MODINE
APPLIED THERMAL INNOVATION™

6-170.2
February, 2010

High-Efficiency Condensing Gas-Fired Separated Combustion Unit Heaters

Effinity 93
with Conservicore™ Technology

INDOOR AIR SOLUTIONS

At 93% thermal efficiency for all model sizes, Modine's Effinity[93] condensing unit heater features the highest efficiency available in North America for commercial and industrial gas-fired unit heaters. This industry leading efficiency is a result of the coupling of our Conservicore™ secondary heat exchanger technology with our robust tubular primary heat exchanger design. The Conservicore™ technology features a secondary recuperative heat exchanger fabricated from AL29-4C® stainless steel. This material is superior to other lower grades of stainless steel and aluminum, resulting in outstanding ability to withstand the corrosive environment of condensing gas fired equipment.

Available in six model sizes with input ranges from 135,000 to 310,000 Btu/Hr, Modine offers application flexibility unmatched in the industry. The separated combustion units draw combustion air from outside to ensure that the unit will always have plenty of fresh, clean air for combustion while increasing the overall heating efficiency. Venting material to be used is PVC, an extremely cost effective vent system.

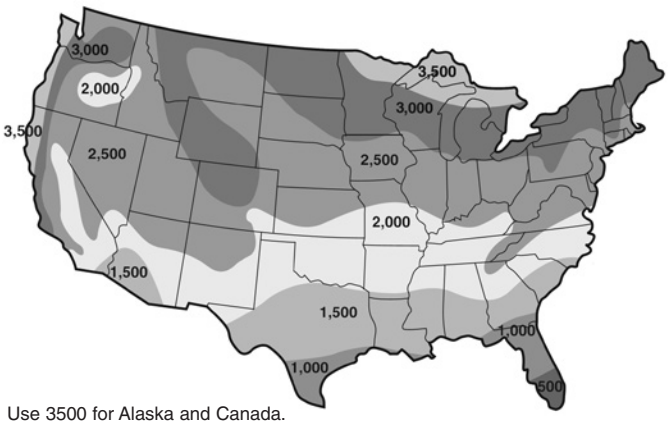
This catalog describes the design benefits, construction features, performance data, unit selection procedure, and the optional and accessory devices available for the Modine Effinity[93] Condensing Unit Heater, model PTC.

Table 2.1 - Estimated Annual Fuel Cost Savings Using the Effinity[93] Condensing Unit Heater

		Estimated Annual Savings Against Other Equipment ① ②			
		Gravity Vented		Power Vented	
Design Heat Load (Btu/Hr):		120,000	280,000	120,000	280,000
Annual Heat Load Hours (refer to Figure 2.1)	500	$306	$713	$136	$318
	1000	$611	$1,427	$273	$637
	1500	$917	$2,140	$409	$955
	2000	$1,223	$2,853	$546	$1,274
	2500	$1,529	$3,567	$682	$1,592
	3000	$1,834	$4,280	$819	$1,911
	3500	$2,140	$4,993	$955	$2,229

① Based on a natural gas rate of $1.10/Therm. Actual realized savings can vary significantly based on a number of changing factors including, but not limited to, fuel prices, climate, building use or construction, etc.
② Compares 93% efficient against 65% seasonal efficient gravity vented and 78% seasonal efficient power vented.

Figure 2.1 - U.S. Average Heat Load Hours Map



Use 3500 for Alaska and Canada.

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⚠ WARNING

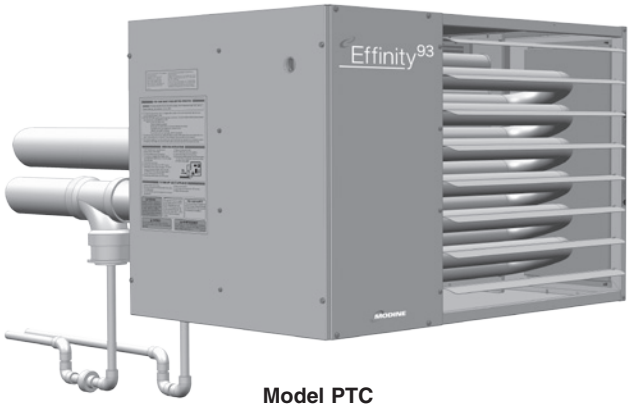
1. Do not locate ANY gas-fired unit in areas where chlorinated, halogenated or acid vapors are present in the atmosphere.
2. Do not install in potentially explosive or flammable atmosphere laden with dust, sawdust, or similar airborne materials.

⚠ CAUTION

Heaters are designed for use in heating applications with ambient temperatures between 40°F and 80°F. Heaters should not be used in applications where the heated space temperature is below 40°F. The combination of low space and combustion air temperatures may result in condensate freezing in the secondary heat exchanger and/or condensate drain.

As Modine Manufacturing Company has a continuous product improvement program, it reserves the right to change design and specifications without notice.
® AL29-4C is a Registered Trademark of Allegheny Ludlum Corporation.
™ Effinity[93], Conservicore, and any combination of these names either together or with other words is trademarked by Modine Manufacturing Co.

Figure 3.1 - Effinity[93] (model PTC)



Model PTC

PVC piping and piping components shown are by others.

