

Gas-Fired Separated Combustion Unit Heaters Propeller & Blower Models



MODEL HDS



MODEL HDC



MODEL PTS (shown) / BTS

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

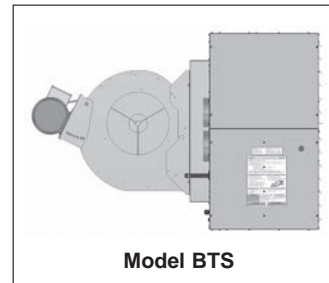
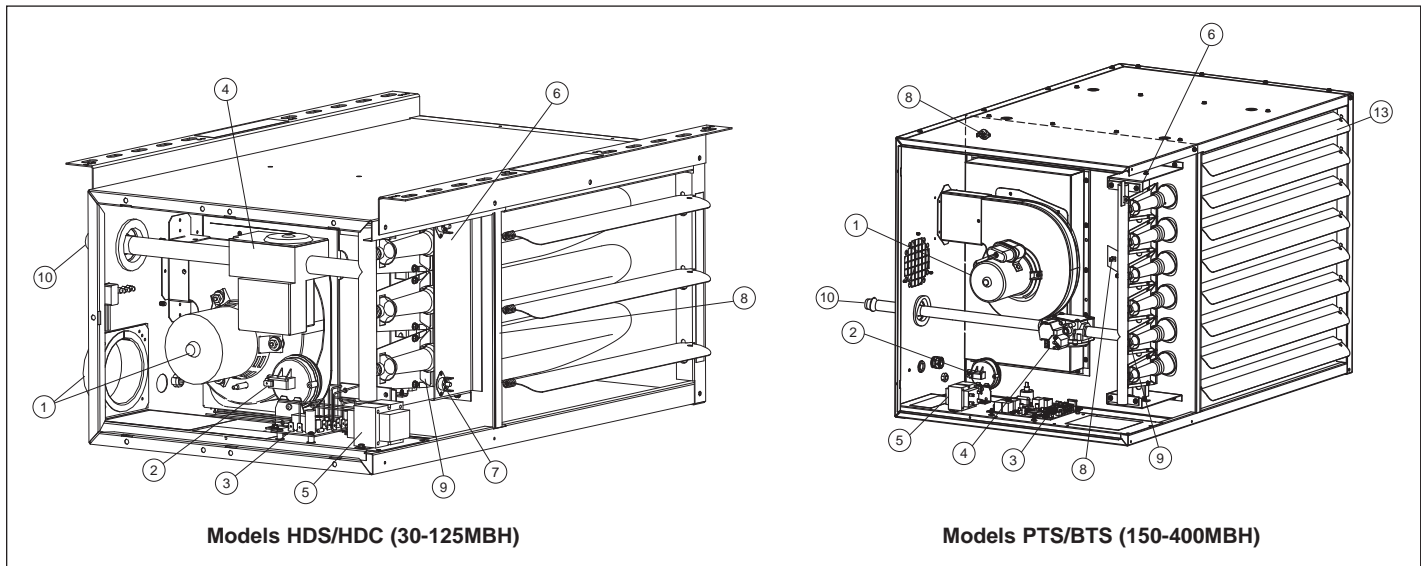


Table 3.1 - Standard Features and Factory Options ①

	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.

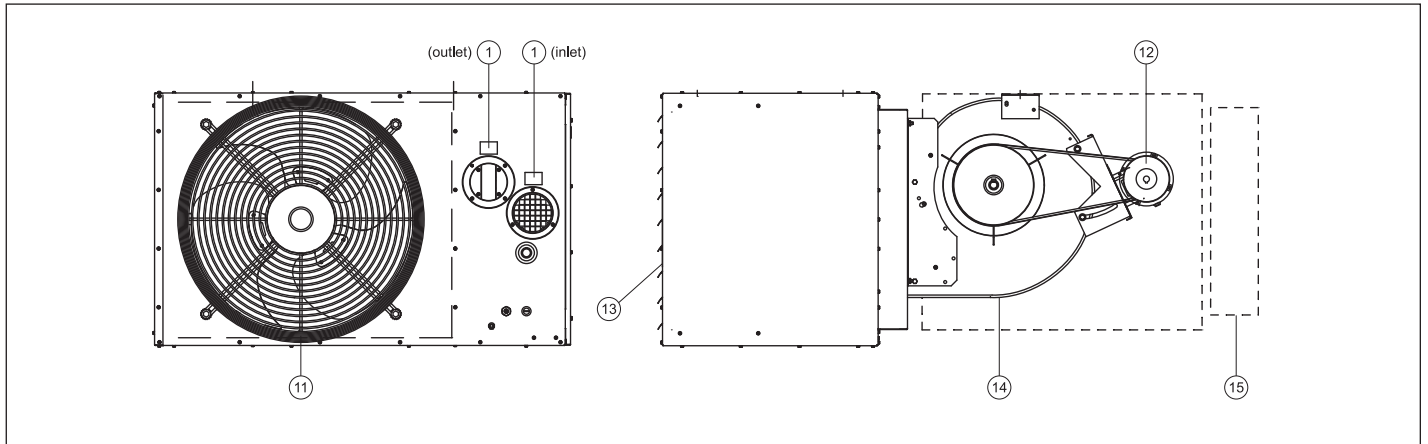
⑨ **Direct Spark Igniter (hidden) - (STD)**

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.

