SECTION 23 22 23
STEAM CONDENSATE PUMPS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Steam condensate pumps for Plumbing, Heating, Ventilating and Air Conditioning.

1.2 QUALITY ASSURANCE

A. Refer to Paragraph, QUALITY ASSURANCE in Section 23 05 11, COMMON WORK RESULTS FOR HVAC and STEAM GENERATION.

B. Design Criteria:

1. Pumps design and manufacturer shall conform to Hydraulic Institute Standards.
2. Pump sizes, capacities, pressures, operating characteristics and efficiency shall be as scheduled.
3. Test all pumps before shipment. The manufacturer shall certify all pump ratings.

1.3 SUBMITTALS

A. Submit in accordance with latest adopted VA Specification Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, and SAMPLES.

B. Manufacturer's Literature and Data:

1. Pumps and accessories.

C. Manufacturer's installation, maintenance and operating instructions, in accordance with Section 23 05 11, COMMON WORK RESULTS FOR HVAC and STEAM GENERATION.

D. Characteristic Curves: Head-capacity for each pump.

1.4 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only:

B. American Iron and Steel Institute (AISI):

AISI 1045.....Cold Drawn Carbon Steel Bar, Type 1045

AISI 416.....Type 416 Stainless Steel

C. American National Standards Institute (ANSI):

ANSI B15.1-00(R2008)....Safety Standard for Mechanical Power Transmission Apparatus

ANSI B16.1-05.....Cast Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250 and 800

D. American Society for Testing and Materials (ASTM):

A48-03(2008).....Standard Specification for Gray Iron Castings
B62-09.....Standard Specification for Composition Bronze or Ounce Metal Castings

E. Maintenance and Operating Manuals in accordance with latest adopted VA Specification Section 01 00 00, GENERAL REQUIREMENTS.

1.5 DEFINITIONS

A. Capacity: Liters per second (L/s) (Gallons per minute (GPM)) of the fluid pumped.

B. Head: Total dynamic head in kPa (feet) of the fluid pumped.

PART 2 - PRODUCTS

2.1 PRESSURE POWERED CONDENSATE PUMP

A. Pressure-Powered Pump Packages:

1. Pump packages shall be furnished and installed as a packaged assembly of the types, sizes, capacities, and characteristics as shown on the drawings. Pump package shall be rated for 185 degrees C (365 degrees F), maximum condensate temperatures.
2. Pump package(s) shall come completely piped and mounted on a steel skid including one receiver/reservoir, two positive displacement pressure-powered pumps as scheduled, interconnecting piping and valves, and all accessories as hereafter specified below:
   a. The receiver shall be of a steel elevated design, warranted for 1 year against defects in material and workmanship. Receiver shall be 150 PSIG ASME labeled and coded. Receiver shall be sized for the required condensate storage volume and flash steam capacity. Receiver shall be horizontally mounted and have openings of the appropriate size and number including: two inlets, one vent opening, one NPT drain with pipe plug, one NPT anode opening with anode, and gauge glass openings with gauge glass set consisting of two brass isolation valves and guard rods, and red-line tubular glass. Replaceable magnesium anode, which retards the corrosive action of most waters and adds to the service life of the tanks, shall be furnished with each receiver for corrosion protection.
   b. Pressure-powered pumps shall be non-electric as shown on the drawings. Pumps shall be constructed of 1034 kPa (150 psig) ASME labeled and coded fabricated steel body, shall be float operated, and contain a condensate inlet baffle. Each pump shall have one

inlet check valve, one outlet check valve, and gauge glass set with isolation valves.

c. The float operating mechanism shall have all moving components constructed of stainless steel and be of a snap acting design with no external seals or packing. The float mechanism shall contain a reinforced stainless steel float, two 300 series stainless steel open coil design springs, and spring calibration pins.

d. Pressure-powered pumps shall be of a non-cavitating design capable of operation on systems up to the maximum working pressure of the tank rating using steam, compressed air, or other compatible inert gas as the supply (motive) pressure. Units shall be capable of operating at temperatures up to 365 F when pumping from a 'closed' system using a compatible motive gas. Balance and fine tune motive pressure to be 138 kPa (20 psig) higher than the static backpressure.

e. Package shall include interconnecting piping between receiver/reservoir and the positive displacement pressure-powered pump(s). Interconnecting suction (fill) line shall be provided to each unit and each suction (fill) line shall include a gate valve for isolation.

f. Manufacturer shall provide the following for field installation on each pressure-powered pump:
   1) Cycle counter
   2) Removable insulation jacket
   3) Pressure gauge
   4) Drain piping

g. Provide the following components for each pump:
   1) Motive pressure reducing valve
   2) Safety relief valve(s)
   3) Motive pressure inlet strainer
   4) Pressure gauge with pigtail, as required
   5) Motive pressure drip trap(s)
   6) Motive pressure line check valve(s)

3. The package shall be factory tested as a complete unit using steam as the motive pressure. The pump manufacturer shall furnish appropriate assembly and parts drawings, and installation and operation manuals. The package shall be shipped completely

assembled, or with connection match marks if package must be shipped as sub-assemblies.

B. Removable Insulation Jacket:

1. The insulation jacket should be of sewn construction with Velcro fasteners and have openings for inlet, outlet, drain, and gauge glass.
2. Materials:
   a. Liner and jacket shall be silicone impregnated heavy duty glass fiber rated for a maximum temperature of 260 degrees C (500 degrees F).
   b. Insulation shall be 25 mm (1 inch) minimum thickness, Type E needled glass fiber mat rated for a maximum temperature of 650 degrees C (1200 F).
   c. Jacket shall be sewn with Nomex thread with a UV inhibitor.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Follow manufacturer's written instructions for pump mounting and start-up. Access/Service space around pumps shall not be less than minimum space recommended by pumps manufacturer.

B. Coordinate location of thermometer and pressure gauges as per Section 23 22 13, STEAM and CONDENSATE HEATING PIPING.

3.2 START-UP

A. Verify that the piping system has been flushed, cleaned and filled.

- - - E N D - - -