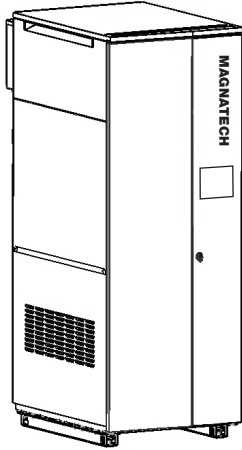


# Brute MagnaTech® HTD

# Volume Water Heater



BMGV | Volume Water Heater

Indoor/Outdoor, Sizes 1600 - 4000



Date:

Project #:

Engineer:

Prepared By:

Bid Date:

## Submittal Data

Project Name:

Location:

Contractor:

## Standard Features

- ASME "HLW" stamp
- 160 psi maximum working pressure
- Meets NSF/ANSI-372 Low Lead Content certification
- Certified for Category II and Category IV vent systems
- Indoor / Outdoor
- Low NOx system exceeds the most stringent regulations for air quality - 9ppm NOx
- High condensing efficiency
- Modulation down to 5% of full fire (20:1 turndown)
- Sophisticated gas/air valve allows for constant control of modulation
- Real-Time O<sub>2</sub> sensing maintains efficiency throughout the modulation range
- Sealed combustion chamber
- Pre-mix stainless steel burner
- Stainless steel heat exchanger with welded construction
- Electronic PID modulating control with large touchscreen and color display
- Multiple independent heat demands
- Controller cascades with up to eight MagnaTech units, if equipped with the same controller
- Accepts 4-20ma or 0-10VDC external modulation or external set point control
- Modbus RTU & BACnet MSTP on board
- Domestic water pump control with time delay
- Sensor for DHW tank
- Horizontal or vertical direct vent
- Vent and air pipe lengths of up to 100 equivalent feet (each)
- "Knock-down" feature: Removable top section for easy handling and installation
- High and low gas pressure switches
- Vent temperature cutoff
- Normally open alarm contact
- Air filter
- Built-in condensate trap
- Water flow switch
- Temperature & pressure gauge
- Low water cutoff
- 125 psi (861kPa) ASME rated pressure relief valve
- Groove lock fittings (optional flange adapter)
- Burner site glass
- 10-Year limited warranty

## Heater Data

Number of Units

Fuel

Natural

Voltage

120V, single ph (1600-2000)

208V, single ph (1600-2000)

220/240V, single ph (1600-2000)

208V, three ph (2000-4000)

480V, three ph (2000-4000)

600V, three ph (2000-4000)

## Factory Mounted Options

ASME CSD-1

ASME "H" Stamp (instead of standard "HLW" Stamp)

BACnet IP gateway

LonWorks gateway

Additional auto & manual reset high limit switches

Alarm bell with silence switch

Groove lock to flange connections

125 psi pressure relief valve (std)

30 psi pressure relief valve

50 psi pressure relief valve

60 psi pressure relief valve

75 psi pressure relief valve

150 psi pressure relief valve



## Accessories for Field Mounting

- |  |   |   |
|--|---|---|
| <input type="checkbox"/> Gateway for BACnet IP                             | <input type="checkbox"/> Screen for vertical stainless steel vent | <input type="checkbox"/> Screen/adapter for vertical or horizontal PCV ducted air |
| <input type="checkbox"/> Gateway for LonWorks                              | <input type="checkbox"/> Screen for horizontal CPVC vent          | <input type="checkbox"/> Screen for horizontal galvanized or vertical ducted air  |
| <input type="checkbox"/> Condensate neutralizer                            | <input type="checkbox"/> Screen for vertical CPVC vent            | <input type="checkbox"/> Screen for horizontal polypropylene ducted air           |
| <input type="checkbox"/> Condensate neutralizer with pump                  | <input type="checkbox"/> Screen for horizontal polypropylene vent | <input type="checkbox"/> Screen for vertical polypropylene ducted air             |
| <input type="checkbox"/> Vent terminal for outdoor unit                    | <input type="checkbox"/> Screen for vertical polypropylene vent   |   |
| <input type="checkbox"/> Screen for outdoor unit air                       |   |   |
| <input type="checkbox"/> Vent terminal for horizontal stainless steel vent |   |   |

