

Brute Magnum Volume Water Heaters

Indoor 1,200,000 - 2,400,000 BTU/Hr.
Up to 98% Efficiency



12-Year Limited Heat Exchanger Warranty / 1-Year Limited Warranty on Component Parts.

For more information on warranty, please visit www.bradfordwhite.com

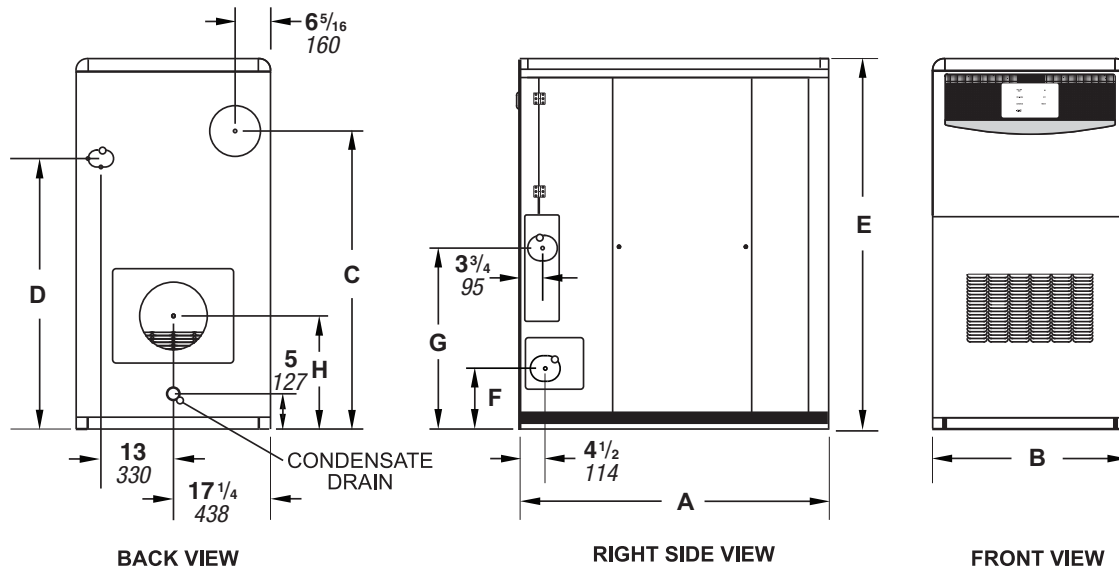
For products installed in USA, Canada and Puerto Rico. Some states do not allow limitations on warranties.

See complete copy of the warranty included with the heater.

MANUFACTURED UNDER ONE OR MORE OF THE FOLLOWING U.S. PATENTS: 5,954,492; 5,761,379; 5,943,984; 5,081,696; 5,988,117; 6,142,216; 5,199,385; 5,574,822; 5,372,185; 5,485,879; 5,277,171; (B1)5,341,770; 5,660,165; 5,596,952; 5,682,666; 4,904,428; 5,023,031; 5,000,893; 4,669,448; 4,829,983; 4,808,356; 5,115,767; 5,092,519; 5,052,346; 4,416,222; 4,628,184; 4,861,968; 4,672,919; Re. 34,534; 7,270,087 B2. OTHER U.S. AND FOREIGN PATENT APPLICATIONS PENDING. CURRENT CANADIAN PATENTS: 1,272,914; 1,280,043; 1,289,832; 2,045,862; 2,112,515; 2,108,186; 2,107,012; 2,092,105; 2,409,271.