Figure 3.2 - Modine Conservicore™ Heat Exchanger

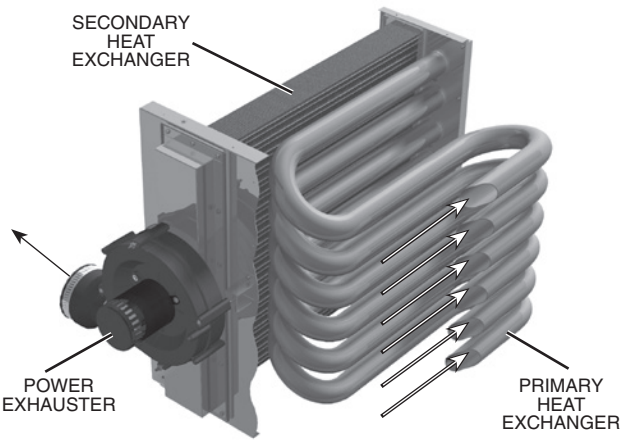
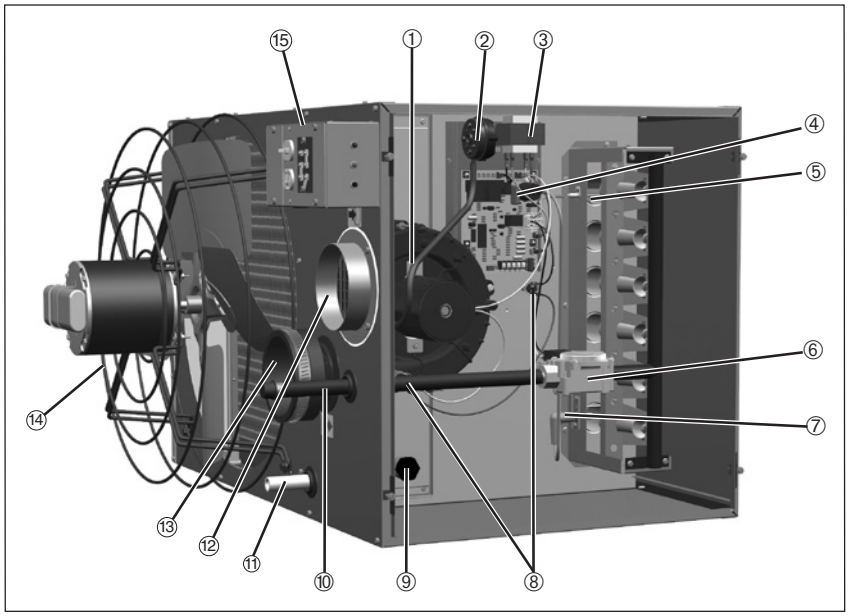


Table 3.1 - Standard Features and Factory Options ①

	Feature	
Cabinet and Air Mover	Aluminized steel cabinet (gauge indicated)	20 ga.
	Baked-on polyester powder paint for durability and corrosion resistence	•
	Adjustable air-deflector blades	•
	Fans engineered for quiet operation	•
	Totally enclosed fan motors for maximum durability	•
	Fingerproof fan guard	O
Heat Exchanger and Burner	93% thermally efficient	•
	Aluminized steel primary heat exchanger (409 stainless steel optional)	•
	Tubular heat exchanger for superior durability	•
	In-shot burner on each heat exchanger tube for reliable performance, ease of serviceability and low sound level on flame ignition/extinction	•
	Modine Conservicore™ technology on secondary recuperative heat exchanger with AL29-4C® stainless steel material as standard	•
Controls	ETL certification for commericial and industrial use in the US and Canada	•
	Factory-installed power exhauster	•
	Controls for natural gas (propane optional)	•
	Single stage gas controls	•
	High limit safety controls for both the heated air and flue gas temperature	•
	Condensate drain overflow switch to verify proper condensate drainage	•
	Differential pressure switch for proof of venting	•
	Direct spark ignition with continuous retry control system	•
	Contractor Convenience Package featuring a condensate pump convenience outlet, unit on/off switch, heater function status indicator lights, and external terminals for thermostat wiring	•
	Gas control step down transformer with 24V gas controls	•
	Fan delay timer	•

① • = Standard, O = Option. See page 6 for Field Installed Accessories.

Figure 4.1 - Factory Mounted Standard Features



① **Power Exhauster**
All units are supplied with a round vent pipe and combustion air inlet pipe connections.

② **Pressure Switch**
An automatic reset vent pressure switch is supplied on all units and is designed to prevent operation of the main burner in the event there is restricted venting of flue products. This restriction may occur due to an improper vent diameter, long vent runs, un-approved vent terminal, high winds, high negative pressure within space, etc. After the cause of the restriction has been corrected, the pressure switch will reset automatically.

③ **Control Step Down Transformer**
The control step down transformer is located in the electrical junction box. The transformer is used to step down from 115V to 24V for the gas controls, fan delay relay, field supplied motor starter, etc. An additional field installed transformer is required if the supply voltage is 208V, 230V, 460V, or 575V. To determine the control transformer supplied as well as any required accessory transformers, refer to Table 5.2.

④ **Integrated Direct Spark Control Board**
The integrated direct spark ignition control combines all furnace control functions. The integrated board provides digital control of the air mover, inducer, ignition, gas valve and flame sense as well as monitoring the safety circuit at all times. The board includes LED diagnostics for trouble shooting and a fused power supply. Ignition control is 100% shut-off with continuous retry.

