

# Fisher® POSI-SEAL™ A81 Rotary Valve

The Fisher POSI-SEAL A81 rotary valve with FieldQ™ rack-and-pinion actuator offers automated on-off, quarter-turn performance. It is available in spring-return and double-acting piston designs.

The valve body meets PN 10 through PN 40, CL150, and CL300 ratings. Face-to-face dimensions meet EN 558, API 609, and MSS-SP68 standards. Line centering clips provide for versatility to mount and align the same wafer style valve body in different piping configurations (ASME and EN ratings).

The A81 rotary valve features an eccentrically-mounted disk with either soft or metal seal, providing capability for enhanced shutoff. The interchangeable sealing technology allows for the same valve body to accept both soft and metal seals.

The actuator sizing and selection process is improved by simply reading a table for information.



W9479

## A81 Features

- **Quarter-turn performance**— The valve has a square shaft-to-actuator connection and offers automated on-off, quarter-turn performance.
- **Global Standards**— The valve meets API, ASME, and EN standards, making it suitable for use in all world areas. An optional mounting bracket provides ISO 5211 actuator mounting capability.
- **PEEK/PTFE bearing as standard**— The PTFE-lined PEEK bearing is a low friction, low wear bearing. It allows the valve to operate under high pressure drops for a high cycle life while maintaining low torque. The drop-in bearing design enables fast, easy maintenance.
- **Improved shaft-disk pinning**— The improved expansion pin system ensures there is a positive, durable connection between disk and shaft. This reduces backlash and wear in the drive system, optimizing long-term performance. It also makes disassembly for maintenance quick and simple with no need for special tools.
- **New Spring-Loaded Shaft**— The spring in the outboard shaft provides support to the drive train and disk, enabling the shaft to be installed in both horizontal and vertical orientations with no detriment to performance or cycle life. This complements the ability to mount the actuator on the left- or right-hand side, enabling access for any installation.



- **Excellent Emissions Capabilities**— The optional ENVIRO-SEAL™ packing systems, are designed with very smooth shaft surfaces and live-loading to provide improved sealing, guiding, and loading force transmission. The seal of the ENVIRO-SEAL system can control emissions to below 100 ppm (parts per million).
- **Sour Service Capability**— Depending on material selection, some trim and bolting materials are available for applications involving sour liquids and gases. These constructions comply with NACE MR0175-2002, MR0103, and MR0175 / ISO 15156. Contact your Emerson Process Management sales office for more information.
- **Easy Installation**— Line-centering clips engage the line flange bolts to simplify installation and provide for centering of wafer-style valves in the pipeline. End connections are compatible with EN and ASME standards.
- **Excellent Shutoff**— Both the metal and soft seal rings have pressure-assisting sealing action that ensures tight shutoff regardless of pressure drop.
- **Long Seal Life**— The opening and closing path of the eccentric disk minimizes disk contact with the seal ring, thereby reducing seal wear, undue friction, and seating torque requirements. See figure 2.
- **Reliable Flange Gasketing Surface**— The seal retainer screws and retention clips are outside the gasket surface of the seal retainer. Spiral-wound or flat-sheet gaskets can be installed between the uninterrupted seal retainer face and the pipeline flange.
- **Integral Shaft-to-Valve Body Bonding**— Standard valve construction includes conductive packing to provide electrical bonding for hazardous area applications.
- **Powder paint as standard**— The Emerson Process Management™ powder paint finish offers an excellent corrosion-resistant finish to all steel parts.
- **High Temperature Capability**— The valve will operate at elevated temperatures, with the appropriate trim components.
- **Shaft Retention**— Redundant shaft retention provides added protection. The packing follower, anti-blowout ring, and shaft groove interact to hold the shaft securely in the valve body (see figure 1).
- **Travel Indication**— Additional travel indication can be achieved by using the indication line on the shaft, along with the disk position markings on the packing follower (see figure 4).

