

SECTION 232223 - STEAM CONDENSATE PUMPS

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. This Section includes:
 - 1. Electric-driven steam condensate pumps.
 - 2. Pressure-powered steam condensate pumps

1.3 SUBMITTALS

- A. Product Data: Include certified performance curves and rated capacities, operating characteristics, furnished specialties, and accessories for each type of product indicated. Indicate pump's operating point on curves. Include receiver capacity and material.
- B. Shop Drawings: Show pump layout and connections. Include setting drawings with templates for installing foundation and anchor bolts and other anchorages.

Retain subparagraph below for electric-driven steam condensate pumps.

- 1. Wiring Diagrams: Power, signal, and control wiring.

- C. Operation and Maintenance Data: For pumps to include in emergency, operation, and maintenance manuals.
- D. Warranties: Submit written special warranty as specified in this Section. Include contact information, description of coverage, and start date for each special warranty.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain steam condensate pumps through one source from a single manufacturer.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. ASME Compliance: Fabricate and label steam condensate pumps to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Manufacturer's Preparation for Shipping: Clean flanges and exposed machined metal surfaces and treat with anticorrosion compound after assembly and testing. Protect flanges, pipe openings, and nozzles with wooden flange covers or with screwed-in plugs.
- B. Store steam condensate pumps in dry location.
- C. Retain protective covers for flanges and protective coatings during storage.
- D. Protect bearings and couplings against damage from sand, grit, and other foreign matter.
- E. Comply with pump manufacturer's written rigging instructions.

1.6 COORDINATION

- A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 03.

PART 2 - PRODUCTS

2.1 ELECTRIC-DRIVEN STEAM CONDENSATE PUMPS

- A. Description: Factory-fabricated, packaged, electric-driven pumps; with receiver, pump(s), controls, and accessories suitable for operation with steam condensate from drip lines, steam heating coils and converters.
- B. Configuration: Duplex floor-mounting pump with receiver and float switch(es); rated to pump 210 deg F steam condensate.
 - 1. Manufacturers: Subject to compliance with the requirements, provide products by one of the following:
 - a. Domestic Pump; Div. of ITT Industries.
 - b. Skidmore Div.; Vent-Rite Valve Corp.
 - c. Spence Engineering Company, Inc.; Division of Circor International, Inc.
 - d. Spirax Sarco, Inc.
 - 2. Receiver: Floor-mounting, close-grained cast iron; with sight glass with floating ball and shutoff valve; inlet basket strainer; a dial thermometer; and a tank overflow piped to the nearest floor drain.
 - 3. Pumps: Centrifugal, close coupled to 3500 rpm motor; cast iron castings with bronze impellers and casing trim, stainless steel shafts, and mechanical seals equal to John Crane XP662D1 rated for an operating temperature of 275F.
 - 4. Float switches: mounted on a removable flange for service access to float. Float shall be constructed of type 316 stainless steel.

5. Automatic mechanical alternator: automatically alternates pumps, provides for simultaneous operation in case of heavy condensate flow, and automatically operates the second pump should the active pump or its control fail.
6. Combination motor starters: with accessories specified in Section 16160, mounted on the condensate receiver package or wall mounted as space limitations permit.
7. Factory Wiring: Between pump(s) and float switch(es), for single external electrical connection. Fused control power transformer if voltage exceeds 230 V.
8. Motors: Open, drip-proof, ball bearing style designed for operation with the shaft in a vertical position, and at 250 degree F.

