

Date:

Bid Date:

Project #:

Location:

Project Name:

Engineer:

Contractor:

Prepared By:

# Brute® FT

## Residential, Floor Standing Boiler



Model BFTHF 199, Indoor

### Specification

Contractor shall supply and install Qty.: \_\_\_\_\_ Bradford White Model No. BFTHF 199 floor standing modulating condensing boiler(s)

The boiler shall be a FT Series model LFTHF199 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. The unit(s) shall be designed and constructed in accordance with the ASME Boiler & Pressure Vessel Code, Section IV requirements for 30 psi (207 kPa) maximum working pressure, and shall bear the ASME "H" Stamp and be listed by the National Board. The boiler shall modulate from 10-100% of full fire for 10:1 turndown ratio.

The boiler shall be listed with AHRI (Air Conditioning, Heating and Refrigeration Institute), with a minimum AFUE of 95%. The unit(s) shall be constructed to comply with the efficiency requirements of the latest edition of ASHRAE Standard 90.1. The boiler shall meet the most stringent NOx emissions requirements.

The fire tube heat exchanger shall be stainless steel with aluminum core fire tubes. The heat exchanger shall be a low head loss design, and shall be accessible for visual inspection and cleaning of internal surfaces. The boiler shall be fully condensing design with built-in condensate drain and trap. The heat exchanger shall have a limited 10-year warranty.

The boiler shall be sealed combustion, and use a premix ceramic fiber burner and a zero governor gas valve to burn cleanly. The boiler shall operate with 3.5-10.5" w.c. natural gas pressure (or 8-13" propane gas pressure with conversion). The combustion chamber shall include a sight glass for viewing flame. The boiler jacket shall be a unitized shell finished with acrylic thermoset paint. The boiler shall have three service panels for easy service access, and shall have adjustable leveling feet.

The boiler shall be designed and certified for vertical or horizontal Category IV venting, two-pipe or concentric. Vent materials may be PVC, CPVC, Polypropylene or stainless steel. Vent pipe length may be up to 50 equivalent feet of 2" diameter pipe, or up to 100 equivalent feet of 3" diameter pipe.

Air may be taken from the room, or ducted directly to the boiler. Air pipe materials may be ABS, PVC, CPVC, Polypropylene or galvanized. Air pipe length may be up to 50 equivalent feet of 2" diameter pipe, or up to 100 equivalent feet of 3" diameter pipe. The boiler shall be equipped with a removable and cleanable inlet air filter.

The boiler(s) shall be built with an integral stainless steel mini boiler tank that serves as a low loss header and boiler buffer tank.

The control shall have indirect domestic water heating logic, which shall have priority over the hydronic heating requirements, with the ability to serve both indirect domestic water and space heating at the same time when conditions permit.

The boiler shall be packaged with mounted and wired pump inside the boiler jacket. The boiler shall be equipped with an ASME certified pressure relief valve set at 30psi (207kPa). The boiler shall have a condensate trap that does not need to be primed and will not allow flue gases to pass back through unit.

Unit shall be 120VAC, single phase, less than 4 Amps (including mounted pump) for connection to a 15A breaker. Maximum power consumption shall be 160W. The control circuit shall be 24VAC. A three-foot length 14 AWG plug-in line cord shall be included for connection to a 120VAC/15A receptacle. A 120V receptacle for condensate pump, along with a space for placement of the pump, shall be included as standard equipment.

Field connections for main power, external circulator, call for heat (thermostat or end switch), low water cutoff, and outdoor sensor shall be easily accessible via line voltage and low voltage terminal strips. The control shall have the ability to accept a 0-10VDC input connection from an external control or building automation system, for remote temperature setpoint control. A bonus TT connection, for a high temperature zone shall be included.

The ignition system shall be direct spark, and the boiler control shall be an integrated electronic PID temperature and ignition control with LCD, push buttons and dial. It shall control the boiler operation and firing rate. The boiler display shall be visible without the removal of any jacket panels, and shall be waterproof.

The display shall include a numeric display to indicate temperature values, and shall have icons that indicate call for space heating, storage heating mode, anti-freeze mode, warm weather shutdown (summer mode), outside temperature mode, 0-10V setpoint mode, controller lock, status or installer mode, flame signal, and pump operation.

The control shall have built-in outdoor reset feature with warm weather shutdown, and customizable reset curves, based on the outdoor temperature and desired system water temperature. The boiler shall be shipped with the outdoor reset sensor, as standard equipment. The control shall have customizable freeze protection, and anti-short-cycle logic.

The control shall easily allow the user to force the boiler into minimum or maximum firing rate, for boiler setup and diagnostic purposes. The control shall monitor flue gas temperature and shall stop the boiler from firing if temperature is excessive. The boiler shall have built-in gas leakage detection capabilities, such that when gas is detected for greater than 5 seconds, or three times within 10 minutes, the boiler will lock out for safety purposes.

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The control shall have menu structures for user mode and installer mode. Allowable control adjustments shall include: Boiler temperature setpoint; °F or °C display; Outdoor reset selection; Low boiler setpoint temperature (for outdoor reset operation); Boiler temperature at high outdoor temperature (for outdoor reset operation); Boiler setpoint at low outdoor temperature (for outdoor reset operation); and indirect DHW temperature setpoint.

The control shall be able to display the following parameters: Outdoor temperature; Return boiler water temperature; Blower rpm; indirect DHW temperature; Exhaust temperature; Output condition for pump; Burner operation times, Ignition cycles.

Control diagnostics shall include, at a minimum, the following: Ignition failure; Grounded flame rod; Boiler high limit exceeded; Sensor errors (open or shorted); and Fan speed proving rate failure.

*Standard features shall include:*

- High condensing efficiency 95% AFUE
- ASME 30 psi (207 kPa) working pressure
- ASME "H" stamp
- Stainless steel fire tube heat exchanger with welded construction
- Integral stainless steel buffer tank serves as low loss header
- Boiler pump wired and mounted inside jacket
- Full modulation 100% to 10% (10:1 turndown)
- Electronic PID modulating control
- Large user interface and display
- Receptacle for condensate pump (2A max)
- Supply and return boiler sensors
- Smart DHW priority
- Bonus TT connection for high temp zone
- Accepts 0-10VDC temp setpoint signal
- Outdoor reset (w/ sensor)
- Customizable freeze protection
- Anti-short cycle
- Direct spark ignition
- Manual reset high limit
- Sealed combustion chamber
- Pre-mix ceramic fiber burner
- Natural gas with propane conversion kit included
- Horizontal or vertical direct vent
- Concentric or two-pipe venting options
- Vent and air pipe lengths of up to 100 equivalent feet (each)
- Vent with PVC, CPVC, stainless steel, or polypropylene
- Built-in condensate trap and drain, priming not required
- 3-in-1 brass pipe adapter (for air vent, PRV, optional LWCO)
- 30 psi (207 kPa) pressure relief valve
- Removable and cleanable inlet air filter
- Adjustable leveling feet
- Three service panels
- Gas leak detection
- Automatic air vent
- Pressure gauge
- Boiler water pressure switch
- Blocked vent pressure switch
- Blocked condensate pressure switch
- Burner site glass
- 10-Year limited warranty



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