

**To be inserted into Section 15700 – Hydronic System**

- 1 Pressure Independent Actuated Ball Valves and Cartridge (PIC-V)
  - A. The modulating control valves shall be pressure independent.
  - B. The pressure independent modulating control valve shall include a Pressure Compensating Cartridge, Actuated Ball Valve, and Manual Isolation Ball in a single valve housing.
  - C. Valve housing shall consist of forged brass, rated at no less than 360 psi at 250°F.
  - D. Valve shall have a fixed end or union end connection with factory installed air vent to allow for venting of the coil or heat pump.
  - E. The control valve shall accurately control the flow from 0 to 100% full rated flow.
  - F. A flow tag shall be furnished with each valve.
  - G. A universal mounting plate shall allow installation of actuators meeting the system electrical requirements and valve torque requirements as provided by Belimo, ELO Drive, Honeywell, Johnson Controls, KMC, Neprionics, Siemens, or Snyder Electric.
  - H. The actuator and plate can be rotated after mounting.
  - I. Pressure Compensating Cartridge (PCC)
    1. PCC shall automatically compensate for pressure changes in valve and shall maintain a constant pressure drop across the flow limiting actuated ball.
    2. The operating pressure range shall be available with the minimum range requiring 5.8 PSID to actuate the mechanism.
    3. Valve internal control mechanism includes a diaphragm and full travel linear coil spring.
    4. Valves shall include an accessible/ replaceable cartridge.
    5. Dual pressure/temperature test valves for verifying the pressure differential across the cartridge and flow limiting ball shall be standard.
  - J. Actuated Ball Valve
    1. Valve ball shall consist of chemically plated nickel brass or stainless steel.
    2. Actuator stem shall be removable/replaceable without removing valve from line.
    3. Manufacturer shall be able to provide ball insert to limit flow to maximum flow rate with  $\pm 5\%$  accuracy.
    4. Valve shall have EPDM O-rings behind the seals to allow for a minimum close-off pressure of 100 psi with 35 in-lbs of torque for 1/2" – 2" sizes.
    5. Actuator shall provide minimum torque required for full valve shutoff position.
  - K. Isolation Ball Valve
    1. Valve shall include a 600 WOG manual isolation ball valve
  - L. Pressure Independent Control Valves shall be by Griswold Controls.
  - M. The control valve actuator may be furnished by the controls contractor under Section 15970 or by the Pressure Independent Control Valve manufacturer.

2. Warranty

- A. All components shall be warranted by manufacturer for no less than one year from date of purchase.

***To be inserted into Section 15970 – Energy Management & Controls or Section 17000 – Building Automation***

- 1. All pressure independent valves for individual coil control shall be provided as part of Hydronic Coil Piping / Hose Kit Packages as specified in section 15700. Control valve actuators will be (supplied and installed by the pressure independent valve manufacturer) or (supplied and installed by the controls contractor) or (supplied by the controls contractor and shipped to the pressure independent valve manufacturer for factory installation). The controls contractor is responsible for wiring and testing the valve actuators.

***This portion should be included in the balancing specification and temperature control specification to provide detail for the deletion of the balancing valves and balancing where pressure independent valves are installed.***

- 1. Balancing valves and associated balancing shall not be required on devices where pressure independent control valves are installed. Balancing valves and balancing are required if self-contained pressure independent control valves are not installed.