## Sizing Data

	Model	Minimum Input Rate		Maximum Input Rate		Minimum Output Rate		Maximum Output Rate		Thermal Efficiency
		MBH	kw	MBH	kw	MBH	kw	MBH	kw	%
<input type="checkbox"/>	<b>1600</b>	80	23.4	1600	469	76	22.3	1520	445	96
<input type="checkbox"/>	<b>2000</b>	100	29.3	1999	586	95	27.8	1895	555	96
<input type="checkbox"/>	<b>2500</b>	125	36.6	2499	732	119	34.9	2374	696	96
<input type="checkbox"/>	<b>3000</b>	150	44.0	3000	879	141	41.3	2814	825	95
<input type="checkbox"/>	<b>3500</b>	175	51.3	3500	1025	164	48.1	3276	960	96
<input type="checkbox"/>	<b>4000</b>	200	58.6	4000	1172	190	55.7	3800	1113	96

	Model	Product Weight		Operating Weight		Shipping Weight		Water Content	
		lbs	kg	lbs	kg	lbs	kg	gal	l
	<b>1600</b>	1410	640	1582	718	1610	731	22	83
	<b>2000</b>	1410	640	1582	718	1610	731	22	83
	<b>2500</b>	1810	822	2064	937	2010	913	31	117
	<b>3000</b>	1810	822	2064	937	2010	913	31	117
	<b>3500</b>	2325	1056	2789	1266	2525	1146	56	212
	<b>4000</b>	2325	1056	2789	1266	2525	1146	56	212

## Clearances

	Clearance to Combustibles		Suggested Service Clearance	
	inches	cm	inches	cm
Front	18	46	24	61
Back	11	28	24	61
Left	4	10	8	20
Right	4	10	8	20
Top	1	2.5		

### Suggested Top Service Clearance by Model

1600/2000		2500/3000		3500/4000	
inches	cm	inches	cm	inches	cm
12	30	15	38	24	61

## Electrical Data

Size	1600			2000																					
	Voltage	FLA	MCA	MOP	Voltage	FLA	MCA	MOP	Voltage	FLA	MCA	MOP													
	120	6.2	7.8	20	240/220	3.4	4.2	15	208 1Φ	18.6	10.1	12.5	25	208 3Φ	7.5	9.4	15	480	3.5	4.4	15	600	4.4	5.5	15

Size	2500/3000			3500/4000																				
	Voltage	FLA	MCA	MOP	Voltage	FLA	MCA	MOP																
	208 3Φ	9.5	12	20	480 3Φ	4.4	6	15	600 3Φ	3	4	15	208 3Φ	9.9	12	20	480	3.6	5	15	600	4.5	6	15

Full Load Amperage  
Minimum Circuit Ampacity  
Max Over-current Protection

## Vent System

Model	Vent / Air Connector Size		Air Pipe Size		Maximum Ducted Air Pipe Length		Category IV Vent Pipe Size		Maximum Category IV Vent Pipe Length		Typical Category II Vent Pipe Size***	
	inches	cm	inches	cm	ft**	m	inches	cm	ft**	m	inches	cm
1600	6	15	6	15	100	30.5	6	15	50	15.2	14	36
							8*	20*	100	30.5	14	36
2000	8	20	8	20	100	30.5	8	20	100	30.5	14	36
2500	8	20	8	20	100	30.5	8	20	50	15.2	18	46
							10*	25*	100	30.5	18	46
3000	10	25	10	25	100	30.5	10	25	100	30.5	18	46
3500	10	25	10	25	100	30.5	10	25	50	15.2	22	56
							12*	30*	100	30.5	22	56
4000	12	30	12	30	100	30.5	12	30	100	30.5	22	56

\*A vent increaser at the boiler outlet is required

\*\*Equivalent Feet: To calculate maximum equivalent length, measure the linear feet of the pipe and add 5 feet (1.5m) for each elbow used.

\*\*\*Category II: Category II pipe size may vary. Draft must remain between -0.01 and -0.001" w.c..

Notes:

- Installations in the U.S. require exhaust vent pipe that is CPVC complying with ANSI/ASTM D1785 F441, stainless steel complying with UL1735, or polypropylene complying with ULC S636.
- Installations in Canada require exhaust vent pipe that is certified to ULC S636.
- Intake (air) pipe must be PVC or CPVC that complies with ANSI/ASTM D1785 F441, ABS that complies with ANSI/ASTM D1527, stainless steel, or galvanized material.

