SUGGESTED SPECIFICATIONS

PEERLESS®
PUREFIRE®

Peerless® PureFire® High Efficiency Stainless Steel Boilers: PF-1500

1. GENERAL
   1.1. SECTION INCLUDES:
      A) Condensing Boilers
      B) Boiler Controls
   1.2. REFERENCE STANDARDS:
      A) American Society of Mechanical Engineers
         - ASME Boiler & Pressure Vessel Code, Section IV – Rules for Construction of Heating Boilers
         - ASME CSD-1 – Controls and Safety Devices for Automatically Fired Boilers
      B) American National Standards Institute
         - ANSI Z21.13/CSA 4.9 – Standard for Gas-Fired Low Pressure Steam and Hot Water Boilers
      C) Air conditioning , Heating and Refrigeration Institute
         - BTS 2000 Testing Standard – Method to Determine Efficiency of Commercial Space Heating Boilers
      D) National Fire Protection Association
         - NFPA 54 – National Fuel Gas Code
   1.3. SUBMITTALS:
      A) Product Submittal Sheet: Provide submittal data sheet which lists performance, features, standard equipment and optional equipment
      B) Capacities and Pressure Drop: Provide total water capacity, expected pressure drop, gas pressure range, maximum length of vent/air intake piping and shipping weight.
      C) Dimensional Drawings: Provide detailed dimensional drawings that show overall length, width and height along with locations of all water, exhaust, air inlet, gas inlet and condensate drain connections.
      D) Manufacturer's Instructions: Provide Installation, Operating and Maintenance Instructions, including detailed wiring diagrams showing all required electrical connections.
      E) Electrical Ratings: Provide electrical supply specifications including current draw of the appliance and maximum rated draw of circulating pumps.
   1.4. Regulatory Requirements:
      A) Boiler pressure vessel to be designed, constructed and tested in accordance with Section IV of the ASME Boiler and Pressure Vessel Code entitled, "Rules for Construction of Heating Boilers".
      B) ETL Listed in the United States and Canada. Certified in accordance with ANSI Z21.13/CSA 4.9 by Intertek Testing Services NA Inc.
      C) Each boiler shall be listed in the AHRI Certification Directory and shall bear the AHRI Certified Logo.
      D) Designed to meet ASME CSD-1 requirements for Controls & Safety Devices without additional separate equipment.
      E) Tested by Gas Consultants, Inc. in accordance with Rule 1146.2 Administrative Certification Program for California's South Coast Air Quality Management District (SCAQMD) for NOx Compliance (14 ng/J or 20 PPM corrected to 3% O_2).
   1.5. QUALITY ASSURANCE:
      A) Each boiler is supplied with a Manufacturer's Data Report for Watertube Boilers, Form H-3, which provides full traceability of all pressure vessel parts to their raw materials.
      B) Each boiler is factory tested by the manufacturer to assure proper operation of the heating system.
         - The factory testing includes testing of each burner individually and both burners together at low fire and high fire.
         - A factory test report showing the satisfactory results of all combustion and controls tests is supplied with each boiler.

1.6. WARRANTY:

A) 10 year limited Heat Exchanger warranty.

B) 1 year parts warranty

C) 1 year labor warranty (registered providers)

D) Available extended service plans

2. PRODUCTS

2.1. MANUFACTURERS:

A) PB Heat, LLC, Manufacturers of Peerless Boilers

B) Approved equal conforming to these specifications.

2.2. PERFORMANCE:

A) Full Load Thermal Efficiency 96% minimum as tested in accordance with BTS-2000, Method to Determine Efficiency of Commercial Space Heating Boilers by AHRI.

B) Fully Modulating boiler(s) with 10:1 input turndown ratio capability.

2.3. CONSTRUCTION:

A) Fully assembled, packaged, watertube, condensing boiler design certified for zero clearance to combustible construction and approved for installation on combustible floors.

B) Pressure vessel to be designed, constructed and tested in accordance with Section IV of the ASME Boiler and Pressure Vessel Code for a maximum allowable working pressure of 160 psig and a maximum temperature of 210°F.

C) All heat exchanger surfaces must be constructed of high grade stainless steel to prevent corrosion due to acidic condensation.

D) The heavy gauge jacket and support structure shall be factory designed to allow stacking of identical units up to two high.

E) The boiler shall have removable jacket panels to allow access for cleaning, inspection and service.

F) The heat exchanger shall be designed with dual combustion chambers to facilitate dual combustion systems.

G) Leveling legs shall be provided to assure level installation of the boiler on uneven floors allowing for proper condensate drainage.

