

SECTION 23 22 23

STEAM CONDENSATE PUMPS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Condensate pumps.

B. Related Sections:

1. Division 23 - Common Motor Requirements for HVAC Equipment: Product requirements for motors for placement by this section.
2. Division 23 - Vibration and Seismic Controls for HVAC Piping and Equipment: Product requirements for vibrations isolators installed with pumps.
3. Division 23 - Steam and Condensate Heating Piping: Execution requirements for connection to pumps specified by this section.
4. Division 23 - Steam and Condensate Piping Specialties: Product and execution requirements for piping specialties installed in steam systems.
5. Division 26 - Equipment Wiring Connections: Execution requirements for electrical connections to pumps specified by this section.

1.02 REFERENCES

A. American Society of Mechanical Engineers:

1. ASME Section VIII - Boiler and Pressure Vessel Code - Pressure Vessels.

B. Electrical components, devices and accessories: Listed and labeled as defined in NFPA 70, Article 100 by a tested agency acceptable to County's Representative and marked for intended use.

C. Underwriters Laboratories Inc.:

1. UL 778 - Motor Operated Water Pumps.

1.03 PERFORMANCE REQUIREMENTS

- A. Provide pumps to operate at system fluid temperatures without vapor binding and cavitation, are non-overloading in parallel or individual operation, and operate within 25 percent of midpoint of published maximum efficiency curve.

1.04 SUBMITTALS

A. Division 01 - Submittal Procedures.

B. Product Data: Submit certified pump curves showing performance characteristics with pump and system operating point plotted. Include NPSH curve when applicable. Include electrical characteristics and connection requirements. Submit also, manufacturer model number, dimensions, service sizes, and finishes.

C. Manufacturer's Installation Instructions: Submit application, selection, and hookup configuration with pipe and accessory elevations. Submit hanging and support requirements and recommendations.

D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.05 CLOSEOUT SUBMITTALS

- A. Division 01 - Execution and Closeout Requirements.
- B. Operation and Maintenance Data: Submit installation instructions, servicing requirements, assembly views, lubrication instructions, and replacement parts list.
- C. Maintain one copy of each document on site.

1.06 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience and with service facilities within 100 miles of Project.
- B. Installer: Company specializing in performing Work of this section with minimum three years documented experience.

1.07 PRE-INSTALLATION MEETINGS

- A. Division 01 - Administrative Requirements.
- B. Convene minimum one week prior to commencing work of this section.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Division 01 - Product Requirements.
- B. Protect systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

1.09 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.10 WARRANTY

- A. Division 01 - Execution and Closeout Requirements.
- B. Furnish one year manufacturer warranty for pumps.

1.11 EXTRA MATERIALS

- A. Division 01 - Execution and Closeout Requirements.
- B. Furnish one set of mechanical seals for each pump pumps.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

- B. Configuration: Simplex or Duplex floor-mounting pump configuration with receiver and float switches; rated to pump minimum 212 deg F steam condensate.
1. Manufacturers:
 - a) Shipco
 - b) Paco
 - c) ITT
 - d) Industrial Steam
 - e) Spirax Sarco
 - f) Armstrong
 2. Receiver: Floor-mounting, stainless steel receiver; externally adjustable float switches; with water-level gage, steam condensate thermometer, discharge-pressure gage for each pump, bronze gate valves between receiver and pumps, flanges for pump mounting, and lifting eyebolts.
 3. Inlet Strainer: Cast iron with self-cleaning bronze screen, dirt pocket, and cleanout plug on receiver inlet.
 4. Pumps: Centrifugal, close coupled, vertical design, permanently aligned, and bronze fitted; with replaceable bronze case rings, stainless-steel shafts, and mechanical seals; mounted on receiver flanges; rated to operate with a minimum of 2 feet of NPSH.
 5. Control Panel: NEMA 250, Type 12 enclosure with hinged door and grounding lug, mounted on pump; factory wired for single external electrical connection; and with the following components within cabinet:
 - a) Motor controller for each pump.
 - b) Electrical pump alternator to operate pumps in lead-lag sequence and allow both pumps to operate on receiver high level.
 - c) Manual lead-lag control to override electrical pump alternator to manually select the lead pump.
 - d) Momentary contact "TEST" push button on cover for each pump.
 - e) Numbered terminal strip.
 - f) Disconnect switch.
 6. Blowdown separator (with cooling unit):
 - a) Ace Boiler

2.02 MOTORS

- A. Comply with requirements in Division 23 "Motors."
- B. Capable of 250 degrees F. application, without bearing failure.

PART 3 EXECUTION

3.01 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.

3.02 INSTALLATION

- 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 pumps on concrete bases. Anchor pumps to bases using inserts or anchor bolts.
- E. Install thermometers and pressure gages.

3.03 CONNECTIONS

- A. Piping installation requirements are specified in other Division 23.
- B. Install piping adjacent to machine to allow service and maintenance.
- C. Install check valve, gate valve, and globe valve at pump discharge connections for each electric-driven pump.
- D. Pipe drain to nearest floor drain for overflow and drain piping connections.
- E. Install full-size vent piping to outdoors, terminating in 180-degree elbow at point above highest steam system connection or as indicated.
- F. Ground equipment according to Division 26 "Grounding and Bonding."
- G. Connect wiring according to Division 26 "Conductors and Cables."

3.04 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.

3.05 DEMONSTRATION

- A. Engage a factory-authorized service representative to train County's maintenance personnel to adjust, operate, and maintain steam condensate pumps. Refer to Division 1 "Demonstration and Training."

END OF SECTION