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## Table of Contents

|                                                                 |   |
|-----------------------------------------------------------------|---|
| A81 Features .....                                              | 1 |
| A81 Valve Specifications and<br>Materials of Construction ..... | 3 |

|                                |    |
|--------------------------------|----|
| FieldQ Actuator Features ..... | 16 |
|--------------------------------|----|

# A81 Valve Specifications and Materials of Construction

**Table 1. Fisher A81 Valve Specifications**

| Specifications                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                     | EN                                                                                                                 | ASME                                          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| Valve Body Size                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                     | DN 50, 80, 100, 150, 200, 250, and 300                                                                             | NPS 2, 3, 4, 6, 8, 10, and 12                 |
| Pressure Rating                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                     | PN 10 to 40 per EN 12516-1                                                                                         | CL150 / 300 per ASME B16.34                   |
| Valve Body Materials                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                     | EN 1.0619 steel                                                                                                    | WCC steel                                     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                     | EN 1.4409 stainless steel                                                                                          | CF3M (316L) stainless steel                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                     | LCC                                                                                                                | LCC                                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                     | CW2M <sup>(1)</sup>                                                                                                | CW2M <sup>(1)</sup>                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                     | M35-2 <sup>(2)</sup>                                                                                               | M35-2                                         |
| Disk Materials                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | PTFE or RPTFE <sup>(4)</sup> Seal   | EN 1.4409 stainless steel                                                                                          | CF3M stainless steel                          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                     | CW2M                                                                                                               | CW2M                                          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                     | M35-2                                                                                                              | M35-2                                         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Metal or UHMWPE <sup>(3)</sup> Seal | Chrome-plated EN 1.4409 Stainless Steel                                                                            | Chrome-plated CF3M Stainless Steel            |
| End Connections                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                     | Mates with raised-face flanges per EN 1092-1                                                                       | Mates with raised-face flanges per ASME B16.5 |
| Valve Body Style                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                     | Wafer (flangeless) and single flange with tapped or through holes <sup>(5)</sup>                                   |                                               |
| Face-to-Face Dimensions                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                     | Meets MSS SP68, API 609, and EN 558 standards                                                                      |                                               |
| Shutoff                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                     | PTFE, RPTFE, or UHMWPE seal ring - No visible leakage per MSS SP-61                                                |                                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                     | S31600 (316 SST) seal ring - 0.1 scfh per unit of NPS (NPS 6 valve = 0.6 scfh) per MSS SP-61                       |                                               |
| Flow Coefficients                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                     | See Fisher Catalog 12                                                                                              |                                               |
| Flow Direction                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                     | Standard (forward flow) is with the seal retainer facing upstream; reverse flow is permissible for soft seals only |                                               |
| Flow Characteristic                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                     | Approximately linear                                                                                               |                                               |
| Disk Rotation                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                     | Counterclockwise to open (when viewed from actuator side of valve body) through 90 degrees of disk rotation        |                                               |
| Shaft Diameters and Approximate Weights                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                     | See table 8                                                                                                        |                                               |
| 1. This material is not listed in EN 12516-1 or ASME B16.34. See figure 6 for pressure/temperature ratings.<br>2. This material is not listed in EN 12516-1. See figure 6 for pressure/temperature ratings.<br>3. UHMWPE stands for ultra high molecular weight polyethylene.<br>4. RPTFE is a reinforced PTFE seal.<br>5. LCC construction is standard in wafer style only. Consult your Emerson Process Management sales office for single flange valve body style information. |                                     |                                                                                                                    |                                               |

