# Fisher™ V250 Rotary Control Valve

The V250 Hi-Ball rotary control valve is designed for heavy-duty throttling and on-off applications. Depending on size, this valve installs between two CL600 or CL900 pipeline flanges. The V250 valve is available with a single ball seal, flow ring, or dual-seal construction. Single-seal constructions are used in tight shutoff applications; the flow ring construction can satisfy higher temperature requirements. The dual-seal construction, with a seal in the inlet and outlet openings, is used in bidirectional flow-shutoff applications. The V250 Hi-Ball valve is typically used for throttling and controlled flow applications in gas transmission lines, gas distribution, or liquid pipelines.

W4177

## Features

- High Pressure Drop Capabilities—Depending on the construction, a V250 valve is capable of a maximum static pressure differential of 103 bar (1500 psi) at 82°C (180°F) for CL600, and 155 bar (2250 psi) for CL900 constructions at 38°C (100°F) for LCC steel and CF8M (316 stainless steel).
- Efficient Operation—Tapered-polygon ball-to-shaft connection (see figure 4) and clamped splined actuator connection (see figure 5) remove lost motion or deadband from the drive train for throttling control applications.
- Excellent Flow Control—Reduced ball port design provides a modified equal percentage flow characteristic and an excellent response characteristic.
- Tight Shutoff—Shutoff with the V250 ball seal is 0.0001 percent of maximum capacity.
- Greater Capacities—V250 ball valve construction offers greater capacities than conventional globe valves for both compressible and incompressible fluids.
- Sour Service Capability—Materials are available for applications handling sour service. These materials comply with the requirements of NACE MR0175-2002.
- Long Service Life—Pressure-balanced drive shaft design with PTFE-lined bearings and pressure-assisted shaft sealing arrangement provides for a long life of reliable service.
- Minimum Maintenance—Two-piece ball and shaft assembly allows for complete trim overhaul; parts replacement is kept to a minimum.
- Excellent Environmental Capabilities—The optional live loaded packing system is designed with very smooth shaft surfaces and live loading to provide excellent sealing.

Specifications

**Available Configuration**

Flangeless ball valve assembly with ■ single ball seal, ■ flow ring, or ■ dual ball seal

**Valve Body Sizes and End Connection Styles**

NPS 4 through 12 flangeless valves retained by line flange bolts and designed to fit between CL600 or CL900 ■ raised-face or ■ ring-type joint flanges (ASME B16.5)

NPS 16 through 24 flangeless valves retained by line flange bolts and designed to fit between CL600 ■ raised-face or ■ ring-type joint flanges (ASME B16.5)

**Maximum Inlet Pressure(1)**

NPS 4 through 12 consistent with CL600 or CL900 (ASME B16.34)
NPS 16 through 24 consistent with CL600 (ASME B16.34)

**Maximum Allowable Shutoff Pressure Drop(1,2)**

Single-Seal and Dual-Seal Construction: See figure 2.
Flow Ring Construction: Limited by the pressure-temperature rating of the valve body

**Shutoff Classification**

Single-Seal and Dual-Seal Constructions: 0.0001% of maximum valve capacity (less than 1% of Class IV, ANSI/FCI 70-2 and IEC 60534-4)
Flow Ring Construction: 1% of maximum valve capacity

**Construction Materials**

See table 1

**Seal Material Temperature Capability(1)**

Single-Seal and Dual-Seal Construction:
■ -46 to 82°C (-50 to 180°F) for LCC steel and CF8M [316 stainless steel (SST)] valve bodies
Flow Ring with Nitrile O-Rings: ■ -46 to 93°C (-50 to 200°F) for LCC steel and CF8M valve bodies
Flow Ring with Fluorocarbon O-Rings: ■ -46 to 204°C (-50 to 400°F) for LCC steel and CF8M valve bodies

**Flow Characteristic**

Modified equal percentage

**Flow Direction**

Single Seal Construction: Forward-flow only (see figure 3)

Flow Ring Construction: Forward- or reverse-flow (see figure 3)

