

SECTION 15755

HEAT EXCHANGERS

PART 1 DESIGN DIRECTIVES

1.1 DESCRIPTION OF WORK

- A. Types of heat exchangers specified in this section include steam-to-water and water-to-water U-tube heat exchangers.

1.2 QUALITY ASSURANCE

- A. Construct heat exchangers in accordance with ASME Boiler and Pressure Vessel Code, Section VIII "Pressure Vessels", Division 1, latest edition

1.3 DESIGN CRITERIA

- A. Consultant shall schedule all parameters of the heat exchanger, including the fouling factor.
- B. Consultant shall indicate on the drawings the area for the tube pull.
- C. Recommended control scheme for steam to hot water heat exchangers is a 1/3, 2/3 control valve setup. The 1/3 valve shall be the initial operating valve with the 2/3 valve opening after the 1/3 valve is fully open.
- D. Where two heat exchangers are used in a building and are redundant, use one set of control valves and a bypass valve.

PART 2 PRODUCTS

2.1 STEAM-TO-WATER U-TUBE HEAT EXCHANGERS

- A. Materials:
 - 1. Shell: Steel
 - 2. Tubes: 3/4" O.D. copper.
 - 3. Heads: Cast iron or steel.
 - 4. Tube Sheets: Steel.
 - 5. Tube Supports: Steel.
- B. ASME construction and stamped for 125 psig design pressure at 375°F, and shall be hydrostatically tested at the factory at 300 psig.
- C. Manufacturers: Subject to compliance with requirements, provide steam-to-water U-tube heat exchangers of one of the following:
 - 1. Bell & Gossett ITT; Fluid Handling Div. – Type 'SU'
 - 2. Taco, Inc. – 'Steam to Liquid Heat Exchanger'

2.2 WATER-TO-WATER U-TUBE HEAT EXCHANGERS

- A. Shell and tube, U-bend removable tube bundle, heating water in shell, heated water in tubes.

- B. Materials:
 - 1. Shell: Steel.
 - 2. Tubes: 3/4" O.D. copper.
 - 3. Heads: Cast iron or steel.
 - 4. Tube Sheets: Steel.
 - 5. Baffles, Tie-Rods, Spacers: Steel.
 - C. ASME construction and stamped or 125 psi design pressure at 300°F, and shall be hydrostatically tested at the factory at 300 psig.
- 2.3 Manufacturers: Subject to compliance with requirements, provide water-to-water U-tube heat exchangers of one of the following:
- 1. Bell & Gossett ITT; Fluid Handling Div. – Type ‘WU’
 - 2. Taco, Inc. – ‘Liquid to Liquid Heat Exchanger’

2.4 PLATE AND FRAME HEAT EXCHANGERS

- A. Materials:
 - 1. Plates: 304 stainless steel with a minimum thickness of 0.8 millimeters.
 - 2. Frame: Fabricate the structural frame, consisting of both stationary and movable coers, upper and lower carrying bolts, outrigger and compression bolting of carbon steel. Construct the upper T-section hanger and the lower guide bar of stainless steel and provide a positive steering and locking mechanism for plate to plate alignment.
- B. Furnish nitrile gaskets suitable for the respective maximum working pressures, temperatures, and water treatment of each water system.
- C. Carbon steel nozzles to be rated for 150% of maximum system operating pressure and to be flanged type.
- D. Install the following items:
 - 1. Two lifting lugs.
 - 2. Roller assembly on the movable cover for ease of opening.
 - 3. Ball bearing assemblies for ease of tightening and untightening of the unit.
- E. Paint all carbon steel fabricated components with epoxy paint on all surfaces.
- F. Provide sufficient surface area to perform the specified thermal requirements plus additional surface area for fouling as recommended by the equipment manufacture, but not less than 5%.
- G. Equip unit with insulated enclosure panels supplied by the unit to meet OSHA requirements.
- H. Manufacturers:
 - 1. APV
 - 2. Alfa-Laval

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine areas and conditions under which heat exchangers are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.2 U-TUBE HEAT EXCHANGER INSTALLATION

- A. Mount heat exchangers on steel floor stands or on trapeze hangers, located for required clearance for tube bundle removal. Insure steam to water heat exchangers are sufficiently high enough to provide a minimum 12” to the steam trap inlet and to provide gravity drain to the condensate return system.

3.3 PLATE AND FRAME INSTALLATION

- A. Provide isolation valves and unions or flanges on all connections to the exchanger in locations allowing disassembly of the heat exchanger without disturbing system piping.
- B. On all four pipe connections, provide a valve with hose connection between the heat exchanger and the isolation valve to permit flushing of the heat exchanger.

3.4 ADJUSTING AND CLEANING

- A. Clean factory-finished surfaces. Repair any marred or scratched surfaces with manufacturer's touch-up paint.

END OF SECTION 15755