



## STEAM/HOT WATER UNIT HEATERS



**MODEL HSB/HC**



**MODEL V/VN**



**MODEL PT/PTN**



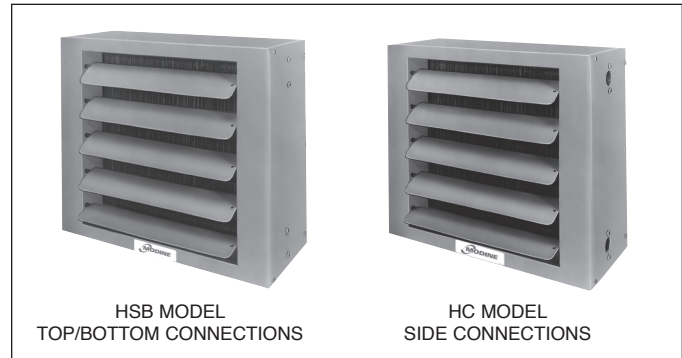
**MODEL GLW**

## Unit Features - Horizontal Delivery Unit Heaters

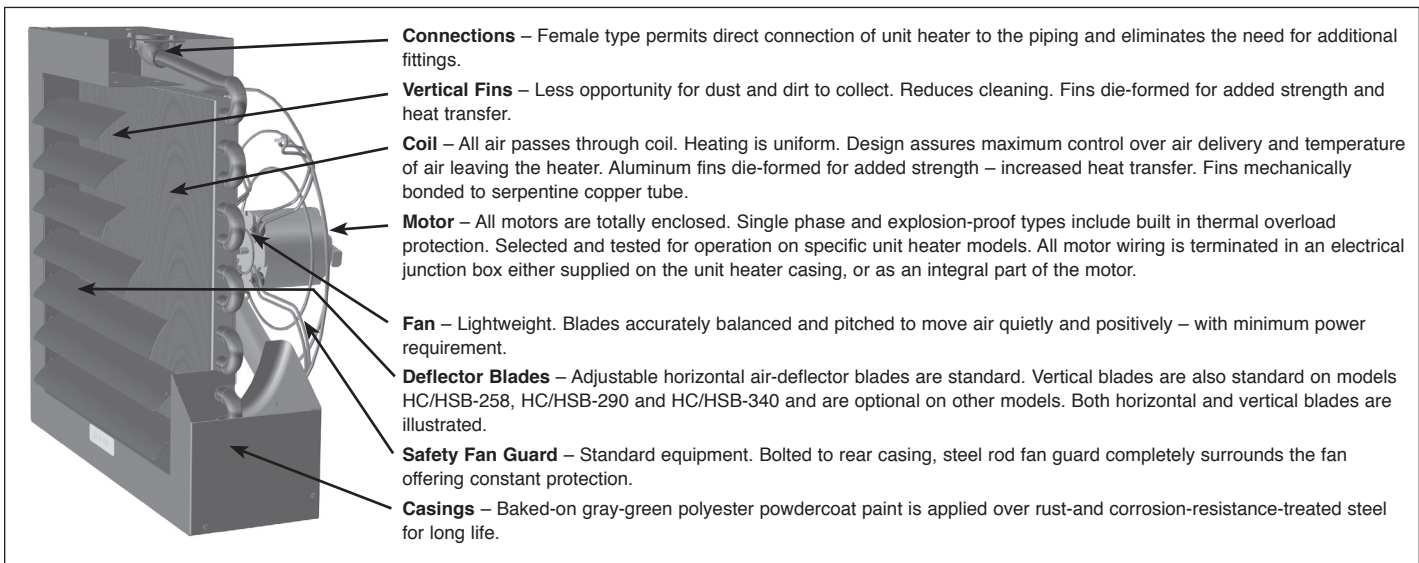
Horizontal delivery unit heaters are the most popular of all types. These units are ideal for heating buildings with large open areas and low ceilings. They are used to counter heat loss along outside building walls, especially where windows are present.

**In addition to the features noted on page 2, features that enhance the popularity of the horizontal delivery unit heater are:**

- HSB units have top and bottom supply and return connections. This permits the unit to be rotated 360° without piping changes.
- HC units have side supply and return connections. This permits the unit to be installed in low clearance areas.
- Units have a 2-piece casing for easy coil access.
- All models have tapped holes for suspension by threaded rod or optional pipe hanger adapter kit, except HSB 18 and HSB 24 which mount directly to and are supported by the supply and return piping.
- Serpentine copper tube coil design has high resistance to thermal shock, even under high steam pressures.
- Absence of coil headers eliminates potential leaks and increases coil face area without increasing overall size of unit.
- Coil designed for greater water carrying capacity with lower friction loss.



**Figure 4.1 - Unit Features**





Steam Conversion Tables

Table 10.1 and the formulas below are used to determine the heating capacity (Btu/hr) of a unit heater at a steam pressure and/or entering air temperature other than standard conditions of 2 lb. steam, 60°F entering air temperature.

**Table 10.1**  
**Steam Heating Capacity Conversion Factors**

Unit Heater Type	Steam Pressure (PSIG)	Entering Air Temperature (°F)											
		-10	0	10	20	30	40	50	60	70	80	90	100
Horizontal Delivery	0	1.54	1.45	1.37	1.27	1.19	1.11	1.03	0.96	0.88	0.81	0.74	0.67
	2	1.59	1.50	1.41	1.32	1.24	1.16	1.08	1.00	0.93	0.85	0.78	0.71
	5	1.64	1.55	1.46	1.37	1.29	1.21	1.13	1.05	0.97	0.90	0.83	0.76
	10	1.73	1.64	1.55	1.46	1.38	1.29	1.21	1.13	1.06	0.98	0.91	0.84
	15	1.80	1.71	1.61	1.53	1.44	1.34	1.28	1.19	1.12	1.04	0.97	0.90
	20	1.86	1.77	1.68	1.58	1.50	1.42	1.33	1.25	1.17	1.10	1.02	0.95
	30	1.97	1.87	1.78	1.68	1.60	1.51	1.43	1.35	1.27	1.19	1.12	1.04
	40	2.06	1.96	1.86	1.77	1.68	1.60	1.51	1.43	1.35	1.27	1.19	1.12
	50	2.13	2.04	1.94	1.85	1.76	1.67	1.58	1.50	1.42	1.34	1.26	1.19
	60	2.20	2.09	2.00	1.90	1.81	1.73	1.64	1.56	1.47	1.39	1.31	1.24
	70	2.26	2.16	2.06	1.96	1.87	1.78	1.70	1.61	1.53	1.45	1.37	1.29
	75	2.28	2.18	2.09	1.99	1.90	1.81	1.72	1.64	1.55	1.47	1.40	1.32
	80	2.31	2.21	2.11	2.02	1.93	1.84	1.75	1.66	1.58	1.50	1.42	1.34
	90	2.36	2.26	2.16	2.06	1.97	1.88	1.79	1.71	1.62	1.54	1.46	1.38
	100	2.41	2.31	2.20	2.11	2.02	1.93	1.84	1.75	1.66	1.58	1.50	1.42
125	2.51	2.41	2.31	2.21	2.11	2.02	1.93	1.84	1.76	1.68	1.59	1.51	
150	2.60	2.50	2.40	2.30	2.20	2.11	2.02	1.93	1.84	1.76	1.67	1.59	
Vertical Delivery and Power-Throw	0	1.49	1.41	1.33	1.25	1.18	1.11	1.03	0.96	0.90	0.83	0.76	0.69
	2	1.52	1.45	1.37	1.29	1.22	1.15	1.07	1.00	0.93	0.86	0.80	0.73
	5	1.58	1.50	1.42	1.34	1.27	1.20	1.12	1.05	0.98	0.91	0.85	0.78
	10	1.64	1.57	1.49	1.41	1.34	1.27	1.19	1.12	1.05	0.98	0.91	0.85
	15	1.70	1.62	1.55	1.47	1.40	1.32	1.25	1.18	1.11	1.04	0.97	0.90
	20	1.75	1.67	1.60	1.52	1.45	1.37	1.30	1.23	1.16	1.09	1.02	0.96
	30	1.83	1.75	1.68	1.61	1.53	1.46	1.39	1.32	1.25	1.18	1.11	1.04
	40	1.90	1.82	1.75	1.68	1.61	1.53	1.46	1.39	1.32	1.25	1.18	1.11
	50	1.96	1.87	1.81	1.74	1.67	1.59	1.52	1.45	1.38	1.31	1.24	1.17
	60	2.02	1.94	1.87	1.79	1.72	1.64	1.57	1.50	1.43	1.36	1.29	1.22
	70	2.07	1.99	1.92	1.84	1.76	1.69	1.62	1.55	1.47	1.40	1.33	1.27
	75	2.10	2.02	1.94	1.86	1.79	1.71	1.64	1.57	1.49	1.42	1.36	1.29
	80	2.11	2.04	1.96	1.88	1.80	1.73	1.66	1.59	1.51	1.44	1.38	1.31
	90	2.15	2.08	2.00	1.92	1.84	1.77	1.69	1.62	1.55	1.48	1.41	1.34
	100	2.19	2.11	2.03	1.95	1.88	1.80	1.73	1.66	1.59	1.52	1.45	1.38
	125	2.27	2.19	2.11	1.99	1.91	1.88	1.81	1.74	1.67	1.60	1.53	1.46
	150	2.34	2.26	2.18	2.10	2.03	1.95	1.88	1.81	1.74	1.67	1.60	1.53
175	2.40	2.32	2.24	2.16	2.09	2.01	1.94	1.87	1.80	1.73	1.66	1.59	
200	2.45	2.37	2.29	2.22	2.14	2.07	1.99	1.92	1.85	1.78	1.71	1.64	
225	2.50	2.42	2.34	2.26	2.19	2.12	2.04	1.97	1.90	1.83	1.76	1.69	
250	2.54	2.46	2.38	2.31	2.23	2.16	2.09	2.01	1.94	1.87	1.80	1.73	