Brute Magnum Volume Water Specifications

Dimensions shown in **inches mm**

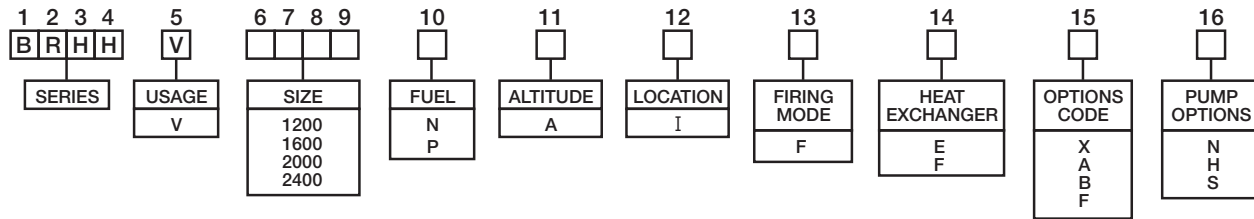


Dimensions

Model Number	A Depth	B Width	C	D	E	F	G	H	Vent Conn.	Air Inlet Conn.	Water Conn.	Gas Conn. Control Packages		
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	Std., A, F Nat./LP NPT in.	B Nat. NPT in.	B LP NPT in.
BRHHV1200	55	34½	53	48	65¾	8	34¼	18¼	6	6	2½	1	1½	1½
BRHHV1600	55	34½	53	48	65¾	8	34¼	18¼	6	8	2½	1½	2	2
BRHHV2000	55	34½	53	48	65¾	8	34¼	18¼	7	8	3	1½	2	2
BRHHV2400	55	34½	53	48	65¾	8	32	18¼	10	8	3	1½	2	2

Model Number	A Depth	B Width	C Floor to Air Inlet	D	E	F	G	H Floor to Flue Conn.	Vent Conn.	Air Inlet Conn.	Water Conn.	Gas Conn. Control Packages		
	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	Std., A, F Nat./LP NPT mm.	B Nat. NPT mm.	B LP NPT mm.
BRHHV1200	1397	876	1346	1219	1670	203	870	464	152	152	64	25	38	38
BRHHV1600	1397	876	1346	1219	1670	203	870	464	152	203	64	38	51	51
BRHHV2000	1397	876	1346	1219	1670	203	870	464	178	203	72	38	51	51
BRHHV2400	1397	876	1346	1219	1679	203	813	464	254	203	72	38	51	51

Brute Magnum Volume Water Specifications



Model Character Designation

(1-4) Model Series Designation

BRHH = Brute Magnum

(5) Usage

V = Volume Water

(6-9) Size

1200 = 1,200,000 BTU/Hr. input
1600 = 1,600,000 BTU/Hr. input
2000 = 2,000,000 BTU/Hr. input
2400 = 2,400,000 BTU/Hr. input

(10) Fuel

N = Natural Gas
P = Propane

(11) Altitude

A = 0-10,000 ft.

(12) Location

I = Indoor

(13) Firing Mode

F = Modulating

(14) Heat Exchanger

E = Glass Lined Steel with Copper Tubes
F = Glass Lined Steel with Cupronickel Tubes

(15) Options

X = Standard, meets CSD-1, CA, FM,
A = Control Pack A: CSD-1, CA, FM, Alarm Bell (Instead of dry contacts)
B = Control Pack B: CSD-1, CA, FM, Alarm Bell (Instead of dry contacts, normally open vent valve, mounted safety w/proof of closure and solenoid safety valve)
F = Non CSD-1

(16) Pump Options

N = Pump Mounted (Normal Water Conditions)
H = Pump Mounted (Hard Water Conditions, N/A for 2400)
S = Pump Mounted (Soft Water Conditions)

Sizing Data

Model Number	Input		Output		Input		Output		Approx. Shipping Weight lbs.	Approx. Shipping Weight kg.
	Hi-Fire BTU/Hr.	Hi-Fire kW	Hi-Fire BTU/Hr.	Hi-Fire kW	Lo-Fire BTU/Hr.	Lo-Fire kW	Lo-Fire BTU/Hr.	Lo-Fire kW		
BRHHV1200	1,200,000	352	1,068,000	313	300,000	88	267,000	78	1420	644
BRHHV1600	1,600,000	469	1,424,000	417	400,000	117	356,000	104	1465	665
BRHHV2000	2,000,000	586	1,780,000	521	499,750	146	444,775	130	1495	678
BRHHV2400	2,400,000	703	2,140,000	627	600,000	176	535,000	157	1550	703

NOTES:

Output shown is based on certification test standards. The efficiency of this unit will increase with lower return water temperature and/or lower modulating point, which will alter the output of the Brute Magnum.

