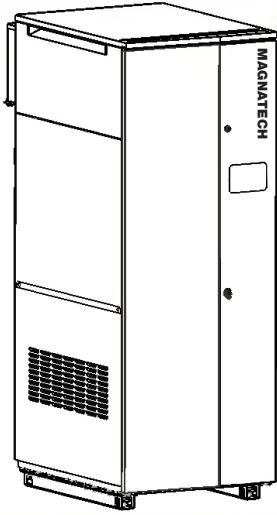


# MagnaTech

# 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

- High condensing efficiency
- Modulation down to 20% of full fire (5:1 turndown)
- Pre-mix stainless steel burner
- Low NOx system exceeds the most stringent regulations for air quality – 9ppm NOx
- Gas Pressures. 4" to 10.5" NG and 8" to 14" LP.
- 'Knock-Down' feature: Removable top section for easy handling / installation
- Sealed combustion chamber
- Equipped with an engineered gas/air chamber that ensures proper mixing for stable combustion at all firing rates
- Horizontal or vertical direct vent
- Vent and air pipe lengths of up to 100 equivalent feet (each)
- Air filter
- Stainless steel heat exchanger with welded construction (no gaskets)
- ASME "HLW" stamp
- 160 psi maximum working pressure
- 125 psi (861 kPa) ASME rated pressure relief valve
- Groove lock fittings on all units (optional flange adaptor)
- Built-in condensate trap
- Electronic PID modulating control with large touchscreen and color display
- Meets NSF/ANSI-372 Low Lead Content Certification
- Controller cascades with up to eight MagnaTechs (total) to lead/lag the units together.
- Accepts external modulation control 4-20mA (0-10V with optional converter)
- Accepts external temperature set point signal 4-20mA (0-10V with optional converter)
- Sensor for domestic water tank
- Domestic water pump time delay
- Low water cutoff
- Manual reset high limit
- Auto reset high limit
- High gas pressure switch
- Normally open alarm contact
- Vent temperature cutoff
- Water flow switch
- Temperature & pressure gauge
- Burner sight glass
- 10-Year limited warranty

## Heater Data

Number of Units:

Fuel

- Natural  
 Propane

## Factory Mounted Options

- CSD-1
- Alarm bell for ignition failure
- Low gas pressure switch
- Groove lock to flange connection
- LON gateway
- BACnet gateway
- 120V single phase (1600 & 2000 only)
- 240/220V single phase (1600 & 2000 only)
- 208V single phase (1600 & 2000 only)
- 208V three phase (2000 - 4000 only)
- 480V three phase (2000 - 4000 only)
- 600V three phase (2000 - 4000 only)
- 30 psi pressure relief valve
- 50 psi pressure relief valve
- 60 psi pressure relief valve
- 75 psi pressure relief valve
- 125 psi pressure relief valve (std)
- 150 psi pressure relief valve



## Accessories for Field Mounting

- Gateway for BACnet (MS/TP,IP) or Metasys
- Gateway for Lonworks
- Envirocom outdoor sensor
- Condensate neutralizer
- Condensate neutralizer with pump
- Horizontal vent terminal for stainless steel
- Screen for horizontal CPVC vent
- Screen for vertical stainless steel vent
- Screen for vertical CPVC vent
- Screen for horizontal galvanized ducted air
- Screen for horizontal PVC ducted air
- Screen for horizontal polypropylene ducted air
- Screen for vertical galvanized ducted air
- Screen for vertical PVC ducted air
- Screen for vertical polypropylene ducted air
- Vent terminal for outdoor unit
- Screen for outdoor unit air connection
- 0-10V converter for modulation control or temperature setpoint

## Sizing Data

Model	Water Heater			Product Weight		Operating Weight		Shipping Weight		Water Content	Vent Diameter	Vent Length
	Input Rate	Thermal Efficiency										
	MBH	kW	%	lbs	kg	lbs	kg	lbs	kg	Gallons	in (cm)	ft (m)
1600	1600	469	96	1390	630	1562	709	1590	721	22	6 (15)	100 (30.5)
2000	1999.9	585	96	1390	630	1562	709	1590	721	22	8 (20)	100 (30.5)
2500	2499.9	732	96	1785	810	2039	925	1985	900	31	8 (20)	100 (30.5)
3000	3000	878	95	1785	810	2039	925	1985	900	31	10 (25)	100 (30.5)
3500	3500	1025	96	2278	1033	2742	1244	2478	1124	56	10 (25)	100 (30.5)
4000	4000	1171	96	2278	1033	2742	1244	2478	1124	56	12 (30)	100 (30.5)

