

Separated Combustion Unit Heaters, 30-125MBH

For residential, commercial or industrial applications that require a low profile unit, Modine offers the Hot Dawg®. Capable of being installed just one inch below the ceiling, the superior quality of the Hot Dawg makes it a preferred choice for a variety of applications, including garages and workshops.

Separated Combustion Unit Heaters, 150-400MBH

For commercial or industrial applications that require higher input ratings, the PTS/BTS is available in ratings that range from 150,000 to 400,000 Btu/Hr in either natural or propane gas.

Figure 3.1 - Hot Dawg Propeller Unit Heater

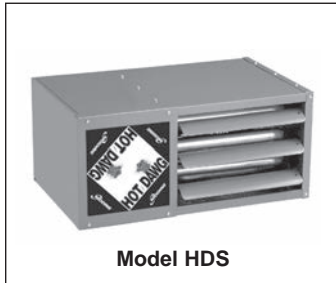


Figure 3.2 - Hot Dawg Blower Unit Heater



Figure 3.3 Propeller Unit Heater

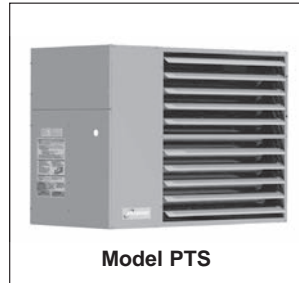


Figure 3.4 Blower Unit Heater

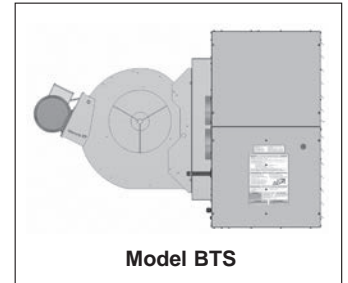
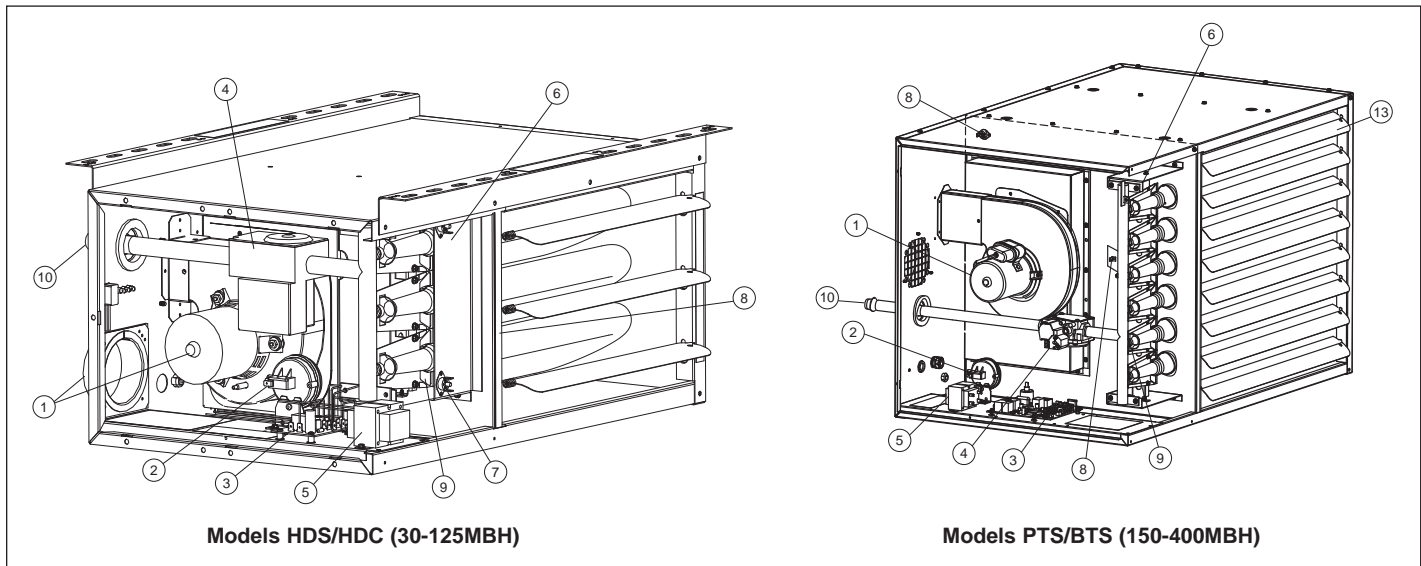


