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The Description of the Project
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SPECIFICATION DIVISION 23

NUMBER SECTION DESCRIPTION

DIVISION 23 HEATING, VENTILATING AND AIR CONDITIONING (HVAC)
SECTION 232116 - HYDRONIC PIPING SPECIALTIES

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DIVISION 23 HEATING, VENTILATING AND AIR CONDITIONING (HVAC)
SECTION 232116 - HYDRONIC PIPING SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, Standard General and Supplementary General Conditions, Division 1 Specification Sections, and other applicable Specification Sections including the Related Sections listed below, apply to this Section.

1.2 SCOPE OF WORK:

A. Provide hydronic specialties for the following systems:

1. Chilled Water System
2. Condenser Water System
3. Hot Water Heating System
4. Process Cooling Water System

PART 2 - PRODUCTS

2.1 AUTOMATIC AND MANUAL AIR VENTS:

A. Manual air vents shall be ¾" ball valve per Section 220523.

B. Automatic air vents shall be non-ferrous, rated for 150 psig maximum operating pressure.

1. Manufacturers:
   a. For pipe sizes 2" and less. Bell & Gosset model 87, Armstrong model 75, Taco Hy-Vent
   b. For pipe sizes 2 ½" and larger. Hoffman model 78, Armstrong model 75.

2.2 SUCTION DIFFUSERS:

A. Provide angle pattern suction diffusers rated at 175 psig, 250 F., having cast iron or ductile iron body, with flanged (grooved piping if grooved piping is specified for system) connections. Provide a stainless steel combination diffuser-strainer cylinder with 3/16" or 1/8" diameter perforations, stainless steel flow straightening inlet vanes, a 16 mesh bronze start-up strainer, a permanent magnet and an adjustable support foot.

B. Manufacturers: Bell & Gossett, Armstrong, Wheatley, Taco, Grinnell, Victualic

2.3 TRIPLE DUTY VALVE:

A. Provide a straight or angle pattern combination bubble tight shut-off, calibrated balancing and non-slam check valve rated at 175 psig working pressure and 250 degrees F. Body shall be cast iron or ductile iron, with flanged or grooved piping connections.

B. Valve shall have a bronze seat, replaceable bronze disc with EDPM seat insert, stainless steel stem and spring. Provide brass readout valves with integral check valves to measure differential pressure readings across the orifice.

C. Valve design shall permit re-packing under full system pressure.

D. Manufacturers: Bell & Gossett model 3D or 3DS, Armstrong, Wheatley, Taco

2.4 WATER PRESSURE REGULATING/REDUCING VALVE:

A. Bronze valve body, renewable stainless steel seat. Adjustable reduced pressure range, built-in bypass, diaphragm type with spring cage and orifice. Pressure to be adjustable from a top screw on the valve.

B. Manufacturers: Watts model 223BHP, Bell & Gossett, Hoffman

2.5 WATER PRESSURE RELIEF VALVE:

A. ASME rated, sized for the full installed capacity of the low pressure side of the regulating station. Factory set valve at not more than 20% above low side pressure. Furnish seat material suited for the service.

B. Manufacturers: Consolidated, ITT Bell & Gossett, ITT McDonnell Miller, Watts

2.6 COALESCING SEPARATOR:

A. Provide coalescing type air/dirt or dirt separator, type and sized to match main system piping or as indicated on the drawings. Air/dirt separator shall include separate air chamber for air removal and a lower vessel extension for dirt separation.

B. Separator shall be welded carbon steel fabricated with ANSI B16.5 flange connections and rated for 150 psig design pressure and 250F design temperature. Separator shall include an internal assembly of rigidly constructed vertical tubes of stainless steel or copper wire matrix designed to coalesce microbubbles out of solution and form larger air bubbles that rise to the top of the vessel and to separate dirt particles that collect at the bottom.

C. Separators shall include manufacturer’s integral high capacity air vent or cast iron air vent as specified in Section 2.1, flanged lower head to allow coalescing media removal, side tap valve to facilitate system filling and bottom drain connection with ball valve for draining.

D. Separators shall be capable of removing 100% of the free air, 100% of the entrained air, and up to 99.6% of the dissolved air in the system fluid. Dirt separation shall be at least 80% of all particles 30 micron and larger within 100 passes.

E. Approved Manufacturers:

1. Spirotherm
2. Thrush Aar-O-Vent
3. Bell & Gossett CRS Air and Dirt Separator

2.7 EXPANSION TANKS:

A. Provide expansion tank, constructed of welded steel with butyl rubber bladder, replaceable and full acceptance volume, ASME stamped for 125 psig at 240F. Tank shall have capacity, size and operating pressures as shown on drawings.

B. Manufacturer: Bell & Gossett, Wessels, Amtrol, Armstrong or Taco.

2.8 CENTRIFUGAL SOLID SEPARATOR:

A. Provide centrifugal solids separator, with efficiency of 98% to 40 microns, as scheduled and detailed on drawings. Body shall be steel, ASME stamped for 125 psig, with flanged connections and factory painted exterior. Provide 4"x6" cleanout for lower section, and flanged upper dome for easy maintenance access.

B. Provide automatic recovery tank with bag filter (solids collection vessel) as scheduled and detailed. Controlled continuous flow, 25 micron solids collection bag, 600 cubic inches capacity, manual isolation valves, sight glass for flow verification and differential pressure switch, Annunciator in an independent junction box, contacts rated for 4 amps at 115 volts, set at 10 psid with a range of 4 to 25 psid.

C. Manufacturers: LAKOS, Griswold Controls

2.9 IN –LINE FILTER:

A. Cartridge type impingement filter, with replaceable 100 micron or 300 micron filter media. Size and capacity shall be as indicated on drawings.

B. Manufacturers: Bruner, Culligan, Cuno, Dollinger, Honeywell.

PART 3 - EXECUTION

3.1 INSTALLATION OF AUTOMATIC & MANUAL AIR VENTS

A. Install automatic air vents at high points (where pipe drops in direction of flow) in hydronic systems. Isolate the auto air vent with an isolation valve.

B. Where manual air vents are indicated, they shall consist of an isolation valve terminated with an elbow, threaded hose connection, and hose cap.

3.2 INSTALLATION OF SUCTION DIFFUSERS:

A. Install to allow complete removal of strainer elements. Remove 16 mesh bronze start-up mesh after system start-up and flushing is complete. Replace with standard operating strainer. Adjust support foot to carry weight of suction piping (to inertia pad where applicable).

3.3 INSTALLATION OF EXPANSION TANK:

A. See drawings for locations, support and piping details. Document initial and operating pressures, and temperature, and submit report for approval.

END OF SECTION 232116