⑤ **Flame Sensor**
Remote flame sensor verifies ignition of all burners, monitors the flame signal and communicates with the integrated circuit board.

⑥ **Single Stage Gas Valve**
The main gas valve is factory installed on the unit heater gas train. The main gas valve provides regulator, main gas, and manual shutoff functions. The valve is redundant and provides 100% shut off. Natural gas is Control Code 11, propane gas is Control Code 21.

⑦ **Direct Spark Igniter**
Provides spark for direct ignition of the burners.

⑧ **High Limit Switches**
One limit control is mounted in the air stream and will shut off the gas supply in the event of overheating. The other limit control is mounted on the power exhauster housing and will shut off the gas supply in the event of overheating flue gas temperatures.

⑨ **Condensate Drain Overflow Switch**
Shuts down gas controls if condensate is not properly draining from the unit.

⑩ **Gas Pipe Connection**
Easy access to factory installed gas pipe connection stubbed to outside of unit casing.

⑪ **Condensate Drain Connection**
Easy access to factory installed condensate drain pipe connection stubbed to outside of unit casing.

⑫ **Combustion Air Inlet Pipe Connection**
Simple connection for combustion air inlet piping.

⑬ **Vent Pipe Connection**
Simple Fernco® rubber boot connection for PVC vent system.

⑭ **Fan Guard**
Propeller units may be equipped with an optional finger proof fan guard for added protection. If ordered, the finger proof fan guard is installed at the factory in place of the standard fan guard.

⑮ **Contractor Convenience Package**
External junction box features simple connection of supply power wiring internally, thermostat wiring to terminals externally, an On/Off switch, a single 115V outlet for connection of an external condensate pump, and status indicator lights to display the operational state of the unit.

⑯ **Horizontal Air Deflector Blades (hidden)**
Factory mounted on the discharge of the unit, the blades can be adjusted to provide horizontal (up and down) delivery control of the heated air. Vertical deflector blades are available as a field installed accessory.

Table 5.1 - Propeller Unit Heater Model PTC General Performance Data

	Model PTC Sizes					
	135	**155**	**180**	**215**	**260**	**310**
Btu/Hr Input ①	135,000	155,000	180,000	215,000	260,000	310,000
Btu/Hr Ouput ①	125,550	144,150	167,400	199,950	241,800	288,300
Condensate Production (Ggal./Hr.)	1.0	1.1	1.3	1.6	1.9	2.3
Entering Airflow (CFM) @ 70°F ②	2160	2510	3020	3865	4585	5400
Outlet Velocity (FPM) ②	719	835	676	699	831	765
Air Temp. Rise (°F)	54	53	51	48	49	49
Max. Mounting Height (Ft.) ②	14	17	15	17	20	19
Heat Throw (Ft.) @ Max Mtg Ht	51	59	53	60	70	67
Motor Type ③	PSC	PSC	PSC	PSC	PSC	PSC
Motor HP	1/3	1/3	1/3	1/2	3/4	3/4
Motor RPM	1075	1075	1075	1075	1125	1125

① Ratings shown are for elevations up to 2,000 ft. For elevations above 2,000 feet, ratings should be reduced at the rate of 4% for each 1,000 feet above sea level. (In Canada see rating plate.) Reduction of ratings requires use of a high altitude kit.

② Data taken at 65°F ambient and unit fired at full-rated input. Mounting height as measured from bottom of unit, and without deflector hoods.

③ All motors used are produced, rated and tested by reputable manufacturers in accordance with NEMA standards and carry the standard warranty of both the motor manufacturer and Modine. All motors are totally enclosed and all single phase motors have built-in thermal overload protection.

Table 5.2 - Electrical Selection Details - All Models

Model	Supply Voltage	Phase	Required Accessory Transformer ④	Power & Gas Control Circuit Transformer Voltages	Factory Installed Transformer
PTC	115	1	none	115V/1ph	115 to 24V
	208	1 or 3	208V to 115V		
	230		230V to 115V		
	460	3	460V to 115V		
	575		575V to 115V		

④ For accessory transformer sizing, refer to Table 5.3.

Table 5.3 - Model PTC Operating Electrical Data ⑤

Supply Voltage	Power Code		Model PTC Sizes					
			135	**155**	**180**	**215**	**260**	**310**
115V 1 Phase	01 (115V)	**Motor Amps**	4.6	4.6	4.6	7.0	8.8	8.8
		Total Amps	6.9	6.9	6.9	9.3	11.1	9.9
		Transformer kVA	n/a	n/a	n/a	n/a	n/a	n/a
208V 1 or 3 Phase	01 (115V) with Transformer	**208V Total Amps**	3.81	3.81	3.81	5.14	6.14	5.47
		Transformer kVA	1.0	1.0	1.0	1.5	1.5	1.5
230V 1 or 3 Phase	01 (115V) with Transformer	**230V Total Amps**	3.45	3.45	3.45	4.65	5.55	4.95
		Transformer kVA	1.0	1.0	1.0	1.5	1.5	1.5
460V 3 Phase	01 (115V) with Transformer	**460V Total Amps**	1.73	1.73	1.73	2.33	2.78	2.48
		Transformer kVA	1.0	1.0	1.05	1.5	1.5	1.5
575V 3 Phase	01 (115V) with Transformer	**575V Total Amps**	1.38	1.38	1.38	1.86	2.22	1.98
		Transformer kVA	1.0	1.0	1.0	1.5	1.5	1.5

⑤ Amp draw data shown is operating amp draw at incoming power. For units that use a field installed accessory step-down transformer as noted, the amp draw shown is the primary side operating amp draw. For sizing of circuit protection for equipment with transformers, please refer to the National Electric Code.