Table 3.1 - Standard Features and Factory Options ①

| | Feature | Model | | | |
|---------------------------|--|--------|--------|--------|--------|
| | | HDS | HDC | PTS | BTS |
| Cabinet and Air Mover | Aluminized steel cabinet (gauge indicated) | 22 ga. | 22 ga. | 20 ga. | 20 ga. |
| | Low profile casing design | • | • | | |
| | Baked-on polyester powder paint for durability and corrosion resistance | • | • | • | • |
| | Adjustable air-deflector blades | • | • | • | • |
| | Fans engineered for quiet operation | • | • | • | • |
| | Totally enclosed fan/blower motors for maximum durability (model sizes 100 and above) | • | | • | • |
| | Fingerproof fan guard (optional on PTS units) | • | • | • | • |
| | Two L-shaped mounting brackets (optional on sizes 100/125) | • | • | | |
| | Multi-tap 3-speed motors, certified to 0.8" W.C. external static pressure | | • | | |
| | Adjustable motor sheaves, certified to 0.7" W.C. external static pressure | | | | • |
| Heat Exchanger and Burner | 80% thermally efficient | • | • | • | • |
| | Aluminized steel 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 | • | • | • | • |
| Controls | CSA certification for commercial and industrial use in the US and Canada | • | • | • | • |
| | CSA certification for residential use in the US and Canada | • | • | | |
| | Factory-installed power exhauster | • | • | • | • |
| | Controls for natural gas (propane optional) | • | • | • | • |
| | Single stage gas controls (two stage optional) | • | • | • | • |
| | High limit safety control | • | • | • | • |
| | Differential pressure switch for proof of venting | • | • | • | • |
| | Flame roll-out safety switch | • | • | | |
| | Direct spark ignition with continuous retry control system | • | • | • | • |
| | Control terminal board and low voltage terminal connections | • | • | • | • |
| | Gas control step down transformer with 24V gas controls | • | • | • | • |
| Fan delay timer | • | • | • | • | |

① See page 13 for Field Installed Accessories

Figure 4.1 - Factory Mounted Standard and Optional Features



① **Power Exhauster (STD)**

All units are supplied with a round vent pipe and combustion air inlet pipe connections.

② **Pressure Switch (STD)**

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 **Integrated Direct Spark Control Board (STD)**

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.

④ **Gas Valve - (See Table 12.2)**

a) **Single Stage Gas Valve - (STD)**

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.

b) **Two Stage Gas Valve - (OPT)**

The two-stage gas valve is factory installed on the unit heater gas train. The two stage gas valve provides the regulator, main gas (100% and 50% fire), and manual shutoff functions. The valve is redundant and provides 100% shut off.

⑤ **Control Step Down Transformer - (STD)**

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 accessory/field supplied transformers required, refer to Table 12.1

⑥ **Flame Sensor (hidden) - (STD)**

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

⑦ **Flame Roll Out Switch (HDS/HDC models only) - (STD)**

Flame roll out switches are mounted near the burners and will shut off the gas supply in the event of an unsafe flame roll out condition.

⑧ **High Limit Switch (hidden) - (STD)**

The limit control is mounted in the air stream and will shut off the gas supply in the event of overheating.

⑨ **Direct Spark Igniter (hidden) - (STD)**

Provides spark for direct ignition of the burners.

⑩ **Gas Pipe Connection - (STD)**

Easy access to factory installed gas pipe connection stubbed to outside of unit casing.

