



## STEAM/HOT WATER UNIT HEATERS



**MODEL HSB/HC**



**MODEL V/VN**



**MODEL PT/PTN**



**MODEL GLW**

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Refer to page 9 for information regarding the  
Breeze™ AccuSpec Sizing and Selection Program



Canadian  
Registered  
heat exchangers  
CRN  
OH 9234.5C  
\*Does not apply to  
V/PT 952

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

## Application, Design, Construction Overview - All Units

### Wide Product Selection

- Ratings as low as 11,300 Btu/hr for hot water to as high as 952,000 Btu/hr for steam, based on standard conditions.
- Horizontal, Vertical, and Power-Throw™ (high velocity horizontal air delivery) models offer maximum application flexibility.
- Ratings are shown as Btu/hr (based on 2 PSI steam, 60°F entering air conditions), eliminating the need to convert from EDR. This simplifies the matching of unit ratings to building heat loss.

### Application Flexibility

- Horizontal and Power-Throw™ units are furnished with louvers for directional control of heated air. Vertical units are available with various louver, truncone, and cone-jet deflector options to accommodate many different air distribution patterns. See page 22 for more information.
- Units are available as low outlet temperature (LOT) models. LOT models have coils with fewer fins per inch to reduce the output rating. This is a benefit for applications where the steam pressure exceeds 30 PSI and mounting height is critical; the lower output results in outlet air temperatures that approximate that of standard coils at standard steam pressure. LOT models are also well suited for dirty environments where the increased fin spacing decreases the build-up of foreign particles. Finally, LOT models offer lower airside resistance resulting in greater allowable mounting heights and greater heat throw.
- Vertical and Power-Throw™ units are available with 90/10 cupro-nickel coils for high pressure/temperature applications, up to 250 PSI or 400°F.
- Side piping connections on the HC horizontal air delivery model allow for low clearance installations.
- Explosion-proof motors are available for use in hazardous areas. See page 8 for additional details.
- Design assures the correct relationship between air temperature, velocity, and air volume for greater heat throw; air is delivered to the floor at maximum mounting height, increasing comfort and reducing fuel costs.

### Ease of Installation/Maintenance = Reliability

- Units are compact and lightweight, requiring fewer contractor hours to install.
- All units include an electrical junction box, either integral to the motor or mounted on the unit casing, to allow for easy electrical connections.
- All motors are totally enclosed. All single phase and explosion-proof motors include internal overload protection to protect the motor from insulation damaging heat, resulting in longer motor life.
- Different suspension options are available for most units including threaded rod or pipe hanger adapters.
- All units are component tested for proper motor function and the coils are leak tested under pressure to ensure proper function when the unit arrives at the jobsite.
- Fins on all units are vertical to limit build-up of foreign particles, prolonging periods between cleanings. Fins on vertical and Power-Throw™ units are exposed for easy cleaning.

### Blends with the Environment

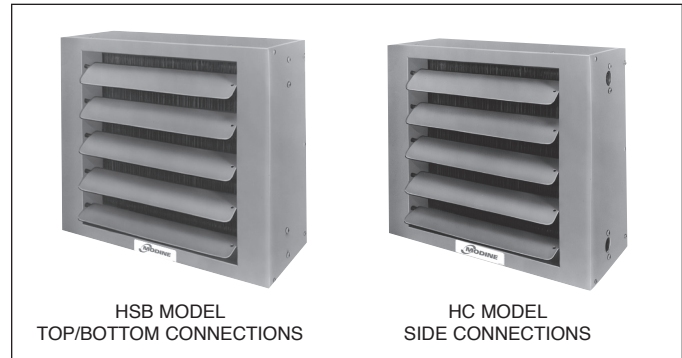
- Quiet operation is assured through the use of carefully selected motors, fans, and scientifically designed venturi fan shrouds.
- HSB and HC models have squared off corners for a clean, defined appearance. Vertical and Power-Throw™ units have a pleasing circular symmetry.
- Casings are treated for corrosion resistance and finished with a neutral gray-green baked-on, electrostatically applied polyester powder coat paint finish.