Figure 5.1 - Factory Mounted Standard and Optional Features



⑪ Finger Proof Fan Guard (STD thru 125, OPT 150-400)

Propeller units may be equipped with an optional finger proof fan guard for added protection. The finger proof fan guard is installed at the factory in place of the standard fan guard.

⑫ Blower Motor - (STD for HDC/BTS Models)

The blower motor is factory installed on the blower housing. For blower models 60-125, the blower is direct driven by a 3-speed motor. For blower models 150-400, the blower motor is supplied with an adjustable sheave that can be used to increase/decrease the blower RPM, and the blower motor can be provided in a variety of supply voltages and motor horsepowers.

⑬ Horizontal Air Deflector Blades (STD)

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.

⑭ Blower Enclosure (OPT for HDC/BTS Models)

⑮ Filter Rack (OPT for HDC/BTS Models)

Provides filtration of air to be heated. Must include Blower Enclosure accessory.

Table 7.1 - Blower Unit Model HDC and BTS General Performance Data

	Model HDC Sizes				Model BTS Sizes						
	60	75	100	125	150	175	200	250	300	350	400
Btu/Hr Input ①	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	48,000	60,000	80,000	100,000	120,000	140,000	160,000	200,000	240,000	280,000	320,000
Entering Airflow Range (CFM)	635-1111	794-1389	1140-2116	1235-2058	1587-2778	1852-3241	2116-3704	2646-4630	3175-5556	3704-6481	4233-7407
Outlet Velocity (FPM)	437-726	546-908	443-781	488-773	543-903	428-711	489-813	497-826	596-991	543-903	621-1032
Air Temp. Rise (°F)	40-70	40-70	35-65	45-75	40-70	40-70	40-70	40-70	40-70	40-70	40-70
Max. Mounting Height (Ft.) ②	7-13	7-16	8-19	8-17	9-21	8-18	9-21	10-22	11-26	11-26	13-29
Heat Throw (Ft.) @ Max Mtg Ht ②	20-45	24-57	27-68	27-59	33-75	28-65	32-74	34-78	40-94	39-90	44-102
Motor Type ③	P.S.C.	P.S.C.	P.S.C.	P.S.C.	T.E	T.E	T.E	T.E	T.E	T.E	T.E
Motor HP	1/4	1/3	1/2	1/2	See Table 9.1						
Motor RPM	Max 1100	Max 1100	Max 1100	Max 1100	1725	1725	1725	1725	1725	1725	1725

Table 7.2 - Blower Unit Model HDC and BTS General Performance Data

Supply Voltage	Power Code		Model HDC Sizes				Model BTS Sizes						
			60	75	100	125	150	175	200	250	300	350	400
115V 1 Phase	01 (115V)	Motor Amps	5.4	7.1	9.5	9.5	See Tables 7.3 through 7.5						
		Total Amps	6.4	8.1	11.5	11.5							
		Transformer kVA	n/a	n/a	n/a	n/a							
208V 1 Phase	01 (115V) with Transformer	Transformer kVA	1.0	1.0	1.5	1.5							
		208V Total Amps	3.54	4.48	6.36	6.36							
230V 1 Phase	01 (115V) with Transformer	Transformer kVA	1.0	1.0	1.5	1.5							
		230V Total Amps	3.20	4.05	5.75	5.75							
208V 3 Phase	01 (115V) with Transformer	Transformer kVA	1.0	1.0	1.5	1.5							
		208V Total Amps	3.54	4.48	6.36	6.36							
230V 3 Phase	01 (115V) with Transformer	Transformer kVA	1.0	1.0	1.5	1.5							
		230V Total Amps	3.20	4.05	5.75	5.75							
460V 3 Phase	01 (115V) with Transformer	Transformer kVA	1.0	1.0	1.5	1.5							
		460V Total Amps	1.60	2.03	2.88	2.88							
575V 3 Phase	01 (115V) with Transformer	Transformer kVA	1.0	1.0	1.5	1.5							
		575V Total Amps	1.28	1.62	2.30	2.30							

