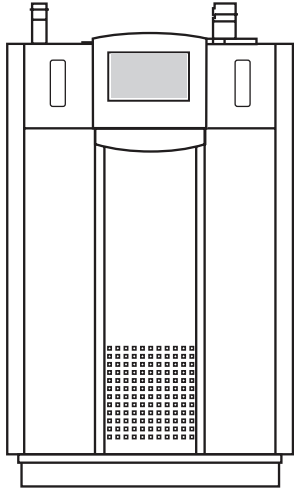


Brute



Volume Water Heater

Date:

Project #:

Engineer:

Prepared By:

Bid Date:

BNTV | Volume Water Heater

Indoor Sizes 150-850

Submittal Data



Project Name:

Location:

Contractor:

Standard Equipment

- Electronic PID modulating control with large color touchscreen display
- Password-protected parameters for installer use
- Test feature allows forced min or max firing
- Complete diagnostics for analog and digital inputs
- Displays holds, alerts and errors in clear text form
- Dray alarm contacts for ignition failure
- High condensing efficiency
- Modulation down to 20% of full fire (5:1 turndown)
- Sealed combustion chamber
- Pre-mix stainless steel burner
- Low NOx system exceeds the most stringent regulations for air quality - less than 10ppm NOx
- Horizontal or vertical direct vent
- Horizontal vent and air terminals
- Vent and air pipe lengths of up to 100 equivalent feet (each)
- Built-in condensate trap
- Vent temperature cutoff feature
- Direct spark ignition system
- Sensor for domestic water tank
- 160 psi maximum working pressure
- Stainless steel heat exchanger with welded construction (no gaskets)
- ASME "H" stamp
- 125 psi (861 kPa) ASME rated pressure relief valve
- Water flow switch (399-850 only)
- Temperature & pressure gauge
- Drain valve
- Integrated PID temperature and ignition controls
- Alarm output
- Accepts external 4-20mA (0-10V with optional convertor) modulation signal
- On/off toggle switch
- Manual reset high limit
- Burner site glass
- Zero clearance to combustible surfaces
- Built-in cascade function for up to eight Brutes.
- 8 year limited warranty

Heater Data

Number of Units:

Fuel

- Natural
 Propane

- Pump included (150-500 only)
 No pump

Factory Mounted Options

- ASME "HLW" Stamp
 CSD-1 (covers FM & GAP) (500-850 only)
 Low water cutoff (500-850 only)
 High & Low gas pressure switches (500-850)
- Additional auto reset high limit
 60 psi pressure relief valve
 75 psi pressure relief valve
 125 psi pressure relief valve (std)
 150 psi pressure relief valve
- Bell for ignition failure



Accessories for Field Mounting

| | | |
|---|---|---|
| <input type="checkbox"/> Water flow switch (285 only) | <input type="checkbox"/> Boiler pump (285-500) | <input type="checkbox"/> Propane conversion kit |
| <input type="checkbox"/> Low water cutoff | <input type="checkbox"/> Concentric vent terminal, 2" | <input type="checkbox"/> Condensate neutralizer kit |
| <input type="checkbox"/> 0 - 10V convertor for modulation control | <input type="checkbox"/> Concentric vent terminal, 3" | <input type="checkbox"/> BACnet gateway |
| <input type="checkbox"/> High & Low gas pressure switches | <input type="checkbox"/> Flush-mount terminal, 3" | <input type="checkbox"/> LON gateway |
| | <input type="checkbox"/> Flush-mount terminal, 4" | |

Sizing Data

| Model | Input | | Output | | Thermal Efficiency % | Gas Conn. Size inches | Water Conn. Size inches | Shipping Weight | |
|-----------------------------------|---------|-------|---------|-------|----------------------|-----------------------|-------------------------|-----------------|-----|
| | BTU/h | kW | BTU/h | kW | | | | lbs | kg |
| <input type="checkbox"/> BNTV 150 | 150,000 | 44.0 | 142,500 | 41.7 | 95 | ½ NPT | 1¼ NPT | 228 | 103 |
| <input type="checkbox"/> BNTV 199 | 199,000 | 58.3 | 193,030 | 56.5 | 97 | ½ NPT | 1¼ NPT | 270 | 123 |
| <input type="checkbox"/> BNTV 285 | 285,000 | 83.5 | 270,750 | 79.3 | 95 | ¾ NPT | 2 NPT | 299 | 136 |
| <input type="checkbox"/> BNTV 399 | 399,000 | 116.9 | 383,040 | 112.2 | 96 | ¾ NPT | 2 NPT | 364 | 165 |
| <input type="checkbox"/> BNTV 500 | 500,000 | 146.5 | 480,000 | 140.6 | 96 | 1 NPT | 2 NPT | 419 | 190 |
| <input type="checkbox"/> BNTV 600 | 600,000 | 175.8 | 582,000 | 170.4 | 97 | 1 NPT | 2 NPT | 426 | 193 |
| <input type="checkbox"/> BNTV 750 | 750,000 | 219.8 | 705,000 | 206.4 | 94 | 1½ NPT | 2 NPT | 481 | 218 |
| <input type="checkbox"/> BNTV 850 | 850,000 | 249.1 | 816,000 | 238.9 | 96 | 1½ NPT | 2 NPT | 503 | 228 |

