SECTION 232116

HYDRONIC SPECIALTIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Expansion tanks.

B. Air vents.

C. Air separators.

D. Strainers.

E. Pump suction fittings.

F. Combination fittings.

G. Flow indicators, controls, meters.

H. Relief valves.

I. Heat tape.

1.2 RELATED SECTIONS

A. Section 22 05 19 - Plumbing Specialties: Backflow Preventers.

B. Section 23 21 13 - Hydronic Piping.

C. Section 23 25 00 - Chemical Water Treatment: Pipe Cleaning.

1.3 REFERENCES

A. ASME - Boilers and Pressure Vessel Codes, SEC 8-D-Rules for Construction of Pressure Vessels.

1.4 SUBMITTALS

A. Submit under the provisions of Division 01.

B. Product Data: Provide product data for manufactured products and assemblies required for this project. Include component sizes, rough-in requirements, service sizes, and finishes. Include product description, model, and dimensions.

C. Manufacturer's Installation Instructions: Indicate hanging and support methods, joining procedures.

1.5 SUBMITTALS AT PROJECT CLOSEOUT

A. Submit under the provisions of Division 01.

B. Maintenance Data: Include installation instructions, assembly views, lubrication instructions, and replacement parts list.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with a minimum of three (3) years' documented experience.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect, and handle products to site under provisions of Section 23 05 00.

B. Accept valves on site in shipping containers with labeling in place. Inspect for damage.

C. Provide temporary protective coating on cast iron and steel valves.

D. Provide temporary end caps and closures on piping and fittings. Maintain it in place until installation.

E. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

PART 2 PRODUCTS

2.1 EXPANSION TANKS

A. Manufacturers:
1. Bell & Gossett.
2. Other acceptable manufacturers offering equivalent products.
a) Amtrol.
b) Taco.
c) Armstrong.

B. Construction: Closed, welded steel, tested and stamped in accordance with ASME SEC 8-D; cleaned, prime coated, and supplied with steel support saddles; with tapping for installation of accessories.
1. Pressure rating: 125-psi.

C. Gage Glass Set: Brass compression stops, guard, and 3/4-inch glass, maximum 24 inches length, long enough to cover tank for 2 inches above bottom to 2 inches below top.

D. Quick Connect Air Inlet:
1. Compressed Air: 75 inches of 1/4 inch diameter braided reinforced air hose, air chuck, check valve, and shut-off valve on supply from control air compressor.
2. Expansion Tank: Inlet tire check valve, manual air vent, tank drain, and pressure relief valve.

E. Automatic Cold Water Fill Assembly: Pressure reducing valve, reduced pressure back flow preventer, test cocks, strainer, vacuum breaker, and valved by-pass.

F. Hot Water Heating System:
1. Select expansion tank pressure relief valve at 60-psi maximum.
2. Set pressure reducing valve to select 12-psi.

G. Chilled Water System:
1. Select expansion tank pressure relief valve at 60-psi maximum.
2. Set pressure reducing valve to 12-psi.

2.2 DIAPHRAGM -TYPE EXPANSION TANKS

A. Manufacturers:
   1. Bell & Gossett.
   2. Other acceptable manufacturers offering equivalent products.
      a) Amtrol.
      b) Taco.
      c) Armstrong.

B. Construction: Welded steel, tested and stamped in accordance with ASME SEC 8-D; supplied with National Board Form U-1, rated for working pressure of 125-psig, with flexible butyl diaphragm sealed into tank, and steel support stand.

C. Accessories: Pressure gage and air-charging fitting, tank drain; pre-charge to 12-psig.

D. Automatic Cold Water Fill Assembly: Pressure reducing valve, reduced pressure back flow preventer, test cocks, strainer, vacuum breaker, and valved by-pass.

2.3 AIR VENTS

A. Manual Type: Short vertical sections of 2-inch diameter pipe to form air chamber, with 1/8-inch brass needle valve at top of chamber.

B. Float Type:
   1. Manufacturers:
      a) Bell & Gossett Model 107.
      b) Amtrol Model 720.
      c) Taco Model 400.
   2. Cast iron body and cover, float, bronze pilot valve mechanism suitable for system operating temperature and pressure, with isolating valve.

2.4 AIR SEPARATORS

A. Dip Tube Fitting:
   1. Manufacturers:
      a) Bell & Gossett Model ABF.
   2. For 125-psig operating pressure; to prevent free air collected in boiler from rising into system.

B. In-line Air Separators:
   1. Manufacturers:
      a) Bell & Gossett Model IAS and RL.
      b) Amtrol Model 721 and ASL.
      c) Armstrong Model VA.
   2. Cast iron for sizes 1-1/2 inch and smaller, or steel for sizes 2 inch and larger; tested and stamped in accordance with ASME SEC 8-D; for 125-psig operating pressure.

C. High Performance Combination Air Separators/Strainers:
   1. Manufacturers:
      a) Spirovent.
   2. Steel, tested and stamped in accordance with ASME SEC 8-D; for 150-psig operating pressure, with integral copper Spiro tube elements, inlet and outlet connections, and internal stainless steel air collector tube.

3. Performance:
    a) Air Elimination: 100% free air, 100% entrained air and 99.6% dissolved air at the installed location.
    b) Dirt: 80% of all 30 micron and larger particles within 100 passes.