Table 6.1 - Field Installed Accessories

	Feature
Cabinet and Air Mover	**Vertical Deflector Blades** - Allows directional discharge air control in the left and right directions.
	Downward Air Deflector Hoods - Available in 30°, 60°, and 90° configurations these deflector hoods provide more focused air flow control. Refer to page 7 for further details.
	Two-Point Suspension Kits - Converts from 4-point suspension to 2-point suspension.
	Fingerproof Fan Guard - Ships installed on unit in place of standard guard.
Controls	**Natural Gas to Propane Gas Conversion Kit** - All required parts to convert a natural gas unit to propane gas.
	Energy Saver Thermostats - Mounted high and independent of the room stat, this control turns on the unit heater fan if high temperatures are sensed, forcing the heated air down, reducing stratification and potentially gas usage. SPDT switch, 30°-100° range. 16 amp @ 120V. Honeywell T631A1113.
	Single-Stage Room Thermostats - See Table 6.2 for details.
	Stepdown Transformers - Used to operate units on 208V, 230V, 460V, or 575V supply voltage. Refer to Tables 5.2 and 5.3 for further selection details.
Condensate Handling	**Condensate Pump** - Used for high lift applications of up to 22' - DiversiTech CP-22
	Condensate Pump Suspension Kit - Used to suspend/support pump (DiversiTech CP-22) from heater.
	Condensate Treatment - Controls slime growth in pump (DiversiTech CP-22) and downstream drain.
	Condensate pH Neutralizing Kit - Reduces acidity of condensate.
	Recharge Kit for pH Neutralizing Kit - Aggregate material to recharge the pH Neutralizing kit (once per year or every 2000 hours).
Venting	**Horizontal Concentric Vent Kit** - Enables horizontal concentric venting. Kit consists of one concentric adapter, one vent termination screen, and one inlet guard assembly (See Figure 6.1).
	Vertical Concentric Vent Kit - Enables vertical concentric venting. Kit consists of one concentric adaptor, one combustion air inlet cap, and one vent guard assembly (See Figure 6.2).
	Termination screens for horizontal or vertical, 2-pipe system terminals. Terminals are by others.

Figure 6.1 - Horizontal Concentric Vent Kit

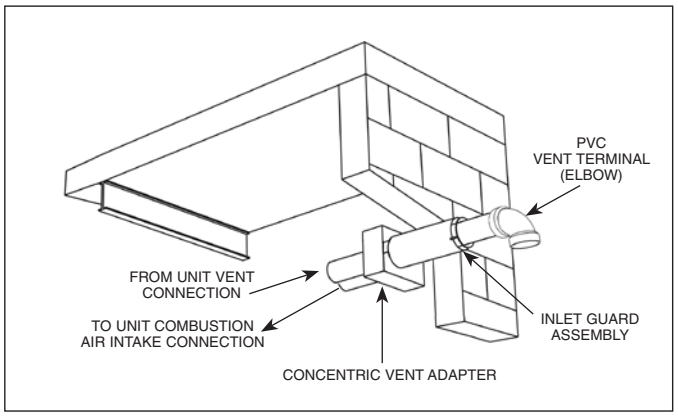


Figure 6.2 - Vertical Concentric Vent Kit

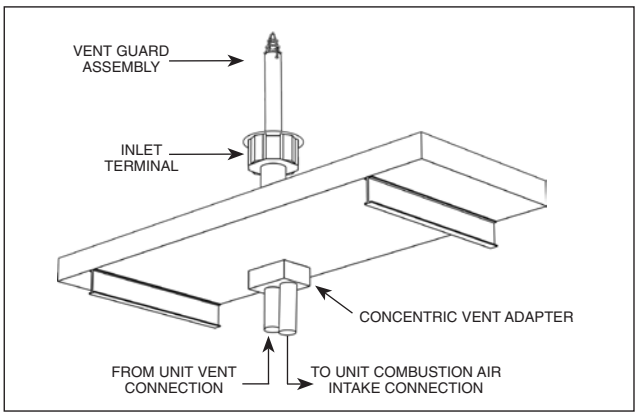


Table 6.2 - Field Installed Thermostats

	Description
Single-Stage Room Thermostats	WHITE-RODGERS 1C20-101 - 1.2 amps @30VAC, 50° -90°F temperature range, 0.15 to 1.2 amps adjustable heat anticipator
	WHITE-RODGERS 1C26-101 - Same as 1C20-101 above except adds Heat/Off/Cool and Fan On/Auto switches
	HONEYWELL TH5220D1029 digital non-programmable room stat with switching - range 40-90°F

