



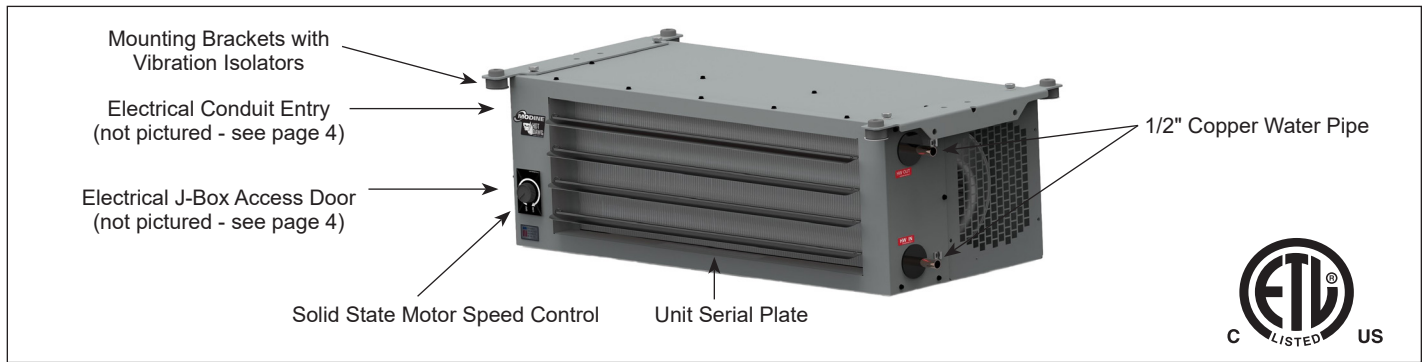
## LOW PROFILE HOT WATER UNIT HEATER



MODEL HHD45

# HOT DAWG H<sub>2</sub>O® – LOW PROFILE HOT WATER UNIT HEATER

**Figure 1 - Model HHD Standard Features**

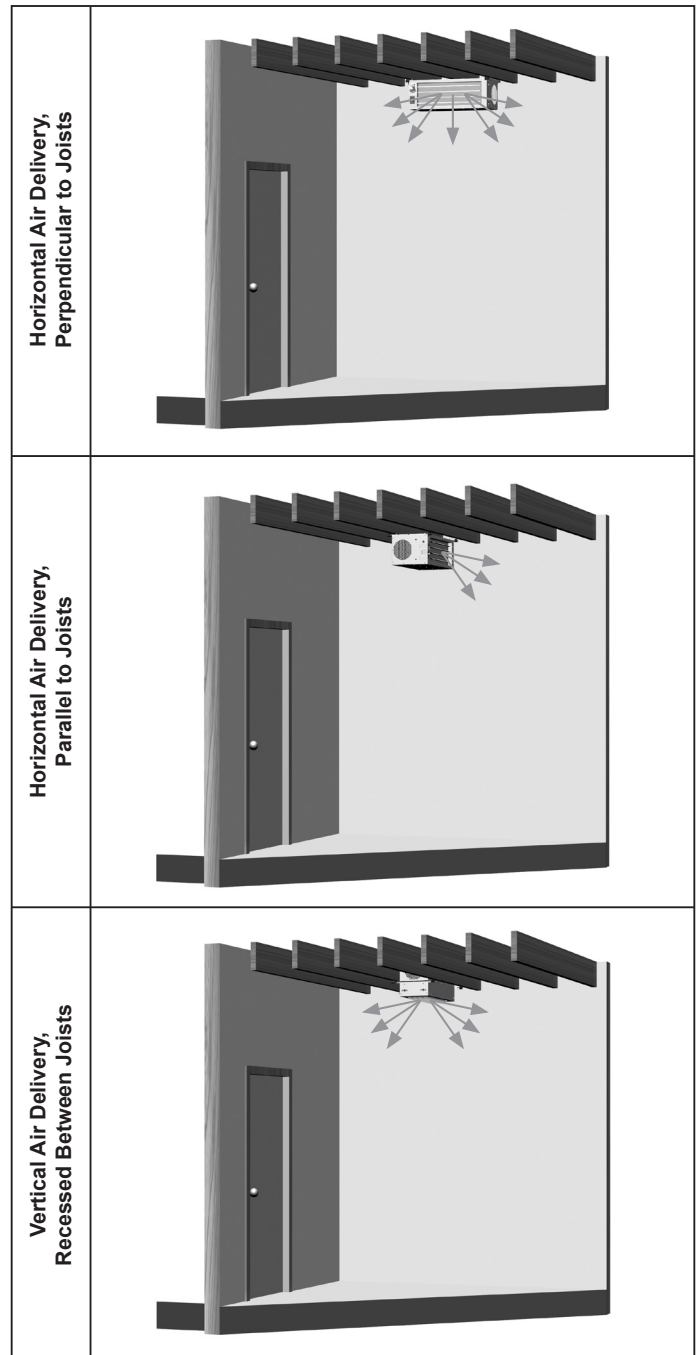


**Note:** Standard piping/electrical access side orientation shown.

**Table 1 - Standard Features**

	Feature
<b>General</b>	All units are listed by ETL as design certified for use in both the US and Canada to the UL 60335-2-40 and CSA C22.2 Standards for Heating and Cooling Equipment for safe operation, construction, and performance.
	Low profile design is ideally suited for residential garages, basements, vestibules, commercial, industrial, institutional installations. Non-potable water applications only.
<b>Cabinet</b>	Low profile, 20 gauge steel cabinet results in a clean appearance that maximizes head room.
	Cabinet pre-treated for prevention of rust and corrosion and finished with a durable electrostatically applied baked-on polyester powdercoat paint. Environmentally friendly.
	Attractive modern gray paint color.
	Horizontal adjustable air-deflector blades.
	Fingerproof inlet air openings.
	Side access piping and electrical (see “Mounting Flexibility” for info on reversing access side). Two L-shaped mounting brackets (see “Mounting Flexibility” for mounting orientations).
<b>Mounting Flexibility</b>	Brackets designed to match up to standard 16” on-center joist spacing.
	Mounting orientation flexibility includes (refer to Figure 2): <ul style="list-style-type: none"> <li>• Horizontal air delivery, mounted parallel to joists.</li> <li>• Horizontal air delivery, mounted perpendicular to joists.</li> <li>• Vertical air delivery, mounted between joists.</li> </ul>
	Electrical connections are standard on the left with piping on the right. Access sides can be easily reversed in the field by simply flipping the unit over.
<b>Heating Coil</b>	High capacity, 3 row hot water coil.