2.5 STRAINERS

A. Size 2 inch and Under:
1. Manufacturers:
    a) Watts Model 777.
    b) Armstrong Model F4SC.
    c) Mueller Model 351.
2. Screwed brass or iron body for 175-psig working pressure, Y pattern with 1/32-inch stainless steel perforated screen.

B. Size 2-1/2 inch to 4 inch:
1. Manufacturers:
    a) Watts Model 77F.
    b) Armstrong Model AIFC.
    c) Mueller Model 752.
2. Flanged iron body for 175-psig working pressure, Y pattern with 3/64-inch stainless steel perforated screen.

C. Size 5 inch and Larger:
1. Manufacturers:
    a) Watson McDaniel.
    b) Wheatley.
    c) Mueller.
2. Flanged iron body for 175-psig working pressure, basket pattern with 1/8-inch stainless steel perforated screen.

2.6 PUMP SUCTION FITTINGS

A. Manufacturers:
1. Bell & Gossett Suction Diffuser.
2. Other acceptable manufacturers offering equivalent products.
    a) Amtrol.
    b) Taco.
    c) Armstrong.

B. Fitting: Angle pattern, cast-iron body, threaded for 2 inch and smaller, flanged for 2-1/2 inch and larger, rated for 175-psig working pressure, with inlet vanes, cylinder strainer with 3/16-inch diameter openings, disposable fine mesh strainer to fit over cylinder strainer, and permanent magnet located in flow stream and removable for cleaning.

C. Accessories: Adjustable foot support, blowdown tapping in bottom, gage tapping inside.

2.7 COMBINATION PUMP DISCHARGE VALVES

A. Manufacturers:
1. Bell & Gossett Triple Duty Valve.
2. Other acceptable manufacturers offering equivalent products.
    a) Amtrol.
    b) Taco.
    c) Armstrong.

B. Valves: Straight or angle pattern, flanged cast-iron valve body with bolt-on bonnet for 175-psig operating pressure, non-slam check valve with spring-loaded bronze disc and seat, stainless steel stem, and calibrated adjustment permitting flow regulation.

2.8 FLOW CONTROLS

A. Manufacturers:
   1. Parts Service, Inc.
   2. Other acceptable manufacturers offering equivalent products.
      a) Griswold.
      b) Autoflow.

B. Construction: Brass or bronze body with union on inlet temperature and pressure test plug on inlet.

C. Calibration: Control flow within 5 percent of selected rating, over operating pressure range of 10 times minimum pressure required for control, maximum minimum pressure 3.5-psig.

D. Control Mechanism: Stainless steel or nickel-plated brass piston or regulator cup, operating against stainless steel helical or wave formed spring.

E. Accessories: In-line strainer on inlet and ball valve on outlet.

2.9 FLOW METERS

A. Manufacturers:
   1. Bell & Gossett.
   2. Other acceptable manufacturers offering equivalent products.
      a) Taco.
      b) Armstrong.
      c) Amtrol.

B. Cast iron, wafer type, orifice insert flow meter for 250-psig working pressure, with read-out valves equipped with integral check valves with gasketed caps.

C. Calibrated, plug type balance valve with precision machined orifice, readout valves equipped with integral check valves and gasketed caps, calibrated nameplate and indicating pointer.

D. Cast iron or bronze, globe style, balance valve with handwheel with Vernier type ring setting and memory stop, drain connection, readout valves equipped with integral check valves and gasketed caps.

E. Portable meter consisting of case containing two, 3 percent accuracy pressure gages with 0-135 inches and 0-60 feet for 500-psig maximum working pressure, color coded hoses for low- and high-pressure connections, and connectors suitable for connection to read-out valves.

2.10 RELIEF VALVES

A. Manufacturers:
   1. Watts Model 174A.
   2. Other acceptable manufacturers offering equivalent products.
      a) Bell & Gossett.
      b) Armstrong.

B. Bronze body, Teflon seat, stainless steel stem and springs, automatic, direct pressure actuated, capacities ASME certified and labeled.

2.11 HEAT TAPE

A. Manufacturers:
   1. Chromalox.
   2. Easy Heat.

B. U.L. listed with 38-degree F preset thermostat mounted in waterproof thermoplastic tube, located in center of heater section.

C. Provide five watts per linear foot of pipe.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install specialties in accordance with the manufacturer's instructions.

B. Where large air quantities can accumulate, provide enlarged air collection standpipes.

C. Provide manual air vents at system high points and as indicated.

D. For automatic air vents in ceiling spaces or other concealed locations, provide vent tubing to nearest drain.

E. Provide air separator on suction side of system circulation pump and connect to expansion tank.

F. Provide valved drain and hose connection on strainer blow down connection.

G. Provide pump suction fitting on suction side of base mounted centrifugal pumps. Remove temporary strainers after cleaning systems.

H. Provide combination pump discharge valve on discharge side of base mounted centrifugal pumps.

I. Support pump fittings with floor mounted pipe and flange supports.

J. Provide relief valves on pressure tanks, low pressure side of reducing valves, and shell and tube heat exchangers.

K. Select system relief valve capacity so that it is greater than make-up pressure reducing valve capacity. Select equipment relief valve capacity to exceed rating of connected equipment.

L. Pipe relief valve outlet to nearest floor drain.

M. Where one line vents several relief valves, make cross sectional area equal to sum of individual vent areas.

N. Provide heat tape on all exterior above ground piping and as shown on drawings. Include valves and make-up water line and drains. Tape shall be held firmly in place with silicone tape and covered with insulation.

END OF SECTION