## Flow and Headloss

Model	Flow Rate GPM	Temp Rise °F	Water Hardness 1-10 grains per gallon			
			Headloss*	Flow Rate	Temp Rise	Headloss*
			Ft	LPM	°C	m
1600	152	20	31.0	525	11.1	10.1
2000	152	25	33.0	575	14	10.1
2500	190	25	33.7	719	13.9	10.0
3000	190	30	36.0	719	17	11.0
3500	222	30	30.6	839	17	9.0
4000	224	34	30.0	848	19	9.1

Allowable pH: 6.5 to 9.5

\*Headloss is for the heater only (no piping)

Model	Flow Rate GPM	Temp Rise °F	Water Hardness 11-15 grains per gallon			
			Headloss*	Flow Rate	Temp Rise	Headloss*
			Ft	LPM	°C	m
1600	177	17	41.0	670	9.4	12.5
2000	177	21	43.9	670	12	13.4
2500	220	21	46.0	833	11.7	14
3000	220	26	46.0	833	14	14
3500	266	25	40.6	1007	14	12
4000	266	29	41.2	1007	16	12.6

Allowable pH: 6.5 to 9.5

\*Headloss is for the heater only (no piping)

## Recovery Data

Model	Temperature Rise						
	40°F	50°F	60°F	70°F	80°F	90°F	100°F
	GPH	GPH	GPH	GPH	GPH	GPH	GPH
1600	4562	3649	3041	2607	2281	2027	1825
2000	5702	4562	3802	3258	2851	2534	2281
2500	7128	5702	4752	4073	3564	3168	2851
3000	8553	6843	5702	4888	4277	3802	3421
3500	9979	7983	6653	5702	4989	4435	3992
4000	11405	9124	7603	6517	5702	5069	4562

Model	Temperature Rise						
	22°C	28°C	33°C	39°C	44°C	50°C	56°C
	LPH	LPH	LPH	LPH	LPH	LPH	LPH
1600	17268	13815	11512	9868	8634	7675	6907
2000	21585	17268	14390	12335	10793	9594	8634
2500	26982	21585	17988	15418	13491	11992	10793
3000	32378	25902	21585	18502	16189	14390	12951
3500	37775	30219	25184	21584	18885	16788	15111
4000	43171	34537	28781	24669	21585	19187	17268

## Dimensional Data

Model	A	B	C	D	E	G	H	J
1600	29.3 (75)	79.8 (203)	38.0 (96)	57.5 (147)	49.8 (126)	60.8 (154)	2.6 (7)	8.4 (21)
2000	29.3 (75)	79.8 (203)	38.0 (96)	57.5 (147)	49.8 (126)	60.8 (154)	2.6 (7)	8.4 (21)
2500	30.8 (78)	87.0 (221)	41.5 (105)	60.5 (154)	60.8 (154)	71.0 (180)	4.0 (10)	9.8 (25)
3000	30.8 (78)	87.0 (221)	41.5 (105)	60.5 (154)	60.8 (154)	71.0 (180)	4.0 (10)	9.8 (25)
3500	34.5 (88)	97.5 (248)	52.0 (133)	70.0 (178)	60.8 (154)	81.3 (207)	7.0 (18)	8.3 (21)
4000	34.5 (88)	97.5 (248)	52.0 (133)	70.0 (178)	60.8 (154)	81.3 (207)	7.0 (18)	8.3 (21)

inches (cm)

Model	K	N	P	Q	R	S	T	U
1600	67.4 (171)	30.4 (77)	16.0 (41)	23.0 (58)	10.2 (26)	14.0 (36)	13.0 (33)	6.3 (16)
2000	67.4 (171)	30.4 (77)	16.0 (41)	23.0 (58)	10.2 (26)	14.0 (36)	13.0 (33)	6.3 (16)
2500	76.4 (194)	34.5 (88)	17.7 (45)	27.2 (69)	11.8 (30)	18.3 (46)	14.8 (38)	6.0 (15)
3000	76.8 (195)	34.5 (88)	17.7 (45)	27.2 (69)	11.8 (30)	18.3 (46)	14.8 (38)	6.0 (15)
3500	86.4 (219)	40.0 (102)	21.6 (55)	30.7 (78)	13.0 (33)	16.0 (41)	17.4 (44)	6.7 (17)
4000	86.4 (219)	40.0 (102)	21.6 (55)	30.7 (78)	13.0 (33)	16.0 (41)	17.4 (44)	6.7 (17)

