areas of sharp angular bends or adjacent to welds. Roll-forming eliminates sharp angles and reduces the use of welds. Stresses are distributed freely and uniformly.

Made of corrosion-resistant, aluminized steel, the heat exchanger contains a preformed, ceramic fiber fire pot. This thermally efficient fire pot is lightweight, resilient, and resists both mechanical and thermal shocks. It reaches operation temperature quickly following start of burner. This also contributes to the efficiency of operation. Unless it becomes damaged, the fire pot can be expected to last the life of the unit.

FAN AND LIMIT CONTROL – Delays fan start until heat exchanger has warmed up to prevent cold air delivery. After burner stops, fan continues to operate until heat exchanger has cooled and prevents unit from overheating.

FAN – Statically balanced. Lightweight and properly pitched to move air in correct volume for maximum heat throw. Finger-proof fan guard and motor are resiliently mounted to unit.

OIL BURNER – Pressure-atomizing, gun-type with flame retention head and two-stage fuel unit. Features constant electric spark ignition and cad-cell for safe, automatic operation. Produces stable flame and high-efficiency combustion.

BURNER NOZZLE – Selected to provide a flame shape matching the heat exchanger.

Effective Heat Throw

Heat throw and heat coverage are controlled by manual adjustment of standard horizontal and/or optional vertical louvers. Depending upon which models are used, the heat throw will vary from 39 to 51 feet. Heated air is discharged toward the floor and not wasted on the ceiling.

Less Maintenance

Under average conditions Modine unit heaters require inspection only once a year; more often if air is contaminated with fumes, dust, or spray. All motors are permanently lubricated.

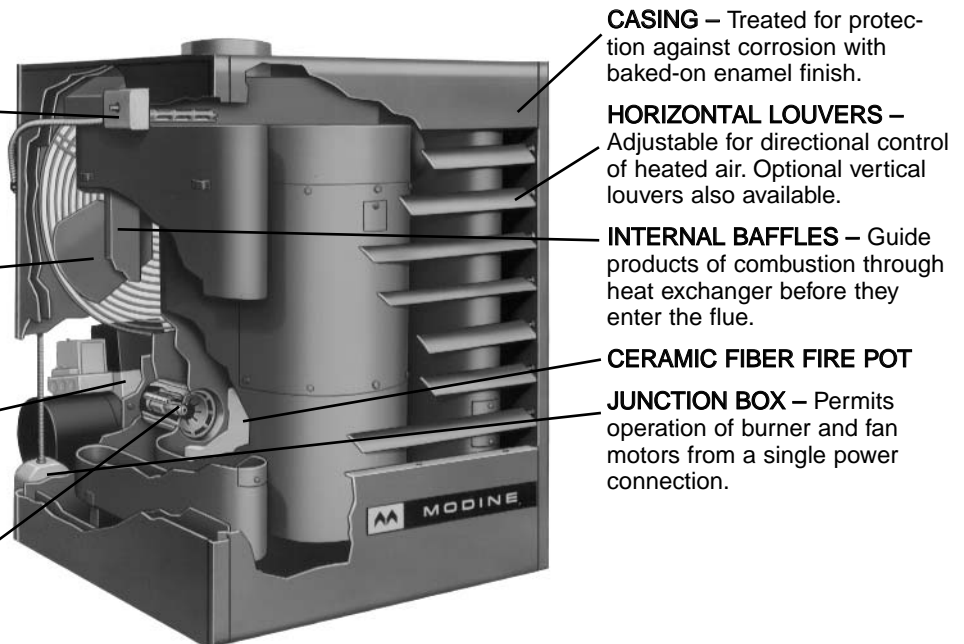
Safe and Automatic Operation

A self-contained, constant electric spark ignition is energized by the thermostat, and a cad-cell safety system de-energizes both the burner motor and spark if flame is not produced in 30 seconds. Manual reset of flame protection relay is required following this safety shut-down.

The units are also equipped with a fan and limit-control safety device. This control performs three functions: 1) delays start of fan until the heat exchanger has warmed up and prevents fan from stopping until the heat exchanger has cooled, 2) protects the unit from possible damages due to overheating, and, 3) provides a manual fan switch for constant fan or summer fan operation.