Figure 7.1 - 30°, 60°, & 90° Deflector Hoods

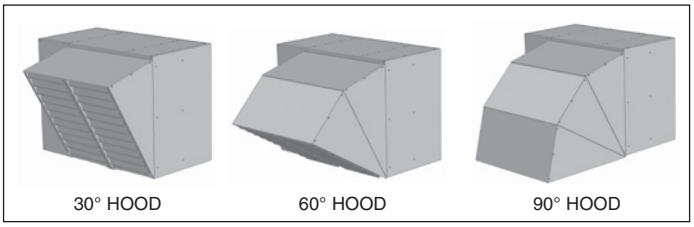
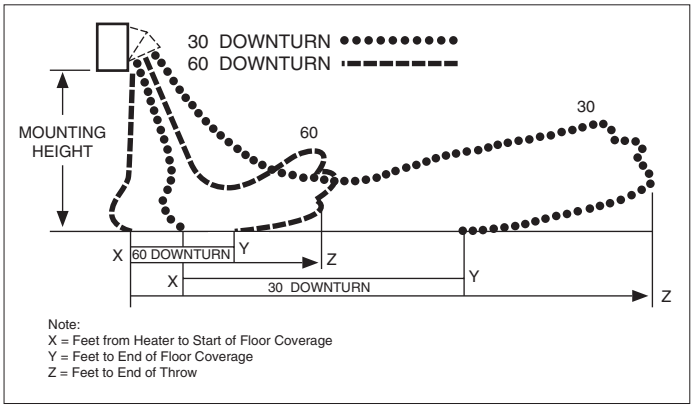


Figure 7.2 - 30° & 60° Hood Throw/Floor Coverage



Note:
X = Feet from Heater to Start of Floor Coverage
Y = Feet to End of Floor Coverage
Z = Feet to End of Throw

Figure 7.3 - 90° Hood Throw/Floor Coverage

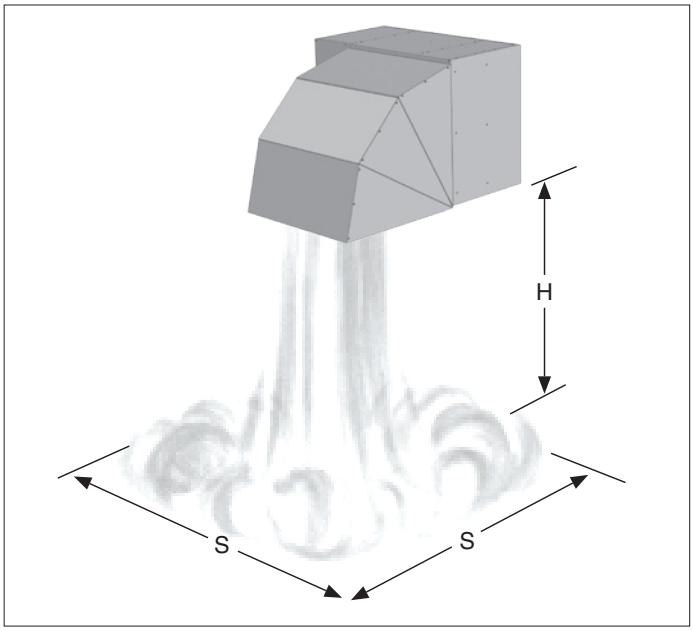


Table 7.1 - Deflector Hood Performance Data

Model Size	Airflow	Temp Rise	Mounting Height	Blade Angle	30° Hood			60° Hood			90° Hood
					X	Y	Z	X	Y	Z	S
	(cfm)	(°F)	(ft)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
135	2160	54	8	60	15	32	44	0	34	47	24
			10	52	13	31	42	0	32	44	21
			12	42	12	29	40	0	29	40	19
			14	30	10	26	36	0	25	34	18
155	2510	53	8	60	14	32	43	0	33	46	23
			10	51	13	30	42	0	31	43	21
			12	41	12	28	39	0	28	39	19
			14	29	10	25	35	0	24	33	17
			16	8	6	17	26	0	15	21	16
180	3020	51	8	63	16	35	48	0	37	51	26
			10	55	15	34	46	0	35	48	23
			12	46	13	32	44	0	32	45	21
			14	36	12	29	41	0	29	40	20
215	3865	48	8	66	19	41	56	0	43	59	32
			10	60	18	40	54	0	42	57	29
			12	53	17	38	53	0	40	54	26
			14	46	15	36	50	0	37	51	24
			16	37	14	34	47	0	33	46	23
260	4585	49	8	69	22	45	62	0	48	66	37
			10	63	21	44	61	0	47	64	33
			12	57	19	43	59	0	45	62	30
			14	51	18	42	57	0	43	59	28
			16	44	17	40	55	0	40	55	26
			18	35	15	37	52	0	36	50	25
			20	25	13	33	47	0	31	43	24
310	5400	49	8	68	20	43	58	0	45	62	34
			10	61	19	42	57	0	44	60	31
			12	55	18	40	55	0	42	58	28
			14	48	17	39	53	0	40	54	26
			16	40	15	37	51	0	36	50	24
			18	31	13	34	47	0	32	44	23

Note: Refer to Figures 7.1 through 7.3.

