

**SECTION 236100 - HYDRONIC SPECIALTIES**

- 1.0 This section pertains to Hydronic specialties to be applied to chilled water, condenser water, glycol and hot water heating systems. Reference Sections:
- A. Section 230200 for Basic Materials and Methods.
  - B. Section 231000 for Piping Systems.
- 2.0 Refer to the typical piping diagrams contained in the Appendices for arrangements of specialties serving various types of equipment.
- 3.0 Each closed loop hot water heating system in each building shall have a dual redundant full flow filter installed in series with the primary pumps but parallel to each other. The filter shall be manufactured by Filter Specialists, Inc. (FSI) and be designed for a maximum clean pressure drop of 3.0 PSI when using a 50 micron filter bag. All filters above 4" shall be supplied with hydraulic lifting mechanism and raised landing for better leverage. The interior of the filter housing shall be epoxy coated.
- 4.0 Strainers - Cast iron "Y" type with removable, cleanable stainless steel screens having 1/16" perforations through 4" and 1/8" perforations above 4". Each strainer blowdown connection shall be piped with a ball valve and hose connection. Strainers shall be rated for a 300 PSI working pressure.
- 5.0 Isolation Valves, Unions and Flanges - Refer to Section 230200.
- 6.0 Check valves shall be of the silent type, center guided spring loaded type with screwed ends through 2" and wafer type above 2". All trim shall be 316 stainless steel with a carbon steel or bronze body to match piping materials. Manufacture: DFT, Inc or equal. Consider the use of stop-check valves for chilled water bridge installations.
- 7.0 Balancing valves - Refer to Section 230200.
- 8.0 Backflow preventers - Double check back pressure type with integral drain. Equal to Watts Regulation Co. Series LF 909 or City of Philadelphia approved equals. Relief shall be piped to a suitable drainage facility as indicated in Section 221000.
- 9.0 Pressure relief valves shall be constructed of the following materials:
- A. Bronze body
  - B. Trim - stainless steel
  - C. Springs - stainless steel
- All relief valves shall conform to ASME standards and be National Board certified. Relief valve discharge shall be piped to a suitable drainage facility as indicated in Section 231000. Manufacturer: Sarco or equivalent.
- 10.0 Pressurized Expansion Tanks - Diaphragm or bladder (butyl rubber) type steel tanks complete with charging valve, drain valve, ASME stamp, lifting rings and system connection. Connection between tank and system shall be provided with a locking type ball valve. Provide vertical floor-mounted tanks wherever possible, mounted on concrete equipment pad.

- 11.0 Dirt and air separators with coalescing medium shall be of the centrifugal type with blowdown connections complete with piped ball valve and hose adapter. Air separators shall be furnished without the strainers.
- 12.0 Thermometers and Gauges - Provide and install all thermometers and gauges in such a manner as to be easily read from normal observation positions. Provide adjustable angle stem industrial-type thermometers with brass case, red reading column, clear double strength glass, 304 stainless steel stem, 9 inch scale, white face and black numerals. Thermometers containing mercury are not permitted. Case shall be adjustable so the scale is readable from the floor. Thermometer ranges shall be as follows:
- A. Condenser water –30°F to 130°F
  - B. Chilled water – 0°F to 100°F
  - C. Heating water – 30°F to 240°F

Thermometers shall be certified and have a guaranteed accuracy of plus or minus 1 percent of full scale, except for thermometers located in the chilled water supply and return piping at the chillers which shall have an accuracy of plus or minus 0.15 degrees F. The accuracy of all pressure gauges shall be 1% of scale range. Select range in such a manner that the operating pressure is at the mid-point of the scale. Minimum range for chilled water gauges shall go up to 200 psi. Minimum size of dial shall be 4 1/2" diameter. Refer to the typical piping diagrams in the Appendices for locations of gauges and thermometers. Provide ball valves on all gauges. Manufacturer: Trerice (BX Type), Philadelphia Instruments, Weiss (Navy Class). All gauges shall be installed with 2-valve connections.

- 13.0 Thermometer Mounting - Provide thermometers with matching stainless steel separable socket thermometer wells. Where thermometers are installed in piping with insulation 2 inches thick or greater, provide thermometer wells with extension necks. Omit extension necks where thermometers are used on bare pipe or pipe with insulation less than 2 inches. Where thermometer wells are installed in piping 2-1/2 inches and smaller, increase the pipe size by at least one pipe diameter to avoid restricting the flow in the pipe. Add depth extension into pipe.
- 14.0 Air Vents - High capacity, float activated, non-modulating 150 PSIG, cast iron body, stainless steel trim designed to prevent air from entering the system when pressure falls below atmospheric pressure, or manual type consisting of a 1/2" ball valve with 1/2" hose end.
- 15.0 Incoming services to buildings or projects, as determined by the University, such as chilled water, steam, domestic water and natural gas, shall be sub-metered and reported to the University Operations Control Center (OCC) and the Energy Management System. Refer to Utility Meter section of this standard.