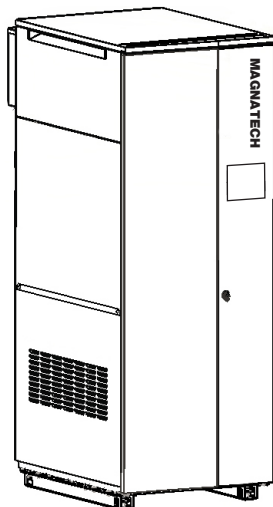


Brute MagnaTech®



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 IV vent
- Indoor / Outdoor
- Low NOx system exceeds the most stringent regulations for air quality - 9ppm NOx
- High condensing efficiency
- Modulation down to 20% of full fire (5:1 turndown)
- Sophisticated gas/air valve allows for constant control of modulation
- 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 (total) 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
☐ Propane

Voltage

- ☐ 120V, single ph (1600-2000) ☐ 208V, three ph (2000-4000)
☐ 208V, single ph (1600-2000) ☐ 480V, three ph (2000-4000)
☐ 220/240V, single ph (1600-2000) ☐ 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

☐ Gateway for BACnet IP	☐ Screen for vertical stainless steel vent	☐ Screen/adapter for vertical or horizontal PCV ducted air
☐ Gateway for LonWorks	☐ Screen for horizontal CPVC vent	☐ Screen for horizontal galvanized or vertical ducted air
☐ Condensate neutralizer	☐ Screen for vertical CPVC vent	☐ Screen for horizontal polypropylene ducted air
☐ Condensate neutralizer with pump	☐ Screen for horizontal polypropylene vent	☐ Screen for vertical polypropylene ducted air
☐ Vent terminal for outdoor unit	☐ Screen for vertical polypropylene vent	
☐ Screen for outdoor unit air		
☐ 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	%
☐ 1600	320	93.8	1600	469	304	89.1	1520	445	96
☐ 2000	400	117.2	1999	586	379	111.0	1895	555	96
☐ 2500	500	146.5	2499	732	475	139.2	2374	696	96
☐ 3000	600	175.8	3000	879	563	165.0	2814	825	95
☐ 3500	700	205.1	3500	1025	655	191.9	3276	960	96
☐ 4000	800	234.4	4000	1172	760	222.7	3800	1113	96

Model	Product Weight		Operating Weight		Shipping Weight		Water Content	
	lbs	kg	lbs	kg	lbs	kg	gal	l
1600	1390	630	1562	709	1590	721	22	83
2000	1390	630	1562	709	1590	721	22	83
2500	1785	810	2039	925	1985	900	31	117
3000	1785	810	2039	925	1985	900	31	117
3500	2278	1033	2742	1244	2478	1124	56	212
4000	2278	1033	2742	1244	2478	1124	56	212

Clearances

	Clearance to Combustibles		Suggested Service Clearance		Suggested Top Service Clearance by Model					
	inches	cm	inches	cm	1600/2000		2500/3000		3500/4000	
Front	18	46	24	61	inches	cm	inches	cm	inches	cm
Back	11	28	24	61	12	30	15	38	24	61
Left	4	10	8	20						
Right	4	10	8	20						
Top	1	2.5								

Electrical Data

Size	1600			2000					
Voltage	120	240/220	208 1Φ	120	240/220	208 1Φ	208 3Φ	480	600
FLA	6.2	3.4	3.6	18.6	10.1	12.5	7.5	3.5	4.4
MCA	7.8	4.2	4.5	23.3	12.7	15.6	9.4	4.4	5.5
MOP	20	15	15	30	25	25	15	15	15

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

Full Load Amperage
Minimum Circuit Ampacity
Max Over-current Protection

Vent System

Model	Air Pipe Size		Maximum Ducted Air Pipe Length		Category IV Vent Pipe Size		Maximum Category IV Vent Pipe Length	
	inches	cm	ft*	m	inches	cm	ft*	m
1600	6	15	100	30.5	6	15	100	30.5
2000	8	20	100	30.5	8	20	100	30.5
2500	8	20	100	30.5	8	20	100	30.5
3000	10	25	100	30.5	10	25	100	30.5
3500	10	25	100	30.5	10	25	100	30.5
4000	12	30	100	30.5	12	30	100	30.5

*Equivalent Feet: 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 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.

Water Flow Requirements

Water Hardness 1-10 grains per gallon

Model	Flow Rate	Temp Rise	Headloss*	Flow Rate	Temp Rise	Headloss*
	GPM	°F	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)

Water Hardness 11-15 grains per gallon

Model	Flow Rate	Temp Rise	Headloss*	Flow Rate	Temp Rise	Headloss*
	GPM	°F	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

Temperature Rise

Model	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

Temperature Rise

Model	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

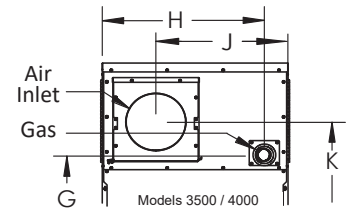
Model	A	B	C	D	E	G	H	J
1600	29.3 (75)	79.8 (203)	38.0 (96)	57.5 (147)	49.8 (126)	60.8 (154)	2.6 (7)	8.4 (21)
2000	29.3 (75)	79.8 (203)	38.0 (96)	57.5 (147)	49.8 (126)	60.8 (154)	2.6 (7)	8.4 (21)
2500	30.8 (78)	87.0 (221)	41.5 (105)	60.5 (154)	60.8 (154)	71.0 (180)	4.0 (10)	9.8 (25)
3000	30.8 (78)	87.0 (221)	41.5 (105)	60.5 (154)	60.8 (154)	71.0 (180)	4.0 (10)	9.8 (25)
3500	34.5 (88)	97.0 (246)	52.0 (133)	70.0 (178)	60.8 (154)	80.8 (205)	28.8 (73)	26.5 (67)
4000	34.5 (88)	97.0 (246)	52.0 (133)	70.0 (178)	60.8 (154)	80.8 (205)	28.8 (73)	26.5 (67)

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	85.6 (217)	40.0 (102)	21.6 (55)	30.7 (78)	13.0 (33)	16.0 (41)	17.4 (44)	6.7 (17)
4000	85.6 (217)	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	Gas Connection	Condensate Line
1600	6 (15)	6 (15)	60.8 (154)	3" groove lock (opt. flange)	2" NPT	1"
2000	8 (20)	8 (20)	60.8 (154)	3" groove lock (opt. flange)	2" NPT	1"
2500	8 (20)	8 (20)	71.0 (180)	3" groove lock (opt. flange)	2" NPT	1"
3000	10 (25)	10 (25)	71.0 (180)	3" groove lock (opt. flange)	2" NPT	1"
3500	10 (25)	10 (25)	80.8 (205)	4" groove lock (opt. flange)	2" NPT	1"
4000	12 (30)	12 (30)	80.8 (205)	4" groove lock (opt. flange)	2" NPT	1"



Models 3500 and 4000 differ from the other sizes in the location of their Air Inlet and Gas Supply.

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