Selection Example

Selection Example Conditions

Select a unit heater to meet the following conditions:

1. Heating output capacity = 166,000 Btu/Hr per design engineer
2. Heat exchanger = 409 Stainless Steel
3. Gas Type = Natural
4. Gas Controls = Single Stage
5. Supply Voltage: 460V/60Hz/3Ph
6. Altitude: 1,000 feet

With the information listed above, the basic model, using the information in this catalog and the Model Nomenclature shown on page 11, can be selected as shown:

1. Determine the Model and Input Rating (MBH):

Using the Heating output capacity, the Furnace Input Rating is determined from Table 6.1. The closest model to 166,000 Btu/Hr output has an Btu/Hr Input rating of 180,000 Btu/Hr so the Furnace Input Rating = 180. The corresponding model for a 180 size, propeller, separated combustion unit heater is PTC. The model and size are a PTC180.

2. Determination of Heat Exchanger Material:

From item #2 in the example, the Heat Exchanger required is 409 Stainless Steel. Thus, the Heat Exchanger Material = S from the Model Nomenclature on page 11.

3. Determine the Ignition Type:

The Ignition Type = S from the Model Nomenclature on page11

4. Determine Power Code Required:

Referring to Table 5.2, it can be seen that the supply voltage from the example conditions is not available (460V). A transformer kit selected later in this example must be used. In this instance, from Table 5.2 select the 115V/60Hz/1Ph power code (PC) = 01 unit.

5. Determine the control type:

From items #4 and #5 in the example conditions, the gas type is Natural Gas and controls are Single Stage. From note ⑥ on page 4, we are directed to use Control Code (CC) 11.

At this point we have a full model number of: PTC180SS0111

6. Determination of transformer:

To operate a 115V/60Hz/1Ph unit on 460V/60Hz/3Ph supply power a unit step down transformer must be selected. By referring to Table 5.2 we see that a 460V to 115V step down transformer is required. As noted in the footnote for Table 5.2, the size can be determined to be 1.0VA from Table 5.3.

7. Altitude:

Since deration of gas fired unit heaters is only required for units to be installed at 2,000 ft or greater, no high altitude kit is required.

Figure 9.1 - Dimensional Drawings - Model PTC

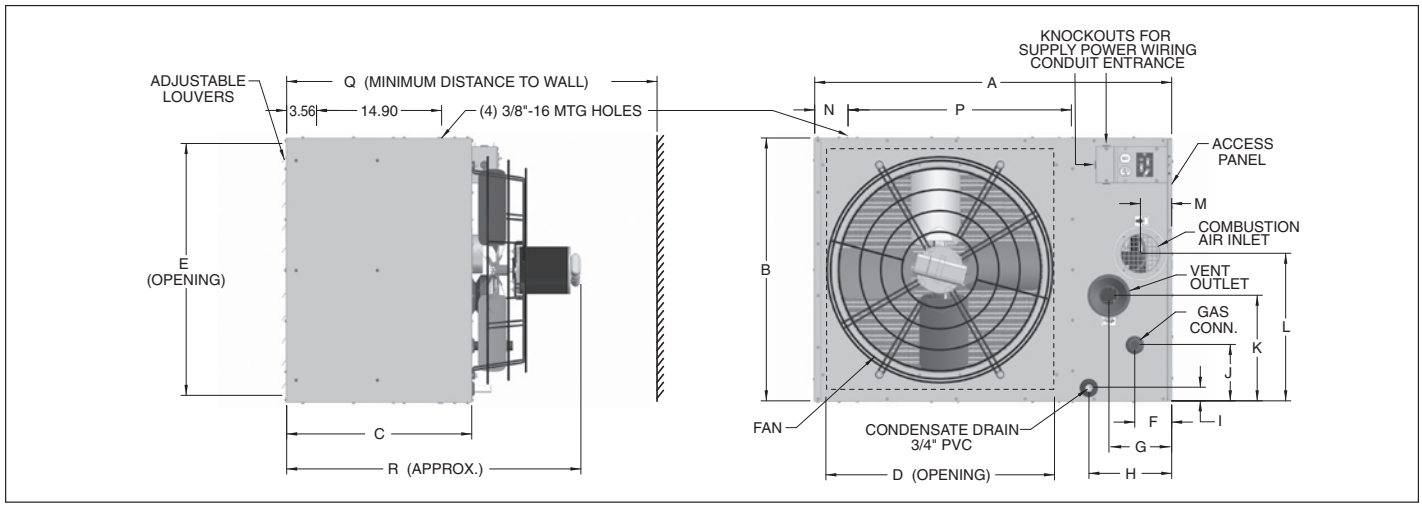


Table 9.1 - Dimensions (inches)

Models	PTC135	PTC155	PTC180	PTC215	PTC260	PTC310
A	35.53	35.53	42.53	42.53	42.53	42.53
B	23.06	23.06	25.81	31.31	31.31	39.56
C	22.05	22.05	22.05	22.05	22.05	22.05
D	22.52	22.52	29.52	29.52	29.52	29.52
E	21.18	21.18	23.93	29.43	29.43	37.68
F	4.50	4.50	4.50	4.50	4.50	4.50
G	7.98	7.98	7.98	7.47	7.47	8.12
H	10.18	10.18	10.36	9.86	9.86	9.79
I	2.15	2.15	1.73	1.63	1.63	1.88
J	8.09	8.09	9.47	6.72	6.72	10.84
K	8.45	8.45	9.82	12.58	12.58	16.19
L	12.95	13.45	14.92	17.58	17.58	22.19
M	3.48	3.98	3.98	3.72	3.72	4.62
N	1.54	1.54	3.97	3.97	3.97	3.97
P	22.03	22.03	26.60	26.60	26.60	26.60
Q	45.83	45.83	45.83	45.83	46.83	46.83
R	33.83	33.83	33.83	33.83	34.83	34.83
Combustion Air Inlet Pipe	3.00	4.00	4.00	4.00	4.00	6.00
Vent Outlet Pipe	3.00	4.00	4.00	4.00	4.00	4.00
Gas Connection	1/2	1/2	1/2	3/4	3/4	3/4
Fan Diameter	20.00	20.00	22.00	24.00	24.00	26.00
Approx. Shipping Weight (lbs.)	165	165	215	265	265	310

