

SECTION 235700 - HEAT EXCHANGERS FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes plate heat exchangers.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include rated capacities, operating characteristics, and furnished specialties and accessories.
 - 2. For plate heat exchangers, include indication that the selection and calculated capacities are per AHRI 400 requirements and indicate that the unit furnished will be AHRI 400 certified.
- B. Shop Drawings: Signed and sealed by a qualified professional engineer. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 1. Design Calculations: Calculate requirements for selecting seismic restraints and for designing bases.
 - 2. Base Details: Detail fabrication including anchorages and attachments to structure and to supported equipment.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Equipment room, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 - 1. Tube-removal space.
 - 2. Structural members to which heat exchangers will be attached.

- B. Source quality-control reports.

- C. Field quality-control reports.
- D. Sample Warranty: For manufacturer's warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For heat exchangers to include in emergency, operation, and maintenance manuals.

1.6 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of domestic-water heat exchangers that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including heat exchanger, storage tank, and supports.
 - b. Faulty operation of controls.
 - c. Deterioration of metals, metal finishes, and other materials beyond normal use.
 - 2. Warranty Periods: From date of Substantial Completion.
 - a. Plate, Heat Exchangers:
 - 1) Brazed-Plate Type: Ten year(s).
 - 2) Plate-and-Frame Type: Ten year(s).

PART 2 - PRODUCTS

2.1 GASKETED-PLATE HEAT EXCHANGERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Danfoss
 - 2. Alfa Laval Inc.
 - 3. API Heat Transfer Inc.
 - 4. APV; a brand of SPX Corporation.
 - 5. ITT Corporation; Bell & Gossett.
 - 6. Mueller, Paul, Company.

7. TACO Incorporated.

- B. For units that fall within AHRI 400 standard criteria, provide certified units (no exceptions even if manufacturer is listed above).
- C. Configuration: Freestanding assembly consisting of frame support, top and bottom carrying and guide bars, fixed and movable end plates, tie rods, individually removable plates, and one-piece gaskets.
- D. Construction: Fabricate and label heat exchangers to comply with ASME Boiler and Pressure Vessel Code, Section VIII, "Pressure Vessels," Division 1.
 - 1. Working pressure: 300 psi.
- E. Frame:
 - 1. Capacity to accommodate a minimum 20 percent additional plates.
 - 2. Painted carbon steel with provisions for anchoring to support.
- F. Top and Bottom Carrying and Guide Bars: Painted carbon steel, aluminum, or stainless steel.
- G. End-Plate Material: Painted carbon steel.
- H. Tie Rods and Nuts: Steel or stainless steel.
- I. Plate Material: 0.031 inch thick before stamping; Type 316L stainless steel.

Glue-free gaskets are mechanically held in place by plates on both sides of each gasket.

- J. Gasket Materials: Nitrile rubber.

Retain "Glue" Subparagraph below for glued gaskets.

- K. Piping Connections: Factory fabricated of materials compatible with heat-exchanger shell. Attach tapings to shell before testing and labeling.
 - 1. NPS 2 and Smaller: Threaded ends according to ASME B1.20.1.
 - 2. NPS 2-1/2 and Larger: Flanged ends according to ASME B16.5 for steel and stainless-steel flanges and according to ASME B16.24 for copper and copper-alloy flanges.
- L. Enclose plates in solid stainless-steel removable shroud.
- M. Capacities and Characteristics: As scheduled on Drawings.

2.2 ACCESSORIES

- A. Hangers and Supports:
 - 1. Custom, steel supports for mounting on floor.
 - 2. Field-fabricated steel supports to ensure both horizontal and vertical support of heat exchanger. Comply with requirements in Section 230529 "Hangers and Supports for HVAC Piping and Equipment."
- B. Shroud: Aluminum sheet.
- C. Miscellaneous Components for Steam Unit: Strainers, steam-control valve, steam trap, valves, pressure gage, thermometer, and piping.
- D. Pressure Relief Valves: ASME rated and stamped.
 - 1. Pressure relief valve setting: As scheduled on Drawings.

2.3 SOURCE QUALITY CONTROL

- A. If the plate heat exchangers fall within AHRI 400 standards, then the plate heat exchanger must be AHRI 400 certified and labeled.
- B. Factory Tests: Test and inspect heat exchangers according to ASME Boiler and Pressure Vessel Code, Section VIII, "Pressure Vessels," Division 1. Affix ASME label.
- C. Hydrostatically test heat exchangers to minimum of one and one-half times pressure rating before shipment.
- D. Heat exchangers will be considered defective if they do not pass tests and inspections.
- E. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas for compliance with requirements for installation tolerances and for structural rigidity, strength, anchors, and other conditions affecting performance of heat exchangers.
- B. Examine roughing-in for heat-exchanger piping to verify actual locations of piping connections before equipment installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 GASKETED-PLATE HEAT-EXCHANGER INSTALLATION

- A. Install metal shroud over installed gasketed-plate heat exchanger according to manufacturer's written instructions.

3.3 BRAZED-PLATE HEAT-EXCHANGER INSTALLATION

- A. Install brazed-plate heat exchanger on custom-designed wall supports anchored to structure as indicated on Drawings.

3.4 CONNECTIONS

- A. Comply with requirements for piping specified in other Section 232113 "Hydronic Piping." Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Comply with requirements for steam and condensate piping specified in Section 232213 "Steam and Condensate Heating Piping."
- C. Maintain manufacturer's recommended clearances for tube removal, service, and maintenance.
- D. Install piping adjacent to heat exchangers to allow space for service and maintenance of heat exchangers. Arrange piping for easy removal of heat exchangers.
- E. Install shutoff valves at heat-exchanger inlet and outlet connections.
- F. Install relief valves on heat-exchanger heated-fluid connection and install pipe relief valves, full size of valve connection, to floor drain.
- G. Install vacuum breaker at heat-exchanger steam inlet connection.
- H. Install hose end valve to drain shell.
- I. Install thermometer on heat-exchanger inlet and outlet piping, and install thermometer on heating-fluid inlet and outlet piping. Comply with requirements for thermometers specified in Section 230519 "Meters and Gages for HVAC Piping."
- J. Install pressure gages on heat-exchanger and heating-fluid piping. Comply with requirements for pressure gages specified in Section 230519 "Meters and Gages for HVAC Piping."

3.5 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections with the assistance of a in accordance with factory-authorized service representative instructions:

1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- B. Heat exchanger will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

3.6 CLEANING

- A. After completing system installation, including outlet fitting and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finishes.

3.7 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain heat exchangers.

END OF SECTION