Date: Bid Date:

Project #: Location:

Project Name: Engineer:

Contractor: Prepared By:

Mascot FT
Residential Wall Mounted Combination Boiler

Models MFTCW 140 & 199, Indoor

Specification

Contractor shall supply and install Qty.: _____ Laars Model No. MFTCW (size)_____ modulating condensing boiler(s).

The boiler shall be a Laars Mascot FT Model MFTCW (size)_____ rated at the input and output shown on the schedule. The boiler shall modulate _____ -100% of full fire. 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 unit(s) shall be constructed to comply with the efficiency requirements of the latest edition of ASHRAE Standard 90.1. The boiler shall be equipped with an ASME certified pressure relief valve set at 30psi (207kPa).

The boiler shall be listed with the U.S. Department of Energy as an Energy Star appliance. The boiler shall be listed with AHRI (Air Conditioning, Heating and Refrigeration Institute). The boiler shall have a minimum AFUE of 95%.

The fire tube heat exchanger shall be stainless steel with aluminum core fire tubes, rated for 30 psi (207 kPa) working pressure. The heat exchanger shall be a low head loss design. Heat exchanger 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.

Boiler(s) shall provide domestic hot water flow rates, at 77°F (25°C) temperature rise, through an integral stainless steel domestic water indirect tank of:

- 140 MBH = 3.2 gpm (12 l/m)
- 199 MBH = 4.8 gpm (18 l/m)

Integral DHW indirect tank shall hold a minimum of 0.5 gallon (1.9 L) of DHW

Domestic water heating shall have priority over the hydronic heating requirements. A Hall Effect flow sensor shall initiate the call for domestic water.

Boiler shall be packaged with mounted and wired pump inside the boiler jacket.

Each boiler shall be test fired and all safety components tested, at the factory.

The boiler shall be sealed combustion. The boiler jacket shall be a unitized shell finished with acrylic thermoset paint. Chamber shall include a sight glass for viewing flame.

Boiler shall have a condensate trap that does not need to be primed and will not allow flue gases to pass back through unit.

Boiler shall operate on 3.5-13" w.c. gas pressure.

The boiler shall use a premix ceramic fiber burner and a zero governor gas valve to burn cleanly, with NOx emissions not exceeding 17ppm. The boiler shall meet the emissions requirements of SCAQMD.

The boiler shall be designed for vertical or horizontal Category IV venting:

- Up to 50 equivalent feet with 2" diameter in PVC, CPVC, Polypropylene or stainless steel vent material (propane models limited to 25 equivalent feet of 2" diameter vent).
- Up to 100 equivalent feet with 3” diameter in PVC, CPVC, Polypropylene or stainless steel vent material

Air may be taken from the room, or ducted directly to the boiler:

- Up to 50 equivalent feet with 2" diameter in ABS, PVC, CPVC, Polypropylene or galvanized pipe (propane models limited to 25 equivalent feet of 2" diameter vent).
- Up 100 equivalent feet with 3” diameter in ABS, PVC, CPVC, Polypropylene or galvanized pipe

Unit shall be 120VAC, single phase, less than 4 Amps (including mounted pump) for connection to a 15A breaker. The control circuit shall be 24VAC. A 3 ft. length 14 AWG plug-in line cord is included for connection to 120VAC/15A receptacle.

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.

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

The control shall have built-in outdoor reset feature with 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 the ability to accept a 0-10VDC input connection from an external control or building automation system, for remote temperature setpoint control.

The control shall monitor flue gas temperature and shall stop the boiler from firing if temperature is excessive.

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The control shall easily allow the user to force the boiler into minimum or maximum firing rate, for boiler setup and diagnostic purposes.

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 DHW temperature setpoint.

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
- Low pressure drop, fire tube heat exchanger design
- Full Modulation
  - 140MBH: From 100% down to 20% of full fire (5:1 turndown)
  - 199MBH: From 100% down to 10% of full fire (10:1 turndown)
- Sealed combustion chamber
- Pre-mix ceramic fiber burner
- Low NOx system
- Horizontal or vertical direct vent
- Vent and air pipe lengths of up to 100 equivalent feet (each)
- Stainless steel heat exchanger with finned aluminum core fire tubes, welded construction
- ASME 30 psi (207kPa) working pressure heat exchanger
- ASME "H" stamp
- 30 psi (207kPa) ASME pressure relief valve
- Low lead compliant
- Gas leak detection
- Stainless Steel DHW indirect tank storage heat exchanger with priority for on-demand hot water
- Boiler pump wired and mounted inside jacket
- Built-in condensate trap and drain, priming not required
- Automatic air vent
- Pressure gauge
- Boiler water pressure switch
- Blocked vent pressure switch
- Blocked condensate pressure switch
- Burner site glass
- Electronic PID modulating control
- Direct spark ignition
- Customizable Freeze Protection
- Anti-short cycling
- Large user-interface and display
- Accepts external (0-10VDC) temperature setpoint signal
- Outdoor reset (sensor included)
- Outdoor air reset curve
- Manual reset high limit
- Wall mount bracket
- Field convertible between natural gas and propane
- 10-Year limited warranty

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