Table 7.3 - Blower Model BTS Motor Amp Draw ④ ⑤

Motor HP	Supply Voltage					
	115V/1ph	230V/1ph	208V/3ph	230V/3ph	460V/3ph	575V/3ph
1/4	5.4	-	-	-	-	-
1/3	5.0	2.5	1.9	1.6	0.8	0.6
1/2	8.5	3.8	2.3	2.6	1.3	0.9
1	13.4	6.7	4.0	3.8	1.9	1.5
1-1/2	15.4	7.7	5.2	5.2	2.6	1.9
2	-	-	6.8	6.6	3.3	2.3
3	-	-	10.6	-	-	4.0
5	-	-	14.3	13.2	6.6	5.2

Table 7.5 - Blower Model BTS Accessory Transformer Size (kVA) ⑥

Model Size	Supply Voltage			
	208V	230V	460V	575V
	3 ph	1 or 3 ph	3 ph	3 ph
150-250	0.5	0.5	0.5	0.5
300-400	0.5	0.25	0.25	0.25

- 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. Model HDC motors are open drip proof, while model BTS motors are totally enclosed and all single phase motors have built-in thermal overload protection.
- 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.
- ⑤ For BTS models, add the Motor Amp Draw and Control Circuit Amp Draw to get the Total Unit Amp Draw.
- ⑥ Transformers for blower models are typically smaller than those used for propeller models, as the transformer is not needed for the blower motor. Size 300-400 use a PSC power exhaustor motor, further reducing the required transformer size.

Table 7.4 - Blower Model BTS Control Circuit Amp Draw ④ ⑤

Model Size	Supply Voltage					
	115V/1ph	230V/1ph	208V/3ph	230V/3ph	460V/3ph	575V/3ph
150-250	2.2	1.1	1.2	1.1	0.6	0.4
300-400	1.3	0.7	0.7	0.7	0.3	0.3

BLOWER PERFORMANCE DATA - MODEL BTS



Table 9.1 - Power Code Description - Blower Model BTS ①

Power Code	Voltage	Phase	BTS150		BTS175		BTS200		BTS250		BTS300		BTS350		BTS400	
			HP	Drive	HP	Drive	HP	Drive	HP	Drive	HP	Drive	HP	Drive	HP	Drive
01	115	1	1/4	230	-	-	-	-	-	-	-	-	-	-	-	-
02	115/230	1	1/4	230	1/3	238	1/2	233	1/2	204	1	240	1-1/2	250	1-1/2	250
05	208	3	-	-	-	-	-	-	-	-	1	240	1-1/2	250	1-1/2	250
08	208-230/460	3	1/3	230	1/3	238	1/2	233	1/2	204	-	-	-	-	-	-
09	230/460	3	-	-	-	-	-	-	-	-	1	257	1-1/2	251	1-1/2	251
11	575	3	1/3	231	1/3	238	1/2	233	1/2	204	1	240	1-1/2	251	1-1/2	251
13	115/230	1	1/3	232	1/2	229	1	229	1	241	1	241	1-1/2	247	1-1/2	247
16	208	3	-	-	-	-	1	229	1	241	1	241	1-1/2	247	1-1/2	247
19	208-230/460	3	1/3	232	1/2	229	-	-	-	-	-	-	-	-	-	-
20	230/460	3	-	-	-	-	1	259	1	258	1	258	1-1/2	248	1-1/2	248
22	575	3	1/3	233	1/2	229	1	229	1	241	1	241	1-1/2	248	1-1/2	248
24	115/230	1	1/2	229	1	175	1	175	1-1/2	23	1-1/2	243	1-1/2	252	1-1/2	252
27	208	3	-	-	1	175	1	175	1-1/2	23	1-1/2	243	1-1/2	252	1-1/2	252
30	208-230/460	3	1/2	229	-	-	-	-	-	-	-	-	-	-	-	-
31	230/460	3	-	-	1	253	1	253	1-1/2	177	1-1/2	244	1-1/2	180	1-1/2	180
33	575	3	1/2	229	1	175	1	175	1-1/2	177	1-1/2	244	1-1/2	180	1-1/2	180
35	115/230	1	1	175	1-1/2	237	1-1/2	235	-	-	1-1/2	23	-	-	-	-
38	208	3	1	175	1-1/2	237	1-1/2	235	2	180	1-1/2	23	2	177	2	177
42	230/460	3	1	253	1-1/2	234	1-1/2	236	2	180	1-1/2	177	2	177	2	177
44	575	3	1	175	1-1/2	234	1-1/2	236	2	180	1-1/2	177	2	177	2	177
49	208	3	-	-	-	-	-	-	-	-	2	177	2	180	2	180
53	230/460	3	-	-	-	-	-	-	-	-	2	177	2	180	2	180
55	575	3	-	-	-	-	-	-	-	-	2	177	3	180	3	180
60	208	3	-	-	-	-	-	-	-	-	3	112	3	246	3	246
64	230/460	3	-	-	-	-	-	-	-	-	3	112	3	246	3	246
66	575	3	-	-	-	-	-	-	-	-	3	112	5	246	5	246
71	208	3	-	-	-	-	-	-	-	-	-	-	5	245	5	245
75	230/460	3	-	-	-	-	-	-	-	-	-	-	5	245	5	245
77	575	3	-	-	-	-	-	-	-	-	-	-	5	245	5	245

① For selection of correct Power Code, refer to the Tables on pages 10-11.

