

V9 SERIES PRESSURE FIRED BOILER-BURNER UNIT SUGGESTED SPECIFICATIONS

Note: To use as a project specification:

- A. Insert, in the blank spaces provided, the applicable model number, capacity, fuel, and electrical data.
- B. Delete the item in parentheses or marked “*” which are not applicable to the project requirements.
- C. Insert, where applicable, optional non-standard features desired.

1. GENERAL SPECIFICATION

Contractor shall furnish and install, where indicated on the drawings, _____ (quantity) Model V-9 _____ A, _____ (steam or water), _____ (#2 Oil, Nat. or LP Gas, #2 Oil and Nat. or LP Gas) pressure fired boiler-burner unit(s), having an I=B=R approved gross output of _____ MBH per boiler and a net rating of _____ MBH with an I=B=R burner capacity of _____ MBH (Gas) _____ GPH (#2 Oil). Boiler(s) shall be constructed of cast iron sections manufactured in accordance with ASME requirements for low pressure boilers and each section shall be permanently marked with the ASME symbol and the maximum allowable working pressures. The boiler-burner unit shall not require a refractory combustion chamber and the sections shall be of wet base construction. Further, the boiler-burner unit shall be designed so that only a vent shall be required that extends only 3 feet above the highest point of the roof.

2. BOILER EQUIPMENT SPECIFICATION

- *2.1 The boiler shall be furnished as a knocked down unit for field erection according to the manufacturer's instructions.
 - *(NOTE TO SPECIFIER: The V9 boiler-burner unit is shipped as standard with sections unassembled. However, if job conditions permit, the following options are available.
- *2.2 The boiler shall be furnished as a factory assembled and water tested section assembly with the jacket, burner, and controls shipped separately.
- *2.3 The boiler shall be furnished as a factory packaged boiler with jacket, burner, and controls mounted and wired. Boiler shall be mounted on a steel shipping skid and entire package shall be shrink wrapped.
- *2.4 Factory packaged boiler shall be factory firetested.
- 2.5 Boiler shall be equipped with a flange mounted flame retention forced draft burner that has been designed and tested for a minimum of 82% (Gas fired) and/or 84% (Oil fired) combustion efficiency based on I=B=R testing procedure.
- 2.6 The boiler-burner mounting plate shall be lined with lightweight refractory insulation and shall have built-in observation port with closure cover.
- 2.7 Boiler sections shall have pin-like projections on each center section, evenly spaced on the vertical flue surfaces to extract the greatest possible heating value from the hot flue gases.
- 2.8 Boiler sections shall be surface ground to ensure smooth positive mating surfaces.
- 2.9 Boiler sections shall be assembled with precision machined cast iron push nipples, pressed into a mating machined nipple port in the section eliminating the need for any gasket material which would be subject to deterioration due to corrosion or oil based chemicals. The sections are to be assembled with short draw rods.
- 2.10 A gas-tight seal, which is imperative for forced draft boilers, will be achieved with the application of a silastic sealant in a finished ground groove between sections.

