

SECTION 23 22 23

STEAM CONDENSATE PUMPS

PART 1 GENERAL

1.01 SUBMITTALS

- A. Product Data:
 - 1. Pumps
- B. Shop Drawings:
 - 1. Product Data: Include certified performance curves and rated capacities; shipping, installed, and operating weights; furnished specialties; final impeller dimensions; and accessories for each type of product indicated. Indicate pump's operating point on curves. If parallel pumping is used, provide parallel pump operating curve data.
 - 2. Show pump layout and connections. Include Setting Drawings with templates for installing foundation and anchor bolts and other anchorages.
 - 3. Prefabricated Pieces
- C. Operation and Maintenance Data:
 - 1. Operating and maintenance procedures.

1.02 QUALITY ASSURANCE

- A. UL Compliance: Fabricate and label pumps to comply with UL 778, "Motor-Operated Water Pumps," for construction requirements.
- B. Product Options: drawings indicate size, profiles, connections, and dimensional requirements of pumps and are based on the specific types and models indicated. Other manufacturers' pumps with equal performance characteristics may be considered. Refer to Division 1 Section "Substitutions."
- C. Regulatory Requirements: Fabricate and test steam condensate pumps to comply with HI 1.1-1.5, "Centrifugal Pumps for Nomenclature, Definitions, Application and Operation," and HI 1.6, "Centrifugal Pump Tests."
- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.

1.03 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 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.

1.04 COORDINATION

- A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 3 Section Cast-in-Place Concrete.

PART 2 PRODUCTS

2.01 STEAM CONDENSATE RETURN PUMPS/RECEIVERS (ELECTRIC)

- A. Approved Manufacturers:
 - 1. Shippensburg Pump Company SHIPCO
 - 2. Hoffman. ITT Fluid Handling; Div. of ITT Fluid Technology Corp.
 - 3. Fab Tek

- B. Description: factory-fabricated, packaged, electric-drive pump units; with receiver, pumps, controls, and accessories suitable for operation with low-pressure steam condensate.
1. Receiver tanks shall be of cast iron or stainless-steel design and shall include the following:
 - a) Inlet Cascade baffle with inlet basket strainer
 - b) Basket strainer to include compound pressure gauge with isolation valve
 - c) Temperature thermometer
 - d) Gauge glass with top and bottom shutoff valves, to include ball stop checks in case of glass breakage, receiver and hurling chamber
 - e) Drain valve with cap/plug, condensate receiver and hurling chamber
 - f) Vacuum/hurling chamber will be cast iron
 - g) Suction valves for condensate pumps
 - h) Make up water solenoid valve with three valve bypass and wye strainer vacuum and condensate pumps
 - i) Duplex pumps unless additional pumps are required, vacuum and condensate
 - j) Sch 80 discharge piping with globe valve (balancing), non-slam check valve and gate valve (isolation) for condensate pumps
 - k) Pump discharge pressure gauges with isolation valves, condensate pumps.
 2. Controls
 - a) NEMA 4 type electrical enclosure with liquid tight conduit to all control devices UL listed
 - b) Single point power connection with integrated, fused, step-down control circuit transformer, vacuum and condensate pumps
 - c) Through the door disconnect for control circuit, vacuum and condensate pumps
 - d) Through the door circuit breaker for each individual pump
 - e) NEMA rated magnetic motor starter for each individual pump
 - f) Off-lead/lag-continuous selector switches for vacuum pumps
 - g) Hands-Off-Auto selector switches for condensate pumps with momentary push buttons for test
 - h) Electric alternator for vacuum and condensate pumps
 - i) Pressure switches and timer for automatic pump fail switchover, condensate pumps
 - j) Alarm bell with silencing switch, vacuum and condensate pumps
 - k) Indicator lamps for general alarm, pump fail, pump on, low water, high water
 - l) Low water pump cutoff switches
 - m) Low and high-water level switches, condensate pumps
 - n) Unloading switch, vacuum pump
 - o) Temperature high-limit makeup and cutoff switches, vacuum pump
 - p) Terminals for general/summary alarm for BAS interface, vacuum and condensate pumps

2.02 STEAM CONDENSATE RETURN PUMPS/RECEIVERS (STEAM OR AIR)

- A. Acceptable Manufacturers:
1. Watson-McDaniel
 2. Yarway
 3. Armstrong

- B. Description: factory-fabricated, pressure-powered pump units with body and receivers constructed of cast iron or welded steel and with controls, valves, piping connections, and accessories suitable for pumping low.
- C. Configuration: packaged duplex unit with float-operated valve control and receiver.

