

**RECOMMENDED SPECIFICATIONS FOR  
PARKER TC SERIES CONDENSING HOT WATER BOILERS  
GAS FIRED, OPTIONAL LOW NOX**

**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 IV: Boiler and Pressure Vessel Codes, Rules for Construction of Heating Boilers
- D. ASME SEC VIII: Boilers and Pressure Vessel Codes, Rules for Construction of Pressure Vessels
- E. NFPA 54 (AGA Z223.1): National Fuel Gas Code
- F. NFPA 58: Storage and Handling of Liquefied Petroleum Gases
- G. NFPA 70: National Electrical Code
- H. UL 795 & 726: Gas and Oil Equipment Directory
- I. Title VIII: California Code of Regulations
- J. Underwriters' Laboratories, Inc. (UL) Listed Products, UL Standard 795, for Commercial Industrial Gas Heating Equipment
- K. Intertek Testing Laboratories (ETL)

**1.04 QUALIFICATIONS**

- A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum five 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 IV for boiler construction.
- E. Units to bear ASME "H" Stamp and be National Board Registered.
- F. Low Nox 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: The boiler pressure vessel and cabinet are covered by a 5 year prorated warranty. The first year coverage is 100% and the coverage decreases 20% per year after that. The Boiler Trim, Burner and Controls are covered by a 1 Year Warranty subject to review by the original manufacturer. Proper operations and maintenance as well as ongoing water treatment per instructions are required.

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### PART 2: EQUIPMENT

#### 2.01 BOILERS

##### A. MANUFACTURER

1. Parker Boiler Co., Model TC (L) if Low Nox.

##### B. MANUFACTURED UNITS

1. The boiler shall be stainless and carbon steel, Firetube design with Water 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 IV Code, and registered with The National Board of Boiler and Pressure Vessel Inspectors, for a minimum pressure of 79 PSI MAWP.. Relief valve to be furnished for 75 PSI pressure and operating controls for 180 F normally and 201 °F maximum temperature,. Furnish with "H" Stamp Section IV.  
All controls trim shall be in compliance with UL Standards.  
The complete boiler shall be ETL Listed in the United States and Canada as a complete Gas Fired Boiler Assembly. Listing to be UL Standard 795 and Canadian Standard CAN1 3.1-77.

##### D. CONSTRUCTION

1. The boiler shall be a steel triple flue pass, condensing type for installation in a boiler room. The TC Boiler is designed primarily for central heating purposes, in conjunction with a suitable storage cylinder they can also be used to produce domestic hot water.

All parts that come into contact with the combustion gases are made from stainless steel to ensure maximum resistance to the corrosive action of acid condensation.

The boiler shall have a high total water content which is differentially distributed between its top and bottom sections. This allows outgoing water to reach the set temperature quickly while maintaining the condensing effect and the water heating time around the tube bundle for as long as possible.

The boiler shall have a lightly pressurized combustion chambers for a smooth burner action, and high temperature resistant, stainless steel turbulators shall be located inside the tube bundle for maximum burner efficiency.

The boiler body is thoroughly insulated with a 2” layer of high density glass wool. The paint finished external paneling which is 18 gauge is also internally insulated with a layer of high density glass wool.

The boiler’s front door and the flue gas chamber can be opened completely to facilitate inspection, maintenance and cleaning of internal parts and to speed up servicing in general.

The front door can open in either direction and can be opened without removing the burner.

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, 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 Also provided is a high condensate level cutoff system and block flue switch.. 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.

#### **E. LOW NO<sub>x</sub> BURNER FOR 20 PPM NO<sub>x</sub>**

The boiler shall incorporate a forced draft premix combustion system with a Metal Fiber Burner. The burner shall be linked to a fan through a gas air premix manifold. The premix burner shall provide a high degree of NO<sub>x</sub> level repeatability once system is adjusted.

The burner shall be capable of generating Low NO<sub>x</sub> without generating significant CO emissions. NO<sub>x</sub> emissions are guaranteed less than 20 PPM at 3% O<sub>2</sub> with CO emissions guaranteed less than 100 PPM @ 3% O<sub>2</sub>.

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 1.75" 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 shall be provided. Programming flame safeguard with interrupted pilot shall be provided. Unit shall be listed to UL Standard 795.

#### **F. POWER, GAS FIRED BOILERS**

The boiler shall be equipped with a gas burner, which is listed by CSA or 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 or LPG gas. The burner shall be complete with electronic flame safeguard, air pressure switch, blower motor and controls with on/off two-stage firing, or modulating. A gas pilot of the premix type with electric ignition shall provide reliable ignition.

#### **G. FACTORY TRIM OPTIONS**

1. Firing Type
  - (A) On/off for under 1.0MM BTUH only
  - (B) Two stage
  - (C) Modulating with digital operating control
2. California Code Trim
3. All-Limit Alarm 4" Bell
4. All-Limit Alarm Terminals (dry contacts)
5. Anchor Clips, 4 mounted and drilled
6. Remote start-stop relay (24 VAC in from EMCS)
7. Factory Mutual Gas Train (FM Trim)
8. Flow switch loose for field mounting and terminals
9. LPG firing (ETL Listed)
10. Condensate neutralizing kit

**2.02 PERFORMANCE**

Performance rating shall be in accordance with UL Testing and Rating Standard. Unit shall be listed on AHRI Directory of Certified Hot Water Boilers.

**2.03 VENTING**

TC series condensing boilers must use Category IV vent material. Use only special AL429C series Stainless Steel vent.

**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.

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