- 2.11 Washout tappings shall be provided in both the front and back boiler sections. Blowoff tapping shall be provided in the back boiler section.
- *2.12 The front section of the boiler shall have (2) ½” gauge glass tappings for steam; thus eliminating the need for a separate external type water column.
- *2.13 The boiler shall be furnished with a 1-1/2” crown inspection/washout tapping on each side of each section. Each tapping shall be furnished with a brass square head plug.
- *2.14 Water boiler sections shall be individually hydrostatically tested for 80 psi water working pressure in accordance with ASME Code Section IV.
- *2.15 Steam boiler sections shall be hydrostatically tested in accordance with ASME Code Section IV.
- 2.16 Boiler shall have individual cleanout openings between sections covered with insulated steel covers to insure a gas-tight seal.
- 2.17 Boiler flue canopy shall be constructed of heavy gauge aluminized steel and shall be concealed under an insulated steel boiler jacket.
- 2.18 The boiler flue connector shall be (rear)(top) outlet and securely fastened and sealed to the canopy and shall contain a lock-type adjustable damper with test tapping.
- 2.19 The boiler jacket shall be constructed of heavy gauge steel with 1” insulation and have a rust resistant baked enamel finish. The jacket shall be capable of being installed after system piping has been connected to the boiler section assembly. Jacket will have removable side panels so that the jacket can be removed for cleaning without removing any screws or disturbing the system piping.
- 2.20 The boiler shall be furnished with a rear flame observation port (spring loaded pressure relief door with built-in observation port - optional).
- *2.21 Water boiler trim shall include a 3-1/2” round pressure-temperature gauge with separated scales for pressure and water temperature. In addition, an ASME approved safety relief valve shall be furnished sized to exceed the boiler gross output capacity and shall be factory set to relieve pressure at (30) (50) (80) psi.
- *2.22 Steam boiler trim shall include a 3-1/2” round steam pressure gauge with internal siphon device. A water level gauge glass shall be furnished with a flush and drain valve in bottom connection. In addition, an ASME approved safety valve shall be furnished with side outlet porting set to relieve pressure at 15 psi. The safety valve shall be sized to exceed the gross output of the boiler.
- *(**NOTE TO SPECIFIER:** Tankless heaters for domestic water supply are available for the V-9 steam or water boilers. Because of the wide variety of ratings (6.75 to 30.0 GPM), dependent on boiler size, please refer to current V-9 literature or trade price book for exact quantity, heater number rating and control arrangements available. If a tankless heater is desired, we suggest the following paragraph be added.)
- *2.23 The boiler shall include _____ (quantity) tankless heater(s) number V9-2 with a total continuous draw rating of _____ GPM of water raised from 40° to 140°F with 200°F boiler water temperature.
- *2.24 Boiler shall be manufactured of flake graphite/eutectic cell/ cast iron sections which shall have been subjected to a hydrostatic pressure test of 2-1/2 times MAWP at the factory before assembly and each section shall be marked, stamped or cast with the ASME Code symbol. After section assembly, the entire block of sections shall be hydrostatically tested at 1-1/2 times MAWP prior to shipment. Boiler shall be designed in accordance with the ASME Boiler and Pressure Vessel Code Section IV requirements.

3. BOILER CONTROLS

- 3.1 High limit control (a) or (b) below:
 (a) shall be automatic reset type suitable for 115 volt 60 Hz.

(b) shall be manual reset type suitable for 115 volt 60 Hz.

- 3.2 A separate operating control shall be furnished by the contractor in addition to the high limit control and shall be automatic reset type suitable for 115 volt 60 Hz.
- 3.3 A low water cut-off shall be furnished and sized on the basis of boiler capacity and pressures involved. Some of the most commonly used are listed below:

For Water Boilers up to 50 PSI W.P. or Steam Boilers up to 15 PSI W.P.:

McDonnell & Miller No. 63 (Automatic Reset), No. 63M (Manual Reset)
McDonnell & Miller No. 64 (Automatic Reset)
McDonnell & Miller PS851 Probe Low Water Cut-off (Automatic Reset)
McDonnell & Miller 750P-MT Probe Low Water Cut-off (Manual Reset)
McDonnell & Miller No. 53-2 Low Water Cut-off and Water Feeder (Automatic Reset),
No. 53-2M (Manual Reset)

For Water Boilers up to 80 PSI W.P. or Steam Boilers up to 15 PSI W.P.:

McDonnell & Miller No. 150 Low Water Cut-off and Pump Control (Automatic Reset),
No. 150M (Manual Reset)
McDonnell & Miller PS851 Probe Low Water Cut-off (Automatic Reset)
McDonnell & Miller 750P-MT Probe Low Water Cut-off (Manual Reset)

For Steam Boilers up to 15 PSI W.P. Only:

McDonnell & Miller No. 64 Low Water Cut-off (Automatic Reset)
McDonnell & Miller No. 63 (Automatic Reset), No. 63M (Manual Reset)
McDonnell & Miller No. 47-2 Combination Low Water Cut-off and Water Feeder
(Automatic Reset), No. 47-2M (Manual Reset)
McDonnell & Miller No. 51-2 Combination Low Water Cut-off and Water Feeder
(Automatic Reset), No. 51-2M (Manual Reset)
McDonnell & Miller No. 150 Low Water Cut-off and Pump Control (Automatic Reset),
No. 150M (Manual Reset)

*3.4 Boiler controls shall be provided that meet the requirements of (FM) (IRI) (ASME CSD-1).