Applicable formulas (examples on page 15):

To find actual unit heater capacity when operated at non-standard (actual) conditions:

$$Btu_A = Btu_S \times \text{Heating Capacity Factor}$$

To select a heater capacity based on standard conditions to meet a heating capacity at non-standard (actual) conditions:

$$Btu_S = Btu_A \div \text{Heating Capacity Factor}$$

Where:

Btu<sub>S</sub> = Capacity at standard conditions (2 lb. steam, 60°F entering air temperature) from Tables 13.1 through 14.2

Btu<sub>A</sub> = Capacity at non-standard (actual) conditions



Steam Conversion Tables

Table 11.1 and the formulas below are used to determine the air temperature rise of a unit heater at a steam pressure and/or entering air temperature other than standard conditions of 2 lb. steam, 60°F entering air temperature.

Table 11.1  
Air Temperature Rise Conversion Factors

Unit Heater Type	Steam Pressure (PSIG)	Entering Air Temperature (°F)											
		-10	0	10	20	30	40	50	60	70	80	90	100
Horizontal Delivery	0	1.33	1.28	1.24	1.17	1.12	1.07	1.01	0.96	0.90	0.84	0.78	0.72
	2	1.38	1.33	1.27	1.22	1.17	1.11	1.06	1.00	0.94	0.88	0.83	0.76
	5	1.43	1.38	1.33	1.27	1.21	1.16	1.11	1.05	1.00	0.93	0.88	0.82
	10	1.50	1.45	1.40	1.35	1.29	1.24	1.19	1.13	1.07	1.02	0.95	0.90
	15	1.56	1.51	1.46	1.42	1.36	1.31	1.24	1.19	1.14	1.08	1.02	0.97
	20	1.61	1.56	1.52	1.46	1.41	1.36	1.30	1.25	1.19	1.14	1.08	1.02
	30	1.70	1.65	1.61	1.55	1.51	1.46	1.40	1.35	1.29	1.24	1.18	1.12
	40	1.78	1.73	1.68	1.62	1.58	1.54	1.48	1.43	1.38	1.32	1.26	1.21
	50	1.84	1.79	1.74	1.69	1.65	1.60	1.55	1.50	1.45	1.39	1.33	1.28
	60	1.91	1.86	1.81	1.75	1.71	1.66	1.61	1.56	1.50	1.45	1.40	1.33
	70	1.95	1.91	1.86	1.81	1.76	1.71	1.66	1.61	1.56	1.51	1.45	1.39
	75	1.97	1.93	1.89	1.84	1.79	1.74	1.69	1.64	1.58	1.53	1.47	1.42
	80	2.00	1.95	1.91	1.86	1.82	1.76	1.72	1.66	1.61	1.56	1.49	1.44
	90	2.04	2.00	1.95	1.90	1.86	1.81	1.75	1.70	1.65	1.60	1.54	1.49
	100	2.08	2.04	1.99	1.95	1.89	1.85	1.79	1.75	1.69	1.64	1.59	1.53
125	2.17	2.13	2.09	2.04	1.99	1.94	1.89	1.84	1.79	1.74	1.68	1.63	
150	2.25	2.21	2.17	2.12	2.07	2.03	1.98	1.93	1.87	1.83	1.77	1.71	
Vertical Delivery and Power-Throw	0	1.36	1.31	1.25	1.19	1.13	1.08	1.02	0.96	0.90	0.84	0.78	0.72
	2	1.41	1.35	1.29	1.24	1.18	1.12	1.06	1.00	0.94	0.88	0.82	0.76
	5	1.46	1.40	1.35	1.29	1.23	1.17	1.12	1.06	1.00	0.94	0.88	0.82
	10	1.54	1.48	1.43	1.37	1.31	1.25	1.20	1.14	1.08	1.02	0.96	0.89
	15	1.61	1.55	1.49	1.44	1.38	1.32	1.26	1.20	1.14	1.09	1.02	0.97
	20	1.67	1.61	1.55	1.50	1.44	1.38	1.32	1.26	1.20	1.15	1.08	1.02
	30	1.77	1.71	1.65	1.60	1.54	1.48	1.42	1.36	1.30	1.25	1.18	1.12
	40	1.85	1.79	1.74	1.68	1.62	1.56	1.51	1.45	1.39	1.33	1.27	1.21
	50	1.92	1.86	1.81	1.75	1.69	1.64	1.58	1.52	1.46	1.40	1.34	1.28
	60	1.99	1.93	1.88	1.82	1.76	1.70	1.65	1.58	1.53	1.47	1.41	1.35
	70	2.05	1.99	1.94	1.88	1.82	1.76	1.70	1.65	1.59	1.53	1.47	1.41
	75	2.08	2.02	1.96	1.91	1.85	1.79	1.73	1.67	1.62	1.56	1.50	1.43
	80	2.10	2.04	1.99	1.93	1.87	1.81	1.75	1.70	1.64	1.58	1.52	1.46
	90	2.15	2.09	2.04	2.00	1.92	1.86	1.80	1.74	1.69	1.63	1.57	1.51
	100	2.19	2.14	2.08	2.02	1.97	1.91	1.85	1.79	1.73	1.67	1.61	1.55
	125	2.29	2.24	2.18	2.12	2.07	2.01	1.95	1.89	1.83	1.77	1.71	1.65
	150	2.39	2.33	2.27	2.22	2.16	2.10	2.04	1.99	1.93	1.87	1.81	1.75
	175	2.46	2.41	2.35	2.29	2.24	2.18	2.12	2.06	2.00	1.94	1.88	1.82
200	2.54	2.48	2.42	2.37	2.31	2.25	2.19	2.13	2.07	2.02	1.96	1.89	
225	2.60	2.54	2.49	2.43	2.37	2.32	2.26	2.20	2.14	2.08	2.02	1.96	
250	2.66	2.60	2.55	2.49	2.43	2.38	2.32	2.26	2.20	2.14	2.08	2.02	

Applicable formulas (examples on page 15):

To find actual air temperature rise of unit heater when operated at non-standard (actual) conditions:

$$ATR_A = (FAT_S - EAT_S) \times \text{Air Temperature Rise Factor}$$

To find actual final air temperature of unit heater when operated at non-standard (actual) conditions:

$$FAT_A = EAT_A + ATR_A$$

Where:

- EAT<sub>S</sub> = Standard conditions entering air temperature (60°F)
- EAT<sub>A</sub> = Non-standard (actual) entering air temperature
- FAT<sub>S</sub> = Final air temperature at standard conditions from Tables 13.1 through 14.2
- FAT<sub>A</sub> = Final air temperature at non-standard (actual) conditions
- ATR<sub>A</sub> = Air temperature rise at non-standard (actual) conditions



**Steam Conversion Tables**

Table 12.1 is used to determine how steam pressures other than 2 lb. affect mounting height.

**Table 12.1  
Steam Unit Heater Mounting Height Correction Factors ①②**

Correction Factor	Steam Pressure, PSIG																		
	2	5	10	15	20	30	40	50	60	70	80	90	100	125	150	175	200	225	250
1.00	0.97	0.94	0.92	0.89	0.86	0.84	0.82	0.80	0.79	0.77	0.76	0.76	0.74	0.72	0.71	0.70	0.69	0.68	

① Factors are for use with entering air temperatures that range from 50° to 70°F.