Quiet Operation

Fan is statically balanced. Motor is resiliently mounted to the fan guard to minimize vibration and noise. Also, the draw-formed venturi at the air inlet is designed to reduce fan noise and power consumption.



Easy Installation

All units are factory-assembled, wired, and fire tested prior to shipment. Units are ready to connect to single-phase, 60 Hz, 115-volt power and 25-volt thermostat, appropriate-sized fuel lines, and vents. Units are shipped for single-unit two pipe oil supply system, but can be simply modified for a single pipe oil supply system or a multiple-unit installation supplied by a common fuel distribution system. They can be suspended with four threaded rods (1/2 13NC tap) or with 3/4" pipe by use of an optional pipe hanger kit accessory.

Easy to Service

The heat exchanger is equipped with a convenient inspection port. Service door opening is ample in size to facilitate the removal of the fire pot should replacement become necessary. Two clean-out ports are readily accessible for periodic cleaning. The fan and limit control, motors, and burner are externally mounted on the unit for easy servicing.

PERFORMANCE • SPECIFICATIONS • DIMENSIONS

Performance Data

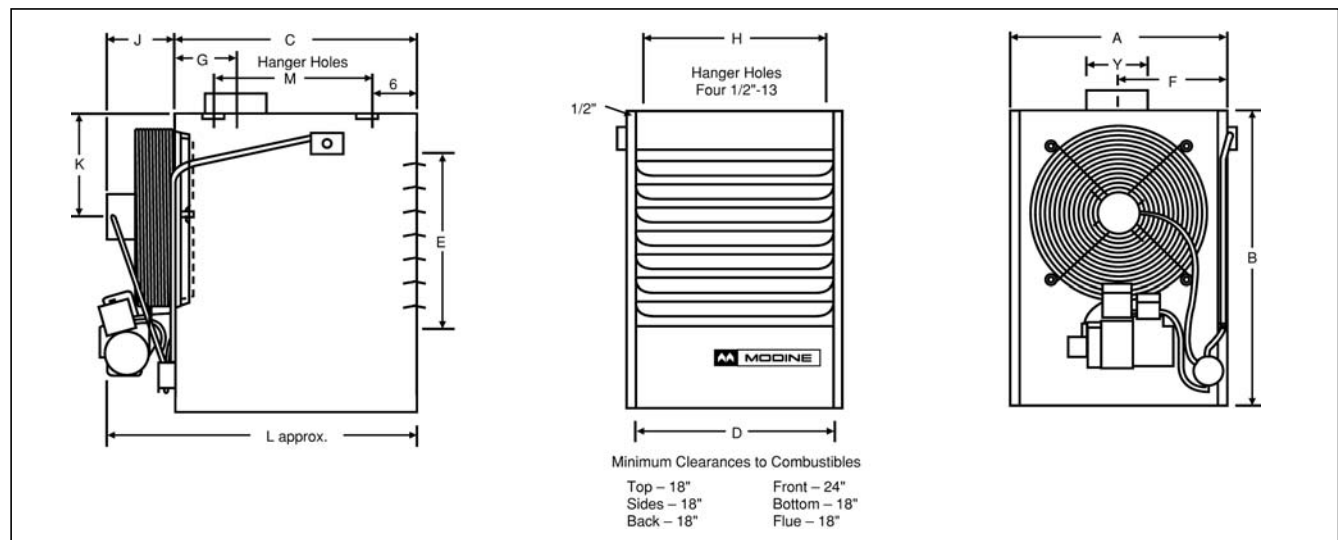
Model	Input Btu/Hr	Input GPH	Output Btu/Hr	CFM @ 70°F	Delivery FPM	Temp. Rise °F	Max Height*	Heat Throw
POR100	119,000	0.85	100,000	1890	460	49	12'	39'
POR145	175,000	1.25	145,000	2400	580	56	13.5'	50'
POR185	231,000	1.65	185,000	3200	740	54	12'	51'

*Deflector blades pitched 45° at the floor (heated air). Mounting height is measured from floor to bottom of unit.