Table 9.2 - Filter Static Pressure Drop ②

	BTS150	BTS175	BTS200	BTS250	BTS300	BTS350	BTS400
Filter Static ("W.C.)	0.1	0.2	0.1	0.2	0.2	0.2	0.2

② For blower units with enclosure and filter, add the following static pressures to the static pressure determined by the system designer for total external static pressure.

BLOWER PERFORMANCE DATA - MODEL BTS



Table 10.1 - Blower Model BTS 150-250 (40-55°F temp rise for 250 size unit) ① ② ③

Model Size	ATR	CFM	HP	External Static Pressure ("W.C.)																								HP					
				0.0			0.1			0.2			0.3			0.4			0.5			0.6			0.7								
				RPM	Drive	Turns	RPM	Drive	Turns	RPM	Drive	Turns	RPM	Drive	Turns	RPM	Drive	Turns	RPM	Drive	Turns	RPM	Drive	Turns	RPM	Drive	Turns	RPM	Drive	Turns			
150	40	2778	1	573	175	4.5	615	175	4.0	658	175	3.0	699	175	2.5	738	175	1.5	775	175	1.0	810	175	0.5	-	-	-	-	-	-	1		
	45	2469	1/2	510	229	4.0	558	229	3.0	606	-	-	650	-	-	692	-	-	731	-	-	769	-	-	806	175	0.5	1	-	-	1/2		
	50	2222	1/3	460	232	4.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1/3	
			1/2		230	1.0	513	229	4.0	565	229	3.0	612	229	2.0	656	-	-	699	-	-	739	-	-	779	-	-	-	-	-	1/2		
			1		229	5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
	55	2020	1/4	418	230	2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1/4
			1/3		232	5.0	477	232	3.5	532	232	2.0	582	229	2.5	629	-	-	674	-	-	717	-	-	759	-	-	-	-	-	-	1/3	
			1/2		230	2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	60	1852	1/4	384	230	3.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1/4
			1/3		230	3.5	448	232	4.0	506	230	0.0	559	-	-	609	-	-	656	-	-	701	-	-	741	-	-	-	-	-	-	-	1/3
			1/2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	65	1709	1/4	354	230	4.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1/4
1/3			230		4.0	423	232	4.5	485	232	3.0	540	232	2.0	592	-	-	642	-	-	690	-	-	735	-	-	-	-	-	-	1/3		
1/2			-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1/2
70	1587	1/4	329	230	5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1/4	
		1/3		230	5.0	403	232	5.0	467	232	3.5	525	232	2.5	580	-	-	635	-	-	680	-	-	722	-	-	-	-	-	-	-	1/3	
		1/2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1/2
175	40	3241	1	625	175	3.5	655	175	3.0	690	175	2.5	727	-	-	764	-	-	799	-	-	834	-	-	866	237	2.0	1-1/2	-	-	1		
	45	2881	1	555	175	5.0	589	175	4.5	630	175	3.5	672	175	3.0	712	175	2.0	750	175	1.5	786	-	-	821	-	-	3.0	1-1/2	-	-	1	
	50	2593	1/2	500	229	4.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1/2
			1-1/2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	55	2357	1/3	454	238	2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1/3
			1/2		229	5.0	497	229	4.5	548	229	3.5	597	229	2.5	642	-	-	684	-	-	724	-	-	763	-	-	-	-	-	-	1/2	
			1-1/2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	60	2161	1/3	416	238	4.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1/3
			1/2		238	2.5	464	238	5.0	520	229	4.0	571	229	3.0	618	-	-	662	-	-	705	-	-	745	-	-	-	-	-	-	-	1/2
			1-1/2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	65	1994	1/3	384	238	4.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1/3
			1/2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-1/2			-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
70	1852	1/3	356	238	5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1/3	
		1/2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1/2
		1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
200	40	3704	1-1/2	715	235	3.5	741	235	2.5	770	235	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1-1/2	
	45	3292	1	635	175	3.5	665	175	3.0	698	-	-	735	-	-	772	-	-	807	-	-	841	-	-	873	-	-	-	-	-	1		
	50	2963	1-1/2	571	229	1.5	604	229	1.0	638	235	3.0	684	235	2.0	723	235	1.0	761	235	0.0	797	-	-	831	-	-	-	-	-	-	1-1/2	
			1		175	4.5	604	175	4.0	643	175	3.5	684	175	2.5	723	175	2.0	761	175	1.5	797	-	-	831	-	-	-	-	-	-	1	
	55	2694	1/2	519	233	2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1/2
			1		229	4.0	556	229	3.0	600	229	2.5	644	229	1.5	686	-	-	725	-	-	763	-	-	799	-	-	-	-	-	-	1	
			1-1/2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	60	2469	1/2	475	233	2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1/2
			1		229	5.0	516	229	4.0	565	229	3.0	612	229	2.0	656	-	-	697	-	-	736	-	-	774	-	-	-	-	-	-	1	
			1-1/2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	65	2279	1/2	439	233	4.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1/2
			1		-	-	484	229	4.5	537	175	5.0	586	175	4.5	632	-	-	675	-	-	716	-	-	756	-	-	-	-	-	-	1	
1-1/2			-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1-1/2
70	2116	1/2	407	233	5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1/2	
		1		-	-	457	229	5.0	513	229	4.0	565	175	4.5	612	-	-	657	-	-	700	-	-	742	-	-	-	-	-	-	1		
		1-1/2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1-1/2
250	4630	1-1/2	542	23	4.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1-1/2	
		2		241	3.5	569	241	2.5	599	180	4.5	629	180	4.0	658	-	-	688	-	-	716	-	-	744	-	-	-	-	-	-	2		
	45	4115	1-1/2	482	-	-	513	-	-	546	23	4.5	580	180	5.0	613	23</																