Clearances

| Appliance Surface | Suggested Service Access Clearance | |
|-------------------|------------------------------------|-----|
| | inches | cm |
| Left Side | 1 | 2.5 |
| Right Side | 12 | 31 |
| Top | 24 | 61 |
| Back | 6 | 15 |
| Closet, Front | 6 | 15 |
| Alcove, Front | 24 | 61 |
| Vent | – | – |

Certified by CSA for zero clearance to combustible materials on all sides.

Vent System

| Size | Intake (Air) | Exhaust (Vent) | Maximum Allowable Equivalent Length* | |
|------|--------------|----------------|--------------------------------------|---------|
| | Pipe | Pipe | | |
| 150 | 3" | 3" | 100 ft | 30 m |
| 199 | 3" | 3" | 100 ft | 30 m |
| 285 | 3" | 3" | 20 ft | 6.1 m |
| | 4" | 4" | 100 ft | 30 m |
| 399 | 4" | 4" | 100 ft | 30 m |
| 500 | 4" | 4" | 100 ft | 30 m |
| 600 | 4" | 4" | 40 ft | 12 m |
| | 6"*** | 6"*** | 100 ft ** | 30 m ** |
| 750 | 4" | 4" | 40 ft | 12 m |
| | 6" | 6" | 100 ft | 30 m |
| 850 | 4" | 4" | 40 ft | 12 m |
| | 6" | 6" | 100 ft | 30 m |

Installations in the U.S. require exhaust vent pipe that is a combination of PVC & CPVC complying with ANSI/ASTM D1785 F441, polypropylene pipe that complies with ULC S636, or stainless steel complying with UL1738. Installations in Canada require exhaust vent pipe that is certified to ULC S636.

Intake (air) pipe may be ABS, PVC, CPVC or galvanized material.

Installer must comply fully with manufacturer's installation instructions, including use of minimum exhaust length CPVC, to maintain ANSI Z21.13 safety certification.

Closet and alcove installations do not allow the use of PVC under any circumstances

* To calculate max equivalent length, measure the linear feet of the pipe, and add 5 feet (1.5m) for each elbow used.

** Allowed only if the vent pipe is no more than 20 equivalent feet longer than the air pipe.

Electrical Data

| Sizes | Volts | Heater | | Pump Connection Ratings (System Pump and DHW Pump Connections) |
|----------------------|-------|--------|------|---|
| | | Phase | Amps | |
| 150-850 No pump | 120 | Single | 2* | n/a |
| 150-199 With pump | 120 | Single | 7* | 115V - Maximum 1HP or 7.4A max |
| 285-500 With pump | 120 | Single | 8* | 115V - Maximum 1 HP or 7.4A max |

*Minimum 15A circuit required

Recovery Data

| Size | GPH Delivered | | | | | | | | |
|------|---------------------------------|-------------|-------------|-------------|-------------|-------------|--------------|--------------|--------------|
| | REQUIRED WATER TEMPERATURE RISE | | | | | | | | |
| | 40°F GPH | 50°F GPH | 60°F GPH | 70°F GPH | 80°F GPH | 90°F GPH | 100°F GPH | 120°F GPH | 140°F GPH |
| 150 | 431 | 345 | 287 | 246 | 215 | 191 | 172 | 144 | 123 |
| 199 | 579 | 463 | 386 | 331 | 290 | 257 | 232 | 193 | 166 |
| 285 | 818 | 654 | 545 | 467 | 409 | 363 | 327 | 273 | 234 |
| 399 | 1153 | 923 | 769 | 659 | 577 | 513 | 461 | 384 | 329 |
| 500 | 1451 | 1161 | 967 | 829 | 726 | 645 | 580 | 484 | 415 |
| 600 | 1729 | 1383 | 1152 | 988 | 864 | 768 | 691 | 576 | 494 |
| 750 | 2170 | 1736 | 1447 | 1240 | 1085 | 964 | 868 | 723 | 620 |
| 850 | 2434 | 1947 | 1622 | 1391 | 1217 | 1082 | 973 | 811 | 695 |