Dual Seal Construction: Required to provide shutoff for bi-directional flow

**Flow Coefficients**

See Catalog 12

**Noise Levels**

See Catalog 12 for sound pressure level prediction

**Maximum Ball Rotation**

90 degrees

**Actuator Mounting**

■ Right-hand or ■ left-hand mounted as viewed from the valve inlet for forward-flow

**Shaft and Bore Diameters**

See figure 7

(continued)

Specifications (continued)

**Approximate Weights**
See table 2

**Options**
■ Line flange bolts, ■ Sour service trim(3), ■ Buried service actuator adaptation, and ■ Dual seal configuration for bi-directional shutoff (this configuration incorporates a tapped and plugged connection which can be used in a double block and bleed system to test seal integrity), ■ Live Loaded PTFE Packing

1. The pressure or temperature limits in this bulletin and any applicable standard or code limitations should not be exceeded.
2. The maximum allowable shutoff pressure drops are further limited for the following constructions. The NPS 12 with S20910 drive shaft is limited to 128 bar (1862 psi) from -46 to 59°C (-50 to 139°F) and to 103 bar (1490 psi) at 93°C (200°F). The NPS 16 with 17-4PH steel, with 2-1/2 inch splined driveshaft is limited to 1000 psi (69 bar), and with the S20910, 2-1/2 inch splined drive shaft is limited to 55 bar (795 psi) at all service temperatures. The NPS 24 with S20910 drive shaft is limited to 92 bar (1336 psi) at all service temperatures.
3. See table 1 for sour service trim materials.

