

SPECIFICATION TEMPLATE – Boiler Model VFC 45-225

1.0 GENERAL

Furnish and install in accordance with the instructions of the manufacturer and in compliance with all rules/regulations of the authority having jurisdiction, [one (1)] only hydronic heating condensing boiler(s) which has an ASME approved pressure vessel constructed of high quality Titanium stabilized 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 VFC 45-225

1.1 Design and Performance Data

The boiler shall be designed as per the following criteria:

- A) Energy input of boiler: 45 to 225 MBH (N.G. /L.P.)
- B) Output of boiler: 43 to 206 MBH (N.G. / L.P.) @ 96.1% A.F.U.E. – AFUE shall be confirmed and certified by current (March 2011) AHRI testing standards and procedures.
- C) The burner shall fully modulate and have a 5 to 1 turn down ratio for precise load matching.
- D) Boiler shall have an AFUE efficiency rating of 96.1%, and up to 98% efficiency under the most favorable supply/return water temperature conditions.
- E) ASME maximum working pressure 80 psig and ASME maximum water temperature 210 °F (98.89 °C); the boiler will be supplied with a 30 psig Conbraco pressure relief valve for installation external to the boiler's case, using a ¾" reducing tee. An optional 75 psig Conbraco pressure relief valve may be specified - for closed loop applications only.
- F) The boiler pressure vessel shall be complete with a limited lifetime residential warranty or a limited 10 year non-residential warranty as applicable.
- G) The burner, controls, and other included equipment shall be complete with a two year warranty.

2.0 CONSTRUCTION

The boiler shall be designed with a vertical combustion chamber. Its heat exchanger is to be manufactured with at least 85 lbs of titanium-stabilized stainless steel, and have a heat transfer area of 32.75 sq.ft. Heat exchanger performance shall be maximized through a multi-pass, counter-flow tubular design, 5 levels on 3 tiers with variable lengths of 5/8" (approx) titanium stabilized stainless steel tubing. Flue temperature shall be no greater than 10° F above boiler water return temperature at the maximum firing level.

The boiler shall be constructed in accord with CSA 4.9-2005 and the ASME Boiler and Pressure Vessel Code, Section IV and bear the *H* stamp as per ASME code. The boiler AFUE shall be AHRI Certified and the boiler shall be included on the Canadian and U.S. register of ENERGYSTAR™ qualified boilers.

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.

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.

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 8,500 ft. without

requirement for orifice changes. The boiler shall offer internal multiple boiler staging and rotation control, for management of up to 24 boilers.

The boiler shall offer venting up to 480 feet (240' each side for combustion air and exhaust) using approved 3 inch PVC, CPVC, PP's or stainless steel venting material. Both sealed combustion and indoor combustion air options shall be permissible. Vent travel under the indoor air option shall be limited to the single "side" distances given, e.g. 240' for 3" pipe.

Required clearances as per manufactures recommendation: top 10 inches, left side 0 inches, right side 2 inches (combustibles) 20 inches recommended for component piping/service, back 0 inches, and bottom 33 inches.

The boiler shall include electronic differential air sensing module for positive fan pressure reading, and water pressure sensing modules for both supply and return water, for digital display of system pressure, and positive flow confirmation.