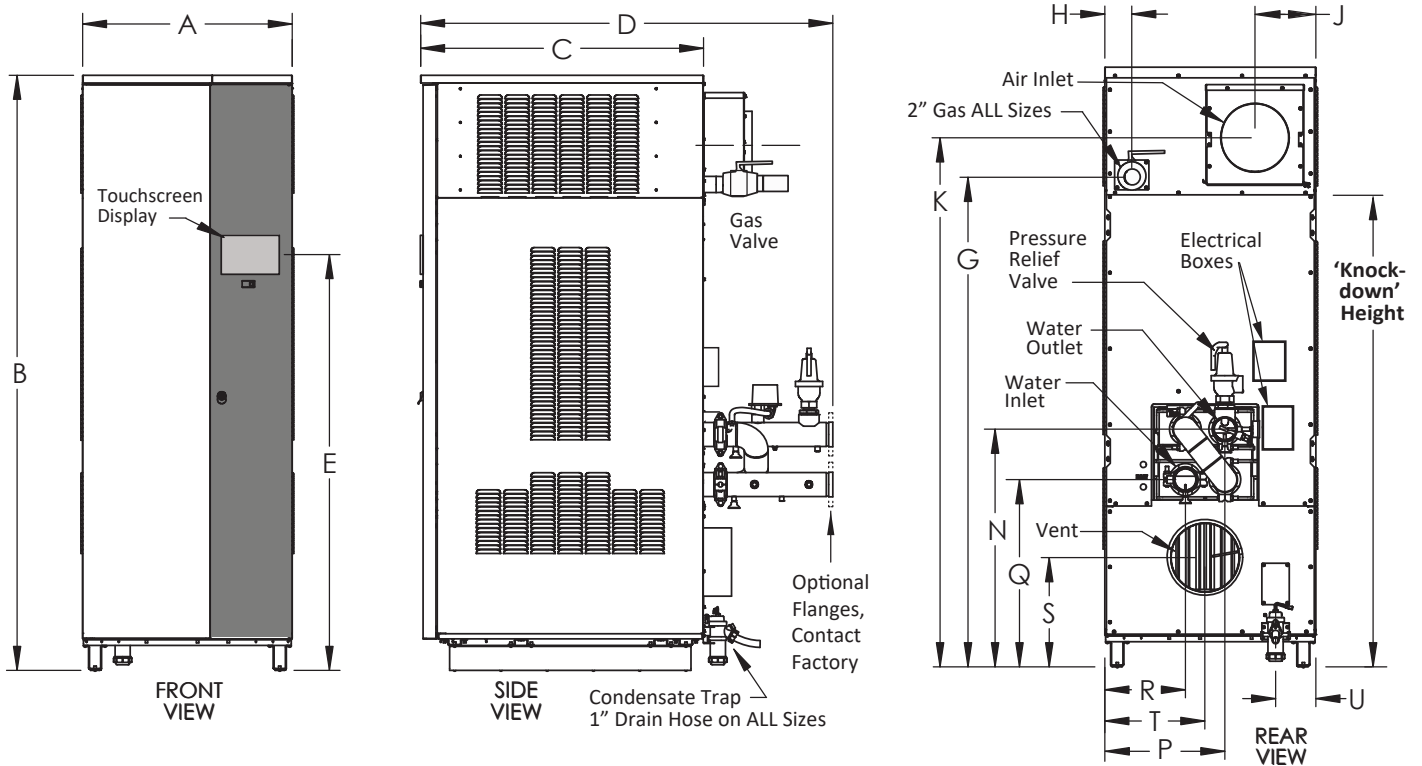
inches (cm)

Model	*Vent Collar Diameter	*Air Inlet Collar Diameter	'Knockdown' Height	Water Connection
1600	6 (15)	6 (15)	60.8 (154)	3" groove lock (opt. flange)
2000	8 (20)	8 (20)	60.8 (154)	3" groove lock (opt. flange)
2500	8 (20)	8 (20)	70.1 (180)	3" groove lock (opt. flange)
3000	10 (25)	10 (25)	70.1 (180)	3" groove lock (opt. flange)
3500	10 (25)	10 (25)	80.8 (205)	4" groove lock (opt. flange)
4000	12 (30)	12 (30)	80.8 (205)	4" groove lock (opt. flange)

\* Collar dimension only.  
Refer to section 1.G for vent and air pipe sizes.

inches (cm)

## Brute MagnaTech® HTD



Bradford White Corporation reserves the right to change specifications, components, features, or to discontinue products without notice.



200 Lafayette St.  
Middleville, MI 49333  
Warranty: (800) 531-2111

[www.BradfordWhite.com](http://www.BradfordWhite.com)

Litho in U.S.A. © Bradford White 1909 Document 2165-BW