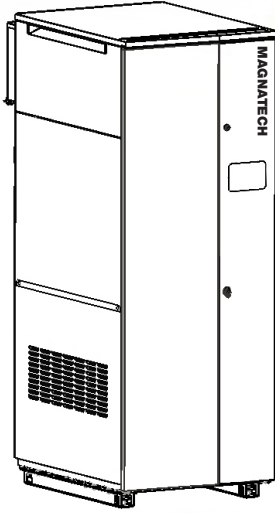


# MagnaTech

# Hydronic Boiler



BMGH | Hydronic Boiler

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)
- Stainless steel heat exchanger with welded construction (no gaskets)
- Air filter
- ASME "H" stamp
- 160 psi maximum working pressure
- 75 psi (517 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
- Variable speed boiler pump control with fixed Delta T control for variable flow through boiler
- Controller cascades with up to eight MagnaTech units 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)
- Multiple pump control for boiler pump, system pump, and indirect domestic water pump, each with delay
- Indirect water heater priority
- Sensor for indirect domestic water tank
- Outdoor reset
- Outdoor air temperature sensor
- 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

## Boiler Data

Number of Units:

Fuel

- Natural  
 Propane

## Factory Mounted Options

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



## Accessories for Field Mounting

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

## Sizing Data

Model	Input Rate		Output Rate		Boiler Thermal Efficiency	Boiler Combustion Efficiency
	MBH	kW	MBH	kW	%	%
1600	1600	469	1520	445	95.0	96.0
2000	1999	586	1895	555	95.0	93.6
2500	2499	733	2374	695	95.0	93.8
3000	3000	878	2814	824	95.0	93.8
3500	3500	1025	3276	959	95.0	93.6
4000	4000	1171	3724	1090	95.0	93.1

Model	Product Weight		Operating Weight		Shipping Weight		Water Content	Vent Diameter	Vent Length
	lbs	kg	lbs	kg	lbs	kg	Gallons	in (cm)	ft (m)
1600	1390	630	1562	709	1590	721	22	6 (15)	100 (30.5)
2000	1390	630	1562	709	1590	721	22	8 (20)	100 (30.5)
2500	1785	810	2039	925	1985	900	31	8 (20)	100 (30.5)
3000	1785	810	2039	925	1985	900	31	10 (25)	100 (30.5)
3500	2278	1033	2742	1244	2478	1124	56	10 (25)	100 (30.5)
4000	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

Model	1600			2000					
	120	240/220	208 1Φ	120	240/220	208 3Φ	208 1Φ	480 3Φ	600 3Φ
Voltage	120	240/220	208 1Φ	120	240/220	208 3Φ	208 1Φ	480 3Φ	600 3Φ
FLA	8.1	3.6/3.9	3.6	24.5	9.7/11.4	7.5	12.5	3.5	2.8
Max. Overcurrent Protection	15	5	5	35	15	10	20	5	5

Model	2500/3000			3500/4000		
	208 3Φ	480 3Φ	600 3Φ	208 3Φ	480 3Φ	600 3Φ
Voltage	208 3Φ	480 3Φ	600 3Φ	208 3Φ	480 3Φ	600 3Φ
FLA	12.5	5	3	11.3	4.8	4.4
Max. Overcurrent Protection	20	10	5	15	10	10

## Vent System

Model	Vent Diameter		Maximum Vent Length		Maximum Air Length	
	Inches	cm	Ft*	m	Ft*	m
	1600	6	15	100	30.5	100
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	Temperature Rise in °F							
	25°F		30°F		35°F		40°F	
	Flow GPM	Head Loss* Feet	Flow GPM	Head Loss* Feet	Flow GPM	Head Loss* Feet	Flow GPM	Head Loss* Feet
1600	122	19.4	100	14.0	87	10	76	8
2000	150	30	128	23.5	109	17.1	95	13.6
2500	190	34	158	23.6	136	17.6	119	13.6
3000	226	47	190	34.2	164	25.8	142	18.9
3500	266	41	222	30.6	190	23.6	166	18.6
4000	300	48	255	38.2	218	28.5	190	22.5

