Date: Bid Date:

Project #: Location:

Project Name: Engineer:

Contractor: Prepared By:

# FT Series Boiler

## LFTHW Indoor
## Models 301 / 399

LAARS Heating Systems Company

## *Specification*

Contractor shall supply and install Qty. Laars Model No. LFTHW modulating boiler(s).

The boiler shall be a Laars FT Series Model LFTHW , rated at BTU/hr input and . BTU/hr output. The boiler shall modulate with a turndown ratio of 7.5:1 (301) or 10:1 (399). 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 80 psi (551 kPa) maximum working pressure, and shall bear the ASME "H" Stamp and be listed by the National Board.

The boiler shall be available as a wall-mounted boiler, or with a stand for floor mounting.

The boiler shall be listed with AHRI (Air Conditioning, Heating and Refrigeration Institute). The boiler shall have a minimum AHRI certified combustion efficiency of 95.4%, and a minimum AHRI certified thermal efficiency of 95.1%.

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 certified for placement indoors, and shall be available with a stand for placement on a floor.

The boiler shall be equipped with an ASME certified pressure relief valve set at 30 psi (207 kPa).

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.

Each boiler shall be fully test fired, (with water, gas, and venting connected), and all safety components tested, at the factory.

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 included conversion kit). 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 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 60 equivalent feet of 3" diameter pipe, or up to 150 equivalent feet of 4” diameter pipe. Up to 65 feet of 3” polypropylene flex mterial shall be allowed for vertical, indirect vent systems.

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 60 equivalent feet of 3" diameter pipe, or up to 150 equivalent feet of 4” diameter pipe.

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.

Unit shall be 120VAC, single phase, less than 4 Amps for connection to a 15A breaker. Maximum power consumption shall be 160W. The control circuit shall be 24VAC.

Field connections for main power, external circulators, 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:***

- Stainless steel heat exchanger w/ finned aluminum core fire tubes
- ASME "H" stamp
- ASME 80 psi (551kPa) working pressure
- 95%+ AHRI certified thermal and combustion efficiencies
- Full Modulation:
  - 10:1 turndown (399)
  - 7.5:1 turndown (301)
- 30 psi (207kPa) ASME PRV
- Pressure gauge
- Sealed combustion chamber
- Pre-mix ceramic fiber burner
- Top & bottom water connections
- Top & bottom gas connections
- Wall mount bracket
- Available with floor stand
- Low NOx system exceeds the most stringent regulations for air quality
- Horizontal or vertical direct vent
- Vent and air pipe lengths up to 150 equivalent feet (each)
- Screens for air and vent pipe
- Large user-interface and display
- Electronic PID modulating control
- Cascade up to 4 units (mixing sizes is allowed)
- Direct spark ignition
- Outdoor reset (sensor included)
- Manual reset high limit
- Low water cutoff
- Customizable freeze protection
- Air filter
- Inlet air flue gas contamination sensor
- Built-in condensate trap and drain
- Automatic air vent
- Air pressure switch
- Burner site glass
- Propane conversion kit
- O-ring and gasket kit included
- 10-year limited heat exchanger warranty
- 5-year limited parts warranty

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