H) The exhaust connection shall be 7” stainless steel with a factory supplied adapter to 8” PVC.

I) The air inlet connection, if required, shall be suitable 8” PVC or 7” diameter metal pipe.

J) The water connections shall be 2 ½” NPT supply (outlet) and return (inlet).

K) The gas inlet connection shall be a minimum of 1-1/2” NPT.

L) Connection for the condensate drain shall to be a 3/4” hose barb fitting.

M) Maximum dimensions : 46” high x 27” wide x 61” Long

2.4. COMBUSTION SYSTEM:

A) A dual, tandem, fully modulating, combustion system shall be provided to provide a maximum boiler turndown ratio of 10:1.

B) Pneumatic gas valves shall be used to provide a consistent fuel/air ratio throughout the modulation range. The valve is to be mounted on the inlet to the combustion air fan to provide a thorough fuel/air mixture.

C) Combustion air fans shall be powered by an electronically commutated brushless DC motor controlled with a pulse width modulated input with a tachometer feedback to the control system.

D) Combustion air fans shall have integral venturi mixers to maximize fuel input capability with minimum electrical energy input.

E) Ported, cylindrical, premix burner heads with a metal mesh sleeves shall be used in each combustion chamber.

F) Flame supervision on each burner shall be through both the flame sensor and the ignition electrode for reliable operation.

G) Ignition of the main flame shall be achieved by a direct spark from a high energy ignition system.

H) Each combustion system shall incorporate a “flapper” valve to prevent back flow of combustion gases through an inactive burner while the other burner is operating.

2.5. ELECTRICAL:

A) Electrical control cabinet with removable terminal strips for easy connection of power supply wiring, circulating pumps, outdoor sensor and central heating and/or domestic hot water demand signal wires.

B) Electrical knockouts on the rear jacket support panel for all required component connections.

C) Two service switches for interrupting power to individual control circuits.

2.6. CONTROL:

A) Dual integrated control systems to provide primary safety functions, temperature operating control and burner sequencing.

B) Integrated manual reset high limit and low water cutoff inputs to meet CSD-1 requirements.

C) Factory installed high and low gas pressure switches.

D) Factory installed vent temperature limit switch.

E) Plain English display interface to explain burner operation and current status of each burner

F) Front pixel display shows status, current supply temperature, target temperature, modulation rate of each burner, outdoor temperature, boiler demand type.

G) Easy access to status of all connected boilers through the master boiler pixel display.

H) Dual temperature operation to allow one boiler reset temperature target and one setpoint target for domestic hot water input. Configurable for two fixed setpoints if required.

I) Factory equipped to allow control and sequencing of up to 16 boilers.

J) Factory equipped for connection to serial communication (Modbus) from building management systems.

K) Factory equipped with alarm contacts for remote annunciation of fault conditions.

L) Installer/Service Menu allows flame signal status, logging of flame signal during the last ignition sequence, fault history, service notification, presets for reset calculation parameters.

M) Control features for efficient operation:

- Warm Weather Shutdown
- Anti-Cycling Logic
- DHW Tank Warm Hold
- Temperature Boost

N) Central Heating Modes: Multiple central heating modes

O) Domestic Hot Water Modes: Multiple domestic hot water modes

2.7. EXHAUST/AIR INLET:

A) Boiler(s) shall be suitable for direct, positive pressure exhaust operation with outside or indoor air.

B) Boiler(s) shall include a stainless steel drain tee (shipped loose) with condensate connection to the neutralization system.

C) Boiler(s) shall be designed to allow a single vent connection from a standalone boiler and common venting from multiple boilers.

D) Boiler(s) shall incorporate a vent temperature sensor with control logic to limit the boiler input to regulate vent temperature if a problem should occur.

2.8. CONDENSATE SYSTEM:

A) Boiler(s) are to include built-in condensate trap with neutralization

B) The condensate collector shall allow visual inspection of neutralizer charge.

C) Boiler(s) shall incorporate a blocked condensate switch to prevent operation condensate to back up into the combustion area.

2.9. ADDITIONAL COMPONENTS (LOOSE):

A) ASME Rated pressure relief valve rated for the full input of the boiler at 30 psig relief pressure.

B) Hardware required to mount relief valve to supply connection

C) Temperature/Pressure Gauge – 0-320°F & 0-75 psig, 2 ½" Diameter

D) 7" Stainless steel boot tee with test port and condensate drain

E) 7" Stainless steel to 8" PVC Adapter

F) Outdoor Sensor

G) Hardware for stacking boilers