

SECTION 230923.11 – CONTROL VALVES

- A. Control valves assemblies shall be provided and delivered from a single manufacturer as a complete assembly. The manufacturer shall warrant all components for a period of 5 years, except where noted, from the date of production with the first two years unconditional.

1.1 BALL-STYLE CONTROL VALVES

1. Manufactured, brand labeled or distributed by Belimo.
2. **NPS 2 (DN 50)** and Smaller: Provide a pipe package supplied by the valve manufacturer. The supply side of the coil shall contain a strainer/shut-off ball valve/drain [an integrated isolation ball valve/manual air vent] with P/T port. The return side of the coil shall contain a union fitting with a P/T port, ball-style control valve, an integrated manual balancing valve/union/isolation ball valve/manual air vent with P/T port. Shut-off valves as an integrated part of the ball-style control valve shall not be permitted. **[For ball valves with two ports, supply an integrated 100% port isolation valve/manual air vent with P/T port for field installation in the bypass of the circuit.] [A [12"] [24"] flexible hose set shall be provided for each coil supply and return connection.]**

- A. Ball Valves with Six Ports and Two Characterized Disks:

1. Pressure Rating for **NPS 3/4" (DN 20)** and Smaller: **232 psi (1600 kPa)**.
2. Close-off Pressure: **50 psig (345 kPa)**.
3. Process Temperature Range: **43 degF to 180 deg (6 to 82 deg C)**.
4. Body and Tail Piece: Forged brass with nickel plating.
5. End Connections: NPT.
6. Ball for **NPS 3/4 (DN 20)** and Smaller: Chrome-plated brass.
7. Stem and Stem Extension:
 - a. Material: brass to match ball.
 - b. Blowout-proof design.
8. Ball Seats: Teflon PTFE.
9. Stem Seal: EPDM O-rings (lubricated)
10. Characterizing Disc: Chrome plated steel.
11. Flow Characteristics: Linear.
12. Leakage: 0%
13. Controllable Flow Range: Sequence 1 is 0 to 30 degree angle; Dead zone is 30 to 60 degree angle; Sequence 2 is 60 to 90 degree angle.
14. Label each valve with following:
 - a. Manufacturer's name and model number.
 - b. Body size.
 - c. Flow directional arrow
 - d. Port numbers

- B. Pressure-Independent Ball Valves with Six Ports and Two Characterized Disks:

1. Pressure Rating for **NPS 3/4" (DN 20)** and smaller: **232 psi (1600 kPa)**.
2. Close-off Pressure: **50 psig (345 kPa)**.
3. Process Temperature Range: **43 degF to 180 deg F (6 to 82 deg C)**.

4. Body and Tail Piece: Forged brass with nickel plating.
5. End Connections: NPT.
6. Ball for **NPS 3/4 (DN 20)** and smaller: w4hrome-plated brass.
7. Stem and Stem Extension:
 - a. Material: brass to match ball.
 - b. Blowout-proof design.
8. Ball Seats: Teflon PTFE.
9. Stem Seal: EPDM O-rings (lubricated)
10. Characterizing Disc: Chrome plated steel.
11. Flow Characteristics: Linear.
12. Leakage: 0%
13. Controllable Flow Range: Sequence 1 is 0 to 30 degree angle; Dead zone is 30 to 60 degree angle; Sequence 2 is 60 to 90 degree angle.
14. Integrated Flow Meter: A characterized control valve shall be integrated with an ultrasonic flow sensor (accuracy +/- 2%) providing analog flow feedback. The valve shall reposition to maintain the required flow with a +/- 5% accuracy over a pressure differential range of **1 to 15 psig (7 to 110 kPa)**.
15. Glycol Compensation: The control valve assembly shall incorporate an algorithm to automatically compensate for the glycol concentration and be readable by a local device.
16. Label each valve with following:
 - a. Manufacturer's name and model number.
 - b. Body size.
 - c. Flow directional arrow
 - d. Port numbers.

SPECIFYING PRESSURE INDEPENDENT CONTROL VALVES REQUIRE THE FOLLOWING ADDITIONS TO SECTIONS 232113 AND 230593.

To be inserted into Section 232113 – HYDRONIC PIPING

2.6 CONTROL VALVES

- K. Calibrated Balancing Valves and Automatic Flow-Control Valves shall not be used on equipment where pressure independent control valves are installed.

To be inserted into Section 230593 – TESTING, ADJUSTING, AND BALANCING FOR HVAC

3.11 PROCEDURE FOR HYDRONIC SYSTEMS

- H. Systems installed with pressure independent control valves shall not require terminal level hydronic system balancing. **[Field verify installation and operating differential pressure range of all pressure independent control valves.] [Total system flow shall be verified to be within +/-10% of system design.] [10%] [20%] [25%] <Insert Percentage> of the total installed product shall be randomly checked for individual conformance. Exact locations of tested product to be coordinated with the design engineer.] Any individual adjustments for the pressure independent valve assembly (valve and actuator combination) for field conditions shall be performed using the pressure independent control valve manufacturer's documented procedure following the guidelines of the National Environmental Balancing Bureau (NEBB) and the Testing Adjusting Balancing Bureau (TABB)]**