



Suggested Specifications

Dunkirk Boiler 399 VX

Stainless Steel Boiler

1.0 General Requirements:

- 1.1 Provide and Install Boiler(s) in accordance with the plan drawings, written specifications and contract documents.
- 1.2 All work shall be performed in a neat workmanship like manner compliant with all local code authorities.

2.0 Submittal

- 2.1 Product Data: Submit manufacturer's technical product data, including
- 2.2 Shop Drawings: Submit manufacturer's end assembly drawings indicating dimensions, connection locations, and clearance requirements.
- 2.3 Wiring Diagrams: Submit manufacturer's electrical requirements for the boiler including ladder type wiring diagrams for interlock and control wiring.

3.0 Boiler Requirements

- 3.1 Boiler shall be a floor model.

4.0 Acceptable Manufacturers

- 4.1 This specification is based on the Dunkirk VX boilers as manufactured by ECR International, Inc. Equivalent units and manufacturers must meet all performance criteria for all fuel options, and will be considered upon prior approval.

5.0 Certifications & Listings

- 5.1 Boiler shall be certified to CSA 4.9/ANSI Z21.13, AHRI.
- 5.2 Boiler shall be National Board registered.
- 5.3 Boiler shall be constructed in accordance with the American Society of Mechanical Engineers (ASME)
- 5.4 Boiler shall have an ASME H stamp that is applied to the Heat Exchanger. Each Heat Exchanger shall be independently reviewed by an ASME authorized inspector. A copy of the inspection report shall accompany the boiler. The boiler shall be rated for a maximum allowable working pressure of 150 MAWP. The boiler shall be equipped with a 50 psi relief valve

6.0 Construction

- 6.1 Boiler Heat Exchanger shall be a tubular construction helical coil with laser welded fins. The Heat Exchanger shall be constructed as one continuous piece of Stainless Steel Type 316 L coiled tube. The fins shall be constructed of Stainless Steel Type 444 and laser welded onto the tube utilizing a computer automated process. The Heat Exchanger shall be vertical mounted with a counter flow of water and flue gases.
- 6.2 Burner Components
 - 6.2.1 Gas Valve shall be negative regulation delivering the proper quantity of fuel based on the speed of the combustion air blower. The valve shall be able to operate at gas supply inlet pressures as indicated.

Gas Supply Pressure			
Natural Gas		Propane	
Min.	Max.	Min.	Max.
3.0" w.c. (0.7 kPa)	13.5" w.c. (3.3 kPa)	5.0" w.c. (1.2 kPa)	13.5" w.c. (3.4 kPa)

- 6.2.2 Combustion air blower shall be equipped with a variable speed blower to regulate the amount of premix gas/air through the blower assembly and into the burner. The on board control system shall regulate the speed of the blower to modulate the capacity of the boiler from 20% input firing rate up to 100% input firing rate.
- 6.2.3 Gas Burner shall be constructed of a stainless steel mesh.
- 6.2.4 Ignition system shall consist of a direct spark igniter (DSI) and separate flame sensing rod.

7.0 **Control System**

7.1 Boiler Control System. Boiler shall feature an integrated modulating control. The control shall sense the supply water, return water and outside air temperatures and adjusts the firing rate to deliver the amount of heat needed to the structure.

Boiler Control System must consist of:

- Replaceable fuse /extra spare fuse shipped with the control.
 - User interface with LCD screen display English text—boiler status indication .
 - Function Programming Keys - Reset, Menu, Enter and arrows (+ -).
 - Central Heating CH and Domestic Hot Water DHW set points. Domestic hot water priority with programmable maximum priority time .
 - Outdoor air sensor. Programmable reset curves and warm weather shutdown or fixed water temperature operation.
 - Boost function temperature setting and adjustable boost time .
 - Integral multiple boiler control capability up to 16 boilers. Requires an optional system sensor
 - Service reminder status display on the user interface with programmable settings in a range of 1 to 999 days
- 7.1.1 The control system shall continuously monitor the boiler during operation and standby modes. The control shall operate in such a manor to receive input data from the supply, return and outdoor air temperature sensors and adjust the modulation rate accordingly.
- 7.1.2 The Boiler's control system shall consist of the following safety devices factory installed on the boiler: manual reset high limit temperature function, vent temperature sensor, heat exchanger temperature limit, UL Listed probe type manual reset Low Water Cut Off (LWCO).
- 7.1.3 CSD-1 Compliant. Boiler meets manufacturer's interpretation of CSD-1 compliance. Consult authority having jurisdiction prior to installation.

8.0 **Primary Secondary Piping System**

8.1 Boiler shall be installed with external primary secondary piping configuration.

9.0 Combustion Air And Flue Vent Exhaust

- 9.1 The boiler shall allow for single pipe or direct vent installations. The venting shall be constructed of approved materials and installed as per the manufactures written instructions, plan drawings and all applicable local code authorities. Foam core pipe is not an approved vent material and Shall Not be used.
- 9.2 The combustion air inlet and flue gas exhaust shall directly connect to the boiler at the locations labeled. Boiler shall have the front removable jacket in place during operation. The jacket can be taken off during commissioning and service per the manufactures written service and kit instructions

10.0 Condensate Drain

- 10.1 Boiler shall be equipped with a corrosion resistance polypropylene flue collector. An internal drain trap is standard. Flue collectors manufactured out of stainless steel or cast aluminum are not acceptable. The drain line external to the boiler shall be constructed of approved materials and installed as per the manufactures written instructions, plan drawings and all applicable local code authorities.

11.0 Electrical Connections

- 11.1 Supply voltage 120 volts 60 HZ 12 amp minimum size circuit. Boiler shall have terminals for a boiler loop general pump, central heat system pump, and domestic hot water pump. The terminals for these pumps shall be rated for 120 volts with a 10 amp FLA connection.
- 11.2 The boiler shall have Line voltage and separate Low voltage terminal strips with clearly marked connections.

12.0 Quality Assurance

- 12.1 Warranty - The Boiler shall be supplied with a written manufactures 8 year limited warranty on the heat exchanger and 1 year on parts and controls supplied with the boiler.
- 12.2 Factory Testing – The boiler shall be factory fired tested and a combustion report available upon request.

13.0 Boiler Manuals

- 13.1 The boiler shall be provided with a complete set of instructions and reports as follows:
- Installation and Operation Manual (IOM)
 - Repair Parts Manual
 - User's Manual
 - Kit Instructions for field installed optional devices