Fan Motor Specifications

Model	HP	Voltage	Hz	Phase	Fan Motor Amps*	RPM	Type	Fan Dia.
POR100	1/6	115	60	1	2.7	1100	PSC	18"
POR145	1/3	115	60	1	5.4	1100	PSC	18"
POR185	1/3	115	60	1	5.4	1100	PSC	22"

*Total AMPS equals fan motor AMPS plus burner motor and ignition transformer load of 5.8 AMPS.



Dimensions (Inches)

Model	A	B	C	D	E	F	G	H	J	K	L	M	Y	Approx. Shipping Wt. (lbs)
POR100	27-1/2	35-1/4	28-1/8	25	23-7/8	13-3/4	8-5/8	23-7/8	8	12	38-1/8	16	8	324
POR145	27-1/2	35-1/4	28-1/8	25	23-7/8	13-3/4	8-5/8	23-7/8	9-1/2	12	38-1/8	16	8	333
POR185	28-5/8	40-1/4	32-3/4	26-1/8	23-7/8	14-3/8	8-5/8	25	10	13-3/4	42-3/4	20-3/4	8	398

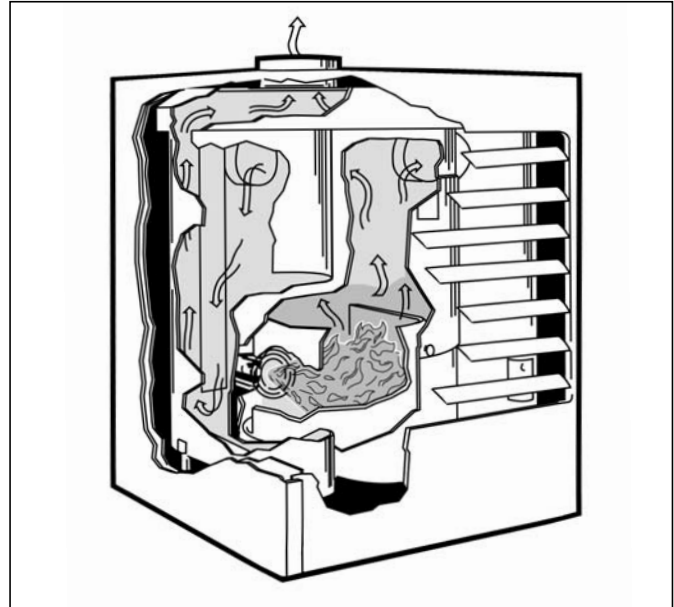
As Modine Manufacturing Company has a continuous product improvement program, it reserves the right to change design and specifications without notice.

Efficient Combustion

Greater combustion efficiency is achieved with the pressure-atomizing, gun-type oil burner equipped with a stainless steel, die-stamped flame retention head.

The flame produced can increase combustion efficiency by as much as 20 to 30 percent over non-flame retention type burners. The flame is also highly stable.

Heat flow through the heat exchanger can be traced by the arrows in the adjoining cross-sectional view. Note how flue products rise to the top of the drum, then pass into the two radiators of the heat exchanger where internal baffles cause them to flow to the bottom of the radiators; then back up to the flue collector and out of the stack. During this passage the original temperature at the fire pot, 2200-2300° F, is reduced to a stack discharge temperature of 470 to 570° F.

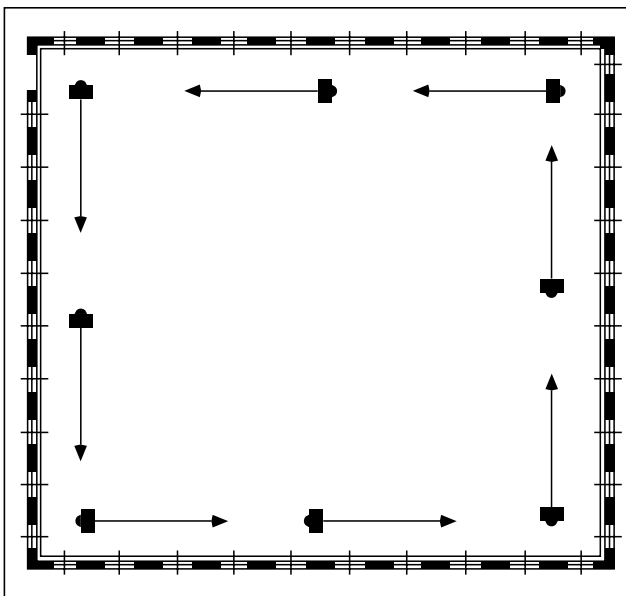


Application Suggestions

Before selecting number and size of oil-fired unit heaters the building heat loss (Btu/hr) and the air flow (cfm) requirements must be determined from the physical layout of the space to be heated. A heated space occupied by many people requires a greater number of air changes than one with fewer people. Other factors used in applying unit heaters:

1. In areas where maximum comfort is not necessarily most important, employ as few heaters as possible to obtain the correct heat coverage. Arrange units to minimize electrical wiring, fuel line, and vent installation costs.
2. In areas where comfort is most important, more heaters of lesser Btu/hr capacities should be specified. Warm air discharge should not be directed at any people, but rather down aisles, along exterior walls, or into open spaces.

3. Mount heaters at the proper height and adjust the louvers to achieve the desired heat distribution.
4. Unit heaters should be installed so that the air streams of the individual units wipe the exposed walls of the building with either parallel or angular flow (see diagrams). To establish a circulatory air movement of warm air to blanket the entire wall, heaters should be spaced so that each supports the air stream from another heater.
5. Air streams from the heaters should be subjected to as little interference or obstruction as possible.
6. Generally, better air distribution and economy of a heating system operation is achieved with a greater number of smaller unit heaters instead of a fewer number of larger units.

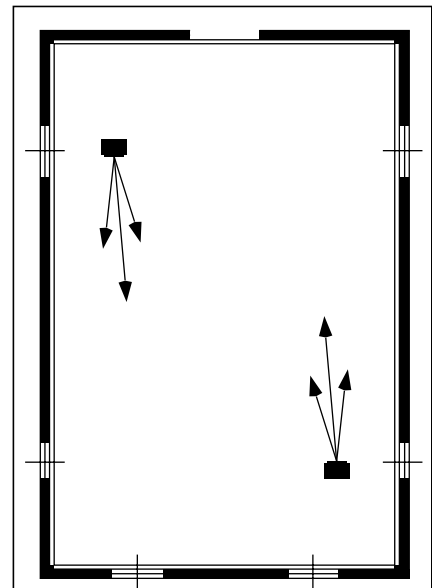


Mill-Type Building

The illustration on the left demonstrates the type of arrangement in which each unit heater supports the horizontal air stream from another. A circulatory air movement is maintained around the perimeter of the building where heat loss is greatest.

Warehouse Heating

As can be seen in the illustration on the right, propeller-driven, oil-fired unit heaters can provide maximum heat coverage with a minimum number of unit heaters. The heaters are placed so that their air streams flow parallel to the exposed walls.



Oil Burner — Pressure-atomizing, gun-type burner with a flame retention head and two-stage fuel unit. Features an electric spark ignition and automatic cad-cell safety system. The 1/7 HP 3450 RPM motor has manual-reset overload protection. Continuous-duty transformer is shielded and balanced. Power requirements: 115-volt, 60 Hz, single-phase.

Heat Exchanger — Made of 14 gauge aluminized steel and roll-formed into a contoured shape having rounded surfaces. Designed for free and uniform distribution of thermal stresses. Contains UL listed, preformed ceramic fiber fire pot. Combustion chamber is equipped with an inspection port, large service door, and two clean-out ports. Designed to operate at a stack draft of minus .02" W.C.