Table 6.1 - Propeller Unit Model HDS and PTS General Performance Data

| | Model HDS Sizes | | | | | | Model PTS Sizes | | | | | | |
|--|-----------------|--------|--------|--------|---------|---------|-----------------|---------|---------|---------|---------|---------|---------|
| | 30 | 45 | 60 | 75 | 100 | 125 | 150 | 175 | 200 | 250 | 300 | 350 | 400 |
| Btu/Hr Input ① | 30,000 | 45,000 | 60,000 | 75,000 | 100,000 | 125,000 | 150,000 | 175,000 | 200,000 | 250,000 | 300,000 | 350,000 | 400,000 |
| Btu/Hr Output ① | 24,000 | 36,000 | 48,000 | 60,000 | 80,000 | 100,000 | 120,000 | 140,000 | 160,000 | 200,000 | 240,000 | 280,000 | 320,000 |
| Entering Airflow (CFM) @ 70°F | 505 | 720 | 990 | 1160 | 1490 | 1980 | 2140 | 2725 | 3015 | 3995 | 4545 | 5280 | 5995 |
| Outlet Velocity (FPM) | 523 | 725 | 653 | 769 | 565 | 747 | 711 | 607 | 673 | 721 | 824 | 748 | 851 |
| Air Temp. Rise (°F) | 44 | 46 | 45 | 48 | 50 | 47 | 53 | 48 | 50 | 47 | 50 | 50 | 51 |
| Max. Mounting Height (Ft.) ② | 10 | 10 | 12 | 14 | 12 | 16 | 15 | 14 | 15 | 18 | 19 | 18 | 21 |
| Heat Throw (Ft.) @ Max Mtg Ht ② | 25 | 27 | 36 | 38 | 42 | 56 | 51 | 50 | 54 | 62 | 69 | 65 | 74 |
| Motor Type ③ | SP | SP | PSC | PSC | SP | PSC | PSC | PSC | PSC | PSC | PSC | PSC | PSC |
| Motor HP | 1/15 | 1/15 | 1/12 | 1/12 | 1/12 | 1/8 | 1/6 | 1/6 | 1/6 | 1/3 | 1/2 | 1/2 | 3/4 |
| Motor RPM | 1550 | 1550 | 1625 | 1625 | 1050 | 1625 | 1075 | 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 55°F air temperature rise. 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. Motors on model sizes 100 and above are totally enclosed (Model size 75 and below are open drip proof) and all single phase motors have built in thermal overload protection.

Table 6.2 - Propeller Unit Model HDS and PTS Operating Electrical Data ④

| Supply Voltage | Power Code | | Model HDS Sizes | | | | | | Model PTS Sizes | | | | | | |
|-----------------|----------------------------|------------------------|-----------------|------|------|------|------|------|-----------------|------|------|------|------|------|------|
| | | | 30 | 45 | 60 | 75 | 100 | 125 | 150 | 175 | 200 | 250 | 300 | 350 | 400 |
| 115V 1 Phase | 01 (115V) | Motor Amps | 2.4 | 2.4 | 1.2 | 1.2 | 2.7 | 2.2 | 2.8 | 2.8 | 2.8 | 5.4 | 7.5 | 7.5 | 8.8 |
| | | Total Amps | 3.7 | 3.7 | 2.5 | 2.5 | 4.7 | 4.2 | 5.0 | 5.0 | 5.0 | 7.6 | 8.8 | 8.8 | 10.1 |
| | | Transformer kVA | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| 208V 1 Phase | 01 (115V) with Transformer | Transformer kVA | 0.5 | 0.5 | 0.5 | 0.5 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.5 | 1.5 | 1.5 |
| | | 208V Total Amps | 2.05 | 2.05 | 1.38 | 1.38 | 2.60 | 2.32 | 2.76 | 2.76 | 2.76 | 4.20 | 4.87 | 4.87 | 5.58 |
| 230V 1 Phase | 01 (115V) with Transformer | Transformer kVA | 0.5 | 0.5 | 0.5 | 0.5 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 1.0 | 1.5 | 1.5 | 1.5 |
| | | 230V Total Amps | 1.85 | 1.85 | 1.25 | 1.25 | 2.35 | 2.10 | 2.50 | 2.50 | 2.50 | 3.80 | 4.40 | 4.40 | 5.05 |
| 208V 3 Phase | 01 (115V) with Transformer | Transformer kVA | 0.5 | 0.5 | 0.5 | 0.5 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.5 | 1.5 | 1.5 |
| | | 208V Total Amps | 2.05 | 2.05 | 1.38 | 1.38 | 2.60 | 2.32 | 2.76 | 2.76 | 2.76 | 4.20 | 4.87 | 4.87 | 5.58 |
| 230V 3 Phase | 01 (115V) with Transformer | Transformer kVA | 0.5 | 0.5 | 0.5 | 0.5 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 1.0 | 1.5 | 1.5 | 1.5 |
| | | 230V Total Amps | 1.85 | 1.85 | 1.25 | 1.25 | 2.35 | 2.10 | 2.50 | 2.50 | 2.50 | 3.80 | 4.40 | 4.40 | 5.05 |
| 460V 3 Phase | 01 (115V) with Transformer | Transformer kVA | 0.5 | 0.5 | 0.5 | 0.5 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 1.0 | 1.5 | 1.5 | 1.5 |
| | | 460V Total Amps | 0.93 | 0.93 | 0.63 | 0.63 | 1.18 | 1.05 | 1.25 | 1.25 | 1.25 | 1.90 | 2.20 | 2.20 | 2.53 |
| 575V 3 Phase | 01 (115V) with Transformer | Transformer kVA | 0.5 | 0.5 | 0.5 | 0.5 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 1.0 | 1.5 | 1.5 | 1.5 |
| | | 575V Total Amps | 0.74 | 0.74 | 0.50 | 0.50 | 0.94 | 0.84 | 1.00 | 1.00 | 1.00 | 1.52 | 1.76 | 1.76 | 2.02 |

④ 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.