② While all units are capable of operation on steam pressures greater than 30 lb., low outlet temperature models are ideally suited for steam pressures above 30 lb. when mounting height is critical.

Applicable formula (examples on page 15):

**Max. Mounting Height<sub>A</sub> = Max. Mounting Height<sub>S</sub> x Correction Factor**

Where:

Max. Mounting Height<sub>A</sub> = Maximum mounting height at actual conditions

Max. Mounting Height<sub>S</sub> = Maximum mounting height at standard conditions

Table 12.2 is used to determine the rate of condensate production at steam pressures other than 2 lb.

**Table 12.2  
Properties of Steam**

Gauge Pressure (PSIG)	Temp (°F)	Latent Heat (Btu/lb.)	Gauge Pressure (PSIG)	Temp (°F)	Latent Heat (Btu/lb.)	Gauge Pressure (PSIG)	Temp (°F)	Latent Heat (Btu/lb.)	Gauge Pressure (PSIG)	Temp (°F)	Latent Heat (Btu/lb.)
0	212.0	970.3	34	279.4	924.7	70	316.0	897.3	109	343.6	875.4
2	218.5	966.2	36	281.9	922.9	72	317.7	896.0	112	345.4	873.9
4	224.4	962.4	38	284.3	921.1	74	319.3	894.8	115	347.2	872.5
5	227.2	960.6	40	286.7	919.3	76	320.9	893.5	118	348.9	871.0
6	229.8	958.8	42	289.0	917.6	78	322.4	892.3	121	350.7	869.6
8	234.8	955.6	44	291.3	915.9	80	323.9	891.1	124	352.4	868.2
10	239.4	952.5	46	293.5	914.3	82	325.4	889.9	125	352.9	867.8
12	243.7	949.6	48	295.6	912.7	84	326.9	888.8	127	354.0	866.9
14	247.8	946.8	50	297.7	911.2	86	328.4	887.6	130	355.7	865.5
16	251.6	944.2	52	299.7	909.7	88	329.8	886.5	133	357.3	864.1
18	255.3	941.7	54	301.7	908.2	90	331.2	885.4	136	358.9	862.9
20	258.8	939.3	56	303.6	906.7	92	332.5	884.3	139	360.4	861.5
22	262.1	936.9	58	305.5	905.3	94	333.9	883.2	142	362.0	860.3
24	265.3	934.7	60	307.3	903.9	96	335.2	882.1	145	363.5	859.0
26	268.3	932.5	62	309.1	902.5	98	336.6	881.1	150	365.9	856.9
28	271.3	930.5	64	310.9	901.2	100	337.9	880.0	175	377.4	846.8
30	274.1	928.5	66	312.6	899.9	103	339.8	878.5	200	387.9	837.2
32	276.8	926.6	68	314.4	898.6	106	341.7	876.9	225	397.3	828.5
-	-	-	-	-	-	-	-	-	250	406.1	820.0

Applicable formula (examples on page 15):

**Condensate rate = Btu<sub>A</sub> ÷ Latent Heat of Steam**

Where:

Btu<sub>A</sub> = Capacity at actual operating conditions

# PERFORMANCE DATA



## Steam Performance Data - Standard Models

Table 13.1 - Performance Data for Standard Units at Standard Conditions of 2 lb. Steam and 60°F Entering Air High Motor Speed

Type	Model No.	Btu/hr	Sq. Ft. EDR	Air Data						Motor Data			
				Maximum Mounting Height (ft.) ①	Heat Throw or Spread @ Max. Height ①	CFM ②	Outlet Velocity (Fpm)	Final Air Temp. (°F)	Condensate lb/hr	Hp	Approx. RPM		
Horizontal Delivery	HSB/HC 18	18,000	75	8	17	340	625	107	19	1/60	1,550		
	HSB/HC 24	24,000	100	9	18	370	695	119	25	1/25	1,550		
	HSB/HC 33	33,000	138	10	21	630	690	108	34	1/25	1,550		
	HSB/HC 47	47,000	196	12	28	730	810	119	49	1/12	1,550		
	HSB/HC 63	63,000	263	14	29	1,120	690	111	65	1/12	1,550		
	HSB/HC 86	86,000	358	15	31	1,340	835	118	89	1/8	1,625		
	HSB/HC 108	108,000	450	17	31	2,010	790	109	112	1/8	1,625		
	HSB/HC 121	121,000	504	16	25	1,775	715	122	125	1/5	1,075		
	HSB/HC 165	165,000	688	19	40	3,240	880	106	171	1/3	1,075		
	HSB/HC 193	193,000	804	18	38	2,900	810	121	200	1/3	1,075		
	HSB/HC 258	258,000	1,075	19	44	4,560	750	111	267	1/2	1,075		
HSB/HC 290	290,000	1,208	20	46	4,590	765	117	300	1/2	1,075			
HSB/HC 340	340,000	1,417	20	46	5,130	735	120	352	1/2	1,075			
Power Throw™ ③	PT/PTN 279	279,000	1,163	16	100	5,460	2,165	111	289	1/2	1,075		
	PT/PTN 333	333,000	1,388	17	110	5,980	2,165	116	345	3/4	1,140		
	PT/PTN 385	385,000	1,604	17	115	7,680	1,860	110	398	1	1,140		
	PT/PTN 500	500,000	2,083	18	130	10,390	2,520	108	517	1 1/2	1,140		
	PT/PTN 610	610,000	2,542	20	140	11,750	2,315	112	631	1 1/2	1,140		
	PT 952	952,000	3,967	21	145	12,170	2,321	139	985	2	1,140		
Vertical Delivery ③	V/VN 42	42,000	175	11	<b>15</b>	17	<b>11</b>	950	825	103	43	1/30	1,050
	V/VN 59	59,000	246	14	<b>19</b>	21	<b>14</b>	1,155	1,005	111	61	1/30	1,050
	V/VN 78	78,000	325	15	<b>20</b>	23	<b>15</b>	1,590	1,065	109	81	1/15	1,050
	V/VN 95	95,000	396	15	<b>20</b>	23	<b>15</b>	1,665	1,120	118	98	1/15	1,050
	V/VN 139	139,000	579	18	<b>24</b>	27	<b>18</b>	2,660	1,285	112	144	1/6	1,075
	V/VN 161	161,000	671	20	<b>27</b>	30	<b>20</b>	2,945	1,420	115	167	1/3	1,075
	V/VN 193	193,000	804	22	<b>30</b>	33	<b>22</b>	3,500	1,690	116	200	1/3	1,075
	V/VN 212	212,000	883	22	<b>30</b>	33	<b>22</b>	3,610	1,740	120	219	1/3	1,075
	V/VN 247	247,000	1,029	26	<b>34</b>	39	<b>26</b>	4,820	1,910	111	256	1/2	1,075
	V/VN 279	279,000	1,163	30	<b>37</b>	45	<b>30</b>	5,460	2,165	111	289	1/2	1,075
	V/VN 333	333,000	1,388	30	<b>37</b>	45	<b>30</b>	5,980	2,165	116	345	3/4	1,140
	V/VN 385	385,000	1,604	30	<b>36</b>	45	<b>30</b>	7,680	1,860	110	398	1	1,140
	V/VN 500	500,000	2,083	37	<b>44</b>	56	<b>37</b>	10,390	2,520	108	517	1 1/2	1,140
	V/VN 610	610,000	2,542	36	<b>43</b>	54	<b>36</b>	11,750	2,315	112	631	1 1/2	1,140
V 952	952,000	3,967	37		56		12,170	2,321	139	985	2	1,140	

Table 13.2 - Performance Data for Standard Units at Standard Conditions of 2 lb. Steam and 60°F Entering Air Reduced Motor Speed ④

Type	Model No.	Btu/hr	Sq. Ft. EDR	Air Data						Motor Data	
				Maximum Mounting Height (ft.) ①	Heat Throw or Spread @ Max. Height ①	CFM ②	Outlet Velocity (Fpm)	Final Air Temp. (°F)	Condensate lb/hr	Hp	Approx. RPM
Horizontal Delivery	HSB/HC 18	14,000	58	8	10	220	415	118	14	1/60	1,000
	HSB/HC 24	18,000	75	9	11	230	440	131	19	1/25	1,000
	HSB/HC 33	25,000	104	10	13	395	440	118	26	1/25	1,000
	HSB/HC 47	38,000	158	12	17	450	515	137	39	1/12	1,000
	HSB/HC 63	47,000	195	14	17	685	430	122	49	1/12	1,000
	HSB/HC 86	64,000	265	15	19	825	525	131	66	1/8	1,000
	HSB/HC 108	81,000	340	17	19	1,255	500	119	84	1/8	1,000

① Horizontal units with horizontal louvers open 30° from vertical plane. Vertical types equipped with cone jet deflector, blades fully opened are shown in bold. Please see page 22 for additional outlet accessory performance data.