Electrical Data

Boiler / Heater			Pump		
Volts	Phase	Amps	Volts	Phase	Amps
120	Single	20	230	Single	20

Water Flow Data

Model Number	Hard Water		Normal Water		Soft Water	
	Flow GPM	Temp. Rise °F	Flow GPM	Temp. Rise °F	Flow GPM	Temp. Rise °F
BRHHV1200	108	20	86	25	72	30
BRHHV1600	169	17	137	21	93	31
BRHHV2000	189	19	157	23	103	35
BRHHV2400	216	20	173	25	144	30

Model Number	Hard Water		Normal Water		Soft Water	
	Flow LPM	Temp. Rise °C	Flow LPM	Temp. Rise °C	Flow LPM	Temp. Rise °C
BRHHV1200	409	11	327	14	273	17
BRHHV1600	641	9	519	12	352	17
BRHHV2000	717	11	593	13	389	19
BRHHV2400	818	11	654	14	545	17

Note: Soft water: 1 to 7.5 grains per gallon. Normal water: 7.6 to 17 grains per gallon. Hard water: More than 17 grains per gallon.

Important Note: water flow shown is calculated based on certification standards. The efficiency of this unit will increase with lower return water temperature and/or lower modulation point, which will lead to varying temperature rise.

Clearances

Appliance Surface	Required Clearance from Combustible Material		Suggested Service Access Clearance	
	in.	mm.	in.	mm.
Left Side	1	25	24	610
Right Side	1	25	24	610
Top	1	25	24	610
Back	1	25	36	914
Front	1	25	36	914
Vent	Per UL1738 venting system supplier's instructions			

Recovery Data

Model Number	GPH Recovery at Degree Rise								
	40°F	50°F	60°F	70°F	80°F	90°F	100°F	120°F	140°F
BRHHV1200	3241	2593	2161	1852	1621	1441	1297	1080	926
BRHHV1600	4322	3457	2881	2470	2161	1921	1729	1441	1235
BRHHV2000	5402	4322	3601	3087	2701	2401	2161	1801	1543
BRHHV2400	6483	5186	4322	3704	3241	2881	2593	2161	1852

Model Number	LPH Recovery at Degree Rise								
	22°C	28°C	33°C	39°C	44°C	50°C	56°C	67°C	78°C
BRHHV1200	12,252	9802	8168	7001	6126	5445	4901	4084	3501
BRHHV1600	16,336	13,069	10,891	9335	8168	7261	6534	5445	4667
BRHHV2000	20,420	16,336	13,613	11,669	10,210	9076	8168	6807	5834
BRHHV2400	24,504	19,603	16,336	14,002	12,252	10,891	9802	8168	7001

Important Note: recovery shown is calculated based on efficiencies from certification standards. The efficiency of this unit will increase with lower return water temperature and/or lower modulation point, which will lead to higher recovery.

Brute Magnum Volume Water Specifications

Standard Features

- 4 sizes, 1,200-2,400 MBH input
- Efficiencies of up to 98%
- Low NOx operation - less than 10ppm
- Finned copper tube 2-pass heat exchanger with ASME 160 psi rating
- Glass lined header & cover plate
- Secondary stainless steel condensing heat exchanger
- Stainless steel condensate collection systems
- 125 psi relief valve
- Full modulation firing capabilities down to 25% of input
- Variable speed, sealed combustion blower with spark-resistant motor & DC direct drive
- Proportional gas valve/regulator for seamless modulation
- High & low gas pressure switches
- Redundant safety gas valve, manual shut off valve
- Leak test valve
- Low fire start with time delay
- Washable combustion air filter
- May use ducted outside air, or room air for combustion
- Hot surface ignition
- Premix stainless steel burner with sealed combustion
- Cat. IV venting, horizontal or vertical terminations
- Low NOx – less than 10ppm
- Boiler circulating pump, factory mounted and wired inside cabinet
- Side-mounted supply and return water connections
- Temperature / pressure gauge
- Power on/off switch
- Diagnostic Indicator lights for: Power On, Call for Heat, Pre-Purge, Burner On, Ignition Failure
- Internal/External 0-10VDC control selector
- Dry alarm contacts
- CSD-1 complaint
- Adjustable, manual reset high limit
- Water flow switch
- Manual reset low water cutoff with test switch
- Air pressure switch
- Condensate Overflow Protection Switch