	Copper tubes mechanically expanded into aluminum fins for maximum heat transfer.
	1/2” copper water pipe connections.
	Coils suitable for water pressures up to 150PSI and temperature up to 200°F.
<b>Air Mover</b>	Twin centrifugal blower wheels for quieter operation.
	Dual shaft blower motor (115V/60Hz/1ph).
	Factory supplied neoprene vibration isolators.

**Figure 2 - Model HHD Mounting Orientations**



# HOT DAWG H<sub>2</sub>O® – LOW PROFILE HOT WATER UNIT HEATER

**Table 2 - Performance Data** ① ②

Model Size	Airflow (CFM)	GPM	WPD (ft. Water)	Entering Water Temperature (60°F Entering Air Temperature)									
				120°F		140°F		160°F		180°F		200°F	
				Btu/Hr	WTD	Btu/Hr	WTD	Btu/Hr	WTD	Btu/Hr	WTD	Btu/Hr	WTD
45	710 (High Speed)	1	0.6	17,200	36	22,900	48	28,600	60	34,400	72	40,100	84
		2	2.2	22,400	23	29,900	31	37,300	39	44,800	47	52,300	55
		3	4.7	24,900	17	33,200	23	41,500	29	49,800	35	58,100	40
		4	7.9	26,400	14	35,100	18	43,900	23	52,700	27	61,500	32
		5	12	28,400	12	37,800	16	47,300	20	56,800	24	66,300	28
	425 (Medium Speed)	1	0.6	11,900	25	15,900	33	19,900	41	23,900	50	27,900	58
		2	2.2	15,600	16	20,700	22	25,900	27	31,100	33	36,300	38
		3	4.7	17,300	12	23,000	16	28,800	20	34,600	24	40,300	28
		4	7.9	18,300	10	24,400	13	30,500	16	36,600	19	42,700	22
		5	12	19,700	8	26,300	11	32,800	14	39,400	16	46,000	19
	280 (Low Speed)	1	0.6	8,900	18	11,800	25	14,700	31	17,700	37	20,600	43
		2	2.2	11,500	12	15,400	16	19,200	20	23,100	24	26,900	28
		3	4.7	12,800	9	17,100	12	21,400	15	25,600	18	29,900	21
		4	7.9	13,600	7	18,100	9	22,600	12	27,100	14	31,600	17
		5	12	14,600	6	19,500	8	24,300	10	29,200	12	34,100	14

- ① For conditions other than shown above, please refer to the Modine Breeze AccuSpec program for detailed performance data.
- ② Allowable water temperature range is 100°F to 200°F. Allowable indoor air temperature range is 40°F to 100°F. If temperatures below freezing are expected, provisions should be made to either drain the unit heater coil or utilize a continually circulating glycol solution.