Figure 1. Sectional View of Fisher V250 Valve

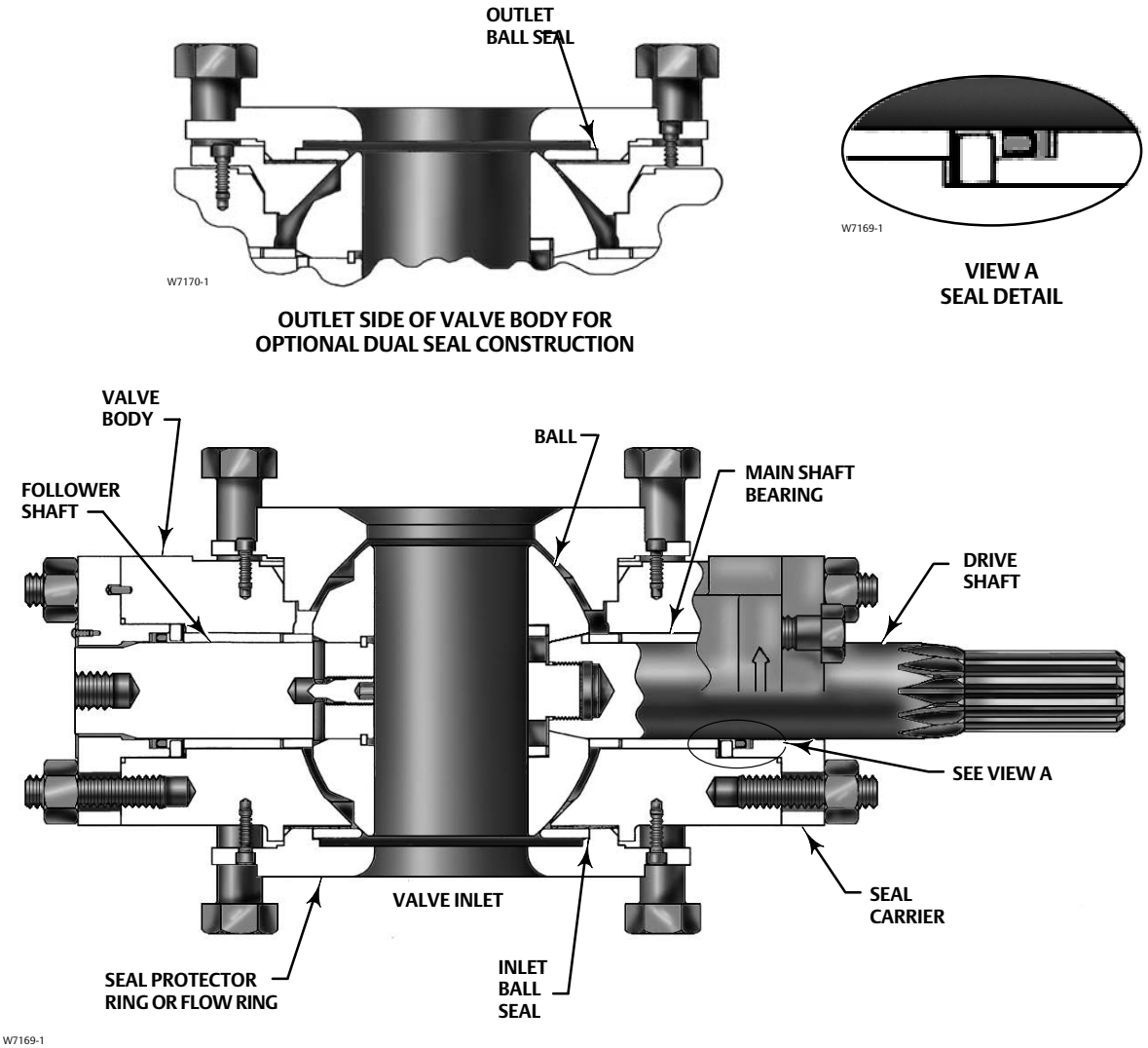


Table 1. Construction Materials

| Part | | Construction Material |
|---|---|---|
| Valve Body, Body Outlet, and Seal Protector Ring or Flow Ring | Standard | LCC carbon steel |
| | Sour Service Trim(1) | LCC steel, heat-treated |
| | Optional | WCC carbon steel or S31600 [316 stainless steel (SST)] |
| Drive Shaft, Follower Shaft, and Shaft Retainer | Standard | S17400 (17-4PH SST) |
| | Sour Service Trim(1) | S17400 (17-4PH SST) H1150 DBL |
| | Optional | S20910 stainless steel |
| Ball | Standard | Chrome-plated WCC steel |
| | Sour Service Trim(1) | Chrome-plated WCC steel, heat-treated |
| | Optional | Chrome-plated S31600 |
| Ball Seal | All Trims | POM (polyoxymethylene) |
| Bearings | All Trims | PTFE/Composition-lined S31600 |
| O-Rings | Standard | Nitrile |
| | Sour Service Trim(1) | Fluorocarbon |
| | Optional | Fluorocarbon |
| Shaft Seal | Std. with Backup Ring | PTFE R30003 / PEEK |
| | Live Loaded Packing | PTFE / SST |
| Seal Carrier | All Trims | S31600 SST |
| Seal Carrier Stud Bolts | Standard | Grade B7 steel |
| | Sour Service Trim(1) | Grade B7M steel |
| | Optional | Grade B8M stainless steel |
| Seal Carrier Hex Nuts | Standard | Grade 2H steel |
| | Sour Service Trim(1) | Grade 2HM steel |
| | Optional | Grade 8M stainless steel |
| Line Bolts(2) | Standard | Grade B7 steel |
| | Sour Service Trim(1) | Grade B7M steel |
| Line Nuts(2) | Standard | Grade 2H steel |
| | Sour Service Trim(1) | Grade 2HM |

1. As detailed in NACE MR0175-2002.
2. Line bolts and nuts are not included as part of the standard package. Specify line bolts and nuts as an option.