Figure 14.1 - 30°, 60°, and 90° Downward Deflector Hoods

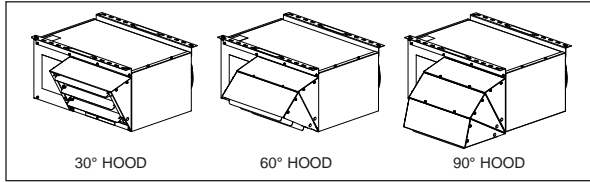


Figure 14.2 - 30° and 60° Throw/Floor Coverage

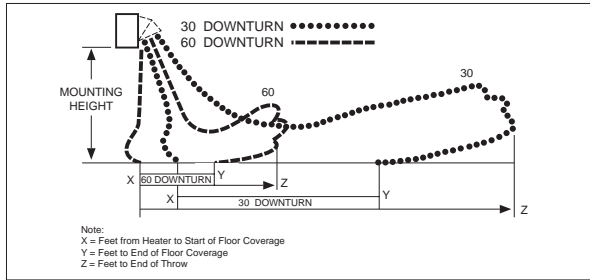


Figure 14.3 - 90° Hood Throw/Floor Coverage

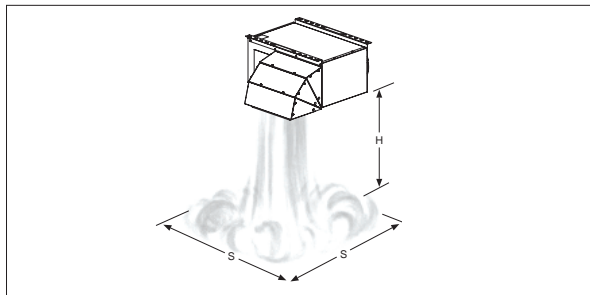


Table 14.1 - Deflector Hood General Performance Data - Model HDS

| Model Size | Airflow (cfm) | Temp Rise (°F) | Mounting Height (ft) | Blade Angle (°) | 30° Hood | | | 60° Hood | | | 90° Hood |
|------------|---------------|----------------|----------------------|-----------------|----------|--------|--------|----------|--------|--------|----------|
| | | | | | X (ft) | Y (ft) | Z (ft) | X (ft) | Y (ft) | Z (ft) | S (ft) |
| 30 | 505 | 44 | 8 | 31 | 6 | 15 | 21 | 0 | 14 | 20 | 10 |
| | | | 9 | 15 | 4 | 12 | 18 | 0 | 11 | 15 | 10 |
| 45 | 720 | 46 | 8 | 52 | 11 | 25 | 34 | 0 | 25 | 35 | 17 |
| | | | 10 | 39 | 9 | 23 | 31 | 0 | 22 | 31 | 15 |
| | | | 12 | 22 | 7 | 19 | 27 | 0 | 17 | 24 | 14 |
| 60 | 990 | 45 | 8 | 49 | 10 | 23 | 31 | 0 | 23 | 32 | 15 |
| | | | 10 | 35 | 8 | 20 | 28 | 0 | 20 | 28 | 14 |
| | | | 12 | 10 | 5 | 15 | 22 | 0 | 13 | 18 | 13 |
| 75 | 1160 | 48 | 8 | 55 | 12 | 27 | 37 | 0 | 28 | 38 | 19 |
| | | | 10 | 44 | 10 | 25 | 34 | 0 | 25 | 35 | 17 |
| | | | 12 | 30 | 9 | 22 | 31 | 0 | 21 | 29 | 15 |
| | | | 14 | 13 | 6 | 18 | 26 | 0 | 15 | 22 | 14 |
| 100 | 1490 | 50 | 8 | 52 | 11 | 25 | 34 | 0 | 26 | 35 | 17 |
| | | | 10 | 40 | 9 | 23 | 32 | 0 | 23 | 31 | 15 |
| | | | 12 | 23 | 7 | 19 | 27 | 0 | 18 | 25 | 14 |
| | | | 13 | 10 | 5 | 15 | 22 | 0 | 13 | 18 | 13 |
| 125 | 1980 | 47 | 8 | 63 | 17 | 36 | 49 | 0 | 38 | 52 | 27 |
| | | | 10 | 56 | 15 | 35 | 48 | 0 | 36 | 50 | 24 |
| | | | 12 | 48 | 14 | 33 | 46 | 0 | 34 | 46 | 22 |
| | | | 14 | 38 | 13 | 31 | 43 | 0 | 31 | 42 | 21 |
| | | | 16 | 26 | 11 | 27 | 39 | 0 | 26 | 36 | 19 |
| 18 | 18 | 9 | 25 | 35 | 0 | 15 | 21 | 18 | | | |

