

# Brute Deluxe

## Hydronic Boiler

Model BMT2H 200-400 Indoor/Outdoor

### Specification

Date: \_\_\_\_\_ Bid Date: \_\_\_\_\_  
Project #: \_\_\_\_\_ Location: \_\_\_\_\_  
Project Name: \_\_\_\_\_ Engineer: \_\_\_\_\_  
Contractor: \_\_\_\_\_ Prepared By: \_\_\_\_\_

Contractor shall supply and install Qty.: \_\_\_\_\_ Brute Deluxe, BMT2H \_\_\_\_\_ boiler(s).

The boiler shall be a Bradford White Brute Deluxe Model BMT2H \_\_\_\_\_, rated at the input and output shown on the schedule. The unit(s) shall be design certified to comply with the current edition of the Harmonized ANSI Z21.13 / CSA 4.9 Standard for Gas-Fired Low Pressure Steam and Hot Water Boilers, and shall be design certified for both indoor and outdoor use. The unit(s) shall be designed and constructed in accordance with the ASME Boiler & Pressure Vessel Code, Section IV requirements for 160 psi (1103 kPa) working pressure, and shall bear the ASME "H" Stamp. The unit(s) shall be constructed to comply with the efficiency requirements of the latest edition of ASHRAE Standard 90.1.

The water tube heat exchanger shall be a straight tube design with ten 5/8" (16mm) inner diameter integral finned copper tubes, with a heat exchanger rating of 160 psi (1103 kPa) working pressure. The heat exchanger shall be a low water volume design. All gaskets shall be non-metallic, outside the jacket, and separated from the combustion chamber to eliminate deterioration from heat. Headers shall have covers permitting visual inspection and cleaning of all internal surfaces. The heat exchanger shall have a ten year warranty.

The piping side header shall have removable flanges, and the boiler design shall permit removal of the complete heat exchanger for service from either the front or top, to facilitate maintenance.

The units shall use a proved hot surface ignition with a 15 second pre-purge cycle to clean out the combustion chamber. Upon a call for heat, if a flame is not detected, the ignition module shall try two more times, and then lockout. If there is a loss of flame signal during a call for heat, the ignition control shall attempt three re-ignition cycles before locking out. The ignition control shall have terminals for checking flame signal without having to remove or access ignitor. The control circuit shall be 24V. Unit shall be 120V, single phase, less than 12 Amps.

Burners shall be multi-port design, and shall be constructed of high temperature stainless steel. The burners shall be designed to mix air and gas, and burn cleanly with NOx emissions not exceeding 10ppm. Burners shall be in easily-removable burner tray assemblies with no more than 4 burners per tray.

The combustion chamber shall be made of a one-piece, formed, lightweight, ceramic fiberboard insulation to retain heat, and shall be approved for service temperatures of not less than 2000°F (1093°C). The outer jacket shall be a unitized shell finished with acrylic thermoset paint baked at not less than 325°F (163°C). The frame shall be constructed of galvanized steel for strength and protection. Chamber shall include a sight glass for viewing flame.

The boiler shall be standard on/off firing, with an option for two-stage firing. The boiler shall be equipped with a PI temperature controller with outdoor reset, warm weather shutdown, domestic hot water operation, automatic boiler differential, and codes for sensor errors. The controller shall have indicator lights for power, heat call, domestic water call, and warm weather shutdown. The controller shall have pump pre-purge, post-purge, and exercise features. The controller shall pre-purge and post-purge the boiler's blower. The boiler shall have a manual reset high limit. A terminal strip shall be used for ease of wiring and troubleshooting. The boiler shall have connections for an external staging control, and a selector switch to enable the user to choose between the boiler's staging control or a field-supplied staging control, without bypassing any of the boiler's safety controls. The boiler shall have a flip-up control panel for easy access to all control components.

Boilers shall have a forced draft design and shall meet a minimum 85% efficiency. The unit shall be designed for vertical venting with standard B-vent as a fan-assisted Category I appliance, and for horizontal venting as a Category III appliance and shall not require an external draft hood. The unit shall accept ducted combustion air, or shall be able to pull combustion air from the boiler room. Vent and ducted combustion air shall each be able to be piped to either the top or the back of the unit, in any combination. Changing from top-to-back or from back-to-top piping orientation shall be easily accomplished in the field.

The gas train shall have a gas shutoff valve and main gas valve(s) with built-in redundant valve seat(s) and gas regulator(s). Gas valves shall be flanged, to permit easy removal of the each gas valve, gas train and burner tray assembly from the front of the unit.

The boiler shall be provided with an integral, washable combustion air filter. The air filter shall provide 83% arrestance to protect the burners and blower(s) from debris. The air filter shall be constructed out of open-cell polyurethane foam.

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**Standard features shall include:**

- ASME 160 psi working pressure heat exchanger
- ASME “H” stamp
- Flanged water connections
- Glass-lined headers
- External header gaskets
- 75 psi (517 kPa) ASME rated pressure relief valve
- Temperature pressure gauge
- Multiple operating gas valve/pressure regulators
- Manual “A” gas valve
- Intake air filter
- Removable burner tray(s)
- Stainless steel burners
- Built-in fan for Category I or III vent systems
- Air pressure switch
- Blocked vent switch
- Burner site glass
- PI controller
- Outdoor reset with ratios of 0.4 to 3.6
- Warm weather shutdown
- Indicator lights for power, heat call, DHW call and WWSD
- DHW operation
- Automatic boiler differential
- Pump pre-purge, post-purge and exercise
- Blower pre-purge and post-purge
- Inlet, outlet, outdoor and supply sensors
- Codes for sensor errors
- 24V control system
- 115/24V transformer
- Flow switch
- Manual reset high limit
- Fusible link (size 200)
- On-off firing
- Certified for indoor or outdoor use
- Hot surface ignition
- On/off toggle switch
- Pump time delay
- CSD-1 compliant
- Less than 10ppm NOx