Table 2. Approximate Weights

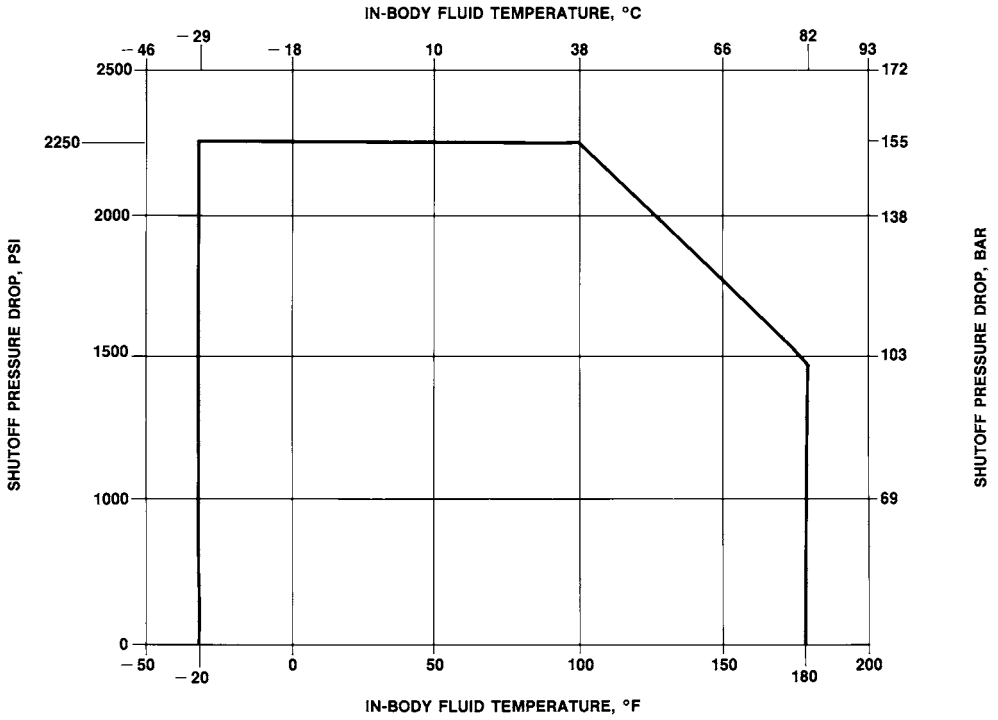
| VALVE SIZE, NPS | WEIGHT | |
|---|---|---|
| | Kilograms | Pounds |
| 4 | 73 | 160 |
| 6 | 132 | 290 |
| 8 | 222 | 490 |
| 10 | 345 | 760 |
| 12 | 431 | 950 |
| 16 | 771 | 1700 |
| 20 | 1814 | 4000 |
| 24 | 2404 | 5300 |

## Installation

Install the V250 valve in any position, but the recommended orientation is in a horizontal pipeline with the shaft positioned horizontally and the ball closing in the downward direction. The actuator can be either right- or left-hand mounted as viewed from the valve inlet for forward-flow. For bidirectional flow, install the valve so that the highest pressure condition will flow as shown by the flow direction arrow on the valve body.

Dimensions are shown in figure 7.

Figure 2. Maximum Allowable Shutoff Pressure Drop for Single and Dual POM Seal Construction




Note:
Do not exceed the limits in this curve or the body rating, whichever is lower.

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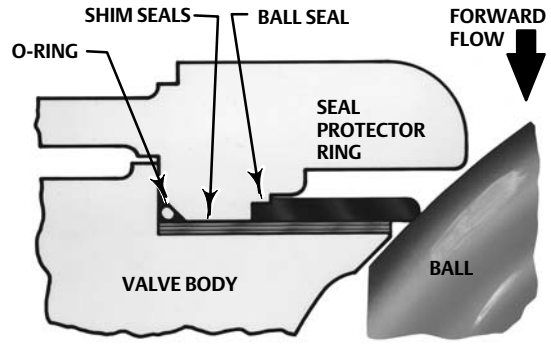
Figure 3. Ball Seal and Flow Ring Constructions