## Clearances

### Clearance to Combustibles

Model	Front		Back		Left		Right		Top	
	Inches	cm	Inches	cm	Inches	cm	Inches	cm	Inches	cm
1600	18	46	11	28	4	10	4	10	1	2.5
2000	18	46	11	28	4	10	4	10	1	2.5
2500	18	46	11	28	4	10	4	10	1	2.5
3000	18	46	11	28	4	10	4	10	1	2.5
3500	18	46	11	28	4	10	4	10	1	2.5
4000	18	46	11	28	4	10	4	10	1	2.5

### Suggested Service Clearances

Model	Front		Back		Left		Right		Top	
	Inches	cm	Inches	cm	Inches	cm	Inches	cm	Inches	cm
1600	24	61	24	61	8	20	8	20	12	30
2000	24	61	24	61	8	20	8	20	12	30
2500	24	61	24	61	8	20	8	20	15	38
3000	24	61	24	61	8	20	8	20	15	38
3500	24	61	24	61	8	20	8	20	24	61
4000	24	61	24	61	8	20	8	20	24	61

## 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	Vent Diameter		Maximum Vent Length		Maximum Air Length	
	Inches	cm	Ft*	m	Ft*	m
1600	6	15	100	30.5	100	30.5
2000	8	20	100	30.5	100	30.5
2500	8	20	100	30.5	100	30.5
3000	10	25	100	30.5	100	30.5
3500	10	25	100	30.5	100	30.5
4000	12	30	100	30.5	100	30.5

Installations in the U.S. require exhaust vent pipe that is CPVC complying with ANSI/ASTM D1785 F441 or stainless steel complying with UL 1738. Installations in Canada require exhaust vent pipe that is certified to ULC S636. Intake (air) pipe may be ABS, PVC, CPVC or galvanized material.

Closet and alcove installations do not allow the use of PVC under any circumstances.  
\*Equivalent Feet: To calculate max equivalent length, measure the linear feet of the pipe, and add 5 feet (1.5m) for each elbow used.

## Water Flow Requirements

Model	Flow Rate	Temp Rise	Water Hardness			
			1-10 grains per gallon			
			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)

Model	Flow Rate	Temp Rise	Water Hardness			
			11-15 grains per gallon			
			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