② Cfm for horizontal types is entering Cfm. Cfm for vertical and Power-Throw™ types is leaving Cfm.

③ V and PT models have copper tubes, VN and PTN models have 90/10 cupro-nickel tubes.

④ Requires Solid State Motor Speed Controller.



Steam Performance Data - Low Outlet Temperature Models

Table 14.1 - Performance Data for Low Outlet Temperature Units at Standard Conditions of 2 lb. Steam and 60°F Entering Air High Motor Speed

Type	Model No.	Btu/hr	Sq. Ft. EDR	Air Data							Motor Data		
				Maximum Mounting Height (ft.) <sup>①</sup>	Heat Throw or Spread @ Max. Height <sup>①</sup>		CFM <sup>②</sup>	Outlet Velocity (Fpm)	Final Air Temp. (°F)	Condensate lb/hr	Hp	Approx. RPM	
Horizontal Delivery	HSB/HC 18L	15,900	66	9	20		364	655	100	16	1/60	1,550	
	HSB/HC 24L	19,300	80	11	21		435	795	100	20	1/25	1,550	
	HSB/HC 33L	29,500	123	12	24		695	745	99	31	1/25	1,550	
	HSB/HC 47L	32,000	133	14	32		855	910	94	33	1/12	1,550	
	HSB/HC 63L	52,500	219	16	33		1,170	710	101	54	1/12	1,550	
	HSB/HC 86L	61,500	256	17	36		1,510	910	97	64	1/8	1,625	
	HSB/HC 108L	86,500	360	19	36		2,150	825	97	90	1/8	1,625	
	HSB/HC 121L	88,000	367	18	29		2,070	800	98	91	1/5	1,075	
	HSB/HC 165L	143,000	596	21	45		3,480	930	97	148	1/3	1,075	
	HSB/HC 258L	190,000	792	22	51		4,655	750	98	197	1/2	1,075	
HSB/HC 290L	207,000	863	23	53		5,040	805	94	214	1/2	1,075		
HSB/HC 340L	255,000	1,063	23	53		5,575	775	102	264	1/2	1,075		
Power Throw™ <sup>③</sup>	PT/PTN 610L	470,000	1,958	22	154		2,400	2,445	97	486	1-1/2	1,140	
Vertical Delivery <sup>③</sup>	V 42L	33,000	138	13	<b>17</b>	20	<b>13</b>	960	835	94	34	1/30	1,050
	V 59L	44,000	183	16	<b>22</b>	24	<b>16</b>	1,190	1,035	96	45	1/30	1,050
	V 78L	62,000	258	19	<b>26</b>	29	<b>19</b>	1,740	1,070	95	65	1/15	1,050
	V 95L	71,000	296	19	<b>26</b>	29	<b>19</b>	1,760	1,180	99	73	1/15	1,050
	V/VN 139L	103,000	429	23	<b>31</b>	35	<b>23</b>	2,860	1,380	95	106	1/6	1,075
	V/VN 161L	127,000	529	26	<b>35</b>	39	<b>26</b>	3,400	1,640	96	132	1/3	1,075
	V/VN 193L	149,000	621	27	<b>36</b>	41	<b>27</b>	3,710	1,790	99	154	1/3	1,075
	V/VN 212L	163,000	679	27	<b>36</b>	41	<b>27</b>	3,830	1,845	102	169	1/3	1,075
	V/VN 247L	190,000	792	32	<b>42</b>	48	<b>32</b>	5,110	2,030	96	197	1/2	1,075
	V/VN 279L	215,000	896	36	<b>45</b>	54	<b>36</b>	5,790	2,300	96	222	1/2	1,075
	V/VN 333L	256,000	1,067	36	<b>45</b>	54	<b>36</b>	6,340	2,300	100	265	3/4	1,140
	V/VN 385L	296,000	1,233	36	<b>43</b>	54	<b>36</b>	8,140	1,970	95	307	1	1,140
	V/VN 500L	385,000	1,604	45	<b>54</b>	68	<b>45</b>	11,000	2,670	94	400	1-1/2	1,140
V/VN 610L	470,000	1,958	44	<b>52</b>	66	<b>44</b>	12,400	2,445	97	485	1-1/2	1,140	
V 952L	733,000	3,055	45	-	68	-	12,940	2,450	115	759	2	1,140	

Table 14.2 - Performance Data for Low Outlet Temperature Units at Standard Conditions of 2 lb. Steam and 60°F Entering Air Reduced Motor Speed<sup>④</sup>

Type	Model No.	Btu/hr	Sq. Ft. EDR	Air Data							Motor Data	
				Maximum Mounting Height (ft.) <sup>①</sup>	Heat Throw or Spread @ Max. Height <sup>①</sup>		CFM <sup>②</sup>	Outlet Velocity (Fpm)	Final Air Temp. (°F)	Condensate lb/hr	Hp	Approx. RPM
Horizontal Delivery	HSB/HC 18L	12,000	51	9	12		230	425	108	12	1/60	1,000
	HSB/HC 24L	14,400	60	11	13		265	490	109	15	1/25	1,000
	HSB/HC 33L	22,000	92	12	14		430	470	107	23	1/25	1,000
	HSB/HC 47L	24,300	101	14	19		540	580	101	25	1/12	1,000
	HSB/HC 63L	39,500	164	16	20		725	445	109	41	1/12	1,000
	HSB/HC 86L	46,000	192	17	22		925	565	105	48	1/8	1,000
HSB/HC 108L	65,000	270	19	22		1,330	520	104	67	1/8	1,000	

① Horizontal units with horizontal louvers open 30° from vertical plane. Vertical types equipped with cone jet deflector, blades fully opened are shown in bold. Please see page 22 for additional outlet accessory performance data.

② Cfm for horizontal types is entering Cfm. Cfm for vertical and Power-Throw™ types is leaving Cfm.

③ V and PT models have copper tubes, VN and PTN models have 90/10 cupro-nickel tubes.

④ Requires Solid State Motor Speed Controller.



Hot Water Conversion Tables

Table 16.1 and the formulas below are used to determine the heating capacity (Btu/hr) of a unit heater at a water temperature and/or entering air temperature other than standard conditions of 200° entering water temperature, 60° entering air temperature.

