

**RECOMMENDED SPECIFICATIONS FOR
PARKER WATER WALL DIRECT FIRED HOT WATER BOILERS
GAS, OIL, LOW NOX OR COMBINATION GAS/OIL FIRED**

SECTION 15559: STEEL WATER TUBE BOILERS

PART I: GENERAL

1.01 PROCUREMENT SPECIFICATION FOR BOILER

1.02 DIVISION 16: ELECTRICAL

1.03 REFERENCES

- A. CSA: Directory of Certified Appliances and Accessories
- B. ANSI Z21.13: Gas-Fired Low-Pressure Steam and Hot Water Boilers
- C. ASME SEC I: Boiler & Pressure Vessel Codes, Rules for Construction of Power Boilers
- D. ASME SEC IV: Boiler and Pressure Vessel Codes, Rules for Construction of Heating Boilers
- E. ASME SEC VIII: Boilers and Pressure Vessel Codes, Rules for Construction of Pressure Vessels
- F. NFPA 54 (AGA Z223.1): National Fuel Gas Code
- G. NFPA 58: Storage and Handling of Liquefied Petroleum Gases
- H. NFPA 70: National Electrical Code
- I. UL 795 & 726: Gas and Oil Equipment Directory
- J. Title VIII: California Code of Regulations
- K. Underwriters' Laboratories, Inc. (UL) Listed Products, UL Standard 795, for Commercial Industrial Gas Heating Equipment
- L. Intertek Testing Laboratories (ETL)

1.04 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum twenty years experience.

1.05 REGULATORY REQUIREMENTS

- A. Conform to applicable code for internal wiring of factory wired equipment.
- B. Units: ETL or UL listed as complete gas fired boiler assemblies.
- C. Gas Train shall comply with UL Standard 795 & ASME CSD-1. FM Approved option.
- D. Conform to ASME Section I & IV for boiler construction.
- E. Oil models shall be listed as oil fired boiler assemblies to UL standard 296.
- F. Units under 2MM BTU input shall be pre certified to SCAQMD Rule 1146.2

1.06 DELIVERY, STORAGE, RIGGING, MOVING, AND PROTECTION

- A. Transport, handle, store, and protect products to point of delivery and receiving (by contractor).
- B. Coordinate shipping dates and off-loading requirements with installing contractor prior to shipment.
- C. Protect boilers and accessories before, during, and after installation from damage to casing by leaving factory shipping packaging in place until immediately prior to final acceptance.

1.07 WARRANTY

- A. Manufacturer's Warranty: Provide non-prorated warranty for not less than 20-years against damage caused by thermal shock at all normal operating conditions.
- B. Provide a 5-year prorated warranty from the date of start-up or 15-mos. from ship date against defects in workmanship and materials on the pressure vessel.
- C. Provide a minimum 1-year Parts Warranty from date of start-up, or 15-months from ship date.

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PART 2: EQUIPMENT

2.01 BOILERS

A. MANUFACTURER

1. Parker Boiler Co., Model G _____ R _____ (L) (L if Low Nox)

B. MANUFACTURED UNITS

1. The boiler shall be flexible bent steel, water tube design with Water Wall Furnace. The heater shall be fired with _____ fuel(s) , _____ BTUH input rating, _____ BTUH output rating, and shall be furnished complete and assembled, factory fired and tested with controls and trim, mounted and wired. Minimum heating surface of _____-square feet.
2. Electrical Characteristics as shown on drawings.

C. CODES & STANDARDS

1. The heater shall be manufactured in accordance with the ASME Section I & IV Code, and registered with The National Board of Boiler and Pressure Vessel Inspectors, for a minimum pressure of 125 PSI MAWP.. Relief valve to be furnished for _____ PSI pressure and operating controls for 240°F maximum temperature, or 350°F maximum temperature. Furnish with "H" Stamp Section IV, or "S" Stamp Section I. All controls trim shall be in compliance with UL Standards. Power Gas, Oil and Combination Gas/Oil Boilers are furnished with a UL Listed Burner.

D. CONSTRUCTION

1. The boiler shall be of the bent water tube design with carbon steel tubes of minimum wall thickness 0.12” (11GA) 1-5/16” O.D welded to top and bottom headers with high tension weld metal. End of Headers to have accessible inspection openings. Tubing shall be staggered to provide a minimum of 8-pass self-baffled heating surface. The tubes shall be of the bent design to permit free expansion and contraction. Tube shall be bent to create a water wall furnace.

The tube bundle shall be mounted on a modular cabinet frame consisting of a carbon steel 12 gauge base with fork lite receivers, 12 gauge corner posts and 14 gauge side, top and back wall panels. The burner mounting flange is 10 gauge The cabinet shall be painted with a black polyurethane over a phosphate washed surface. The back panel shall be easily removable for combustion chamber and burner inspection and shall incorporate a burner site glass.