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

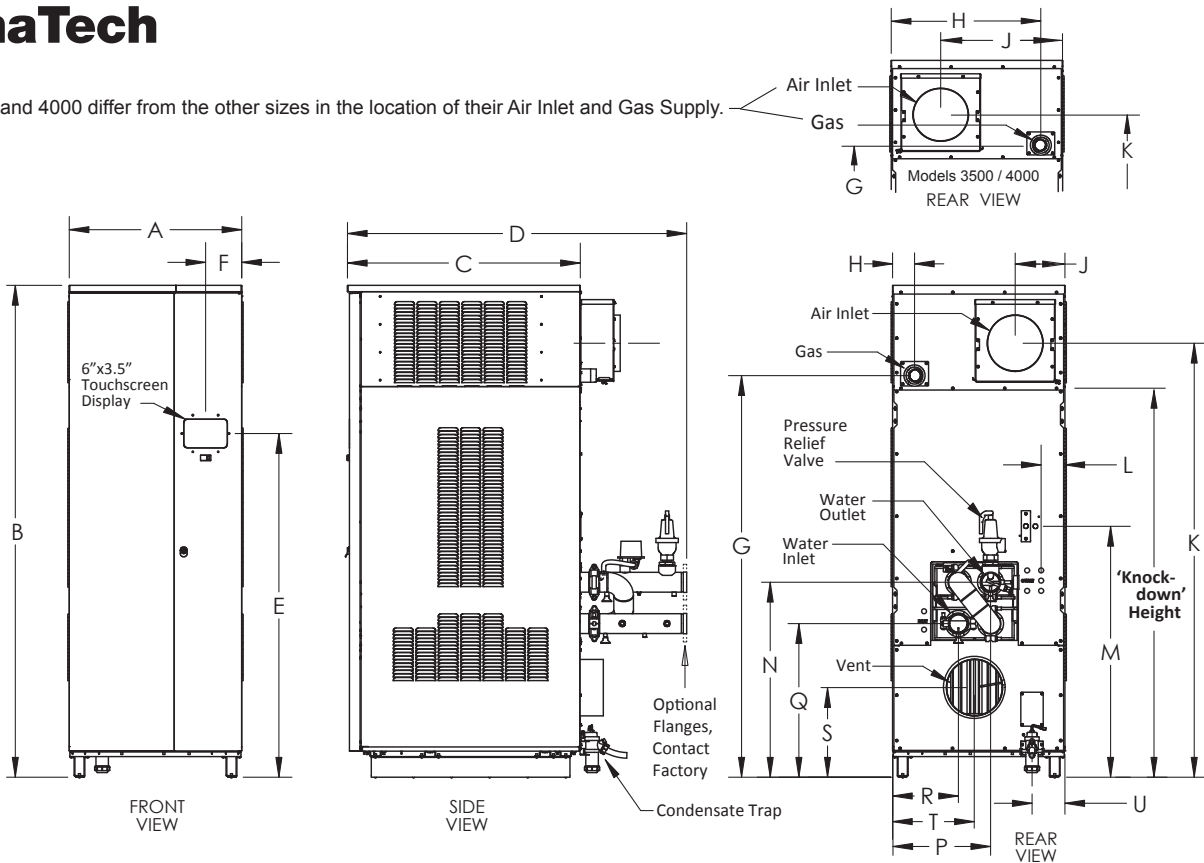
Model	A	B	C	D	E	F	G	H
Inches (cm)								
1600	29.3 (75)	79.8 (203)	38 (96)	57.5 (147)	49.8 (126)	4.8 (12)	60.8 (154)	2.6 (7)
2000	29.3 (75)	79.8 (203)	38 (96)	57.5 (147)	49.8 (126)	4.8 (12)	60.8 (154)	2.6 (7)
2500	30.8 (78)	87 (221)	41.5 (105)	60.5 (154)	60.8 (154)	6.5 (16)	71 (180)	4 (10)
3000	30.8 (78)	87 (221)	41.5 (105)	60.5 (154)	60.8 (154)	6.5 (16)	71 (180)	4 (10)
3500	34.5 (88)	97 (246)	52 (133)	70 (178)	60.8 (154)	6.4 (16)	80.8 (205)	28.8 (73)
4000	34.5 (88)	97 (246)	52 (133)	70 (178)	60.8 (154)	6.4 (16)	80.8 (205)	28.8 (73)

Model	J	K	L	M	N	P	Q	R
Inches (cm)								
1600	8.4 (21)	68.4 (171)	4 (10)	39.2 (100)	30.4 (77)	16 (41)	23 (58)	10.2 (26)
2000	8.4 (21)	67.4 (171)	4 (10)	39.2 (100)	30.4 (77)	16 (41)	23 (58)	10.2 (26)
2500	9.8 (25)	76.4 (194)	4.3 (11)	44.4 (113)	34.5 (88)	17.7 (45)	27.2 (69)	11.8 (30)
3000	9.8 (25)	76.8 (195)	4.3 (11)	44.4 (113)	34.5 (88)	17.7 (45)	27.2 (69)	11.8 (30)
3500	26.5 (67)	85.6 (217)	6.5 (16)	51.3 (130)	40 (102)	21.6 (55)	30.7 (78)	13 (33)
4000	26.5 (67)	85.6 (217)	6.5 (16)	51.3 (130)	40 (102)	21.6 (55)	30.7 (78)	13 (33)

Model	S	T	U	Vent Ø	Air Inlet Ø	'Knock-down' Height	Water Connection	Gas Connection	Condensate Line
Inches (cm)									
1600	14 (36)	13 (33)	6.3 (16)	6 (15)	6 (15)	60.8 (154)	3" Groove Lock (or flange)	2" NPT	1"
2000	14 (36)	13 (33)	6.3 (16)	8 (20)	8 (20)	60.8 (154)	3" Groove Lock (or flange)	2" NPT	1"
2500	18.3 (46)	14.8 (38)	6 (15)	8 (20)	8 (20)	71.0 (180)	3" Groove Lock (or flange)	2" NPT	1"
3000	18.3 (46)	14.8 (38)	6 (15)	10 (25)	10 (25)	71.0 (180)	3" Groove Lock (or flange)	2" NPT	1"
3500	16 (41)	17.4 (44)	6.7 (17)	10 (25)	10 (25)	80.8 (205)	4" Groove Lock (or flange)	2" NPT	1"
4000	16 (41)	17.4 (44)	6.7 (17)	12 (30)	12 (30)	80.8 (205)	4" Groove Lock (or flange)	2" NPT	1"

# MagnaTech

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



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

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

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