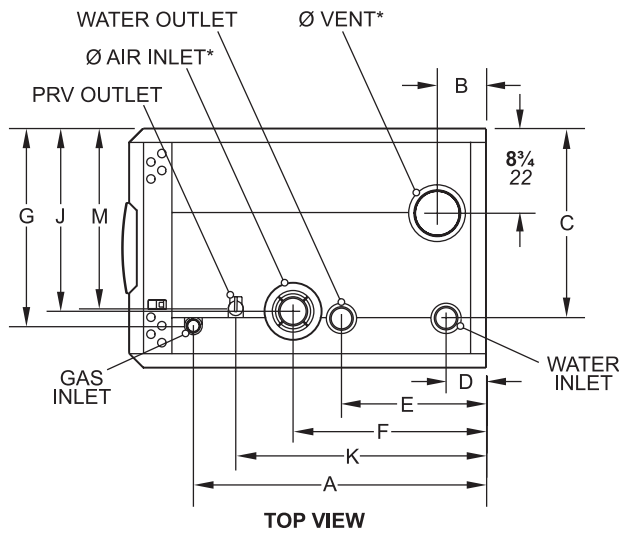
| Size | L/h Delivered | | | | | | | | |
|------|---------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | REQUIRED WATER TEMPERATURE RISE | | | | | | | | |
| | 22°C L/h | 28°C L/h | 33°C L/h | 39°C L/h | 44°C L/h | 50°C L/h | 56°C L/h | 67°C L/h | 78°C L/h |
| 150 | 1629 | 1303 | 1086 | 931 | 814 | 724 | 651 | 543 | 465 |
| 199 | 2190 | 1752 | 1460 | 1251 | 1095 | 973 | 876 | 730 | 626 |
| 285 | 3091 | 2473 | 2061 | 1766 | 1545 | 1374 | 1236 | 1030 | 883 |
| 399 | 4359 | 3487 | 2906 | 2491 | 2181 | 1937 | 1744 | 1453 | 1245 |
| 500 | 5485 | 4388 | 3657 | 3134 | 2743 | 2438 | 2194 | 1828 | 1567 |
| 600 | 6536 | 5288 | 4355 | 3735 | 3266 | 2903 | 2612 | 2177 | 1867 |
| 750 | 8203 | 6562 | 5470 | 4687 | 4101 | 3644 | 3281 | 2733 | 2344 |
| 850 | 9201 | 7360 | 6131 | 5258 | 4600 | 4090 | 3678 | 3066 | 2627 |

Water Flow Requirements

| Size | NORMAL WATER* | | | | | |
|------|---------------|-------------|-----------------|-------------|----------|-----------------|
| | Flow gpm | H/L feet | Temp Rise °F | Flow lpm | H/L m | Temp Rise °C |
| 150 | 19 | 57 | 15 | 72 | 17.4 | 8 |
| 199 | 25 | 28 | 15 | 95 | 8.5 | 8 |
| 285 | 36 | 33 | 15 | 98 | 10.1 | 8 |
| 399 | 50 | 35 | 15 | 189 | 10.7 | 8 |
| 500 | 63 | 28 | 15 | 239 | 8.5 | 8 |
| 600 | 60 | 24 | 19 | 227 | 7.3 | 11 |
| 750 | 68 | 35 | 21 | 257 | 10.7 | 12 |
| 850 | 68 | 26 | 24 | 257 | 7.9 | 13 |

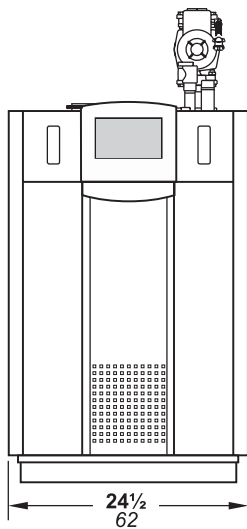
*Maximum water hardness of 10 grains per gallon allowed