**Table 3 - Btu Correction Factors for Varying Entering Air and Entering Water Temperatures** ① ② ③

EAT, °F	EWT, °F										
	100	110	120	130	140	150	160	170	180	190	200
40	0.439	0.512	0.585	0.658	0.731	0.805	0.878	0.950	1.024	1.097	1.170
50	0.361	0.434	0.506	0.578	0.651	0.723	0.795	0.867	0.940	1.012	1.084
60	0.286	0.357	0.429	0.500	0.571	0.643	0.714	0.786	0.857	0.929	1.000
70	0.212	0.283	0.353	0.424	0.494	0.565	0.636	0.706	0.777	0.848	0.918
80	0.140	0.210	0.279	0.349	0.419	0.489	0.559	0.629	0.699	0.768	0.838
90	0.069	0.138	0.207	0.276	0.345	0.414	0.483	0.552	0.621	0.690	0.759
100	0.000	0.068	0.137	0.205	0.273	0.342	0.410	0.478	0.547	0.615	0.684

- ① For conditions other than shown above, please refer to the Modine Breeze AccuSpec program for detailed performance data.
- ② Allowable water temperature range is 100°F to 200°F. Allowable indoor air temperature range is 40°F to 100°F. If temperatures below freezing are expected, provisions should be made to either drain the unit heater coil or utilize a continually circulating glycol solution.
- ③ To use correction factors, start with the 200°F EWT and 60°F EAT data from Table 2 and multiply by the factor shown in Table 3.

**Table 4 - Btu Correction Factors for Glycol** ①

Glycol Type	Glycol %	Solution Temp (°F)		
		100	150	200
Propylene	20	0.96	0.96	0.96
	30	0.93	0.93	0.93
	40	0.92	0.92	0.92
	50	0.88	0.89	0.89
	60	0.85	0.860	0.87
Ethylene	20	0.99	0.99	0.99
	30	0.96	0.96	0.96
	40	0.95	0.95	0.95
	50	0.93	0.94	0.94
	60	0.89	0.90	0.92

- ① To use correction factors, multiply previously determined Btu performance by factor shown in Table 4.

**Table 5 - CFM Correction for Varying Entering Air Temperatures** ①

Entering Air Temperature (°F)					
40	50	60	70	80	90
1.040	1.020	1.000	0.982	0.964	0.945

- ① To use correction factors, multiply CFM from Table 2 by factor shown in Table 5.

**Table 6 – Heat Throw Performance Data for 9 Ft. Maximum Mounting Height and 710 CFM** ①

Louver Angle (Deg)	Air Temp. Rise (°F)	Btu/hr	Heat Throw (ft.)
30	50	38,340	14
	60	46,008	15
45	50	38,340	17
	60	46,008	19
60	50	38,340	27
	60	46,008	32

- ① For conditions of 200°F entering water and 60°F entering air .

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Figure 3 - Model HDD Dimensions (inches)

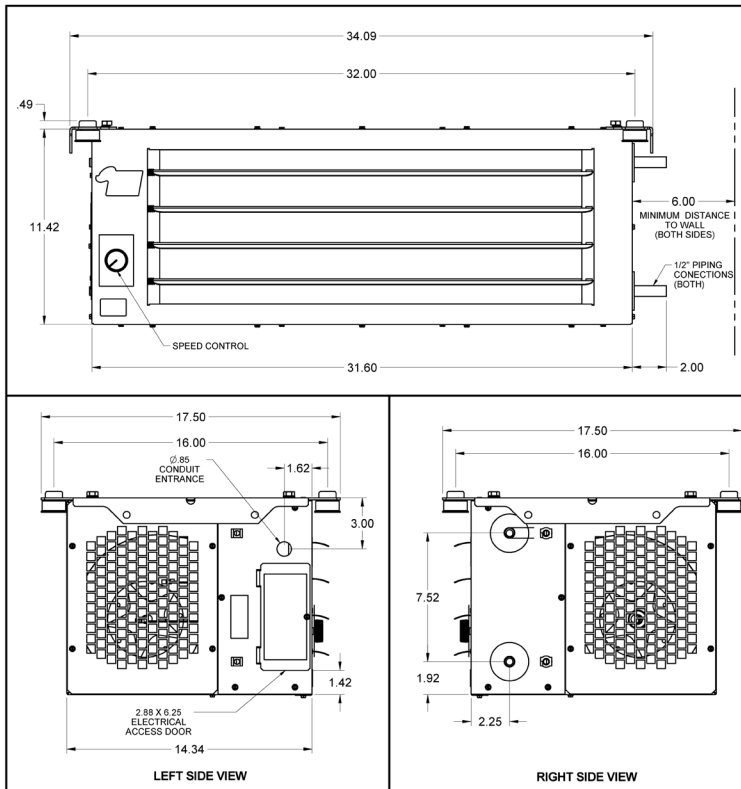


Table 7 - Unit Mechanical/Electrical Data

<b>Coil</b>	
3-Row High Capacity – Face Area, ft <sup>2</sup>	1.55
Standard Coil Connections	1/2" copper water pipe
Approximate Coil Volume (Gallons)	0.34
<b>Blowers (Direct Drive)</b>	
(Qty) - Diameter x Width (Inches)	(2) – 5.75 x 7
Motor Blower Connection	Direct Drive
High / Medium / Low Speed (RPM)	1625 / 1090 / 725
High / Medium / Low Speed (CFM)	710 / 425 / 280
<b>Motor</b>	
Motor Type	Permanent Split Cap
Shaft Arrangement	Double Shaft
(Qty) - HP	(1) - 0.40
Voltage	115V/1ph/60Hz
<b>Maximum Mounting Height (ft.)</b>	9
<b>Shipping Weight – lbs. (approximate)</b>	70



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