2.2 PRESSURE-POWERED STEAM CONDENSATE PUMPS

- A. Manufacturers: Subject to compliance with the requirements, provide products by one of the following:
 1. Armstrong Fluid Handling; Div. of Armstrong International, Inc.
 2. Kadant Johnson.
 3. Spence Engineering Company, Inc.; Division of Circor International, Inc.
 4. Spirax Sarco, Inc.
 5. Watson McDaniel.
- B. Description: Factory-fabricated, pressure-powered pumps with mechanical controls, valves, and accessories suitable for pumping steam condensate using steam.
- C. Configuration:
 1. Pump Body: Cast steel, ASME labeled to 125 psig.
 2. Valves: Stainless steel check valves on inlet and outlet and stainless steel inlet and exhaust valve assembly.
 3. Internal Parts: Stainless steel float-operated snap-acting mechanism.
 4. External Parts: Gauge glass and cycle counter.
- D. Warranty:
 1. Three million cycles x 3 year warranty.
 2. Lifetime warranty on spring.

2.3 PACKAGED PRESSURE-POWERED STEAM CONDENSATE PUMP UNITS

- A. Manufacturers: Subject to compliance with the requirements, provide products by one of the following:
 1. Armstrong Fluid Handling; Div. of Armstrong International, Inc.
 2. Kadant Johnson.
 3. Spence Engineering Company, Inc.; Division of Circor International, Inc.
 4. Spirax Sarco, Inc.
 5. Watson McDaniel.

- B. Description: Factory-fabricated, pressure-powered pumps with mechanical controls, valves, completely pre-piped and assembled with steel framework, and accessories suitable for pumping steam condensate using steam.
- C. Configuration:
 - 1. Pump: Refer to pump specification.
 - 2. Receiver: ASME stamped.
 - 3. Control panel: Float type level control. Remotely mounted with auxiliary contacts for high level alarm and cycle counter.
 - 4. Valves: Include isolation valves, pressure reducing valves, strainers, check valves, and traps.
 - 5. Provide emergency bypass for unit with only one pumping chamber. Provide isolation valves for each chamber for unit with two or more pumping chamber.

2.4 MOTORS

- A. Comply with requirements in Division 23 Section "Common Motor Requirements for HVAC Equipment."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine equipment foundations and anchor-bolt locations for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Examine rough installation of steam condensate piping.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

Delete first paragraph below for pressure-powered steam condensate pumps.

- A. Install pumps according to HI 1.1-1.5, "Centrifugal Pumps for Nomenclature, Definitions, Application and Operation."
- B. Install pumps to provide access for periodic maintenance including removing motors, impellers, couplings, and accessories.
- C. Support pumps and piping separately so piping is not supported by pumps.
- D. Install thermometers and pressure gages.

3.3 CONNECTIONS

- A. Piping installation requirements are specified in other Division 23 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to machine to allow service and maintenance.

Retain two paragraphs below for pressure-powered pump systems.

- C. Install steam supply for pressure-powered pumps as required by Division 23 Section "Steam and Condensate Heating Piping."
- D. Install shut-off and check valves on inlet and outlet of pressure-powered pumps.

Retain first paragraph below for electric-driven pump systems.

- E. Install check valve, shut-off valve, and balancing valve at pump discharge connections for each electric-driven pump.
- F. Pipe drain to nearest floor drain for overflow and drain piping connections.
- G. Install full-size vent piping to outdoors, terminating at least 10 feet above roof or as indicated.

3.4 STARTUP SERVICE

- A. Verify that steam condensate pumps are installed and connected according to the Contract Documents.
- B. Complete installation and startup checks according to manufacturer's written instructions.
- C. Clean strainers.
- D. Set steam condensate pump controls.
- E. Set pump controls for automatic start, stop, and alarm operation.
- F. Perform the following preventive maintenance operations and checks before starting:
 - 1. Set float switches to operate at proper levels.
 - 2. Set throttling valves on pump discharge for specified flow.
 - 3. Check motors for proper rotation.
 - 4. Test pump controls and demonstrate compliance with requirements.
 - 5. Replace damaged or malfunctioning pump controls and equipment.
 - 6. Verify that pump controls are correct for required application.
- G. Start steam condensate pumps according to manufacturer's written startup instructions.

3.5 DEMONSTRATION

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

END OF SECTION 232223