**BALL SEAL**

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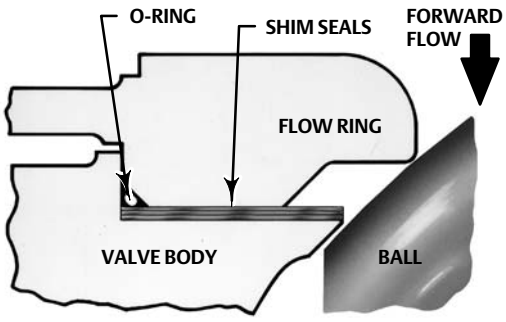


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**FLOW RING**

Figure 4. Drive Shaft for Fisher V250 Valve

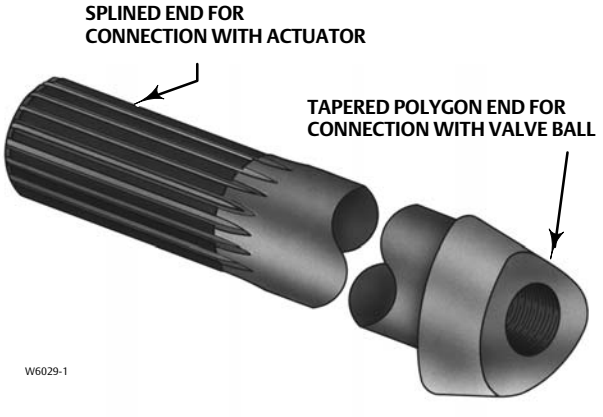



Figure 5. Clamped Splined Actuator Connection on Fisher 1061 Actuator

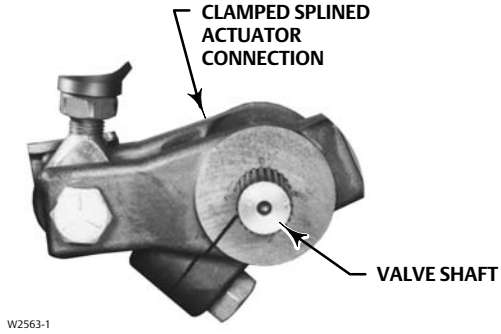



Figure 6. Live Loaded PTFE Packing

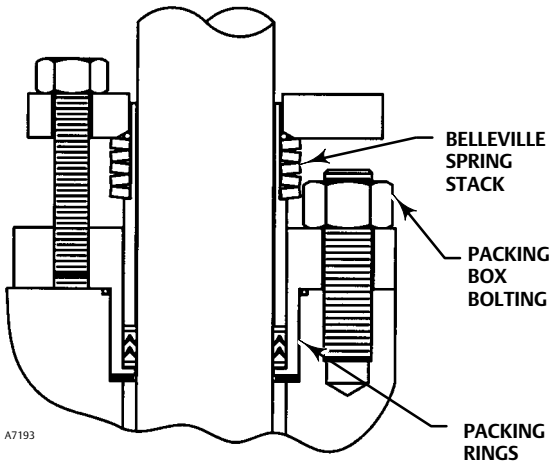
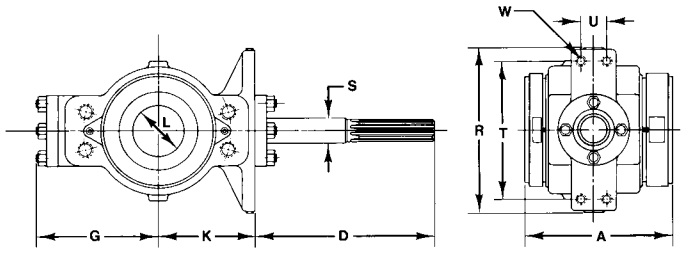
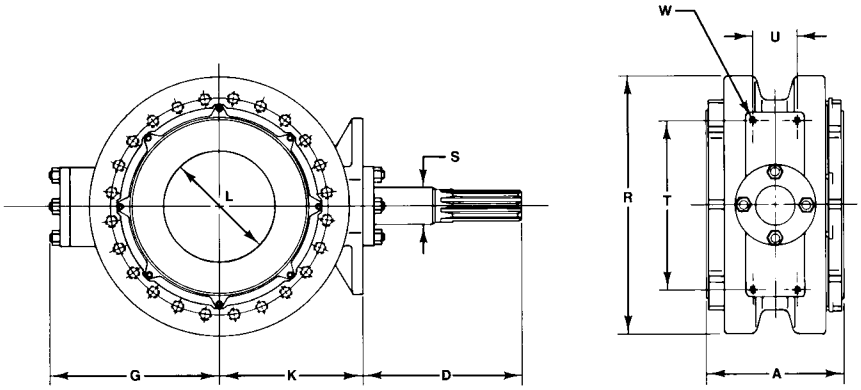