The cabinet sides front & back walls shall be insulated with high temperature vacuum formed alkaline-earth silicate material backed up with 3” of high temperature mineral wool insulation.

Cabinet top to consist of inner and outer 14 gauge steel with 1-1/2” of high temperature mineral wool insulation.

All cabinet panels to be removable

2. The boiler shall be furnished complete with controls and trim to provide safe, efficient operation. standard trim items furnished with the boiler shall include electronic flame safety with electric ignition, barometric damper with flue gas spillage switch, safety relief valve, temperature and pressure gauge, operating temperature control, manual reset high-limit temperature control and Warrick Probe type manual reset low water cutoff with test and reset buttons. The boiler shall be furnished with an enclosed boiler control panel with boiler controls and main burner switch. The Gas Train shall consist of inlet and downstream manual shut off valves, gas pressure regulator and two automatic safety valves. On some gas trains, valves are combined.

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E. FACTORY TRIM OPTIONS

1. California Code Trim
2. Mc Donnell Miller Secondary float level control.

F. LOW NO_x BURNER FOR 20 PPM NO_x

The boiler shall incorporate a fan assisted combustion system with a Metal Fiber Burner. The burner shall be linked to a single fan through a gas air premix manifold. The premix burner shall provide a high degree of NO_x level repeatability once system is adjusted.

The burner shall be capable of generating Low NO_x without generating significant CO emissions. NO_x emissions are guaranteed less than 20 PPM at 3% O₂ with CO emissions guaranteed less than 100 PPM @ 3% O₂.

The burner shall consist of a Metal Fiber hot face made from a iron chromium alloy. The Metal Fiber shall be backed by a layer of stainless steel. The Metal Fiber Burner shall provide a high degree of resistance to mechanical and thermal shock, fast cool down and corrosion resistance. Maximum pressure drop through burner at normal firing rates shall be 1.25" W.C.

A Lox Nox gas air mixing system which distributes a ratio-controlled gas/air mixture to the burner shall be utilized. Blower construction shall be non-sparking with totally enclosed motor. The gas air ratio shall be controlled through the throttling range by a fuel valve supplied as part of the gas train.

Provide single inlet variable speed blower with filter. Gas shall be injected downstream of the blower or at the blower air inlet. Air proving switch, blower VFD/starter and heat roll out switch shall be provided. Programming flame safeguard with interrupted pilot shall be provided. Unit shall be listed to UL Standard 795.

G. POWER, GAS FIRED BOILERS

The boiler shall be equipped with a gas burner, which is listed by Underwriters' Laboratories and displays the listing label. All controls and trim shall be in compliance with UL Standard 795. The burner shall be suitable for use with natural gas. The burner shall be complete with electronic flame safeguard, air pressure switch, blower motor and controls with On/Off or two-stage firing. A gas pilot of the premix type with electric ignition shall provide reliable ignition.

H. OIL FIRED BOILERS

The boiler shall be equipped with an oil burner, which is listed by Underwriters' Laboratories and displays the listing label. All controls and trim shall be in compliance with UL Standard 296. The burner shall be the high pressure atomizing type approved for operation with A.S.T.M. D396 Commercial No. 2 Oil, and shall be complete with electronic flame safeguard with electric spark ignition. Furnished with On/Off or two-stage firing, two (2) main oil valves, oil pump, nozzles, blower motor and starter, air pressure switch control for automatic firing, provided as standard.

I. COMBINATION GAS/OIL FIRED BOILERS

The boiler shall be equipped with a combination gas/oil burner, which is listed by Underwriters' Laboratories and displays the listing label. All controls and trim shall be in compliance with UL Standards 296 and 795. The burner shall be suitable for use with either natural gas or oil, meeting standards of A.S.T.M. D396, Commercial No. 2 Oil. Fuel change-over shall be accomplished by a fuel selector switch. The burner shall be complete with electronic flame safeguard, oil pump, nozzles, blower motor and starter, air pressure switch control for modulating or two-stage firing. A gas pilot of the premix type with electric ignition shall provide reliable ignition of both the gas and oil flame. Gas train components per Item 2.01 D.

2.02 PERFORMANCE

Performance rating shall be in accordance with UL Testing and Rating Standard.

2.03 VENTING

Gas fired boilers for temperatures up to 250°F are suitable for type “B” vent material. (if stamped boilers, oil fired boilers or high temperature boilers for temperatures over 250°F shall utilize A UL listed or factory built chimney.

PART 3: EXECUTION

3.01 MANUFACTURER'S OR MANUFACTURER'S REP FIELD SERVICES

- A. The manufacturer or manufacturer's rep shall provide factory-trained technicians to properly start-up the equipment for maximum performance. Boiler shall be started and tested throughout entire firing range. Systems shall be tested in the presence of the designated owner's representative to demonstrate the system operation. Provide start-up report to the owner.
- B. Instruct operating personnel in operation and maintenance of units.