**Table 16.1**  
**Hot Water Heating Capacity Conversion Factors**

Entering Water Temp. (°F)	Entering Air Temperature (°F)										
	0	10	20	30	40	50	60	70	80	90	100
60	0.462	0.380	0.300	0.222	0.146	0.072	0	0	0	0	0
70	0.539	0.456	0.375	0.296	0.219	0.145	0.071	0	0	0	0
80	0.615	0.531	0.450	0.370	0.293	0.217	0.143	0.071	0	0	0
90	0.692	0.607	0.524	0.444	0.366	0.289	0.214	0.141	0.070	0	0
100	0.769	0.683	0.599	0.518	0.439	0.361	0.286	0.212	0.140	0.069	0
110	0.846	0.759	0.674	0.592	0.512	0.434	0.357	0.283	0.210	0.138	0.068
120	0.923	0.835	0.749	0.666	0.585	0.506	0.429	0.353	0.279	0.207	0.137
130	1.000	0.911	0.824	0.740	0.658	0.578	0.500	0.424	0.349	0.276	0.205
140	1.077	0.987	0.899	0.814	0.731	0.651	0.571	0.494	0.419	0.345	0.273
150	1.154	1.063	0.974	0.888	0.805	0.723	0.643	0.565	0.489	0.414	0.342
160	1.231	1.139	1.049	0.962	0.878	0.795	0.714	0.636	0.559	0.483	0.410
170	1.308	1.215	1.124	1.036	0.950	0.867	0.786	0.706	0.629	0.552	0.478
180	1.385	1.291	1.199	1.110	1.024	0.940	0.857	0.777	0.699	0.621	0.547
190	1.462	1.367	1.274	1.184	1.097	1.012	0.929	0.848	0.768	0.690	0.615
200	1.539	1.443	1.349	1.258	1.170	1.084	1.000	0.918	0.838	0.759	0.684
210	1.615	1.519	1.424	1.332	1.243	1.157	1.071	0.989	0.908	0.828	0.752
220	1.692	1.594	1.499	1.406	1.312	1.229	1.143	1.060	0.978	0.897	0.820
230	1.769	1.670	1.573	1.480	1.390	1.301	1.214	1.130	1.048	0.966	0.889
240	1.846	1.746	1.649	1.554	1.463	1.373	1.286	1.201	1.118	1.035	0.957
250	1.923	1.822	1.723	1.628	1.536	1.446	1.357	1.272	1.188	1.104	1.025
260	2.000	1.898	1.798	1.702	1.609	1.518	1.429	1.342	1.257	1.173	1.094
270	2.077	1.974	1.873	1.776	1.682	1.590	1.500	1.413	1.327	1.242	1.162
280	2.154	2.050	1.948	1.850	1.755	1.663	1.571	1.483	1.397	1.311	1.230
290	2.231	2.126	2.023	1.924	1.829	1.734	1.643	1.554	1.467	1.380	1.300
300	2.308	2.202	2.098	1.998	1.902	1.807	1.714	1.625	1.537	1.449	1.367
310	2.385	2.278	2.173	2.072	1.974	1.879	1.786	1.695	1.607	1.518	1.436
320	2.462	2.354	2.248	2.146	2.048	1.952	1.857	1.766	1.677	1.587	1.504
330	2.539	2.430	2.323	2.220	2.121	2.024	1.929	1.837	1.746	1.656	1.572
340	2.615	2.506	2.398	2.294	2.194	2.096	2.000	1.907	1.816	1.725	1.641
350	2.692	2.581	2.473	2.368	2.267	2.168	2.071	1.978	1.886	1.794	1.709
360	2.769	2.657	2.548	2.442	2.340	2.241	2.143	2.049	1.956	1.863	1.778
370	2.846	2.733	2.622	2.516	2.413	2.313	2.214	2.119	2.026	1.932	1.846
380	2.923	2.809	2.697	2.590	2.486	2.385	2.286	2.190	2.096	2.001	1.914
390	3.000	2.885	2.772	2.664	2.560	2.458	2.357	2.261	2.165	2.070	1.983
400	3.077	2.961	2.847	2.738	2.633	2.530	2.429	2.331	2.235	2.139	2.051

Applicable formulas (examples on page 21):

To find actual unit heater capacity when operated at non-standard (actual) conditions:

$$Btu_A = Btu_S \times \text{Heating Capacity Factor}$$

To select a heater capacity based on standard conditions to meet a heating capacity at non-standard (actual) conditions:

$$Btu_S = Btu_A \div \text{Heating Capacity Factor}$$

Where:

$Btu_S$  = Capacity at standard conditions (200°F entering water temperature, 60°F entering air temperature) from Tables 19.1 through 20.2

$Btu_A$  = Capacity at non-standard (actual) conditions





Hot Water Conversion Tables

Table 17.1 - Minimum Water Flow and Water Volume (gallons) ①

Type	Model	Min. GPM	Max. GPM	Coil Volume (gals)	Type	Model	Min. GPM	Max. GPM	Coil Volume (gals)	Type	Model	Min. GPM	Max. GPM	Coil Volume (gals)
HORIZONTAL DELIVERY HSB/HC	18	0.25	5	0.13	POWER-THROW™ PT/PTN	279	4.50	60	0.97	VERTICAL DELIVERY V/VN	42	0.50	10	0.15
	24	0.25	5	0.13		333	4.50	100	1.24		59	0.75	15	0.23
	33	0.40	10	0.41		385	4.50	100	1.24		78	1.00	20	0.31
	47	0.40	10	0.41		500	6.00	100	1.66		95	1.25	25	0.38
	63	0.50	20	0.66		610	6.00	100	1.98		139	1.00	30	0.43
	86	0.50	20	0.66		952	14.00	200	6.50		161	1.25	40	0.54
	108	0.50	30	0.98							193	1.50	50	0.65
	121	0.50	30	0.98							212	2.00	60	0.86
	165	2.00	30	1.35							247	2.00	60	0.86
	193	2.00	50	1.45							279	2.25	75	0.97
	258	2.50	70	2.20							333	2.25	75	1.24
	290	2.50	70	2.20							385	2.25	75	1.24
	340	2.50	70	2.50							500	3.00	100	1.66
								610	6.00	100	1.98			
								952	14.00	200	6.50			

① Water flow and water volume is the same for standard coils and low-outlet temperature coils

Table 17.2 - Ethylene Glycol Correction Factors ②

Table 17.2 is used to determine how glycol solutions affect heater capacity. These factors should be applied to the heater capacity at actual entering water and air temperature conditions.

Solution Temperature (°F)	Ethylene Glycol Solution %						
	20%	30%	40%	50%	60%	70%	80%
60	0.99	0.96	0.93	0.89	0.85	0.81	0.76
100	0.99	0.96	0.93	0.89	0.85	0.81	0.76
150	0.99	0.96	0.94	0.90	0.87	0.83	0.78
200	0.99	0.96	0.94	0.92	0.88	0.85	0.81
250	0.98	0.96	0.94	0.92	0.89	0.86	0.82
300	0.98	0.95	0.95	0.92	0.90	0.87	0.83
350	0.98	0.95	0.95	0.93	0.91	0.88	0.84
400	0.97	0.95	0.95	0.93	0.92	0.89	0.85

② For Propylene Glycol solution correction factor, multiply Ethylene Glycol correction factor by 0.95.

Applicable formulas (examples on page 21):

To find actual unit heater capacity when operated with glycol solution:

$$Btu_{AG} = Btu_S \text{ (or } Btu_A) \times \text{Glycol Correction Factor}$$

To select a heater capacity based on standard conditions to meet a heating capacity with a glycol solution:

$$Btu_S \text{ (or } Btu_A) = Btu_{AG} \div \text{Glycol Correction Factor}$$

Where:

$Btu_S$  = Capacity at standard conditions (200°F entering water temperature, 60°F entering air temperature) from Tables 19.1 through 20.2

$Btu_A$  = Capacity at non-standard (actual) conditions

$Btu_{AG}$  = Capacity with glycol solution

Table 17.3 - Hot Water Unit Heater Mounting Height Correction Factors ③

Table 17.3 is used to determine how hot water temperatures other than 200°F affect mounting height.

Entering Water Temperature, °F	Correction Factor	Entering Water Temperature, °F	Correction Factor	Entering Water Temperature, °F	Correction Factor
140	1.33	230	0.91	320	0.74
150	1.25	240	0.89	330	0.72
160	1.19	250	0.86	340	0.71
170	1.13	260	0.84	350	0.70
180	1.08	270	0.82	360	0.69
190	1.04	280	0.80	370	0.67
200	1.00	290	0.78	380	0.66
210	0.97	300	0.77	390	0.65
220	0.94	310	0.75	400	0.64

③ Factors are for use with entering air temperatures that range from 50° to 70°F

Applicable formula (examples on page 21):

$$\text{Max. Mounting Height}_A = \text{Max. Mounting Height}_S \times \text{Correction Factor}$$

Where:

Max. Mounting Height<sub>A</sub> = Maximum mounting height at actual conditions

Max. Mounting Height<sub>S</sub> = Maximum mounting height at standard conditions

# PERFORMANCE DATA



## Hot Water Performance Data - Standard Models

Table 19.1 - Performance Data for Standard Units at Standard Conditions of 200°F Entering Water and 60°F Entering Air High Motor Speed

