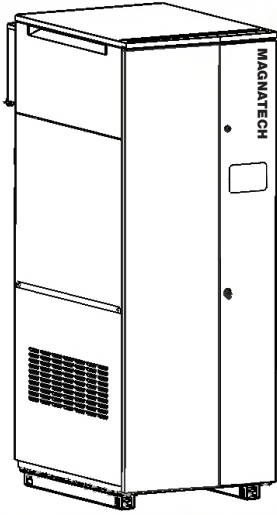


MagnaTech

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 | Input Rate | | Water Heater Thermal Efficiency | Product Weight | | Operating Weight | | Shipping Weight | | Water Content | Vent Diameter | Vent Length |
|-------|------------|------|---------------------------------|----------------|------|------------------|------|-----------------|------|---------------|---------------|-------------|
| | 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" |

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

