

SECTION 230524 - AIR CONTROL EQUIPMENT, HYDRONIC SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-01 Specification sections, apply to work of this section.

1.2 SCOPE

- A. Provide a complete system of makeup water and/or air control equipment for each separate chilled water and/or hot water system as indicated on drawings and as specified herein.

1.3 RELATION TO OTHER WORK

- A. Refer to the section, "General Mechanical Provisions", for related requirements. Refer to other sections of Division-23 and to all other applicable portions of the drawings and specifications.
- B. This section directly relates in particular to sections (which may or may not be included in this division) which describe the following:
 - 1. HVAC water piping systems.
 - 2. Valves, cocks and specialties for HVAC systems.

1.4 TERMINOLOGY

- A. Compression tanks and expansion tanks shall be considered the same regardless of terminology.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Equipment shall be sized as indicated on drawings.

2.2 EXPANSION TANK(S)

- A. Tank: Steel, ASME approved, 125 psig working pressure.
- B. Trim: Gauge glass, gauge cocks and all necessary tappings including union connected gauge valves, stainless steel trim, acrylic gauge tube, drain cock, built-in check valves. Acceptable: Penberthy Series 205; Eugene Ernst Products Model EEP 203 or equivalent.
- C. Tank Fitting: Designed to control air flow into tank while preventing free interchange of water between tank and system; manual air vent tube; 125 psig; Bell & Gossett ATF or ATFL Series or equivalent.

D. Manufacturer: Taco, Armstrong, Bell & Gossett, John Wood Company or equivalent.

2.3 AIR SEPARATION DEVICE(S) GENERAL

A. General:

1. ASME approved and stamped.
2. 125-psig working pressure.
3. Cast iron or steel.

B. Recommended by manufacturer to be suitable for operation with flow rate indicated with pressure drops not in excess of that indicated.

C. Tangential type which operates on low velocity vortex principle of separation of free air from system.

D. Strainer, built-in accessible type.

E. Dimensions suitable for available space.

F. Separators with inlet and outlet connections four inches (4") and larger shall be provided with threaded couplings factory welded to shell for pipe support lets.

G. Design Basis: Bell & Gossett "Rolairtrol", Armstrong, Taco or equivalent.

2.4 AIR VENTS

A. Automatic Air Vents: Male pipe thread connection (3/4 inch minimum); brass body; brass or stainless steel float; check valve feature to prevent air re-entry; drain connection; 300°F operating temperature.

1. 150-psig operating pressure: Suitable for 450-psig hydrostatic pressure. Hoffman No.78, Metraflex MV-15, Crane #976, Sarco 13W or Armstrong 1AV or equivalent.
2. 75-psig working pressure: Suitable for 200-psig hydrostatic pressure. Hoffman No.79, Maid-O-Mist #7, Bell & Gossett #7 or equivalent.

B. Manual Air Vents: Brass, suitable for 500 psig operating pressure and 300°F operating temperature, needle valve type, 1/8 inch size minimum, Trerice No. 735, Crane 700 Series or equivalent.

C. Drain Tubing: Type M copper.

2.5 MAKEUP WATER ASSEMBLY(S)

A. Provide for each closed loop chilled water and hot water system. Use the following components or their equivalent:

B. Reducing Valve(s): Brass body, 3/4-inch or greater F.I.P.T. connections, brass trim, built-in strainer, anti-siphon check valve, extra large diaphragm, adjustable twenty-five (25) to sixty (60) psig. Acceptable: Bell & Gossett #7 or an accepted equivalent.

C. Relief Valve: Brass body, 3/4-inch or greater M. x F.I.P.T. connections, brass trim, diaphragm operated, seventy-five (75) psig setting.

PART 3 - EXECUTION

3.1 GENERAL

- A. Install all air separators, compression tanks and similar items in strict accordance with the manufacturer's instructions.
- B. Test piping systems prior to the application of any insulation and prior to their being rendered inaccessible by the progress of the work. Pressure test the makeup water piping as specified for the potable water piping system.
- C. Pipe, valves and fittings shall be kept clean and protected from entrance of dirt, non-potable water and construction debris during the installation process.
- D. Refer to sections covering closed loop hydronic systems. Coordinate work of other trades as regards their interface on makeup water piping.
- E. Connect water make-up line to pipe which connects air separation device to compression tank assembly. Pipe size from make-up water connection to air separation device shall be same size as make-up water line.

3.2 EXPANSION TANK ASSEMBLY(S)

- A. Drain: Provide valved 3/4 inch minimum diameter tank drain to a point six inches or less above nearest mechanical room floor drain.
- B. Support: Securely support from roof or floor structure and/or from masonry wall(s). Submit shop drawings showing method of support if such drawings are required by Architect/Engineer.
- C. Insulation: Insulate if and as specified elsewhere.

3.3 AIR SEPARATION DEVICE

- A. Remove and clean strainer after 24 hours and 30 days of system operation.
- B. Isolate air separator with gate valves.
- C. Install so strainer is accessible.
- D. Provide valved blowdown drain.
- E. Insulate; insulation finish shall match finish of connecting piping insulation.

3.4 AIR VENTS

- A. Use automatic vents in concealed spaces. Provide tubing discharge to drain pan, plumbing trap, exterior of building or other approved location. Discharge at inconspicuous and safe location. Install automatic air vents with inlet isolation cock.
- B. Provide manual vents at each heating and cooling water coil in accordance with coil manufacturer's recommendations.

C. Provide automatic vents as follows:

1. High points of all main hot water and chilled water piping.
2. In all hot water and chilled water pipe sections which form an inverted trap.
3. Where necessary to completely and properly vent all air which may accumulate in piping circuits.
4. Where otherwise indicated.

D. Provide automatic air vents with gate valve or ball valve in pipe nipple to air vent so that air vent can be removed without affecting pipe system operation.

3.5 MAKEUP WATER ASSEMBLY(S)

A. Provide as follows if not indicated in Divisions 22 and 23 which describe plumbing interface or if not shown on drawings:

1. 1-1/4-Inch (Less if Indicated) Make-up Assembly:

- a. Automatic feed line with the following in series in direction of flow: Gate valve, pressure regulating valve with built-in check valve feature, check valve, vacuum breaker, pressure relief valve and gate valve.

2. 1-1/2-Inch (Greater if Indicated) Make-up Assembly:

- a. Automatic feed line in parallel with manual feed line.
- b. Automatic feed line with the following in direction of flow:
 - (a) Pressure regulating valve with built-in check valve, vacuum breaker and pressure relief valve.
- c. Manual feed line with gate valve and check valve.
- d. Gate valve common to both manual and automatic lines on each side of the parallel system.
- e. Connect chilled water and hot water make-up line to pipe which connects air separation device to compression tank assembly. Pipe size from make-up water connection to air separation device shall be same size as make-up water line.

END OF SECTION 230524