Type	Model No.	Btu/hr	Water Data			Air Data					Motor Data			
			GPM	Pressure Drop (Ft. of Water)	Min/Max GPM	Maximum Mounting Height (ft.) <sup>①</sup>	Heat Throw or Spread @ Max. Height <sup>①</sup>	CFM <sup>②</sup>	Outlet Velocity (Fpm)	Final Air Temp. (°F)	Hp	Approx. RPM		
Horizontal Delivery	HSB/HC 18	12,600	1.3	0.5	0.3 / 5.0	9	18	340	615	93	1/60	1,550		
	HSB/HC 24	16,200	1.7	0.8	0.3 / 5.0	10	19	370	675	100	1/25	1,550		
	HSB/HC 33	21,700	2.3	0.2	0.4 / 10.0	11	23	630	675	91	1/25	1,550		
	HSB/HC 47	30,900	3.2	0.4	0.4 / 10.0	13	30	730	785	98	1/12	1,550		
	HSB/HC 63	45,600	4.7	0.6	0.5 / 20.0	15	31	1,120	680	97	1/12	1,550		
	HSB/HC 86	60,200	6.3	1.0	0.5 / 20.0	16	33	1,340	820	101	1/8	1,625		
	HSB/HC 108	83,700	8.7	2.8	0.5 / 30.0	18	33	2,010	775	98	1/8	1,625		
	HSB/HC 121	93,000	9.7	3.3	0.7 / 30.0	17	27	1,775	700	107	1/5	1,075		
	HSB/HC 165	130,900	13.6	8.6	2.0 / 30.0	20	43	3,240	870	96	1/3	1,075		
	HSB/HC 193	143,000	14.9	1.4	2.0 / 50.0	19	41	2,900	790	105	1/3	1,075		
	HSB/HC 258	201,900	21.0	5.7	2.5 / 70.0	20	47	4,560	740	100	1/2	1,075		
HSB/HC 290	228,600	23.8	7.1	2.5 / 70.0	22	50	4,590	750	105	1/2	1,075			
HSB/HC 340	271,100	28.2	11.3	2.8 / 70.0	22	50	5,130	720	108	1/2	1,075			
Power Throw™ <sup>③</sup>	PT/PTN 279	192,300	20.0	0.2	4.5 / 60.0	17	108	5,460	2,165	94	1/2	1,075		
	PT/PTN 333	238,500	24.8	0.4	4.5 / 100.0	18	117	5,980	2,165	99	3/4	1,140		
	PT/PTN 385	276,100	28.8	0.6	4.5 / 100.0	18	124	7,680	1,860	95	1	1,140		
	PT/PTN 500	358,000	37.3	0.5	6.0 / 100.0	19	138	10,390	2,520	93	1-1/2	1,140		
	PT/PTN 610	450,400	46.9	1.0	6.0 / 100.0	22	151	11,750	2,315	97	1-1/2	1,140		
	PT 952	721,600	75.2	1.1	14.0 / 200.0	23	150	12,166	2,321	120	2	1,140		
Vertical Delivery <sup>③</sup>	V/VN 42	30,100	3.1	0.6	0.5 / 10.0	12	<b>16</b>	18	<b>12</b>	950	825	90	1/30	1,050
	V/VN 59	42,600	4.4	0.5	0.8 / 15.0	15	<b>20</b>	22	<b>15</b>	1,155	1,005	96	1/30	1,050
	V/VN 78	57,000	5.9	0.5	1.0 / 20.0	16	<b>22</b>	24	<b>16</b>	1,590	1,065	95	1/15	1,050
	V/VN 95	69,300	7.2	0.5	1.3 / 25.0	16	<b>22</b>	24	<b>16</b>	1,665	1,120	101	1/15	1,050
	V/VN 139	106,600	11.1	2.6	1.0 / 30.0	19	<b>26</b>	29	<b>19</b>	2,660	1,285	99	1/6	1,075
	V/VN 161	123,200	12.8	2.2	1.3 / 40.0	21	<b>29</b>	32	<b>22</b>	2,945	1,420	101	1/3	1,075
	V/VN 193	147,200	15.3	2.2	1.5 / 50.0	23	<b>32</b>	35	<b>24</b>	3,500	1,690	101	1/3	1,075
	V/VN 212	161,700	16.8	1.5	2.0 / 60.0	23	<b>32</b>	35	<b>24</b>	3,610	1,740	104	1/3	1,075
	V/VN 247	188,700	19.7	2.1	2.0 / 60.0	28	<b>37</b>	41	<b>28</b>	4,820	1,910	98	1/2	1,075
	V/VN 279	212,600	22.2	2.1	2.3 / 75.0	32	<b>40</b>	48	<b>32</b>	5,460	2,165	98	1/2	1,075
	V/VN 333	260,100	27.1	3.8	2.8 / 75.0	32	<b>40</b>	48	<b>32</b>	5,980	2,165	102	3/4	1,140
	V/VN 385	302,100	31.5	5.0	3.3 / 75.0	32	<b>39</b>	48	<b>32</b>	7,680	1,860	98	1	1,140
	V/VN 500	391,700	40.8	4.8	3.0 / 100.0	39	<b>47</b>	59	<b>40</b>	10,390	2,520	96	1-1/2	1,140
V/VN 610	450,400	46.9	1.0	6.0 / 100.0	38	<b>46</b>	57	<b>39</b>	11,750	2,315	97	1-1/2	1,140	
V 952	721,600	75.2	1.1	14.0 / 200.0	39	-	59	-	12,166	2,321	120	2	1,140	

Table 19.2 - Performance Data for Standard Units at Standard Conditions of 200°F Entering Water and 60°F Entering Air Reduced Motor Speeds<sup>④</sup>

Type	Model No.	Btu/hr	Water Data			Air Data				Motor Data	
			GPM	Pressure Drop (Ft. of Water)	Maximum Mounting Height (ft.) <sup>①</sup>	Heat Throw or Spread @ Max. Height <sup>①</sup>	CFM <sup>②</sup>	Outlet Velocity (Fpm)	Final Air Temp. (°F)	Hp	Approx. RPM
Horizontal Delivery	HSB/HC 18	9,900	1.3	0.5	9	11	220	400	101	1/60	1,000
	HSB/HC 24	12,400	1.7	0.8	10	12	230	425	109	1/25	1,000
	HSB/HC 33	16,700	2.3	0.2	11	14	395	430	98	1/25	1,000
	HSB/HC 47	23,600	3.2	0.4	13	18	450	490	107	1/12	1,000
	HSB/HC 63	34,600	4.7	0.6	15	18	685	420	106	1/12	1,000
	HSB/HC 86	45,900	6.3	1.0	16	20	825	515	110	1/8	1,000
	HSB/HC 108	64,300	8.7	2.8	18	20	1,255	490	106	1/8	1,000

① Horizontal units with horizontal louvers open 30° from vertical plane. Vertical types equipped with cone jet deflector, blades fully opened are shown in bold. Please see page 22 for additional outlet accessory performance data.

② Cfm for horizontal types is entering Cfm. Cfm for vertical and Power-Throw™ types is leaving Cfm.

③ V and PT models have copper tubes, VN and PTN models have 90/10 cupro-nickel tubes.

④ Requires Solid State Motor Speed Controller.

# PERFORMANCE DATA



## Hot Water Performance Data - Low Outlet Temperature Models

Table 20.1 - Performance Data for Low Outlet Temperature Units at Standard Conditions of 200°F Entering Water and 60°F Entering Air – High Motor Speed