BLOWER PERFORMANCE DATA - MODEL BTS



Table 11.1 - Blower Model BTS 250-400 (60-70°F temp rise for 250 size unit) ① ② ③

Model Size	ATR	CFM	HP	External Static Pressure ("W.C.)																									
				0.0			0.1			0.2			0.3			0.4			0.5			0.6			0.7				
				RPM	Drive	Turns	RPM	Drive	Turns	RPM	Drive	Turns	RPM	Drive	Turns	RPM	Drive	Turns	RPM	Drive	Turns	RPM	Drive	Turns	RPM	Drive	Turns	HP	
250	3086	1/2	360	204	4.0	403	204	3.0	448	204	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1/2		
				241	5.0	403	241	4.0	490	241	3.0	530	241	2.0	566	241	1.5	601	241	0.5	635	241	0.0	1					
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1-1/2	
		1-1/2	204	4.5	379	204	3.5	427	204	2.0	471	204	1.0	512	204	0.5	550	204	0.0	587	204	0.0	1						
			241	5.0	379	241	4.5	427	241	3.5	471	241	2.5	512	241	1.5	550	241	1.0	587	241	0.0	1						
			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1-1/2		
	2849	1/2	332	204	5.0	359	204	4.5	410	204	2.5	456	204	1.5	498	204	0.5	538	204	0.0	576	204	0.0	613	204	0.0	1/2		
				241	5.0	359	241	4.0	410	241	3.0	456	241	2.0	498	241	1.0	538	241	0.5	576	241	0.0	613	241	0.5	1		
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1-1/2	
		1-1/2	204	4.5	327	204	3.5	379	204	2.0	427	204	1.0	471	204	0.5	512	204	0.0	550	204	0.0	587	204	0.0	622	204	0.0	1
			241	4.5	327	241	4.0	379	241	3.5	427	241	2.5	471	241	1.5	512	241	1.0	550	241	0.5	587	241	0.0	622	241	0.5	1-1/2
			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	
300	2646	1/2	308	204	5.0	359	204	4.5	410	204	2.5	456	204	1.5	498	204	0.5	538	204	0.0	576	204	0.0	613	204	0.0	1/2		
				241	5.0	359	241	4.0	410	241	3.0	456	241	2.0	498	241	1.0	538	241	0.5	576	241	0.0	613	241	0.5	1		
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1-1/2
		1-1/2	204	4.5	327	204	3.5	379	204	2.0	427	204	1.0	471	204	0.5	512	204	0.0	550	204	0.0	587	204	0.0	622	204	0.0	1
			241	4.5	327	241	4.0	379	241	3.5	427	241	2.5	471	241	1.5	512	241	1.0	550	241	0.5	587	241	0.0	622	241	0.5	1-1/2
			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	
	5556	3	650	112	3.0	673	112	2.5	697	112	2.0	721	112	1.0	746	112	0.5	771	112	0.0	797	112	0.0	823	112	0.0	3		
				177	3.5	673	177	3.0	697	177	2.0	721	177	1.0	746	177	0.5	771	177	0.0	797	177	0.0	823	177	0.0	3		
				241	3.5	673	241	3.0	697	241	2.0	721	241	1.0	746	241	0.5	771	241	0.0	797	241	0.0	823	241	0.0	3		
		2	112	5.0	604	112	4.5	631	112	3.5	659	112	3.0	687	112	2.0	715	112	1.5	742	112	0.5	768	112	0.0	3			
			177	5.0	604	177	4.5	631	177	3.5	659	177	2.5	687	177	1.5	715	177	0.5	742	177	0.0	768	177	0.0	3			
			243	2.5	549	243	1.5	580	243	0.0	611	243	0.0	642	243	0.0	672	243	0.0	701	243	0.0	729	243	0.0	1-1/2			
4444	1	520	241	3.5	505	241	3.0	538	241	2.0	573	241	1.0	606	241	0.5	638	241	0.0	669	241	0.0	698	241	0.0	1			
			240	2.0	505	240	1.5	538	240	0.5	573	240	0.0	606	240	0.0	638	240	0.0	669	240	0.0	698	240	0.0	1-1/2			
			243	4.0	505	243	3.0	538	243	1.5	573	243	0.5	606	243	0.0	638	243	0.0	669	243	0.0	698	243	0.0	1-1/2			
	1-1/2	241	4.5	468	241	3.5	506	241	3.0	543	241	2.0	578	241	1.0	612	241	0.5	644	241	0.0	674	241	0.0	1				
		240	3.0	468	240	2.5	506	240	1.5	543	240	0.5	578	240	0.0	612	240	0.0	644	240	0.0	674	240	0.0	1-1/2				