Note: Refer to Figures 14.2 through 14.3.

Table 14.2 - Deflector Hood General Performance Data - Model PTS

| Model Size | Airflow (cfm) | Temp Rise (°F) | Mounting Height (ft) | Blade Angle (°) | 30° Hood | | | 60° Hood | | | 90° Hood |
|------------|---------------|----------------|----------------------|-----------------|----------|--------|--------|----------|--------|--------|----------|
| | | | | | X (ft) | Y (ft) | Z (ft) | X (ft) | Y (ft) | Z (ft) | S (ft) |
| 150 | 2139 | 53 | 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 |
| | | | 16 | 9 | 7 | 20 | 29 | 0 | 17 | 24 | 17 |
| 175 | 2726 | 48 | 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 |
| 200 | 3015 | 50 | 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 |
| | | | 16 | 23 | 10 | 26 | 36 | 0 | 24 | 33 | 18 |
| | | | 17 | 12 | 8 | 22 | 32 | 0 | 19 | 27 | 18 |
| 250 | 3994 | 47 | 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 |
| | | | 18 | 26 | 12 | 31 | 43 | 0 | 28 | 40 | 21 |
| 300 | 4543 | 50 | 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 |
| 22 | 9 | 8 | 25 | 37 | 0 | 21 | 30 | 23 | | | |
| 350 | 5278 | 50 | 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 |
| | | | 20 | 17 | 10 | 29 | 41 | 0 | 25 | 35 | 22 |
| 21 | 2 | 7 | 23 | 34 | 0 | 18 | 26 | 21 | | | |
| 400 | 5995 | 51 | 8 | 70 | 24 | 49 | 66 | 0 | 52 | 71 | 41 |
| | | | 10 | 65 | 22 | 48 | 65 | 0 | 51 | 69 | 37 |
| | | | 12 | 59 | 21 | 47 | 64 | 0 | 49 | 67 | 34 |
| | | | 14 | 54 | 20 | 45 | 62 | 0 | 47 | 64 | 31 |
| | | | 16 | 47 | 19 | 44 | 60 | 0 | 44 | 61 | 29 |
| | | | 18 | 40 | 17 | 41 | 57 | 0 | 41 | 57 | 28 |
| | | | 20 | 32 | 15 | 38 | 54 | 0 | 37 | 51 | 26 |
| 22 | 21 | 13 | 34 | 48 | 0 | 31 | 43 | 25 | | | |
| 23 | 13 | 11 | 31 | 44 | 0 | 26 | 37 | 24 | | | |

Note: Refer to Figures 14.2 through 14.3.