Table 9.2 - Clearances to Combustible Materials

Unit Side	Clearance To Combustible Materials	Recommended Service Clearance
Top and Bottom	6"	6"
Access Side	6"	18"
Non-Access Side	6"	18"
Rear	18"	18"
Vent Connector	6"	6"

Note: Specifications below are extracted from a master gas-fired unit heater specification and therefore certain numbered sections have been intentionally omitted.

General

A. Standards

All unit(s) shall include:

A.2. ETL design certification for use in both the US and Canada to the ANSI Z83.8 - latest revision, standard for "Gas Unit Heater and Gas-Fired Duct Furnaces" for safe operation, construction, and performance.

B. Mechanical Configuration

B.3. Condensing furnace section with 93% minimum efficiency provided by an indirect-fired tubular heat exchanger with individually fired tubes coupled to a secondary recuperative heat exchanger for maximum heat recovery.

C. Venting/Combustion Air Arrangement

C.4. The unit shall be separated combustion. The venting shall be a power exhausted arrangement with a separate combustion air intake pipe connection to allow for fresh combustion air from outside the conditioned space. The unit shall be tested to insure proper ignition when the unit is subjected to 40 mile per hour wind velocities. The unit shall also include a factory mounted differential pressure switch designed to prevent main burner ignition until positive venting has been proven.

Venting shall be Schedule 40 PVC. For Canadian installations, all vent pipe and components must be approved to ULC S636.

D. Unit Casing

D.1. The unit heater(s) casing shall be constructed of not less than 20 gauge aluminized steel with minimization of exposed fasteners.

D.2. All exterior casing parts casing parts shall be cleaned of all oils and a phosphate coating applied prior to painting. The exterior casing parts shall then be painted with an electrostatically applied baked-on gray-green polyester powder paint (7-mil thickness) for corrosion resistance.

D.3. The unit shall be furnished with horizontal air deflectors. The deflectors are adjustable to provide for horizontal directional airflow control (up or down).

E. Furnace Section

E.1.e. The primary heat exchanger(s) shall be made of 18 gauge aluminized steel (opt 409 stainless steel) tubes and headers. Each heat exchanger tube shall be individually and directly flame-fired. The heat exchanger tube shall be crimped to allow for thermal expansion and contraction. The flue collector box shall be made of 20 gauge AL29-4C stainless steel.

The thermal efficiency of the unit(s) shall be a minimum of 93% efficient for all air flow ranges through the use of a secondary recuperative heat exchanger. The secondary heat exchanger shall be constructed of AL29-4C stainless steel to withstand the corrosive environment of condensing gas fired equipment.

E.3.a. The burner(s) shall be in-shot type, directly firing each heat exchanger tube individually and is designed for good lighting characteristics without noise of extinction for both natural and propane gas.

E.5. The ignition controller(s) shall be 100% shut-off with continuous retry.

E.6. The gas pressure shall be between 6-7" W.C for natural gas (opt the gas pressure shall be 11-14" W.C. for propane gas).

E.7.a. The solid state ignition system shall directly light the gas by means of a direct spark igniter each time the thermostat calls for heat.

E.8. The unit gas controls shall be provided with the following:

E.8.d. Single-stage gas controls with a single-stage combination gas control, an ignition control, and a single-stage low voltage thermostat. The unit fires at 100% full fire based on a call for heat from a room thermostat.

E.9. An automatic reset high limit switch mounted in the air stream to shut off the gas supply in the event of overheating.

E.9.a. An automatic reset high limit switch mounted on the power exhauster housing to shut off the gas supply in the event of overheating flue gas temperatures.

E.9.b. A condensate drain line overflow switch that senses if the condensate line is clogged and shuts the unit heater down.

E.10. A time delay relay that delays the start of the air mover to allow the heat exchanger a warm-up period after a call for heat. The time delay relay shall also continue the air mover operation after the thermostat has been satisfied to remove any residual heat on the heat exchanger.

E.11. The unit shall be orificed for up to 2000' elevation above sea level (opt the unit shall be orificed for _____ elevation above sea level).

F. Electrical

F.1. All electrical components shall carry UL, ETL, or CSA listing.

F.2. Low voltage terminal board.

F.3. A single 115V to 24V step down transformer shall be provided for all unit controls.

G. Air Mover

G.1. The motor horsepower shall be ____.

G.2. The motor shall be factory wired.

G.3. The motor shall be controlled by a time delay relay.

G.4. Propeller models shall meet the following requirements.

G.4.a. The motor type shall be Single-speed, totally enclosed (TE)

G.5.b. The motor shall be rated for 115V/60Hz/1Ph.

H. Mounting

H.1. The unit shall be equipped with tapped holes to accept 3/8-16 threaded rod for suspension.