4. ELECTRICAL SUPPLY

Electrical supply to the boiler(s) will be _____ volts _____ Hz _____ phase. All control circuits shall be 120 volts, 60 Hz, 1 phase, with all switches in the ungrounded leg. Fuse protection for the control circuit shall be provided.

5. FUEL BURNING EQUIPMENT

The burner(s) shall incorporate all necessary devices and controls to make a complete fuel burning system for the type of fuel hereinbefore specified, and shall bear the listing label of Underwriters Laboratories, Inc.

- *5.1 The oil burner(s) shall be model number _____ as manufactured by _____ (Beckett, Carlin, Gordon-Piatt, Power Flame). The burner shall be designed for No. 2 oil and shall be of the forced-draft pressure-atomizing type. The oil burner shall be furnished with an integral motor-driven blower, two stage oil pump, oil nozzle(s), oil solenoid valve(s), direct spark ignition assembly and a primary control which utilizes a cadmium sulfide flame detector.

Optional Equipment

- The burner shall be provided with a prewired control panel containing the burner primary control, a power on light and a fuel on light.

- The burner shall be arranged for (on-off) (low-high-off) (low-high-low) (full modulation with manual potentiometer) operation.
- The burner shall be in accordance with (FM) (IRI) (ASME CSD-1) requirements.

Note: Insert additional details and or features to meet project requirements and local codes and authorities.

- *5.2 The gas burner(s) shall be model _____ as manufactured by _____ (Gordon-Piatt, Power Flame). The burner shall be of the forced-draft multi-jet type suitable for burning _____ (natural) (LP) gas with the heat content of _____ BTU per cubic foot and a specific gravity of _____ delivered to the gas train inlet at a pressure of _____ inches water column (w.c.) or _____ psig. The gas burner shall be furnished with an integral motor driven blower, combustion safeguard control with pre-purge timing, air flow safety switch, proven intermittent gas pilot and complete gas train, including gas pressure regulator and dual gas valves.

Optional Equipment

- The burner shall be provided with a pre-wired control panel containing the combustion safeguard, a power on light and a fuel on light.
- The burner shall be arranged for (on-off) (low-high-off) (low-high-low) (full modulation with manual potentiometer) operation.
- The burner shall be in accordance with (FM) (IRI) (ASME CSD-1) requirements.

Note: Insert additional details and/or features to meet project requirements and local codes and authorities.

- *5.3 The combination gas/oil burner shall be model number _____ as manufactured by _____ (Gordon-Piatt, Power Flame). The burner shall consist of an integral assembly of a forced-draft pressure-atomizing oil burner suitable for burning No. 2 oil and a forced-draft multi-jet type gas burner suitable for burning _____ (natural) (LP) gas with a heat content of _____ BTU per cubic foot and specific gravity of _____ delivered to the gas train inlet at a pressure of _____ inches water column (w.c.) or _____ psig. The gas/oil burner shall be furnished with a pre-wired control panel containing the combustion safeguard control with pre-purge timing and ultra violet flame detector. The burner shall be complete with integral motor-driven blower, two stage oil pump, oil nozzle(s), oil solenoid valve(s), proven interrupted gas pilot of both fuels, air flow safety switch, and complete gas train including gas pressure regulator and dual gas valves.

Changeover to either fuel shall be by means of a manual selector switch, which shall energize only those circuits necessary to provide the appropriate timing and sequence of events for the fuel selected, except that the oil pump may continue to operate when firing gas. No burner adjustments or re-positioning of control linkage shall be required when changing from one fuel to the alternate fuel.

Optional Equipment

- The burner shall be arranged for (on-off) (low-high-off) (low-high-low) (full modulation with manual potentiometer) operation.
- The burner shall be equipped with direct spark ignition of oil.
- The burner shall be in accordance with (FM) (IRI) (ASME CSD-1) requirements.

Note: Insert additional details and/or features to meet project requirements and local codes and authorities.