Type	Model No.	Btu/hr	Water Data			Air Data					Motor Data			
			GPM	Pressure Drop (Ft. of Water)	Min/Max GPM	Maximum Mounting Height (ft.) <sup>①</sup>	Heat Throw or Spread @ Max. Height <sup>①</sup>	CFM <sup>②</sup>	Outlet Velocity (Fpm)	Final Air Temp. (°F)	Hp	Approx. RPM		
Horizontal Delivery	HSB/HC 18L	11,300	1.2	0.4	0.3 / 5.0	10	21	364	650	88	1/60	1,550		
	HSB/HC 24L	13,700	1.4	0.6	0.3 / 5.0	12	22	435	775	88	1/25	1,550		
	HSB/HC 33L	19,300	2.0	0.2	0.4 / 10.0	13	26	695	730	85	1/25	1,550		
	HSB/HC 47L	21,100	2.2	0.2	0.4 / 10.0	15	34	855	890	82	1/12	1,550		
	HSB/HC 63L	37,900	4.0	0.4	0.5 / 20.0	17	35	1,170	695	89	1/12	1,550		
	HSB/HC 86L	44,600	4.6	0.6	0.5 / 20.0	18	38	1,510	890	87	1/8	1,625		
	HSB/HC 108L	66,100	6.9	1.8	0.8 / 30.0	20	38	2,150	815	88	1/8	1,625		
	HSB/HC 121L	66,700	6.9	1.9	0.8 / 30.0	19	31	2,070	785	89	1/5	1,075		
	HSB/HC 165L	113,200	11.8	6.6	2.0 / 30.0	23	48	3,480	920	89	1/3	1,075		
	HSB/HC 258L	147,400	15.4	3.2	2.5 / 70.0	23	54	4,655	735	89	1/2	1,075		
	HSB/HC 290L	161,100	16.8	3.7	2.5 / 70.0	25	57	5,040	800	89	1/2	1,075		
HSB/HC 340L	200,900	20.9	6.6	2.5 / 70.0	25	57	5,575	760	93	1/2	1,075			
Power Throw™ <sup>③</sup>	PT/PTN 610L	344,900	35.9	0.6	6.0 / 100.0	24	158	12,400	2,445	86	1 1/2	1,140		
Vertical Delivery <sup>③</sup>	V 42L	23,000	2.4	0.4	0.5 / 10.0	14	<b>18</b>	21	<b>14</b>	960	835	83	1/30	1,050
	V 59L	32,600	3.4	0.3	0.8 / 15.0	17	<b>23</b>	25	<b>17</b>	1,190	1,035	86	1/30	1,050
	V 78L	43,600	4.5	0.3	1.0 / 20.0	20	<b>28</b>	31	<b>21</b>	1,740	1,170	84	1/15	1,050
	V 95L	53,100	5.5	0.3	1.3 / 25.0	20	<b>28</b>	31	<b>21</b>	1,760	1,180	89	1/15	1,050
	V/VN 139L	81,200	8.5	1.6	1.0 / 30.0	24	<b>33</b>	37	<b>25</b>	2,860	1,380	87	1/6	1,075
	V/VN 161L	93,900	9.8	1.3	1.3 / 40.0	28	<b>37</b>	41	<b>28</b>	3,400	1,640	86	1/3	1,075
	V/VN 193L	112,500	11.7	1.3	1.5 / 50.0	29	<b>38</b>	43	<b>29</b>	3,710	1,790	89	1/3	1,075
	V/VN 212L	123,400	12.9	0.9	2.0 / 60.0	29	<b>38</b>	43	<b>29</b>	3,830	1,845	91	1/3	1,075
	V/VN 247L	143,600	15.0	1.2	2.0 / 60.0	34	<b>45</b>	51	<b>35</b>	5,110	2,030	87	1/2	1,075
	V/VN 279L	162,200	16.9	1.2	2.3 / 75.0	38	<b>48</b>	57	<b>39</b>	5,790	2,300	87	1/2	1,075
	V/VN 333L	198,300	20.7	2.3	2.3 / 75.0	38	<b>48</b>	57	<b>39</b>	6,340	2,300	90	3/4	1,140
	V/VN 385L	229,100	23.9	3.0	2.3 / 75.0	38	<b>46</b>	57	<b>49</b>	8,140	1,970	87	1	1,140
	V/VN 500L	295,000	30.7	2.8	3.0 / 100.0	48	<b>57</b>	72	<b>49</b>	11,000	2,670	85	1 1/2	1,140
V/VN 610L	344,900	35.9	0.6	6.0 / 100.0	47	<b>55</b>	70	<b>48</b>	12,400	2,445	86	1 1/2	1,140	
V 952L	546,700	56.9	0.7	14.0 / 100.0	48		72		12,800	2,440	102	2	1,140	

Table 20.2 - Performance Data for Low Outlet Temperature Units at Standard Conditions of 200°F Entering Water and 60°F Entering Air – Reduced Motor Speeds<sup>④</sup>

Type	Model No.	Btu/hr	Water Data			Air Data					Motor Data	
			GPM	Pressure Drop (Ft. of Water)	Maximum Mounting Height (ft.) <sup>①</sup>	Heat Throw or Spread @ Max. Height <sup>①</sup>	CFM <sup>②</sup>	Outlet Velocity (Fpm)	Final Air Temp. (°F)	Hp	Approx. RPM	
Horizontal Delivery	HSB/HC 18L	8,700	1.2	0.4	10	13	230	410	94	1/60	1,000	
	HSB/HC 24L	10,400	1.4	0.6	12	14	265	475	95	1/25	1,000	
	HSB/HC 33L	14,700	2.0	0.2	13	16	430	455	91	1/25	1,000	
	HSB/HC 47L	16,300	2.2	0.2	15	21	540	570	87	1/12	1,000	
	HSB/HC 63L	29,000	4.0	0.4	17	21	725	435	96	1/12	1,000	
	HSB/HC 86L	33,900	4.6	0.6	18	23	925	550	93	1/8	1,000	
	HSB/HC 108L	50,500	6.9	1.8	20	23	1,330	510	94	1/8	1,000	

① Horizontal units with horizontal louvers open 30° from vertical plane. Vertical types equipped with cone jet deflector, blades fully opened are shown in bold. Please see page 22 for additional outlet accessory performance data.

② Cfm for horizontal types is entering Cfm. Cfm for vertical and Power-Throw™ types is leaving Cfm.

③ V and PT models have copper tubes, VN and PTN models have 90/10 cupro-nickel tubes.

④ Requires Solid State Motor Speed Controller.

Motor Data, Step-Down Transformer Accessory Data

Table 23.1 - Motor Data ① ②

Model Number	Motor HP ③	Amp Draw by Motor Type, Voltage and Power Code							
		Totally Enclosed						Explosion-proof	
		115/60/1	208/60/1	230/60/1	208/60/3	230/460/3	575/60/3	115/60/1	230/460/60/3
	01	N/A	02	04	05	10	06	09	
HSB/HC 18	1/60	0.8	④	0.44	④	④	④	4.3	-
HSB/HC 24, 33	1/25	1.6	④	1.0	④	④	④	4.3	-
HSB/HC 47, 63	1/12	3.0	④	1.0	④	1.4/0.7 ⑤	④	4.3	-
HSB/HC 86, 108	1/8	2.3	④	1.0	④	1.4/0.7 ⑤	④	4.3	-
HSB/HC 121	1/5	2.8	④	1.5	1.9 ⑤	2.1/1.05 ⑤	④	4.0	1.4/0.7
HSB/HC 165, 193	1/3	5.4	④	2.5	1.9 ⑤	2.1/1.05 ⑤	④	6.5	1.4/0.7
HSB/HC 258-340	1/2	6.7	④	3.5	2.6 ⑤	3.0/1.5 ⑤	④	9.0	2.0/1.0
V/VN 42, 59	1/30	2.1	④	0.6	1.9 ⑤	2.1/1.05 ⑤	④	4.0	-
V/VN 78, 95	1/15	2.5	④	1.3	1.9 ⑤	2.1/1.05 ⑤	④	4.0	-
V/VN 139	1/5	2.8	④	1.5	1.9 ⑤	2.1/1.05 ⑤	④	4.0	1.4/0.7
V/VN 161-212	1/3	5.4	④	2.5	1.9 ⑤	2.1/1.05 ⑤	④	6.5	1.4/0.7
V/VN 247	1/2	6.7	④	3.5	2.6 ⑤	3.0/1.5 ⑤	④	9.0	2.0/1.0
V/VN, PT/PTN 279	1/2	6.7	④	3.5	2.6 ⑤	3.0/1.5 ⑤	④	9.0	2.0/1.0
V/VN, PT/PTN 333	3/4	8.8	④	4.4	3.7 ⑤	3.4/1.7 ⑤	④	-	-
V/VN, PT/PTN 385	1	-	-	-	4.2	4.0/2.0	1.5	-	3.5/1.75
V/VN, PT/PTN 500, 610	1-1/2	-	-	-	7.4	6.6/3.3	2.0	-	5.8/2.9
V, PT 952	2	-	-	-	7.4	6.8/3.4	-	-	6.2/3.1

- ① Ratings shown are for Standard and Low Outlet Temperature Models.
- ② All HSB/HC units, V/VN 42 thru V/VN, PT/PTN 333 motor HP listed for power code 01. V/VN PT/PTN 333 thru V/VN, PT/PTN 610 motor HP listed for power code 04 and V/PT 952 motor HP listed for power code 05.
- ③ For model sizes V/VN/PT/PTN 385 and above, motors for Power Codes 04, 05, and 10 do not have thermal overload protection.
- ④ For supply voltages of 208V/60Hz/1ph and all non-explosion-proof 3 phase voltages of 208, 230, 460 and 575, Model Numbers indicated with Note ④, require that a 115V/60Hz/1 phase Power Code 01 unit heater be used with a shipped loose accessory transformer. See Table 23.2 for Transformer Sizes.
- ⑤ For non-explosion-proof 3 phase supply voltages of 208, 230, and 460, Model Numbers indicated with Note ⑤, can be ordered with a Power Code (208V/3ph=04, 230/460V/3ph=05) that provides a motor matched to the supply voltage with amp draw as shown. Alternately, a 115V/60Hz/1 phase Power Code 01 unit heater could be used with a shipped loose accessory transformer. See Table 23.2 for Transformer Sizes.