H.3. Units to have 4 suspension points.

J. Accessories

The following field installed accessory control devices shall be provided with the unit:

J.1. A 1-5 psi gas pressure regulator to reduce the inlet gas pressure for the operating controls.

J.2. A clear plastic thermostat guard with two keys for room thermostats.

J.4. Pipe Hanger Adapter Kit to facilitate threaded pipe suspension. (PTC models)

J.7. Vertical Deflector Kit to enables side distribution of airflow.

J.12. Propane conversion kit for converting natural gas units to propane gas.

J.18. 30° non-velocity generating downward air deflector hood constructed of 20 ga. cold rolled steel with baked-on gray-green polyester powder paint.

J.19. 60° non-velocity generating downward air deflector hood constructed of 20 ga. cold rolled steel with baked-on gray-green polyester powder paint.

J.20. 90° non-velocity generating downward air deflector hood constructed of 20 ga. cold rolled steel with baked-on gray-green polyester powder paint.

J21. A 208V to 115V step down shall be provided for operation of the 115V unit.

J.22. A 230V to 115V step down shall be provided for operation of the 115V unit.

J.23 A 460V to 115V step down shall be provided for operation of the 115V unit.

J.24. A 575V to 115V step down shall be provided for operation of the 115V unit.

J.29. A horizontal concentric vent kit shall be provided to allow the vent outlet and combustion air inlet pipes to penetrate the building wall through one opening.

J.30. A vertical concentric vent kit shall be provided to allow the vent outlet and combustion air inlet pipes to penetrate the building roof through one opening.

J.31. A 2-point suspension kit to convert the unit from 4-point mounting to 2-point mounting.

J.32. An Energy Saver Thermostat to be mounted high and independent of the room stat to turn on the unit heater fan if high temperatures are sensed, forcing the heated air down to reduce stratification and gas usage.

J.33. A condensate pump for high lift applications of up to 22'. Pump shall include indicator lights to show pump status, internal vibration isolation, a check valve, condensate treatment tablet dispenser, and alarm contacts to shut the unit heater down if the pump becomes inoperable.

J.34. A condensate pump suspension kit to suspend/support the pump (DiversiTech CP-22) from the unit heater.

J.35. Condensate treatment tablets to controls slime growth in pump (DiversiTech CP-22) and downstream drain.

J.36. A condensate pH neutralizing kit to reduce the acidity of condensate. Includes barbed inlet and outlet fittings, mounting brackets and an initial charge of neutralizing aggregate.

J.37. A recharge kit for pH neutralizing kit. Includes sufficient aggregate for a complete recharge of the neutralizing kit.

K. Thermostats

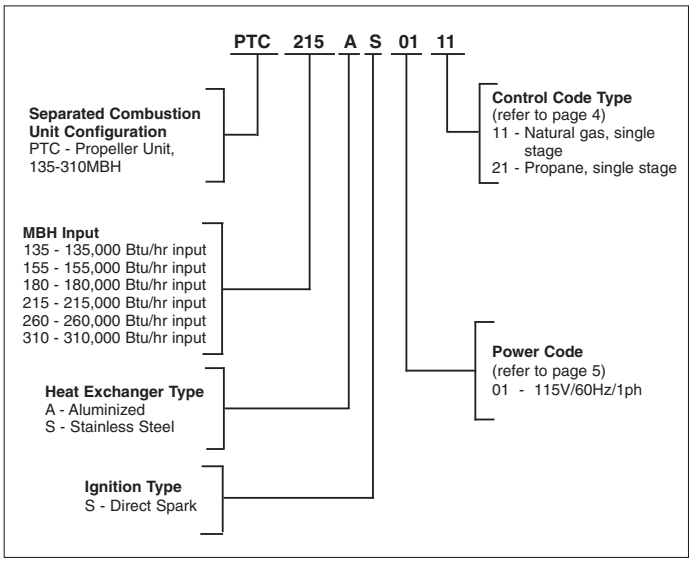
The unit shall be provided with the following thermostat:

K.2. A single stage room thermostat with a 50°-90°F range.

K.3. A single stage room thermostat with a 50°-90°F range with Heat/Off/Cool and Fan On/Auto switching.

K.4. Honeywell TH5220D1029 digital non-programmable room stat with switching - range 40-90°F.

Figure 11.1 - Model Number Designations



The Modine brand has been the industry standard since Arthur B. Modine invented and patented the first lightweight, suspended hydronic unit heater in 1923. No other manufacturer can provide the combined application flexibility, technical expertise and fast delivery found at Modine. Consult your local Modine distributor for help in solving your indoor air problems.

INDOOR AIR SOLUTIONS

Products from Modine are designed to provide indoor air-comfort solutions for commercial, institutional and industrial applications. Whatever your heating, ventilating and cooling requirements, Modine has the product to satisfy your needs, including:

- Gas-fired unit heaters
- Gas-fired duct furnaces
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- Gas-fired low-intensity infrared heaters
- Steam/hot water unit heaters
- Steam/hot water cabinet unit heaters
- Steam/hot water commercial fin tube radiation
- Oil-fired unit heaters
- Electric unit heaters
- Indoor gravity and power vented single and multiple duct furnace make-up air units
- Indoor separated combustion single and multiple duct furnace make-up air units
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