Revised December 4, 2024

SECTION 230923.11 – CONTROL VALVES

1.1 GENERAL

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 from the date of production with the first 2 years unconditional.

* 1. BALL-STYLE CONTROL VALVES
     + - 1. Manufactured, brand labeled or distributed by Belimo.
         2. 2-way Ball Valve with Characterizing Disc

Materials:

Body:

**NPS 3** (**DN 80**) and smaller: Nickel plated (forged) brass;

**NPS 2-1/2** (**DN 65**)through **NPS 6** (**DN 150**): Cast iron GG25.

Ball:

**NPS ½, ¾** (**DN 15, 20**): **[Chrome Plated Brass]** or **[Stainless steel]**;

**NPS 1** (**DN 25**) through **NPS 6** (**DN 150**): Stainless steel.

Seats/Seals:

PTFE (TeflonTM)/double EPDM O-rings.

Stem/Extension:

**[Nickel plated brass]** or [**Stainless steel]** to match ball.

Characterizing Disc:

**NPS 3** (**DN 80**) and smaller:TefzelTM or Stainless steel

**NPS 2-1/2** (**DN 65**)through **NPS 6** (**DN 150**): Stainless steel.

Piping Connections:

**NPS 3** (**DN 80**) and smaller: (2), female NPT.

**NPS 2-1/2** (**DN 65**) through **NPS 6** (**DN 150**): (2), flanged, **[ANSI Class 125B]** or **[ANSI Class 250]**

Media: Water (maximum 60% glycol solution).

Performance:

Media Temperature:

**NPS 2** (**DN 50**) and smaller NPT: **0℉** to **250 ℉** (**-18℃** to **120℃**);

**NPS 2-1/2** (**DN 65**) through **NPS** **3** (**DN 80**) NPT: **0℉** to **212℉** (**-18℃** to **100℃**);

**NPS 2-1/2** (**DN 65**) through **NPS 6** (**DN 150**) flanged**:** **0℉** to **250 ℉** (**-18℃** to **120℃**).

Pressure:

Body:

**NPS ½, ¾, 1, 1-1/4** (**DN 15** to **DN 32**) NPT: **600 psig** (**4137 kPa**);

**NPS 1-1/4, 1-1/2, 2** (**DN 32** to **DN 50**) NPT: **400 psig** (**2758 kPa**);

**NPS 2-1/2** through **NPS 3** (**DN 65** to **DN 80**) flanged: **400 psig** (**2758 kPa**);

**NPS 2-1/2** through **NPS 6** (**DN 65 to DN 150**) flanged**:** In accordance with **[ANSI Class 125B]** or **[ANSI Class 250].**

Maximum Operating Differential:

**NPS 2** (**DN 50**) and smaller NPT: **50 psig** (**345 kPa**);

**NPS 2-1/2** through **NPS 3** **(DN 65, DN 80)** NPT: **30 psig** (**206** **kPa**);

**NPS 2-1/2** through **NPS 6** (**DN 65** to **DN 150**) flanged: **50 psig** (**345 kPa**);

Close-off (valve and actuation assembly):

**NPS ½** through **NPS 2** (**DN 15** to **DN 50**) NPT: **200 psid** (**1379 kPa**);

**NPS 2-1/2** through **NPS 3** **(DN 65, DN 80)** NPT: **100 psid** (**689 kPa**);

**NPS 2-1/2** through **NPS 6** (**DN 65** to **DN 150**) flanged: ANSI Class 125B: **175 psid** (**1206 kPa**); ANSI Class 250: **310 psid** (**2137 kPa**).

Leakage (A-AB): 0%.

Labeling: Valve body shall be furnished with a label containing the following data:

Manufacturer's name and model number;

Nominal size.

* + - * 1. 2-way High Temperature Ball Valve with Characterizing Disc

Materials:

Body: DZR Brass;

Ball: Stainless steel;

Seats/Seals: ETFE (TefzelTM)/FKM O-ring (VitonTM);

Stem/Seals: Stainless steel/EPDM O-rings;

Characterizing Disc: ETFE (TefzelTM).

Piping Connections:

**NPS 1 (DN 25)** and smaller: (2), female NPT.

Media: Steam (≤ 15 psig), Water (maximum 60% glycol solution).

Performance:

Media Temperature:

Steam: Maximum **250℉** (**120℃**);

Water: **60℉** to **266℉** (**16℃** to **130℃**).

Pressure:

Body: **600 psi** (**4137 kPa**);

Maximum Operating Differential:

Steam: **15 psid** (**103 kPa**);

Water**: 60 psid** (**414 kPa**).

Maximum Inlet: **15 psig** (**103 kPa**), steam only;

Close-off (valve and actuation assembly): **200 psid** (**1379 kPa**).

Leakage: 0% (A-AB).

Labeling: Valve body shall be furnished with a label containing the following data:

Manufacturer's name and model number;

Nominal size.

* + - * 1. 3-way Ball Valve with Characterizing Disc

Materials:

Body: Nickel plated (forged) brass;

Ball:

**NPS ½, ¾** (**DN 15, 20**): **[Chrome plated brass]** or **[Stainless steel]**;

**NPS 1** (**DN 25**) through **NPS 2** (**DN 50**): Stainless steel.

Stem/Extension/Seals:

**[Nickel plated brass]** or [**Stainless steel]** to match ball (see D-1b(1) above);

Lubricated EPDM O-Rings.

