

**PERFORMANCE SPECIFICATIONS**

1. Hydronic Piping Packages

1.1. Contractor shall provide and install Griswold Hydronic Piping Packages where indicated on drawings. The Hydronic Piping Packages may include, but are not limited to, ball valves, strainers, flow control valves, unions, 2-way or 3-way temperature control valves, air vents, pressure/temperature test valves, drain valves, tees, fire rated hoses, and other components.

1.2. Griswold Hydronic Piping Packages shall be factory assembled.

2. Flow Control Valves (**Select either Automatic or Manual**)

2.1. Automatic Flow Control Valves (FCV)

2.1.1. FCV shall automatically control flow rates with  $\pm 5\%$  accuracy over an operating pressure differential range of at least 14 times the minimum required for control. Three operating pressure ranges shall be available with the minimum range requiring less than 3 PSID to actuate the mechanism.

2.1.2. Valve internal control mechanism shall consist of a stainless steel one-piece cartridge with segmented port design and full travel linear coil spring.

2.1.3. Dual pressure/temperature test valves for verifying the pressure differential across the cartridge and system shall be standard.

2.1.4. Manufacturer shall be able to provide certified independent laboratory tests verifying accuracy of performance.

2.2. Manual Balance Valves

2.2.1. Contractor shall provide and install "QuickSet" valves manufactured by Griswold Controls.

2.2.2. Manual balancing valves shall be of the venturi type, with "Flow Optimizer" insert in the ball of the valve to provide linear flow, two pressure temperature test valves (ports) in the same valve housing.

2.2.3. Valves that measure the flow across an orifice plate or a calibrated ball valve shall not be allowed.

2.2.4. The valve shall have a memory stop with graduated markings to lock in the set flow position.

2.2.5. The flow accuracy of the venturi shall be guaranteed by the manufacturer to be within +/- 2%

3. Components

3.1. Isolator™B (Union Ball Valve) and Ball Valve

3.1.1. Ball valves shall be made of Bronze and rated for 600 WOG.

3.2. Union

3.2.1. Unions shall be made of Bronze and rated for 600 WOG.

3.3. Y-Strainer

- 3.3.1. Strainer shall be Y-type configuration made of bronze with a brass cap. Maximum pressure rating of 300 PSI.
- 3.3.2. Strainer screen shall be stainless steel and rated for 20 mesh, easily accessible for cleaning.
- 3.3.3. A pressure/temperature test valve shall be standard.
- 3.3.4. Y-Strainer shall be offered with blow down option.
- 3.4. Isolator™S (Combination Union Ball Valve and Y-Strainer)
  - 3.4.1. Strainer shall be Y-type configuration made of bronze with a brass cap. Maximum pressure rating of 300 PSI.
  - 3.4.2. Strainer screen shall be stainless steel and rated for 20 mesh, easily accessible for cleaning.
  - 3.4.3. A pressure/temperature test valve shall be standard.
  - 3.4.4. Y-Strainer shall be offered with blow down option.
- 3.5. Supply and Return Hoses
  - 3.5.1. All hoses shall be equipped with swivel end connections at terminal unit. All end connections shall be crimped to meet stated pressure ratings. Serrated/slip fit connections are not acceptable.
  - 3.5.2. Flame Retardant Hoses
    - 3.5.2.1. Hose materials shall be stainless steel braided over a synthetic polymer liner.
    - 3.5.2.2. Hoses shall meet or exceed the ASTM-D380-83 standard and withstand working pressures of 375 PSI (1/2"), 300 PSI (3/4"), 225 PSI (1"), 200 PSI (1-1/4") at 211°F and 175 PSI (1-1/2") and 150 PSI (2") at 200°F
    - 3.5.2.3. Hoses shall meet or exceed flame retardant testing per standards UL #723, NEPA #225, ANSI 2.5, UBC 42-1, and ASTM-E84A. after ten minutes and produce less than 5% smoke as compared to Red Oak flooring (100%)
  - 3.5.3. Insulated Hoses
    - 3.5.3.1. Hose materials shall be high quality polyethylene pipe insulation over a stainless steel braided inner core and withstand working pressure of 375 PSI (1/2"), 300 PSI (3/4"), 225 PSI (1"), 200 PSI (1-1/4") at 211°F and 175 PSI (1-1/2") and 150 PSI (2") at 200°F
- 4. Warranty
  - 4.1. All components shall be warranted by manufacturer for no less than one year from date of purchase. The flow control cartridge shall be warranted by manufacturer for no less than five years from date of purchase.