## Unit Features - Horizontal Delivery Unit Heaters

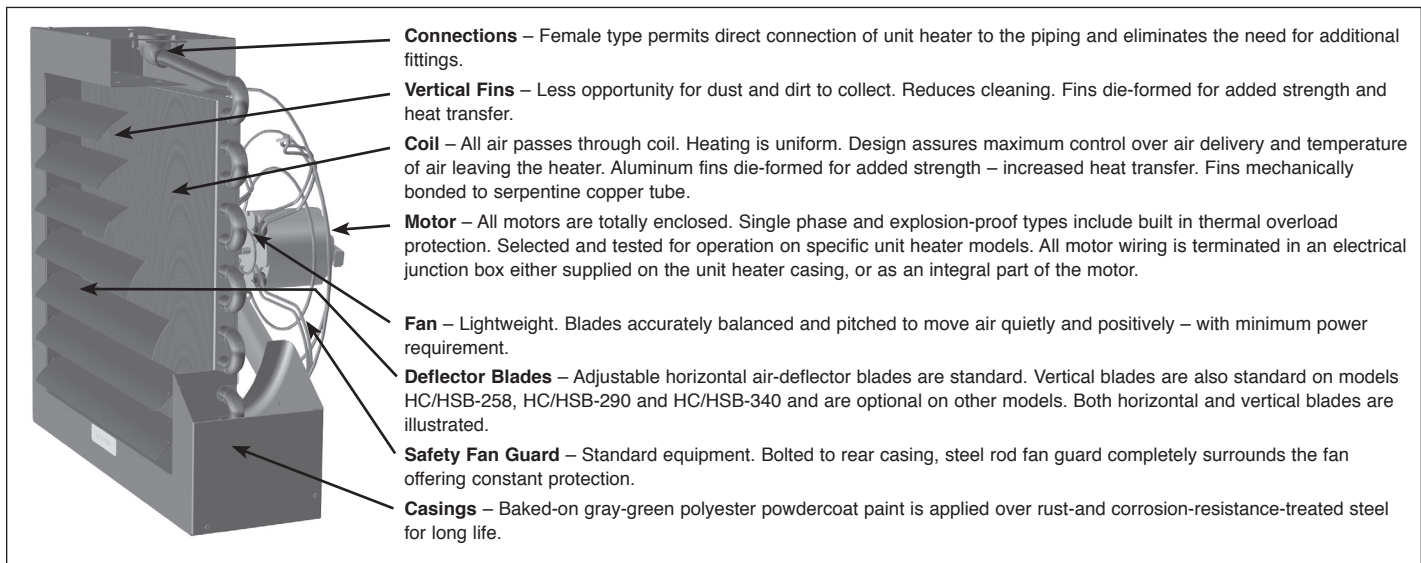
Horizontal delivery unit heaters are the most popular of all types. These units are ideal for heating buildings with large open areas and low ceilings. They are used to counter heat loss along outside building walls, especially where windows are present.

**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**



## Options and Accessories

**Table 7.1**  
**Factory Mounted Options**

Factory Mounted Option	Description
Fingerproof Fan Guard	Standard fan guard may be factory replaced with fingerproof fan guard. For HSB/HC units only. Not available for units with explosion-proof motors.

**Table 7.2**  
**Field Installed Accessories for Horizontal Models**

Field Installed Accessories	Description
Vertical Deflector Blades	Blades used to deflect airflow in directions left or right of unit heater. Used in addition to standard horizontal deflector blades. Vertical deflector blades are standard on HSB/HC models 258 through 340. Not available for Power-Throw™ models.
Solid State Speed Control	Allows for remote control of airflow volume by controlling fan speed. Available only on HSB/HC models 18 through 108 with Power Code 01.

**Table 7.3**  
**Field Installed Accessories for Vertical Models**

Field Installed Accessories	Description
Cone-Jet	The cone-jet allows the discharge air stream to be adjusted from a concentrated high velocity jet to a broadened air stream to cover a larger area. See page 22 for additional information.
Truncone	The truncone causes a broad discharge air stream covering a larger area than possible with the cone-jet. See page 22 for additional information.
One Way Louver	The one-way louver allows the discharge air stream to be adjusted in one direction. See page 22 for additional information.
Two Way Louver	The two-way louver allows the discharge air stream to be adjusted in two directions. See page 22 for additional information.

