

HEATING CONDENSING BOILER

1. Furnish and install in accordance with the instructions of the manufacturer and in compliance with all rules/regulations of the authority having jurisdiction, [x (number)] only hydronic heating condensing boilers which have an ASME approved pressure vessel constructed of high quality 316Ti Stainless Steel. The boiler shall have a Bekaert metal fiber burner with direct spark ignition, brushless DC fan, and zero governing Karl Dungs gas valve. Boiler control will modulate boiler water temperature to outside air temperature and prioritize 3 temperature circuits electrically for maximum fuel efficiencies.

**Model SL 80-399 HP**

1.1 Design and Performance Data

The boiler shall be designed as per the following criteria:

- a) Energy input of boiler:- 80 to 399 MBH (NG)
- b) Output of boiler: 77 to 382 MBH @ 95.7% Combustion Efficiency (NG & LPG) – (CSA 4.9 – 2010)
- c) The burner shall fully modulate and have a 5 to 1 turn down ratio for precise load matching.
- d) Boiler shall have a Combustion Efficiency rating, as tested under CSA 4.9 – 2010 protocol, of 95.7%.
- e) ASME maximum working pressure 80 psig and ASME maximum water temperature 200 F (93.3 C); the boiler will be supplied with a 30 psig Conbraco temperature and pressure relief valve for installation external to the boiler's case, using a ¾", fitting kit supplied with the boiler. The boiler pressure vessel shall be complete with a 10 year limited warranty.
- f) The burner, controls, and other included equipment shall be complete with a one year warranty.

2. Construction

- 2.1 The boiler shall be designed with a vertical combustion chamber and a down firing burner to allow free gravity drainage of condensate from the heat exchanger. Its heat exchanger is to be manufactured with 316Ti stainless steel and have a heat transfer area of 36.58 sq.ft. Heat exchanger performance shall be maximized through a multi-tube, counter-flow fire-tube design.
- 2.2 The boiler shall be constructed in accord with CSA 4.9-2010 and the ASME Boiler and Pressure Vessel Code, Section IV and bear the *H* stamp as per ASME code. The boiler shall carry a CRN# for the Province of installation.
- 2.3 The boiler enclosure panel shall be of stainless steel with black powder coat base.

Enclosure panels shall be designed for installation after all piping, insulation, and venting has been completed, provided all recommended clearances are respected.

- 2.4 The burner shall be of metal fiber burner c/w Fenwal direct spark ignition, ebm-papst brushless dc fan, and fully referenced zero governor Karl Dungs gas valve.
  - 2.5 The boiler control shall be built in complete with full outdoor reset, multiple load control with relays for four pumps, variable speed signal for system pump or air handler, clear constantly bright LCD display providing plain English information and serial port for software upgrades. Altitude compensation shall be available via keypad adjustment, for maintenance of full rating plate output to 6,000 ft. without requirement for orifice changes. The boiler shall offer internal multiple boiler staging and rotation control, for management of up to 24 boilers.
  - 2.6 The boiler control shall be able to accept an external 0-10 VDC or 4-20 mA input signal, as well as being fully capable of a BACNET interface.
  - 2.7 The boiler shall offer venting up to 400 feet (200' each side for combustion air and exhaust) using approved 4 inch CPVC, PP's or stainless steel venting material. Both sealed combustion and indoor combustion air options shall be permissible.
  - 2.8 Required clearances as per manufactures recommendation: top 12 inches, left side 1 inch, right side 1 inch, back 0 inches, and bottom 12 inches.
  - 2.9 Additional standard equipment shall include the following items:
    - Electronic air sensing module for positive fan pressure reading
    - Electronic flue gas temperature sensor
    - Electronic, probe-type Low Water Cut-Off Certified to UL-353
    - Internal, Manual Reset mechanical High limit switch
    - Water pressure sensing, for digital display of system pressure
-