Dimensional Data

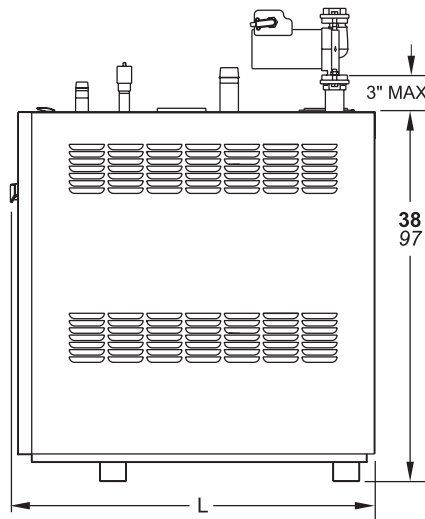


| Size | L | | AIR INLET | | VENT | |
|------|-----|-----|-----------|-----|------|-----|
| | in | cm | in | cm | in | cm |
| 150 | 19½ | 49 | 3 | 7.6 | 3 | 7.6 |
| 199 | 26¾ | 68 | 3 | 7.6 | 3 | 7.6 |
| 285 | 26¾ | 68 | 4 | 11 | 4 | 11 |
| 399 | 31½ | 80 | 4 | 11 | 4 | 11 |
| 500 | 37¾ | 96 | 4 | 11 | 4 | 11 |
| 600 | 37¾ | 96 | 4 | 11 | 4 | 11 |
| 750 | 51 | 130 | 4 | 11 | 6 | 17 |
| 850 | 55¼ | 140 | 4 | 11 | 6 | 17 |

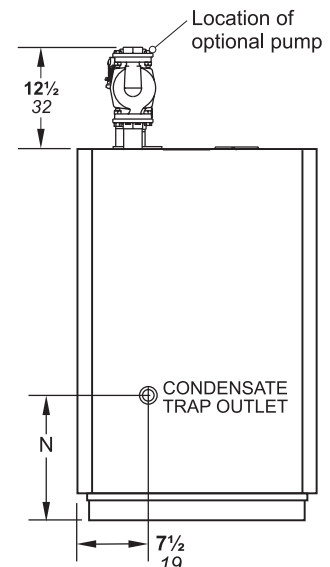
Dimensions are nominal and are shown in inches, cm.
 *Brute is shipped with adapters for the air and vent that accept standard pipe of the proper size and type.



FRONT VIEW



RIGHT SIDE VIEW



BACK VIEW

| Size | A | | B | | C | | D | | E | | F | | G | | J | | K | | M | | N | |
|------|-----|-----|----|----|-----|----|----|----|-----|----|-----|-----|-----|----|-----|----|-----|----|-----|----|----|----|
| | in | cm | in | cm | in | cm | in | cm | in | cm | in | cm | in | cm | in | cm | in | cm | in | cm | in | cm |
| 150 | 13¼ | 34 | 5¼ | 14 | 19 | 48 | 3¼ | 8 | 10¾ | 28 | 7½ | 19 | 14¼ | 36 | 19½ | 49 | 7½ | 19 | 15¼ | 39 | 13 | 33 |
| 199 | 20½ | 52 | 5¼ | 14 | 19 | 48 | 3¼ | 8 | 17¾ | 45 | 7½ | 19 | 14¼ | 36 | 19½ | 49 | 11¾ | 30 | 15¼ | 39 | 13 | 33 |
| 285 | 20¼ | 52 | 7¼ | 19 | 19¾ | 50 | 4¼ | 16 | 11¼ | 29 | 13½ | 34 | 14 | 36 | 15 | 38 | 17 | 43 | 18¾ | 48 | 13 | 33 |
| 399 | 25 | 64 | 5¼ | 13 | 19¾ | 50 | 4¼ | 11 | 14¾ | 37 | 18½ | 47 | 19¼ | 49 | 16½ | 42 | 21¾ | 55 | 18¾ | 48 | 13 | 33 |
| 500 | 30¼ | 77 | 5¼ | 13 | 19¾ | 50 | 4¼ | 11 | 15¼ | 38 | 20 | 51 | 20½ | 52 | 19 | 48 | 26 | 66 | 18¾ | 48 | 13 | 33 |
| 600 | 29¾ | 76 | 5 | 13 | 19½ | 50 | 4¼ | 11 | 15 | 38 | 20 | 51 | 3 | 8 | 19 | 48 | 26 | 66 | 18¾ | 48 | 8¼ | 21 |
| 750 | 35½ | 90 | 6 | 15 | 19½ | 50 | 5¼ | 13 | 19 | 48 | 40½ | 103 | ¾ | 8 | 19 | 48 | 30¾ | 78 | 18¾ | 48 | 8¼ | 21 |
| 850 | 39¾ | 101 | 6 | 15 | 19½ | 50 | 5¼ | 13 | 19 | 48 | 44¾ | 114 | ¾ | 9 | 19 | 48 | 35 | 89 | 18¾ | 48 | 8¼ | 21 |



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

www.BradfordWhite.com

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