**Table 7.4**  
**Field Installed General Accessories**

Field Installed Accessories	Description
Thermostat	Honeywell T4051A1003, 50-80°F range, 16A @ 115V, 8A @ 230V
Thermostat	Honeywell T451A3005, 44-86°F range, 9.8A @ 115V, 4.9A @ 230V
Thermostat	Johnson Controls T22BBC-1, 40-90°F range, Auto/Off/Fan switch, 10A @ 115V, 4.9A @ 230V
Explosion-proof Thermostat	Honeywell T6051B1006, 46-84° range, 10.2A @ 115V, 6.5A @ 230V
Aquastat	Aquastat, 10 amps @ 115V; 6 amps @ 230V; 100°-240°F range, SPDT, 10°F Diff. Fixed, Johnson A19DAC-1
Thermostat Guard	Clear plastic locking guard with tumbler lock and two keys. Available only on thermostat Item Codes 23124, 23125 and 90348.
Pipe Hanger Adapter Kit	Allows unit heater to be suspended by threaded pipe instead of threaded rod. Two kits are required for V and VN models. Kits are not available for HSB-18 and HSB-24 models or Power-Throw™ models.
Manual Starter	Toggle switch starter with thermal overload protection for remote on/off control of unit fan operation. Available for power codes 01 and 02 only.
Step-Down Transformer	For supply voltages of 208V/60Hz/1ph and all non-explosion-proof 3 phase voltages of 208, 230, 460 and 575, certain Model Numbers require that a 115V/60Hz/1 phase Power Code 01 unit heater be used with a shipped loose accessory transformer. See page 23 for additional information.

## Power Code Descriptions & Control Sequence

**Table 8.1**  
**Power Code Descriptions**

Power Code	Supply Voltage	Motor Enclosure	Motor Type	Thermal Overload Protection	Motor Starter
01	115/60/1	Totally Enclosed	①	Yes	N/A
02	230/60/1	Totally Enclosed	①	Yes	N/A
04	200-208/60/3	Totally Enclosed	Polyphase Induction	No	Field Supplied/Installed
05	230/460/60/3	Totally Enclosed	Polyphase Induction	No	Field Supplied/Installed
06	115/60/1	Explosion-proof ②	Split Phase	Yes	N/A
09	230/460/60/3	Explosion-proof ②	Polyphase Induction	Yes	Field Supplied/Installed
10	575/60/3	Totally Enclosed	Polyphase Induction	No	Field Supplied/Installed

① Motors are shaded pole for models HSB/HC 18-33 and V/VN 42-95. Models HSB/HC 47-340 and V/VN 139-333 are permanent split capacitor.

② Explosion-proof motors are suitable for Class I, Group D, Class II, Groups F and G, and Class III, Division 1 and 2 environments. Canadian Standard Association (CSA) requirements state that the explosion-proof units may not be used with a fluid temperature in excess of 329°F or pressures greater than 87 psig and still maintain their T3B temperature rating.

Class I, Group D motors are for operations in areas containing gasoline, petroleum, naphtha, benzene, butane, propane, alcohol, acetone, lacquer solvent or natural gas.

Class II, Group F motors are for operations in areas containing carbon black, coal or coke dust.

Class II, Group G motors are for operations in areas containing flour, starch or grain dust.

Class III motors are for operations in areas containing easily ignitable fibers and flyings.

### Control Sequence

The following control sequence descriptions are typical for steam/hot water unit heaters:

#### Intermittent Fan Operation - Hot Coil

When a room thermostat calls for heat, the motor is energized. Hot water or steam is continuously supplied to the unit heater, even when the motor is not running. When the thermostat is satisfied, the motor is de-energized.

#### Continuous Fan Operation - Intermittent Hot/Cold Coil

When a room thermostat calls for heat, a valve is opened, allowing steam or hot water to enter the unit heater. When the thermostat is satisfied, the valve is closed. The fan runs continuously.

#### Intermittent Fan Operation - Intermittent Hot/Cold Coil

When a room thermostat calls for heat, the motor is energized. At the same time, a valve is opened allowing steam or hot water to enter the unit heater. An aquastat may be attached to the supply or return piping to prevent fan operation until the coil is adequately heated to avoid cold air delivery. When the thermostat is satisfied, the valve closes and the motor is de-energized.