		243	5.0	468	243	4.5	506	243	3.0	543	243	1.5	578	243	0.5	612	243	0.0	644	243	0.0	674	243	0.0	1-1/2				
350	3704	1	433	241	5.0	468	241	4.5	506	241	3.5	543	241	2.5	578	241	1.5	612	241	0.5	644	241	0.0	674	241	0.0	1		
				240	3.0	468	240	2.5	506	240	1.5	543	240	0.5	578	240	0.0	612	240	0.0	644	240	0.0	674	240	0.0	1-1/2		
				243	5.0	468	243	4.5	506	243	3.0	543	243	1.5	578	243	0.5	612	243	0.0	644	243	0.0	674	243	0.0	1-1/2		
		1-1/2	241	5.0	433	241	4.5	468	241	3.5	506	241	2.5	543	241	1.5	578	241	0.5	612	241	0.5	644	241	0.0	674	241	0.0	1
			240	4.0	433	240	3.0	468	240	2.0	506	240	1.0	543	240	0.0	578	240	0.0	612	240	0.0	644	240	0.0	674	240	0.0	1-1/2
			243	5.0	433	243	4.5	468	243	3.0	506	243	1.5	543	243	0.5	578	243	0.0	612	243	0.0	644	243	0.0	674	243	0.0	1-1/2
	3419	1	400	241	5.0	438	241	4.5	478	241	3.5	518	241	2.5	555	241	1.5	590	241	0.5	623	241	0.0	655	241	0.0	1		
				240	4.0	438	240	3.0	478	240	2.0	518	240	1.0	555	240	0.0	590	240	0.0	623	240	0.0	655	240	0.0	1-1/2		
				243	5.0	438	243	4.0	478	243	3.0	518	243	2.0	555	243	1.0	590	243	0.0	623	243	0.0	655	243	0.0	1-1/2		
		1-1/2	241	4.5	371	241	3.5	412	241	2.5	456	241	1.5	497	241	0.5	536	241	0.0	572	241	0.0	607	241	0.0	640	241	0.0	1
			240	3.0	371	240	2.0	412	240	1.0	456	240	0.0	497	240	0.0	536	240	0.0	572	240	0.0	607	240	0.0	640	240	0.0	1-1/2
			243	4.0	371	243	3.0	412	243	2.0	456	243	1.0	497	243	0.0	536	243	0.0	572	243	0.0	607	243	0.0	640	243	0.0	1-1/2
400	4681	5	721	245	3.0	739	245	2.5	757	245	2.0	777	245	1.0	797	245	0.5	817	245	0.0	838	245	0.0	860	245	0.0	5		
				246	3.5	739	246	3.0	757	246	2.5	777	246	1.5	797	246	1.0	817	246	0.5	838	246	0.0	860	246	0.0	5		
				245	5.0	739	245	4.0	757	245	3.0	777	245	2.0	797	245	1.0	817	245	0.5	838	245	0.0	860	245	0.0	5		
		3	180	5.0	602	180	4.5	626	180	4.0	651	180	3.0	678	180	2.0	705	180	1.0	731	180	0.0	757	180	0.0	2			
			177	3.5	602	177	3.0	626	177	2.0	651	177	1.0	678	177	0.5	705	177	0.0	731	177	0.0	757	177	0.0	2			
			247	3.5	602	247	3.0	626	247	2.0	651	247	1.0	678	247	0.5	705	247	0.0	731	247	0.0	757	247	0.0	2			
	4714	1-1/2	528	247	3.5	553	247	3.0	580	247	2.0	608	247	1.0	638	247	0.5	667	247	0.0	696	247	0.0	724	247	0.0	1-1/2		
				250	0.5	553	250	0.0	580	250	0.0	608	250	0.0	638	250	0.0	667	250	0.0	696	250	0.0	724	250	0.0	1-1/2		
				177	5.0	553	177	4.5	580	177	3.5	608	177	2.5	638	177	1.5	667	177	1.0	696	177	0.0	724	177	0.0	1-1/2		
		2	247	5.0	484	247	4.0	512	247	3.0	542	247	2.0	574	247	1.0	606	247	0.5	637	247	0.0	668	247	0.0	1			
			250	2.5	484	250	1.0	512	250	0.0	542	250	0.0	574	250	0.0	606	250	0.0	637	250	0.0	668	250	0.0	1-1/2			
			177	5.0	484	177	4.5	512	177	3.5	542	177	2.5	574	177	1.5	606	177	1.0	637	177	0.5	668	177	0.0	1-1/2			
3989	1-1/2	448	250	4.0	478	250	2.5	511	250	1.0	546	250	0.0	580	250	0.0	614	250	0.0	645	250	0.0	676	250	0.0	1-1/2			
			247	5.0	478	247	4.0	511	247	3.0	546	247	2.0	580	247	1.0	614	247	0.5	645	247	0.0	676	247	0.0	1-1/2			
			177	5.0	478	177	4.5	511	177	3.5	546	177	2.5	580	177	1.5	614	177	1.0	645	177	0.5	676	177	0.0	1-1/2			
	1	250	5.0	416	250	4.0	449	250	2.5	485	250	1.0	523	250	0.0	55													