Figure 23.1 Field Installed Transformer Accessory



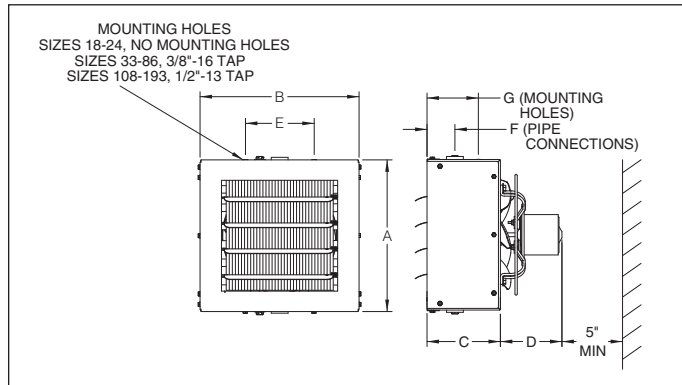
Table 23.2 - Step-Down Transformer Accessory Selection

	208V/60Hz/1 or 3 phase	230/460V/60Hz/3 phase	575V/60Hz/3 phase
Model Number	kVA	kVA	kVA
HSB/HC 18-63	0.50	0.25	0.25
HSB/HC 86-121		0.50	0.50
HSB/HC 165-193	1.00	0.75	0.75
HSB/HC 258-340		1.00	1.00
V/VN 42-59	0.50	0.25	0.25
V/VN 78-139		0.50	0.50
V/VN 161-212	1.00	0.75	0.75
V/VN 247-333		1.00	1.00
PT/PTN 279-333	1.00	1.00	1.00

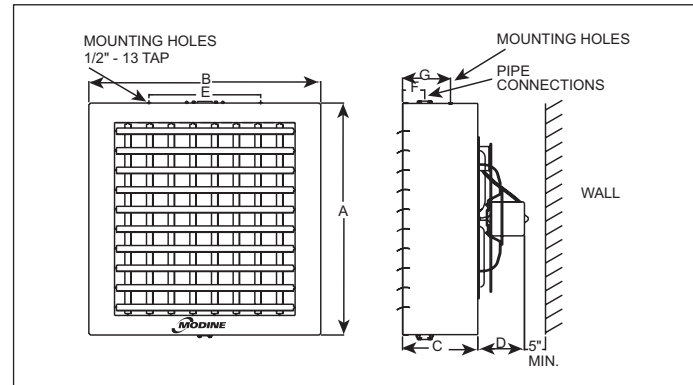
kVA Size	Ship Wt. (Lb.)
0.25	7
0.50	13
0.75	15
1.00	19

## Dimensions - Horizontal Air Delivery Models

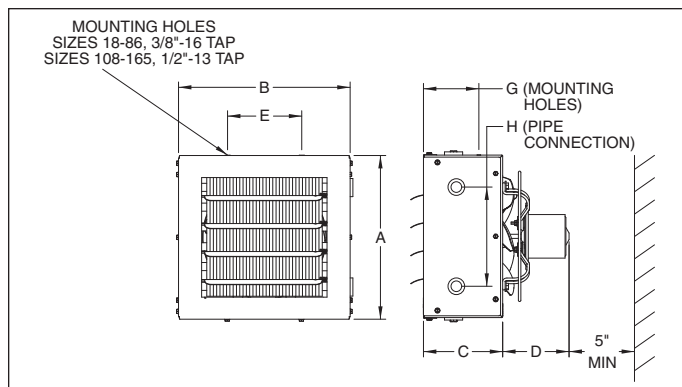
**Figure 24.1 - Model Dimensions HSB 18-193**



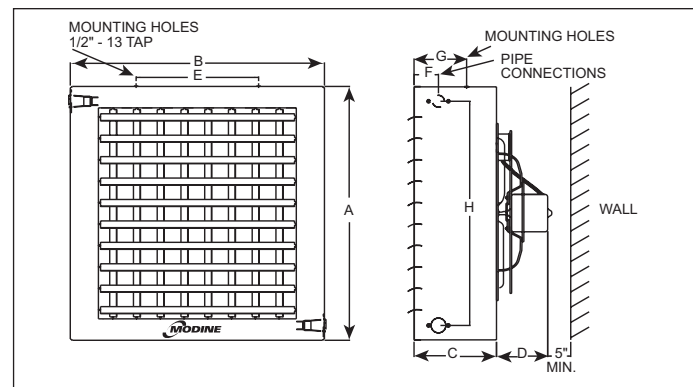
**Figure 24.2 - Model Dimensions HSB 258-340**



**Figure 24.3 - Model Dimensions HC 18-165**



**Figure 24.4 - Model Dimensions HC 193-340 ①**



① Vertical deflector blades shown are standard on models HC 258-340 and optional on model HC 193.

**Table 24.1 - Model HSB and HC Dimensions ② ③**

Model Number	A	B	C	D		E	F	G	H	Female Connections NPT	Fan Diameter	Approx. Shipping Wt. lb.
				115 Std. Motor	115V Exp. Motor							
HSB 18	12-3/8	13	6	5	12-1/4	-	3	-	-	3/4	9	16
HSB 24	12-3/8	13	6	5	12-1/4	-	3	-	-	3/4	9	20
HSB 33	16-3/8	17-1/2	8-3/4	6	11-3/4	11	3-5/8	6	-	1-1/4	12	34
HSB 47	16-3/8	17-1/2	8-3/4	6	11-3/4	11	3-5/8	6	-	1-1/4	12	36
HSB 63	20-7/16	21-1/2	8-3/4	7-3/4	12	15	3-5/8	6	-	1-1/4	14	48
HSB 86	20-7/16	21-1/2	8-3/4	7-3/4	12	15	3-5/8	6	-	1-1/4	14	52
HSB 108	24-7/16	25-1/2	9-1/2	6-3/4	13-1/4	18	3-3/4	6-3/8	-	1-1/4	18	74
HSB 121	24-7/16	25-1/2	9-1/2	6-3/4	13-1/4	18	3-3/4	6-3/8	-	1-1/4	18	76
HSB 165	30-1/2	30-1/2	9-1/4	8-1/2	14	21-1/4	3-3/4	6-3/8	-	1-1/4	22	92
HSB 193	30-1/2	30-1/2	9-1/4	8-1/2	14	21-1/4	3-3/4	6-3/8	-	1-1/4	22	98
HSB 258	38-1/2	38-1/2	12-1/2	10	15	18-1/2	3-5/8	7-7/8	-	1-1/4	22	162
HSB 290	38-1/2	38-1/2	12-1/2	10	15	18-1/2	3-5/8	7-7/8	-	1-1/4	24	168
HSB 340	38-1/2	44-1/2	12-1/2	10	15	18-1/2	3-5/8	7-7/8	-	1-1/4	24	176
HC 18	11-1/2	13	6	5	12-1/4	5-5/8	2-1/4	4-1/8	7-1/2	1/2	9	16
HC 24	11-1/2	13	6	5	12-1/4	5-5/8	2-1/4	4-1/8	7-1/2	1/2	9	20
HC 33	15	17-1/2	8-3/4	6	11-3/4	11	3-5/8	6	10	3/4	12	34
HC 47	15	17-1/2	8-3/4	6	11-3/4	11	3-5/8	6	10	3/4	12	35
HC 63	18-1/2	21-1/2	8-3/4	7-3/4	12	15	3-5/8	6	14	3/4	12	48
HC 86	18-1/2	21-1/2	8-3/4	7-3/4	12	15	3-5/8	6	14	3/4	14	52
HC 108	22-1/2	25-1/2	9-1/2	6-3/4	13-1/4	18	3-5/8	6-3/8	18	3/4	18	74
HC 121	22-1/2	25-1/2	9-1/2	6-3/4	13-1/4	18	3-5/8	6-3/8	18	3/4	18	76
HC 165	26-1/2	29-1/2	9-1/4	8-1/2	14	21-1/4	3-5/8	6-3/8	22	3/4	22	92
HC 193	30-1/2	32-1/2	9-1/4	8-1/2	14	21-1/4	3-5/8	4-3/4	26	1-1/4	22	98
HC 258	38-1/2	38-1/2	12-1/2	10	15	18-1/2	3-5/8	8	34	1-1/4	22	163
HC 290	38-1/2	38-1/2	12-1/2	10	15	18-1/2	3-5/8	8	34	1-1/4	24	168
HC 340	38-1/2	44-1/2	12-1/2	10	15	18-1/2	3-5/8	8	34	1-1/4	24	176

② All dimensions in inches.

③ Dimensions shown are for Standard and Low Outlet Temperature Models.