Seat/Seals: PTFE (TeflonTM)/EPDM O-rings;

Characterizing Disc: TefzelTM or Stainless steel or Ryton PPS.

Piping Connections: **NPS 1/2** (**DN 15**) through **NPS 2** (**DN 50**): (3), female NPT.

Media: Water (maximum 60% glycol solution).

Performance:

Inherent Flow Characteristics:

Control port (A): Equal percentage;

Pressure:

Body:

**NPS ½, ¾, 1, 1-1/4** (**DN 15** to **DN 32**): **600 psig** (**4137 kPa**);

**NPS 1-1/4, 1-1/2, 2** (**DN 32** to **DN 50**): **400 psig** (**2758 kPa**);

Maximum Operating Differential: **50 psid** (**345 kPa**);

Close-off (valve and actuation assembly): **200 psid** (**1379 kPa**).

Leakage:

A-AB: 0%;

B-AB: 2% of maximum rated valve CV.

Labeling: Valve body shall be furnished with a label containing the following data:

Manufacturer's name and model number.

Nominal size.

* + - * 1. 3-way Diverting Ball Valve

Materials:

Body: Nickel plated (forged) brass;

Ball: Chrome plated brass;

Stem/Extension/Seals: Nickel plated brass/PTFE (TeflonTM)/double EPDM O-rings

Seat/Seals: PTFE (TeflonTM)/ EPDM O-rings;

Piping Connections: **NPS 1/2** (**DN 15**) through **NPS 2** (**DN 50**): (3), female NPT.

Media: Water (maximum 60% glycol solution).

Performance:

Inherent Flow Characteristics: Modified linear

Pressure:

Body:

**NPS ½, ¾, 1** (**DN 15** to **DN 25**): **600 psig** (**4137 kPa**);

**NPS 1-1/4, 1-1/2, 2** (**DN 32** to **DN 50**): **400 psig** (**2758 kPa**);

Maximum Operating Differential: **50 psid** (**345 kPa**);

Close-off (valve and actuation assembly): **200 psid** (**1379 kPa**).

Leakage: 0%’

Labeling: Valve body shall be furnished with a label containing the following data:

Manufacturer's name and model number.

Nominal size.

* + - * 1. 2-way and 3-way Reduced Port Ball Valve:

Materials:

Body: Forged brass;

Ball: Chrome plated brass;

Seats/Seals: PTFE (TeflonTM)/EPDM O-Rings;

Stem/Extension/Seals: Brass/double EPDM O-rings.

Piping Connections: **NPS 1** (**DN 25**) and smaller: **[Female NPT]** or **[Sweat]** or **[Press Fit]**.

Media: Water (maximum 60% glycol solution).

Performance:

Inherent Flow Characteristics:

2-way: Equal percentage;

3-way diverting: Linear.

Media Temperature: **0℉** to **212 ℉** (**-18℃** to **100℃**);

Pressure:

Body:

**360 psig** (**2482 kPa**) NPT, Sweat;

**250 psig** (**1723 kPa**) Press fit.

Maximum Operating Differential: **40 psid** (**276 kPa**);

Close-off (valve and actuation assembly);

2-way: **75 psid** (**517 kPa**);

3-way: **40 psid** (**276 kPa**).

Leakage: 0%.

Labeling: Valve body shall be furnished with a label containing the following data:

Manufacturer's name and model number;

Nominal size.

* + - * 1. 6-way Ball Valve with Characterizing Discs

Materials:

Body: Nickel plated brass;

Ball: Chrome plated brass;

Stem/Extension/Seals: Nickel plated brass, double EPDM O-rings;

Seat/Seals: PTFE (TeflonTM)/EPDM O-rings;

Characterizing Disc: Chrome plated steel.

Piping Connections: **NPS 1/2** (**DN 15**) through **NPS 1** (**DN 25**): (6), female NPT.

Media: Water (maximum 60% glycol solution).

Performance:

Media Temperature: **43℉** to **180 ℉** (**6℃** to **82℃**);

Pressure:

Body: **232 psig** (**16 kPa**);

Maximum Operating Differential: **15 psid** (**103 kPa**);

Close-off (valve and actuation assembly): **50 psid** (**345 kPa**).

Leakage: 0%.

The valve shall incorporate a loop pressure relief to release any pressure build up in the loop when the valve is in the isolated position.

Labeling: Valve body shall be furnished with a label containing the following data:

Manufacturer's name and model number;

Nominal size.

* + - * 1. Piping Package Option **NPS 2** (**DN 50**) and smaller: Furnish a piping package with the control valve assembly, package to be supplied by the valve manufacturer, components as follows: 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. Isolation valves furnished 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 flexible hose set shall be provided for each coil supply and return connection.]**
        2. Control Valve Actuators

Actuators for Hydronic Control Valves: Capable of closing valve against system pump shutoff head.

Actuators for Steam Control Valves: Shutoff against [**1.2**] [**1.5**] <**Insert number**> times steam design pressure.

Valve Attachment:

Attach actuator to valve drive shaft in a way that ensure maximum transfer of power and torque without slippage.

Actuators shall be capable of being mechanically and electrically paralleled to increase torque if required.

V-bolt dual nut clamp with a V-shaped toothed cradle; directly couple and mount to the valve bonnet stem; or ISO-style direct-coupled mounting pad.