# 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	15	17	11	950	825	103	43	1/30	1,050
	V/VN 59	59,000	246	14	19	21	14	1,155	1,005	111	61	1/30	1,050
	V/VN 78	78,000	325	15	20	23	15	1,590	1,065	109	81	1/15	1,050
	V/VN 95	95,000	396	15	20	23	15	1,665	1,120	118	98	1/15	1,050
	V/VN 139	139,000	579	18	24	27	18	2,660	1,285	112	144	1/6	1,075
	V/VN 161	161,000	671	20	27	30	20	2,945	1,420	115	167	1/3	1,075
	V/VN 193	193,000	804	22	30	33	22	3,500	1,690	116	200	1/3	1,075
	V/VN 212	212,000	883	22	30	33	22	3,610	1,740	120	219	1/3	1,075
	V/VN 247	247,000	1,029	26	34	39	26	4,820	1,910	111	256	1/2	1,075
	V/VN 279	279,000	1,163	30	37	45	30	5,460	2,165	111	289	1/2	1,075
	V/VN 333	333,000	1,388	30	37	45	30	5,980	2,165	116	345	3/4	1,140
	V/VN 385	385,000	1,604	30	36	45	30	7,680	1,860	110	398	1	1,140
	V/VN 500	500,000	2,083	37	44	56	37	10,390	2,520	108	517	1 1/2	1,140
	V/VN 610	610,000	2,542	36	43	54	36	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.



## 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:

$$\text{Btu}_{AG} = \text{Btu}_S \text{ (or } \text{Btu}_A) \times \text{Glycol Correction Factor}$$

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

$$\text{Btu}_S \text{ (or } \text{Btu}_A) = \text{Btu}_{AG} \div \text{Glycol Correction Factor}$$

Where:

$\text{Btu}_S$  = Capacity at standard conditions (200°F entering water temperature, 60°F entering air temperature) from Tables 19.1 through 20.2

$\text{Btu}_A$  = Capacity at non-standard (actual) conditions

$\text{Btu}_{AG}$  = 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:

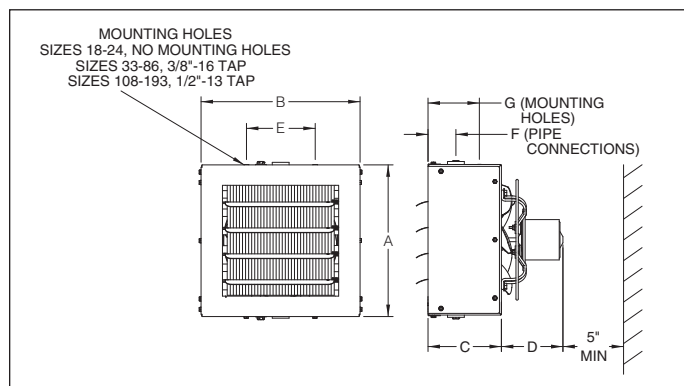
Max. Mounting Height<sub>A</sub> = Maximum mounting height at actual conditions

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

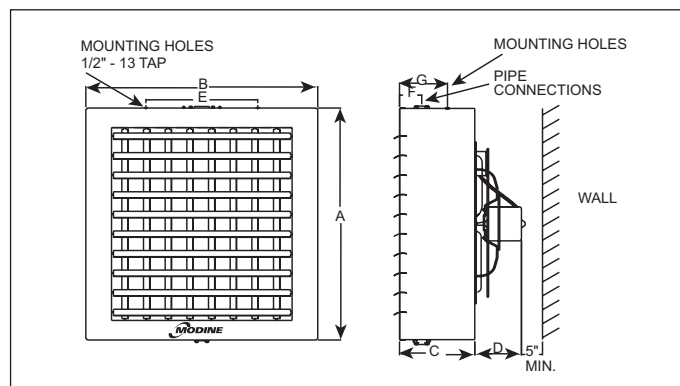


## Dimensions - Horizontal Air Delivery Models

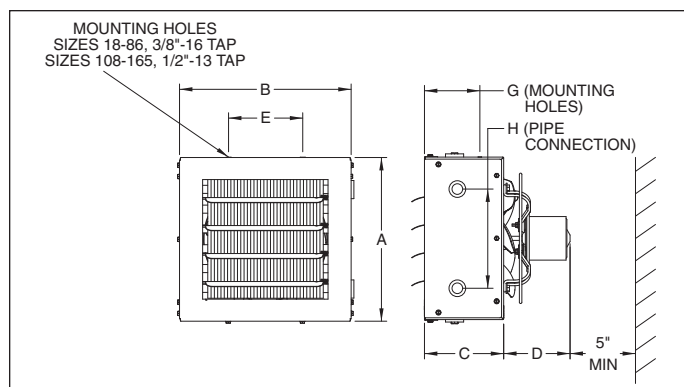
**Figure 24.1 - Model Dimensions HSB 18-193**



