

# Triple-Flex Series

## Ultra High Efficiency Condensing Water Boilers Forced Draft Gas Fired

The boiler shall be a Bryan **TRIPLE-FLEX** Ultra High Efficiency Condensing Flexible water tube boiler. Model \_\_\_\_\_ with a capacity of \_\_\_\_\_ BTUH input and \_\_\_\_\_ BTUH output. (\_\_\_HP)

The boiler manufacturer shall guarantee a minimum of 90% thermal efficiency at 160° F return water and 180° F supply water (20° F rise)

The boiler shall be constructed and assembled as a complete package bearing the UL / C-UL listing mark. The package boiler shall be equipped as standard to meet the intent of CSD-1, FM and GE-GAP specifications. Boiler shall be ready for field connections to the water supply, return connection, electrical power supply, fuel supply, relief valve discharge, building management controls and flue-gas vent.

The water boiler shall be manufactured in strict accordance with the ASME Heating Boiler Code, Section IV, and shall bear the ASME "H" stamp for a maximum working pressure of 160 PSIG at 210° F temperature.

The boiler shall also be built to withstand 100° F delta "T".

The boiler shall have no less than 9 sq. feet of heating surface per boiler horsepower.

### VESSEL AND TUBE CONSTRUCTION

The boiler shall be constructed on a heavy steel frame. The # 316L stainless steel boiler pressure vessel shall be provided with adequately sized upper and lower drums. And includes # 316L stainless steel water tubes that are to be 1 ½" O.D, in two different tube pass configurations: furnace section - 8 pass tube convection section -10 pass tube. All tubes are flexible serpentine bend design, not subject to thermal shock damage. Each individual water tube shall be easily removable and replaceable without either welding or rolling. The boiler shall have no more than two tube configurations. The boiler shall be furnished with an adequate number of tappings and full size inspection openings to facilitate internal boiler inspection and cleaning.

### FLUE COLLECTOR CONSTRUCTION

The boiler shall be provided with four distinct flue gas chambers. All doors shall be individually removable and shall be affixed to the pressure vessel frame with fully gasketed attachments for pressurized firing.

The boiler combustion chamber shall be primarily of water-wall design with an access door opening of no less than 22" wide x 59" high to allow for inspection of the interior chamber and the burner head. The stationary interior wall shall be lined with 2" high temperature ceramic fiber blanket insulation. The front and rear walls are insulated with 2" mineral fiber mono block covered by 2" high temperature ceramic fiber blanket insulation.

The boiler convection chambers (two) shall be primarily of water-wall design with access via a single door opening for inspection of the interior.

The boiler pre-heater chamber shall utilize a integral air to air heat exchanger to pre-heat the combustion air with flue gases for maximum efficiency. Access to the heat exchanger shall be via a single large opening for inspection.

The boiler flue gas chambers shall be designed to operate at a positive 0.20" w.c. at the boiler flue outlet. The boiler will require a "positive pressure AL 29-4 C stainless steel type metal flue.

### JACKET CONSTRUCTION

The boiler shall be complete with a metal jacket, 16 gauge, steel casing, finished with a suitable heat resisting powdered coated finish and shall be constructed on a structural steel frame and properly insulated with an 1" air space. The complete jacket shall be easily removable and reinstalled. The boiler shall incorporate individually removable jacket doors, with handles providing easy access to combustion chamber and access panels. The entire tube area shall be easily accessible for fireside cleaning from one side.

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### BOILER TRIM AND CONTROL EQUIP.

1. Remote reading thermometer and pressure gauges
2. Water temperature operating control
3. High Limit safety control with manual reset
4. Probe type low water cutoff control with manual reset
5. ASME safety relief valve
6. Water flow switch
7. Flue outlet temperature sensor

### BOILER / BURNER CONTROL EQUIPMENT PACKAGE

Boiler / burner control package shall be furnished with a Sub 30 PPM Low NOx forced draft metal fiber gas burner. Boiler shall be able to achieve Sub 9 PPM Low NOx without additional equipment. Burner shall be complete with variable speed combustion blower for supplying optimum combustion air with normal vent conditions at turndown ratio of up to 5:1.

The following controls shall be furnished:

1. Main manual gas shutoff valve
2. Fuel / air ratio regulating gas valve actuator with safety shut-off function
3. Auxiliary safety shutoff gas valve
4. High and low gas pressure switches
5. Gas pilot shutoff and solenoid valves
6. Gas pilot ignition assembly with ignition transformer
7. Pilot gas pressure regulator
8. Air safety switch
9. The boiler indicator panel shall be supplied with:
  - a. Four indicating lamps – power on, enabled, fuel on and failure.
  - b. On-off switch

### BOILER / BURNER CONTROL EQUIPMENT PACKAGE (continued)

- c. Honeywell “ SOLA” boiler control system complete with heat control, primary flame safeguard supervision with UV flame sensing, circulation pump control, combustion fan control, boiler control, electric ignition function, PID load control with 4-20 mA remote set point, internal lead/lag function for up to eight boilers and ModBus communication.
- d. Touch Screen Operator Interface Panel to “SOLA” with LED status indicators, stack and supply water temperature indicator.

### MISCELLANEOUS INFORMATION

All appropriate controls where possible, shall be mounted on boiler front.

A tube removal and replacement shall be demonstrated at time of start-up. Demonstration time not to exceed 40 minutes.

The boiler vessel shall be warranted for entire service life of the boiler against thermal shock on a non-pro-rated basis.

### OPTIONAL BOILER TRIM & CONTROLS

1. Auxiliary probe type low water cutoff control

### OPTIONAL BURNER CONTROLS AND ACCESSORIES

1. Alarm buzzer
2. IRI like specifications
3. Remote temperature sensors for outdoor reset or lead/lag function
4. Combustion air duct adapter
5. Condensate neutralizer kit
6. BAS communication gateway for: LonWorks, BACnet MSTP, BACnet IP, Metasys N2, Modbus TCP