Date: Bid Date:

Project #: Location:

Project Name: Engineer:

Contractor: Prepared By:

Brute Deluxe Pump-Mounted Hydronic Boiler

Model BMT2H 400 Indoor/Outdoor

Specification

Contractor shall supply and install Qty.: Bradford White Model No. BMT2H 400 pump-mounted boiler(s).

The boiler shall be a Bradford White, Brute Deluxe Model BMT2H 400, rated at 399,000 input and 340,000 gross output. 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 boiler shall have an AHRI certified combustion efficiency of 83.4%, and thermal efficiency of 85.3%.

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 boiler shall come complete with an in-line pump, mounted and wired, and sized to provide the correct boiler flow rate for the boiler and thirty feet of 1-1/2" pipe, with a normal number of fittings, for primary/secondary applications.

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 pre-purge and post-purge the boiler's blower, and 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.

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, indirect domestic hot water operation, automatic boiler differential, and codes for sensor errors. The controller shall have indicator lights for power, heat call, indirect domestic water call, and warm weather shutdown. The controller shall have pump pre-purge, post-purge, and exercise features. In addition to the temperature control, the boiler shall be equipped with a non-adjustable manual reset high limit. A terminal strip shall be used for ease of wiring and troubleshooting. The boiler shall have a control panel cover, such that jacket panels do not have to be removed to access control components.

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 low NOx emissions. 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 thermo-set 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.

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 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% arrestence 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:

- Certified for indoor or outdoor use
- Low NOx Emissions
- 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
- Water flow switch
- 24V control system
- 115/24V transformer
- PI temperature controller
- Outdoor reset with ratios of 0.4 to 3.6
- Warm weather shutdown
- Indicator lights for power, heat call, DHW call & WWSD
- Indirect DHW operation
- Automatic boiler differential
- Pump pre-purge, post-purge and exercise
- Inlet, outlet, outdoor and supply sensors
- Codes for sensor errors
- Manual reset high limit
- On-off firing (2-stage optional)
- Adjustable pump time delay
- Hot surface ignition
- On/off toggle switch
- CSD-1 compliant
- Removable burner tray(s)
- Multiple operating gas valve/ pressure regulators
- Manual "A" gas valve
- Burner site glass
- Intake air filter
- Built-in fan for Category I or III vent systems
- Blower pre-purge and post-purge
- Air pressure switch
- Blocked vent switch

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