

SECTION 23 52 16
CONDENSING BOILERS

PART 1 GENERAL

1.01 SUBMITTALS

- A. Product Data:
 - 1. Component and accessories list.
 - 2. Ratings and nameplate information.
 - 3. Finishes and colors.
- B. Quality Assurance Data:
 - 1. Certified production test reports or mill test reports.
 - 2. Test reports for previous design, and documentation showing previous design ratings and configurations.
- C. Project Record Documents:
 - 1. Shop Drawings:
 - a) Certified elevation and outline drawings with dimensions.
 - b) Certified plan view drawings with dimensions.
 - c) Wiring and termination drawings.
- D. Operation and Maintenance Data:
 - 1. Operating and maintenance procedures.
 - 2. Complete set of manufacturer's drawings.
 - 3. Complete documentation of inspections and tests performed, including any logs and certificates. Documentation shall note any replacement of equipment or components that failed during testing.
 - 4. Spare parts lists.
 - 5. Data sheets updated to reflect field installation conditions.

1.02 WARRANTY

- A. Special Warranty: manufacturer's standard form in which manufacturer agrees to repair or replace heat exchangers damaged by thermal shock or condensate corrosion within within specified warranty period.
 - 1. Warranty Period for Heat Exchangers: 20 years from date of Substantial Completion.
 - 2. Warranty Period for Vent Dampers (where applicable) : Five years from date of substantial completion.

PART 2 PRODUCTS

2.01 BOILER , HOT WATER, CONDENSING

- A. Acceptable Manufacturers:
 - 1. Aerco Benchmark.
 - 2. Lochinvar Crest.
 - 3. Riello Array.
- B. Type: forced draft, fire tube boiler with positive pressure vent discharge. Factory-assembled and tested. Condensing with operating efficiency up to 98%.
- C. Construction:
 - 1. Tube bundle assembly to consist of 316 stainless steel tubes, 2" diameter supported by steel frame with expansion joints at each corner. Headers to be 5/8" pressure vessel steel.

- D. Pressure rating:
 - 1. 125 psi minimum working pressure, ASME stamped.
- E. Burner: Forced Draft
 - 1. Burner head shall be cast stainless steel.
 - 2. All burner material exposed to the combustion zone shall be of stainless steel construction.
 - 3. Burner to be designed to burn natural gas.
 - 4. Electronic supervised spark ignition.
 - 5. Burner operation to be modulating firing with minimum of 10:1 turndown.
 - 6. Burner Safety Controls:
 - a) Electric safety controls to be U.L. and A.G.A. design certified.
 - b) Scanner or ultraviolet flame detector.
 - c) Air flow switch.
 - 7. Start-up by factory-authorized agent only.
- F. Fuel: Natural Gas [936 BTU/CF @ 5200 ft. elevation] Inlet gas pressure to burner to be 7" to 11" W.G.
- G. Boiler Controls and Trim:
 - 1. Operating controls L6006A1012.
 - 2. Hi-limit controls L4006E1117.
 - 3. Safety low water cut-off.
 - 4. Electronic supervised spark ignition.
 - 5. ASME pressure relief valve set at proper psi, for operating conditions.
 - 6. Combination temperature/pressure gauge.
 - 7. Built-in air elimination.
 - 8. Control panel with indicating lights with ability to operate, stage, and modulate multiple boilers to optimize efficiency.
 - 9. ASME CSD-1 compliance.
 - 10. Controllers shall use BACnet protocol to integrate with the Integrated Building Automation System. Refer to Section 230901 – Integrated Building Automation System (IBAS) for more details.
 - 11. Condensate neutralization kit.
- H. Gas Train:
 - 1. U.L. and IRI-listed gas train completely factory assembled.
 - 2. Main and pilot gas shut-off valves.
 - 3. Main gas pressure regulator.
 - 4. Main gas valve.
 - 5. Low and High gas pressure gas switches on all sizes.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Boilers shall have start-up, testing, adjusting, instruction of owners operating personnel and 90 days free service by factory-authorized service representative start-up personnel who are on 24 hour call.
- B. Install flue and vent per manufacturer's recommendations and specification section 235100 Breechings, Chimneys, and Stacks.
- C. Perform installation and startup checks according to manufacturer's written instructions.

- D. Leak Test: Hydrostatic test. Repair leaks and retest until no leaks exist.
- E. Operational Test: Start units to confirm proper motor rotation and unit operation. Adjust air-fuel ratio and combustion.
- F. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- G. Adjust initial temperature set points.
- H. Set field-adjustable switches and circuit-breaker trip ranges as indicated.
- I. Occupancy Adjustments: When requested within 12 months of date of substantial completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to site outside normal occupancy hours for this purpose, without additional cost.
- J. Prepare written report that documents testing procedures and results.

END OF SECTION 23 52 16