Figure 19.1 - Dimensional Drawings - Model PTS

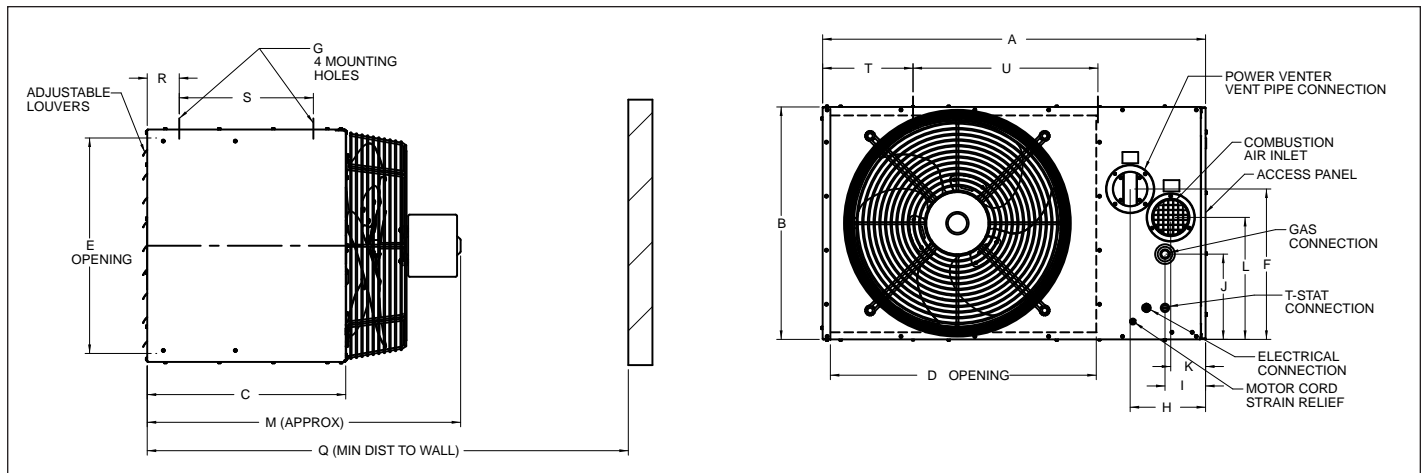


Table 19.1 - Dimensions (inches) - PTS ①

| Models | PTS150 | PTS175 | PTS200 | PTS250 | PTS300 | PTS350 | PTS400 |
|--|--------|--------|--------|--------|--------|--------|--------|
| A | 35.53 | 42.53 | 42.53 | 42.53 | 42.53 | 42.53 | 42.53 |
| B | 23.06 | 25.81 | 25.81 | 31.31 | 31.31 | 39.56 | 39.56 |
| C | 22.05 | 22.05 | 22.05 | 22.05 | 22.05 | 22.05 | 22.05 |
| D | 22.52 | 29.52 | 29.52 | 29.52 | 29.52 | 29.52 | 29.52 |
| E | 21.18 | 23.93 | 23.93 | 29.43 | 29.43 | 37.68 | 37.68 |
| F | 15.33 | 16.70 | 16.70 | 19.45 | 19.45 | 23.58 | 23.58 |
| G (Mounting Hole) ② | 3/8-16 | 3/8-16 | 3/8-16 | 3/8-16 | 3/8-16 | 3/8-16 | 3/8-16 |
| H | 8.37 | 8.37 | 8.37 | 8.37 | 8.37 | 8.37 | 8.37 |
| I | 4.50 | 4.50 | 4.50 | 4.50 | 4.50 | 4.50 | 4.50 |
| J | 8.09 | 9.47 | 9.47 | 6.72 | 6.72 | 10.84 | 10.84 |
| K | 3.87 | 3.87 | 3.87 | 5.20 | 5.20 | 5.20 | 5.20 |
| L | 12.17 | 13.55 | 13.55 | 12.66 | 12.66 | 16.78 | 16.78 |
| M | 31.79 | 32.83 | 32.83 | 33.83 | 33.83 | 34.83 | 34.83 |
| Q ③ | 43.79 | 44.83 | 44.83 | 45.83 | 45.83 | 46.83 | 46.83 |
| R | 3.56 | 3.56 | 3.56 | 3.56 | 3.56 | 3.56 | 3.56 |
| S | 14.90 | 14.90 | 14.90 | 14.90 | 14.90 | 14.90 | 14.90 |
| T | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 |
| U | 13.54 | 20.53 | 20.53 | 20.53 | 20.53 | 20.53 | 20.53 |
| Gas Connection | 1/2 | 1/2 | 1/2 | 3/4 | 3/4 | 3/4 | 3/4 |
| Vent and Combustion Air Connector Size | 4" | 4" | 4" | 6" | 6" | 6" | 6" |
| Fan Diameter | 20.00 | 22.00 | 22.00 | 22.00 | 22.00 | 24.00 | 24.00 |
| Approx. Shipping Weight (lbs.) | 165 | 210 | 215 | 265 | 270 | 310 | 320 |

① Do not use propeller units with duct work.
 ② Listed is the hole diameter and threads per inch to accept threaded rod.
 ③ Dimension equals overall plus 12".

Table 19.2 - 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" | 6" |
| Rear | 18" | 18" |
| Vent Connector | 6" | 6" |

Figure 23.1 - Model Number Designations