Table 12.1 - Electrical Selection Details - All Models

Model	Supply Voltage	Phase	Motor Voltage	Power Exhaust & Gas Control Circuit Voltage	Accessory Transformer Required ①	Factory Installed Transformer	Motor Starter Coil Voltage
HDS/HDC & PTS	115	1	115V/1ph	115V/1ph	none	115V to 24V	none
	208	1 or 3			208V to 115V		
	230				230V to 115V		
	460	3			460V to 115V		
	575				575V to 115V		
BTS	115	1	115V/1ph	115V/1ph	none	115 to 24V	none
	208	1	208V/1ph		208V to 115V		
	230		230V/1ph		230V to 115V		
	208		3		208V/3ph		208V to 115V
	230	230V/3ph			230V to 115V		
	460	3	460V/3ph		460V to 115V		
	575		575V/3ph		575V to 115V		

① For accessory transformer sizing, refer to Table 6.2 for HDS, HDC, and PTS models and Table 7.5 for model BTS.

Table 12.2 - Gas Controls – All Models ②

Model Size	Control System Description	Gas Type	Control Code	Control Voltage
30-400	Single-Stage, Direct Spark Ignition Utilizes a single-stage combination gas control and an ignition control. Gas is automatically lit with the direct spark igniter on call for heat.	Natural	11	24V
		Propane	21	
75-400	Two-Stage, Direct Spark Ignition Utilizes a two-stage combination gas control (fires at 50% or 100% of full rated input) and an ignition control. Gas is automatically lit with the direct spark igniter on call for heat.	Natural	12	
		Propane	22	

② All ignition controls are 100% Shut-Off with Continuous Retry.

PERFORMANCE DATA - HOODS FOR BLOWER MODELS



Table 15.1 - Deflector Hood General Performance Data - Model HDC

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)
60	808	55	8	27	5	14	20	0	13	18	10
			9	8	4	11	16	0	8	12	9
75	1010	55	8	45	9	20	28	0	21	28	14
			10	27	7	17	24	0	16	23	12
			11	13	5	14	21	0	12	17	12
100	1347	55	8	44	9	20	28	0	21	28	14
			10	27	7	17	24	0	16	23	12
			11	12	5	14	20	0	12	17	12
125	1543	60	8	49	10	23	32	0	24	32	16
			10	35	8	21	29	0	20	28	14
			12	13	6	16	23	0	14	19	13

Note: Refer to Figures 14.2 through 14.3 on page 14.