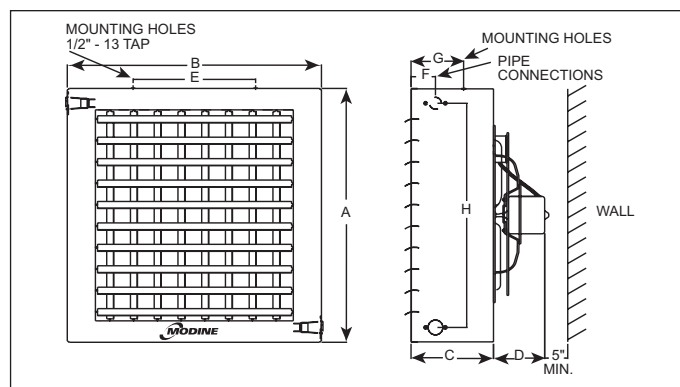
**Figure 24.2 - Model Dimensions HSB 258-340**



**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**

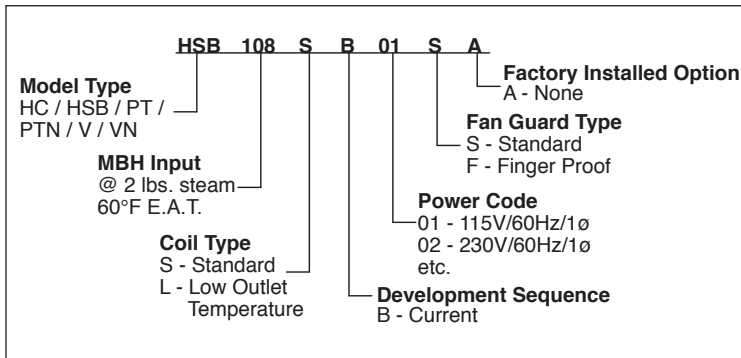
Model Number	A	B	C	D		E	F	G	H	Female Connections NPT	Fan Diameter	Approx. Shipping Wt. lb.
				115 Std. Motor	115V Exp. Motor							
HSB 18	12-3/8	13	6	5	12-1/4	-	3	-	-	3/4	9	16
HSB 24	12-3/8	13	6	5	12-1/4	-	3	-	-	3/4	9	20
HSB 33	16-3/8	17-1/2	8-3/4	6	11-3/4	11	3-5/8	6	-	1-1/4	12	34
HSB 47	16-3/8	17-1/2	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.

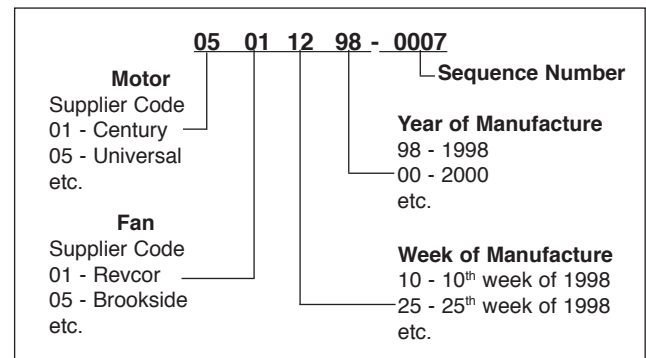
③ Dimensions shown are for Standard and Low Outlet Temperature Models.

## Model Identification

**Figure 26.1**  
**Model Number Designation**



**Figure 26.2**  
**Serial Number Designation**



**Figure 26.3**  
**Model Identification Plate**

HYDRONIC UNIT HEATER			COMMON PARTS		
Model No. HSB108SB01SA		Serial No. 05014005-0007	Motor 9F30212A	Fan 5H58108C4	Coil 3H32251C2
Motor HP 1/8	Volts/Hertz/Phase 115/60/1	Amps 2.3	Units with Hazardous Location Designation are suitable for Class I Group D, Class II Groups F and G and Class III locations, and may be operated with maximum fluid pressure of 87 psig, per temperature code T3B.  <b>WARNING: INSTALL UNIT AT LEAST 8 FT. ABOVE THE FLOOR AND OUT OF REACH.</b> <b>ATTENTION: INSTALLER A 2.45M MINIMUM AU DESSUS DU SOL ET HORS D'ATTEINTE.</b>		
Location Designation Ordinary Location		CSA File No. 0307470000			
Modine Manufacturing Company 604 Liberty Lane, P.O. Box 308 West Kingston, Rhode Island 02893			Made in U.S.A.		

