

SECTION 15181 - HYDRONIC SPECIALTIES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Air separators
- B. Expansion tanks
- C. Pump accessories

1.2 RELATED SECTIONS

- A. Section - Plumbing Piping Specialties
- B. Section - Hydronic Piping

1.3 REFERENCES

- A. ASME (BPV VIII, 1) - Boiler and Pressure Vessel Code, Section VIII, Division 1 - Rules for Construction of Pressure Vessels; The American Society of Mechanical Engineers; 2006.

1.4 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- 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. Certificates: Inspection certificates for pressure vessels from authority having jurisdiction.
- D. Manufacturer's Installation Instructions: Indicate hanging and support methods, joining procedures.
- E. Project Record Documents: Record actual locations of flow controls.
- F. Maintenance Data: Include installation instructions, assembly views, lubrication instructions, and replacement parts list.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum five years of documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Accept equipment on site in shipping containers with labeling in place. Inspect for damage.
- B. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- C. Protect piping components from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

1.7 MAINTENANCE SERVICE

- A. Contractor to furnish service and maintenance for one year from date of substantial completion.

1.8 EXTRA MATERIALS

- A. See Section 01600 - Project Requirements, for additional provisions.

PART 2 - PRODUCTS

2.1 ASME Partial Bladder TYPE EXPANSION TANKS

- A. Manufacturers:
 - 1. Taco, Inc; Model CBX ____: www.taco-hvac.com
 - 2. ITT Bell & Gossett
 - 3. Amtrol Inc
 - 4. Substitutions: See Section 01600 - Product Requirements.
- B. Construction: Welded steel, designed, tested and stamped in accordance with ASME (BPV code sec VIII, div 1); supplied with National Board Form U-1, rated for working pressure of 125 psi , with flexible seamless heavy duty butyl rubber bladder. (optional 150 psi) Bladder shall be able to accept the partial volume of the expansion tank and shall be removable and replaceable. The bladder shall be fabricated with special fluting that allows the bag to more easily collapse and facilitate replacement. The bladder shall be supported with a pole on units larger than 22 gallons. The support pole shall be connected at both the top and bottom and shall have distribution holes that facilitate even expansion of the bladder.
- C. System connection will be via a ¾ inch NPT connection on the bottom of the tank. A Schrader valve fitting shall be installed at the top of the tank to allow external pressurization of the bladder. Valve shall be protected by a 1½ "coupling welded to the tank.
- D. Accessories: Pressure gage(field installed in adjacent piping by others) and air-charging fitting ; precharge to ____ psi.
- E. Automatic Cold Water Fill Assembly (field installed by others): Pressure reducing valve, reduced pressure double check back flow preventer, test cocks, strainer, vacuum breaker, and valved bypass.

F. Size:

1. HW Tank Capacity: _____, _____ bladder acceptance volume.
2. CW Tank Capacity: _____, _____ bladder acceptance volume.

G. Hot Water Heating System:

1. Select expansion tank pressure relief valve at _____ psi maximum.
2. Set pressure reducing valve at _____ psi.

H. Chilled Water System:

1. Select expansion tank pressure relief valve at _____ psi maximum.
2. Set pressure reducing valve at _____ psi.

2.2 AIR SEPARATORS

A. Manufacturers:

1. Taco, Inc.; AC or ACF (strainer) (size and capacity as called for on plans)
2. Spirotherm.
3. Flamco
4. Substitutions: See Section 01600 - Product Requirements.

B. Air removal device shall be constructed of steel. It shall be designed, fabricated and stamped per ASME Section VIII Division 1 with a maximum working pressure of 150 psi at 270°F. Manufacturer shall be holder of ASME U stamp. Manufacturer to have optional 250 psi and 125 psi ASME units available. Units 3 inch and larger shall be provided with flanged system connections as standard. 2 inch and 2½ inch models to be provided with NPT connections. These connections shall be inline with the mechanical room piping. The unit shall be painted with one coat of red oxide primer.

C. The unit shall have a top NPT connection to allow for the tie in of automatic air vent, make up water, and compression tank (air control system). This fitting shall be at the upper most point on the chamber. There shall be a bottom connection for blowdown cleaning.

D. (OPTIONAL) The unit shall be provided with a removable stainless steel strainer with 3/16" perforations and a free area of not less than five times the cross sectional area of the connecting pipe. The unit shall come with an inline connection that will allow for strainer removal. This additional fitting shall allow the installing contractor the option of installing the unit with inlet and outlet on the same side of the unit or on opposite sides.

2.3 PUMP ACCESSORIES

A. Pump discharge multi-purpose valves: All pumps shall be fitted with a discharge multi-purpose balancing valve or other means of providing system balance, isolation, and check feature for reverse flow. The valve shall be straight or angle pattern and shall be field convertible between the two. The valve shall be ductile iron and rated for 250 psi working pressure for all jobs. The valve flanges shall be matched to suit the working pressure of the piping components on the job;

with either ANSI class 125 flanges or ANSI class 250 Flanges. The valve shall include the following components; non-slam check valve with spring-loaded bronze disc and seat, stainless steel stem, and calibrated adjustment permitting flow regulation. Valve shall be serviceable under full system pressure. The valve shall be a Taco model MPV Plus Two multi-purpose valve or equivalent.

- B. Pump inlet guide fitting: All pump suction to be fitted with a multifunction inlet suction diffuser equal to that as manufactured by Taco, Inc. The suction diffuser body and cover plate shall be ductile iron and be rated for 250 psi for all jobs. The guide flanges shall be matched to suit the working pressure of the piping components on the job; with either ANSI class 125 flanges or ANSI class 250 flanges. The suction guide shall include the following components; full length S.S. straightening vanes, permanent S.S. strainer, disposable 16 mesh bronze start up strainer, blow down ports, and metering ports. For those pumps where an inlet guide fitting is not installed, there should be five pipe diameters of straight undisturbed flow going into the pump suction. The fitting shall be a Taco model SD inlet suction elbow or equivalent.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install specialties in accordance with 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. Air separator and expansion tank to be installed on the suction side of the system pumps. Expansion tank to be tied into system piping in close proximity to air separator and system fill line.
- 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 where indicated. Remove temporary strainers after cleaning systems.
- H. Provide combination pump discharge valve on discharge side of base mounted centrifugal pumps where indicated.
- I. Support pump fittings with floor mounted pipe and flange supports.
- J. Provide radiator valves on water inlet to terminal heating units such as radiation, unit heaters, and fan coil units.
- K. Provide radiator balancing valves on water outlet from terminal heating units such as radiation, unit heaters, and fan coil units.

- L. Provide relief valves on pressure tanks, low pressure side of reducing valves, heat exchangers, and expansion tanks.
- M. 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.
- N. Pipe relief valve outlet to nearest floor drain.
- O. Where one line vents several relief valves, make cross sectional area equal to sum of individual vent areas.
- P. Clean and flush glycol system before adding glycol solution. Refer to Section 15189.
- Q. Feed glycol solution to system through make-up line with pressure regulator, venting system high points.
- R. Feed glycol solution to system through make-up line with pressure regulator, venting system high points. Set to fill at ____ psi.
- S. Feed glycol solution to system through make-up line with pressure regulator, venting system high points.
- T. Perform tests determining strength of glycol and water solution and submit written test results.

END OF SECTION 15181