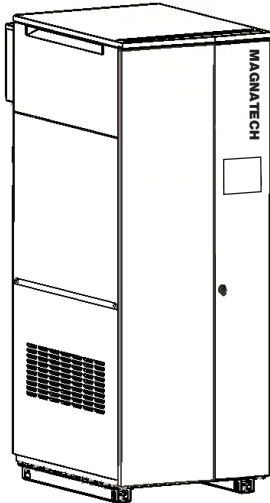


Brute MagnaTech®



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

- ASME "H" stamp
- 160 psi maximum working pressure
- 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
- Variable speed boiler pump control with fixed Delta T control for variable flow through boiler
- 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
- Multiple pump control for boiler pump, system pump, and indirect domestic water pump, each with delay
- Indirect water heater priority
- Sensor for indirect DHW tank
- Outdoor reset with air sensor
- 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
- 75 psi (517kPa) ASME rated pressure relief valve
- Groove lock fittings (optional flange adapter)
- Burner site glass
- 10-Year limited warranty

Boiler Data

Number of Units

Fuel

- ☐ Natural
☐ Propane

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
☐ BACnet IP gateway
☐ LonWorks gateway
☐ Additional auto & manual reset high limit switches
☐ Alarm bell with silence switch
☐ Groove lock to flange connections
☐ 75 psi pressure relief valve (std)
☐ 30 psi pressure relief valve
☐ 50 psi pressure relief valve
☐ 60 psi pressure relief valve
☐ 125 psi pressure relief valve
☐ 150 psi pressure relief valve



Accessories for Field Mounting

☐ Gateway for BACnet IP	☐ Screen for vertical stainless steel vent	☐ Screen/adaptor 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	Combustion Efficiency
	MBH	kw	MBH	kw	MBH	kw	MBH	kw	%	%
☐ 1600	320	93.8	1600	469	304	89.1	1520	445	95	96.0
☐ 2000	400	117.2	1999	586	379	111.0	1895	555	95	93.6
☐ 2500	500	146.5	2499	732	475	139.2	2374	696	95	93.8
☐ 3000	600	175.8	3000	879	563	165.0	2814	825	95	93.8
☐ 3500	700	205.1	3500	1025	655	191.9	3276	960	95	93.6
☐ 4000	800	234.4	4000	1172	760	222.7	3800	1113	95	93.1

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:

1. 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.
2. Installations in Canada require exhaust vent pipe that is certified to ULC S636.
3. 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

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

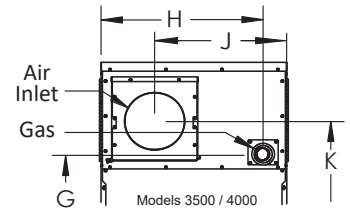
Model	A	B	C	D	E	G	H	J
1600	29.3 (75)	79.8 (203)	38.0 (96)	57.5 (147)	49.8 (126)	60.8 (154)	2.6 (7)	8.4 (21)
2000	29.3 (75)	79.8 (203)	38.0 (96)	57.5 (147)	49.8 (126)	60.8 (154)	2.6 (7)	8.4 (21)
2500	30.8 (78)	87.0 (221)	41.5 (105)	60.5 (154)	60.8 (154)	71.0 (180)	4.0 (10)	9.8 (25)
3000	30.8 (78)	87.0 (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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