Model	Temperature Rise in °C							
	14°C		17°C		19°C		22°C	
	Flow LPM	Head Loss* m	Flow LPM	Head Loss* m	Flow LPM	Head Loss* m	Flow LPM	Head Loss* m
1600	462	5.9	379	4.3	329	3	288	2.5
2000	568	9.2	485	7.2	413	5.2	360	4.2
2500	719	10.0	599	7.0	514	5.0	449	4.1
3000	856	14.3	719	10.4	621	7.9	538	5.8
3500	1007	12.0	839	9.0	719	7.0	629	6.0
4000	1136	14.6	965	11.6	825	8.7	719	6.9

\* Headloss is for boiler only (no piping)

# Dimensional Data

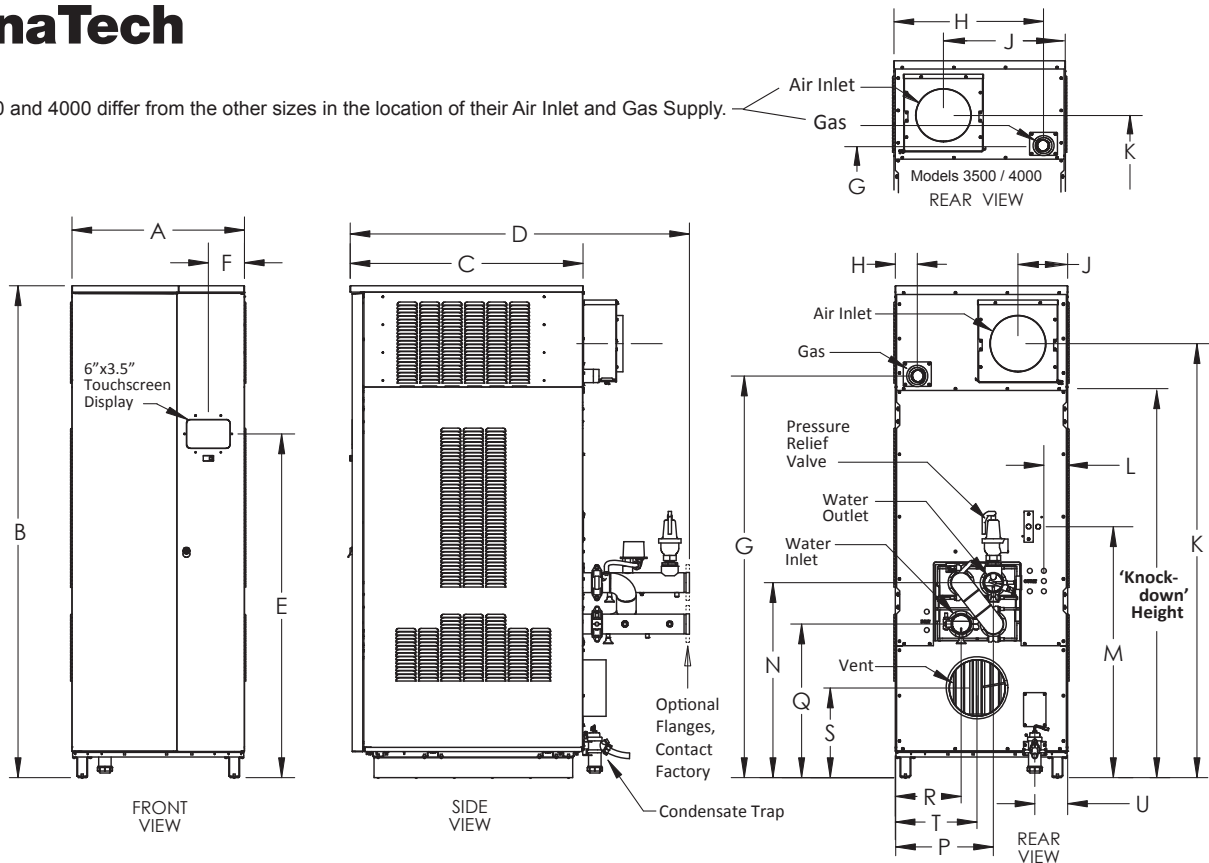
Model	A	B	C	D	E	F	G	H
Inches (cm)								
1600	29.3 (75)	79.8 (203)	38 (96)	57.5 (147)	49.8 (126)	4.8 (12)	60.8 (154)	2.6 (7)
2000	29.3 (75)	79.8 (203)	38 (96)	57.5 (147)	49.8 (126)	4.8 (12)	60.8 (154)	2.6 (7)
2500	30.8 (78)	87 (221)	41.5 (105)	60.5 (154)	60.8 (154)	6.5 (16)	71 (180)	4 (10)
3000	30.8 (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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