Table 15.2 - Deflector Hood General Performance Data - Model BTS

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	2020	55	8	57	13	29	40	0	31	42	21
			10	48	12	28	38	0	28	39	19
			12	37	10	25	35	0	25	34	17
			14	21	8	21	30	0	19	27	16
			15	10	7	19	27	0	12	18	15
175	2357	55	8	51	11	24	33	0	25	34	17
			10	39	9	22	31	0	22	30	15
			12	22	7	19	26	0	17	23	14
			13	2	5	14	21	0	10	14	13
200	2694	55	8	57	13	29	39	0	30	41	20
			10	47	12	27	37	0	28	38	18
			12	35	10	25	34	0	24	33	17
			14	18	7	20	29	0	18	25	15
250	3367	55	15	2	5	16	24	0	11	16	15
			8	59	14	31	42	0	32	44	22
			10	50	13	29	40	0	30	41	20
			12	39	11	27	37	0	27	37	18
			14	25	9	23	33	0	22	30	17
300	4040	55	15	15	7	20	29	0	18	25	16
			8	64	17	37	51	0	40	54	29
			10	57	16	36	50	0	38	52	26
			12	50	15	35	48	0	36	49	23
			14	41	13	33	45	0	33	45	22
350	4714	55	16	30	12	30	41	0	28	39	20
			18	14	9	24	35	0	21	29	19
			8	63	16	36	49	0	37	51	27
			10	55	15	34	47	0	36	49	24
			12	47	14	33	45	0	33	46	22
400	5387	55	14	37	12	30	42	0	30	41	20
			16	25	10	27	38	0	25	34	19
			18	2	6	20	29	0	13	19	18
			8	67	19	41	56	0	44	60	32
			10	60	18	40	55	0	42	58	29
400	5387	55	12	53	17	39	53	0	40	55	26
			14	46	15	37	51	0	37	51	25
			16	37	14	34	48	0	34	47	23
			18	26	12	31	43	0	29	40	22
			20	8	8	23	34	0	20	28	21

Note: Refer to Figures 14.2 through 14.3 on page 14.

Figure 20.1 - Dimensional Drawings - Model BTS

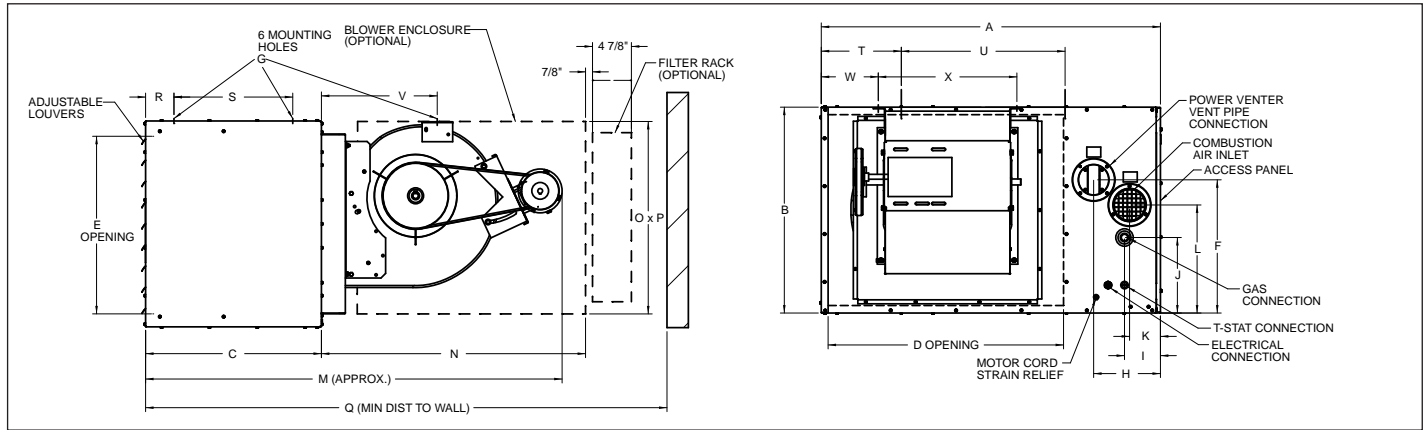


Table 20.1 - Dimensions (inches) — BTS

Models	BTS150	BTS175	BTS200	BTS250	BTS300	BTS350	BTS400
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) ①	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 ②	52.25	52.19	52.19	58.88	58.88	58.88	58.88
N	33.18	33.90	33.90	39.88	39.88	39.88	39.88
O	23.90	24.13	24.13	27.04	27.04	28.57	28.57
P	24.77	24.52	24.52	27.19	27.19	28.28	28.28
Q (w/Blower Encl & Filter Rack)	73.04	73.70	73.70	79.68	79.68	79.68	79.68
Q (w/o Blower Encl & Filter Rack)	64.25	64.19	64.19	70.88	70.88	70.88	70.88
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
V	14.52	14.52	14.52	18.04	18.04	18.00	18.00
W	3.27	7.15	7.15	4.77	4.77	5.24	5.24
X	17.38	17.38	17.38	20.38	20.38	20.38	20.38
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"
Blower	12-12	12-12	12-12	15-15	15-15	15-15	15-15

① Listed is the hole diameter and threads per inch to accept threaded rod.
 ② This is an approximate dimension for standard motors, allow 3" for sheave and optional motors.

Table 20.2 - 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