Figure 7. Dimensions (also see table 3)




**NPS 4 THROUGH 16**

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18A5916-C
B1609-2

**NPS 20 AND 24**

Table 3. Dimensions

| VALVE SIZE, NPS | A | D | G | K | L (BORE DIAMETER) | R | S | | T | U | W |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Shaft Diameter | Spline Diameter(1) | | | |
| **mm** | | | | | | | | | | | |
| 4 | 194 | 208 | 197 | 162 | 76.2 | 279 | 31.8 | 31.8 | 235 | 46 | 5/8-UNC |
| 6 | 229 | 356 | 238 | 194 | 101.6 | 327 | 50.8 | 50.8 | 273 | 51 | 3/4-UNC |
| 8 | 243 | 356 | 327 | 270 | 152.4 | 413 | 63.5 | 63.5 | 337 | 76 | 7/8-UNC |
| 10 | 297 | 356 | 343 | 287 | 187.5 | 445 | 69.9 | 63.5 | 337 | 76 | 7/8-UNC |
| 12 | 338 | 356 | 381 | 324 | 228.6 | 483 | 76.2 | 63.5 | 337 | 76 | 7/8-UNC |
| 16 | 400 | 470 | 460 | 392 | 292.1 | 613 | 101.6 | 63.5 | 533 | 127 | 1-1/4—8UN |
| | | 508 | | | | | | 88.9 | | | |
| 20 | 533 | 508 | 546 | 480 | 371.3 | 864 | 127.0 | 88.9 | 533 | 127 | 1-1/4—8UN |
| 24 | 679 | 508 | 629 | 546 | 438.2 | 991 | 152.4 | 88.9 | 533 | 127 | 1-1/4—8UN |
| **Inches** | | | | | | | | | | | |
| 4 | 7.62 | 8.19 | 7.75 | 6.38 | 3.00 | 11.00 | 1.25 | 1.25 | 9.25 | 1.81 | 5/8-UNC |
| 6 | 9.00 | 14.00 | 9.38 | 7.62 | 4.00 | 12.88 | 2.00 | 2.00 | 10.75 | 2.00 | 3/4-UNC |
| 8 | 9.56 | 14.00 | 12.88 | 10.62 | 6.00 | 16.25 | 2.50 | 2.50 | 13.25 | 3.00 | 7/8-UNC |
| 10 | 11.69 | 14.00 | 13.50 | 11.31 | 7.38 | 17.50 | 2.75 | 2.50 | 13.25 | 3.00 | 7/8-UNC |
| 12 | 13.31 | 14.00 | 15.00 | 12.75 | 9.00 | 19.00 | 3.00 | 2.50 | 13.25 | 3.00 | 7/8-UNC |
| 16 | 15.75 | 18.50 | 18.12 | 15.44 | 11.50 | 24.12 | 4.00 | 2.50 | 21.00 | 5.00 | 1-1/4—8UN |
| | | 20.00 | | | | | | 3.50 | | | |
| 20 | 21.00 | 20.00 | 21.50 | 18.88 | 14.62 | 34.00 | 5.00 | 3.50 | 21.00 | 5.00 | 1-1/4—8UN |
| 24 | 26.75 | 20.00 | 24.75 | 21.50 | 17.25 | 39.00 | 6.00 | 3.50 | 21.00 | 5.00 | 1-1/4—8UN |

1. Use this dimension to select compatible Fisher rotary actuators.

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