Factory Mounted Options

- Factory-installed LON card for communicating inlet / outlet / mixing system water temperatures, extra temperature (user-chosen), low mixing system temperature alarm, burner on/off status
- Control Pack A: adds 4" alarm bell (instead of dry contacts) and normally open vent valve to the standard unit.
- Control Pack B: adds 4" alarm bell (instead of dry contacts), normally open vent valve, motorized safety valve with proof of closure, and solenoid safety valve to the standard unit.
- Control Pack F: same as the standard unit, but with non-CSD-1 ignition control (three trials for ignition).

Accessories for Field Mounting

- Side-wall vent terminal for horizontal venting
- Side-wall combustion air terminal for horizontal ducted air
- Valve Heater Kit (req'd below 15°F (-9°C)- control packs B and E require 2)
- Neutralizer kit
- Condensate pump
- Neutralizer kit with condensate pump

Sample Specification

The water heater shall be a Bradford White Brute Magnum Model BRHHV____, modulating, sealed combustion, Category IV (condensing) water heater with a modulating input and output rate as shown on the schedule, with a recovery rate of ____gph (____L/hr) for a 100°F (56°C) water temperature rise. The water heater shall have a thermal efficiency of 89.2%. The water heater shall be design certified to comply with the current edition of the Harmonized ANSI Z21.10.3 / CSA 4.3 Standard for Gas-Fired Water Heaters. The water heater shall be designed and constructed in accordance with the ASME Water heater & Pressure Vessel Code, Section IV requirements for 160 psi (1103 kPa) working pressure.

The water heater shall be capable of normal operation and full input with supply gas pressure as low as 4" (107mm) w.c. Water heater shall automatically compensate for large fluctuations of gas supply pressure between 4" (107mm) w.c. and 13" (330mm) w.c.

The primary water tube heat exchanger shall be a vertical round design, with 7/8" (22mm) inner diameter integral finned copper tubes. The tubes shall be rolled directly into lined ASME headers rated for 160 psi (1103 kPa) working pressure. The secondary condensing heat exchanger shall be a stacked horizontal design with 7/8" (22mm) inner diameter finned stainless steel tubes. The tubes shall be welded into stainless steel ASME headers rated for 160 psi (1103 kPa) working pressure. All waterways shall be non-ferrous. The heat exchangers shall be a low water volume design. All gaskets shall be non-metallic, and separated from the combustion chamber by at least 3.5" (89mm) to eliminate deterioration from heat. Headers shall have covers permitting visual inspection and cleaning of all internal surfaces.

The heat exchanger shall be removable from the unit, without excessive disassembly of the heater's combustion chamber. The water heater shall use a proven hot surface ignition with a 15 second pre-purge cycle to clear the venturi assembly and combustion chamber. The heater shall start in low fire, and remain in low fire for 15-seconds at the start of each cycle. The heater shall be 120V, single phase, 20A.

The burner shall be cylindrical type with woven metal fiber to provide a cleaner, more complete fuel combustion and low NOx emission, not exceeding 10 PPM.

The water heater shall come complete with an inline mounted pump sized to provide the correct water flow rate for the heater and 30 ft. (9.1m) of full sized piping. Each unit shall be furnished with an EM2 energy management monitor relay and pump timer. The timer shall be a high quality solid state electronic device. The device shall be user adjustable from 0.1 to 10 minutes for continued pump circulation after the call for heat has been satisfied, to remove residual heat from the unit.

Dimensions and specifications subject to change without notice in accordance with our policy of continuous product improvement.



Ambler, PA

For U.S. and Canada field service, contact your professional installer or local Bradford White sales representative.

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