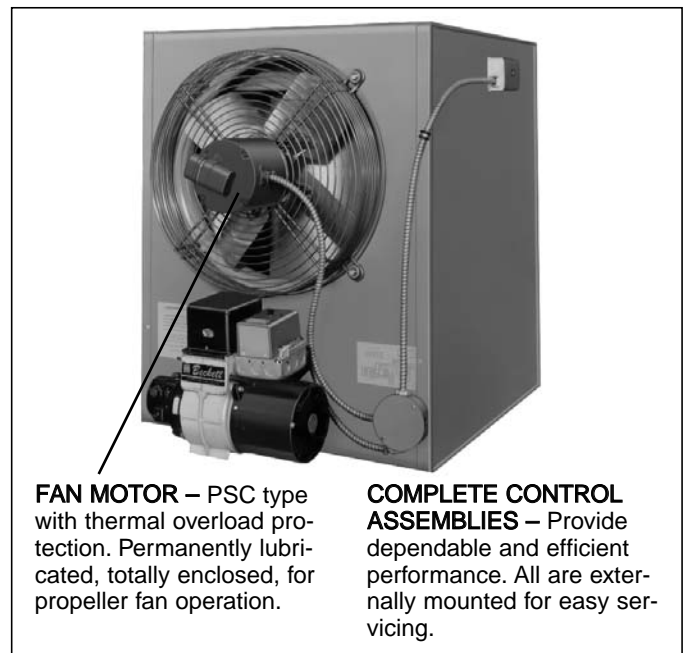
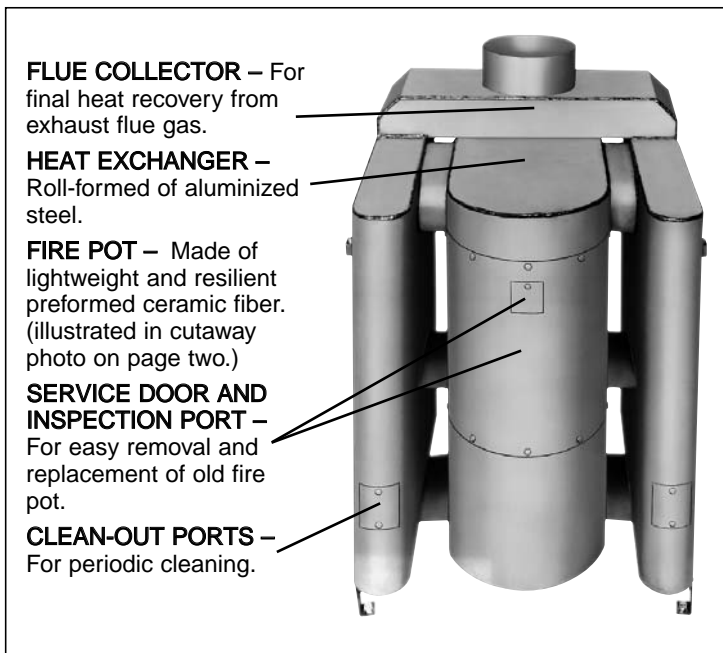
Unit Heater Casing — Treated for protection against corrosion prior to application of gray-green, baked-on enamel finish. Totally enclosed.

Fan Motor With Integral Overload Protection — Selected for propeller fan operation and permanently lubricated for longer operating life. Motor is 115-volt, 60 Hz, single-phase, PSC type with an operating speed of 1100 RPM. A finger-proof fan guard is included on all models.

Complete Control Assemblies — Controls are thoroughly tested, selected, and matched to provide dependable and efficient performance. Controls are externally mounted for easier servicing.

Summer-Winter Fan Switch — Provides air circulation during summer months (on combination fan and limit control).

Horizontal Air-Deflector Louvers — Adjustable up and down, louvers provide control over horizontal air delivery of the unit heater.



Accessories

Booster Pump — Equipped with discharge check valve, it is designed for lifting No. 1 and No. 2 fuel oil for multiple-unit installation. The 1750 RPM motors are split-phase, continuous duty, and available in two capacities: 1/6 HP, 115-volt, 60 Hz for 15 GPH and 1/4 HP, 115-volt, 60 Hz for 30 GPH.

Pressure Switch — Low voltage, normally open contact type. Used to control booster pump operation in the oil supply system. Factory set to close contacts at 50 PSIG with a maximum allowable pressure of 150 PSIG. Supplied with a 1/8" MPT connector and screw terminals.

Oil Safety Valve — Operating simultaneously with the burner motor, the valve protects the burner pump from excessive line pressure. The maximum inlet pressure is 60 PSIG.

Fuel Oil Filter — Protects oil burner from foreign particles.

Low-Voltage Thermostats — Single-stage, 24-volt with a calibrated range of 45° to 75° F., 55° to 95° F., or 40° to 90° F.

Thermostat Guard — Protects thermostat from damage or tampering.

Vertical Louvers — Employed in combination with standard horizontal louvers for complete control of air delivery.

Draft Regulator — Barometric type with screw adjustments and hinge-pin action. Designed for precise control of drafts.