## Specification for Horizontal, Vertical and Power-Throw™ Models

### General

Contractor shall furnish and install steam/hot water unit heater model \_\_\_\_\_. Performance shall be as indicated on the equipment schedule in the plans. Units shall be listed by CSA as certified to CAN/CSA-C22.2 No. 236-05 "Heating and Cooling Equipment" and UL Std. No. 1995 "Heating and Cooling Equipment." Additionally for Canada, the units shall have CRN registered heat exchangers.

### Casing

**HSB and HC Models** - Casings on model sizes 18 through 86 are 20 gauge steel (18 gauge on all other models) and consist of front and back halves. Both halves are joined together at the top and bottom utilizing the condenser mounting screws. Casing top is provided with threaded hanger connections for unit suspension (except for HSB 18 and HSB 24 which are directly mounted to the supply and return piping). Fan venturi is formed in casing back half.

**Vertical and Power-Throw™ Models** - Casings consist of two circular 18 gauge steel covers. With the coil in between, the covers are securely bolted together to form a single unit. The bottom cover has a die-formed fan venturi. The top cover incorporates a motor cooling cone, which shields the motor from coil heat therefore prolonging motor life. An opening is also provided for circulation of motor cooling air.

**All Models** - Casing shall be treated to prevent corrosion and painted with a corrosion resistant, baked, polyester powdercoat gray-green finish.

### Condenser

Condenser coils are of the extended surface type, utilizing aluminum fins and DLP-type copper tubes with malleable iron supply and return connections for HSB units, cast bronze connections for HC models and Schedule 40 steel pipe for V/PT models. Tubes are mechanically bonded to the collars of the fins. The condensers are warranted for operation at steam or hot water pressures and temperatures up to 150 psig and 375°F for copper coils and 250 psig and 400°F for 90/10 cupro-nickel coils.

Fins are continuous across the width and depth of the condenser and are vertically oriented to minimize the collection of dirt and dust.

Canadian Standards Association (CSA) requirements state that explosion-proof units (Power Codes 06 and 09) may not be used with fluid temperatures in excess of 329°F or pressures in excess of 87 psig and still maintain their explosion-proof rating for National Electric Code ignition temperature rating T3B for grain dust.

All coils are leak tested at 165 to 200 psig, air under water.

**Horizontal Models** - Coils are of serpentine design with horizontal tubes, vertical fins and center supply and return connections at top and bottom of unit (except HC models, which have side connections). All tube bends are brazed. All tubes have individual expansion bends. Copper tubes are 1" O.D. with 0.030" wall thickness (except HSB/HC 18 and 24 which are 5/8" O.D. with 0.028" wall thickness).

**Vertical and Power-Throw™ Models** - Coils are circular, providing for natural expansion. Each tube is continuous between supply and return header. All tube joints are silver soldered. Copper tubes are 5/8" O.D. with 0.028" wall thickness.

**Motors** - See page 8 for Power Code and motor descriptions and page 23 for motor amp draw information. Motors are designed for continuous duty and can operate in a maximum ambient temperature of 104°F(40°C).

**Fans/Fan Guards** - Fans are aluminum on all units and are secured to a steel hub. Each fan is balanced and is designed specifically for the unit heater on which it is installed. Horizontal units are equipped with a combination fan guard/motor-mounting bracket. The guard is constructed of steel rod. Vertical units are supplied with an outlet fan guard covering the opening in the bottom of the unit.

**Air Deflectors** - Horizontal units, including the Power-Throw™ units, are furnished with horizontal air deflectors as standard. The deflectors are adjustable to almost any desired position for downward, straight or upward airflow. Vertical deflectors are available as an accessory for HSB/HC models through size 193, standard on model sizes 258-340. See page 22 for air outlet accessories for vertical models.

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

#### **HVAC**

- Unit Heaters:
  - Gas
  - Hydronic
  - Electric
  - Oil
- Ceiling Cassettes
- Duct Furnaces
- Hydronic Cabinet Unit Heaters, Fin Tube, Convectors
- Infrared Heaters
- Make-up Air Systems
- Unit Ventilators

#### **Ventilation**

- Packaged Rooftop Ventilation

#### **School Products**

- Vertical Packaged Classroom HVAC:
  - DX Cooling/Heat Pump
  - Water/Ground Source Heat Pump
  - Horizontal/Vertical Unit Ventilators

#### **Geothermal**

- Water-to-Water
- Water-to-Air
- Combination

Specific catalogs are available for each product. Catalogs 75-136 and 75-137 provide details on all Modine HVAC equipment.



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