PART 3 EXECUTION

3.01 INSTALLATION OF PUMPS

- A. Install pumps to provide access for periodic maintenance, including removing motors, impellers, couplings, and accessories.
- B. Support pumps and piping separately so piping is not supported by pumps.
- C. Suspend in-line pumps using continuous-thread hanger rod and vibration-isolation hangers. Install seismic bracing as required by authorities having jurisdiction.
- D. Set base-mounted pumps on concrete foundation. Disconnect coupling halves before setting. Do not reconnect couplings until alignment operations have been completed.
 - 1. Support pump baseplate on rectangular metal blocks and shims, or on metal wedges with small taper, at points near foundation bolts to provide a gap of 3/4 to 1-1/2 inches between pump base and foundation for grouting.
 - 2. Adjust metal supports or wedges until pump and driver shafts are level. Check coupling faces and suction and discharge flanges of pump to verify that they are level and plumb.
- E. Automatic Condensate Pump Units: Install units for collecting condensate and extend to open drain.

3.02 ALIGNMENT

- A. Align pump and motor shafts and piping connections after setting them on foundations, after grout has been set and foundation bolts have been tightened, and after piping connections have been made.
- B. Comply with pump and coupling manufacturers' written instructions.
- C. After alignment is correct, tighten foundation bolts evenly but not too firmly. Completely fill baseplate with nonshrink, nonmetallic grout while metal blocks and shims or wedges are in place. After grout has cured, fully tighten foundation bolts.

3.03 CONNECTIONS

- A. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect piping to pumps. Install valves that are the same size as piping connected to pumps.
- C. Install suction and discharge pipe sizes equal to or greater than diameter of pump nozzles.
- D. Install check valve and throttling valve on discharge side of in-line circulators.
- E. Install suction diffuser and shutoff valve on suction side of base-mounted pumps.
- F. Install triple-duty valve on discharge side of base-mounted pumps.
- G. Install pressure gauges on pump suction and discharge. Install at integral pressure-gauge tapings where provided.
- H. Install check valve and gate or ball valve on each condensate pump unit discharge.
- I. Install electrical connections for power, controls, and devices.
- J. Electrical power and control wiring and connections are specified in Division 26 Sections.
- K. Final close-out procedure: Remove start-up strainer and install permanent strainer.
- L. Final close-out procedure: Verify that the pump controls are correct for required application.

3.04 STEAM CONDENSATE PUMP INSTALLATION

- A. Install pumps according to manufacturer's written instructions.
- 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 gauges.

3.05 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties. Refer to Specification Section 23 21 13 Hydronic Piping for additional requirements.
- B. Install piping adjacent to machine to allow service and maintenance.
- C. Install shutoff and check valves on inlet of pressure-operated units.
- D. Install inlet strainer and valved bypass to drain at system return connection.
- E. Install check valve, shutoff valve, and throttling valve at pump discharge connections for each pump unit.
- F. Install pipe drain to nearest floor drain for overflow and drain piping connections.
- G. Install full-size vent piping, terminating in 180° elbow at point above highest steam system connection or as indicated.
- H. Install electrical connections for power, controls, and devices.
- I. Electrical power and control wiring and connections are specified in Division 26 Sections.

3.06 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain pumps as specified below:
 - 1. Train owner's maintenance personnel on procedures and schedules for starting and stopping, troubleshooting, servicing, and maintaining pumps.
 - 2. Schedule training with owner, through architect, with at least seven days' advance notice.

END OF SECTION 23 22 23