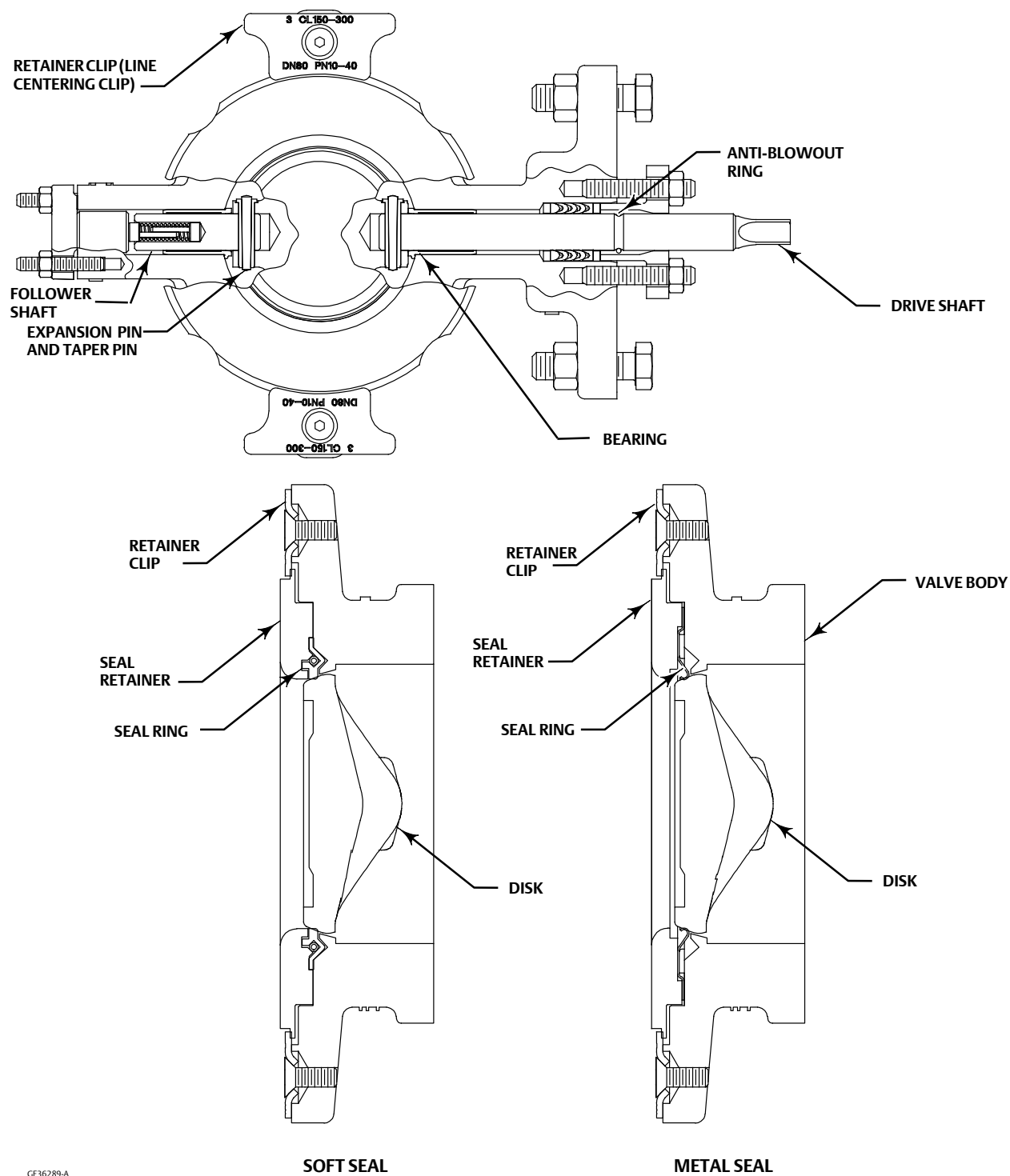
**Table 2. Materials (Other Valve Components)**

| Component         | Material                                                                                                                           |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Shafts and Pins   | S17400 (17-4PH) stainless steel, S20910 (XM-19) stainless steel, N10276, N05500                                                    |
| Anti-blowout Ring | N07718                                                                                                                             |
| Seal              | PTFE, RPTFE, or UHMWPE with S31600 (316 stainless steel) or R30003 spring. Metal seal is 316 stainless steel with graphite gaskets |
| Bearings          | PEEK/PTFE, R30006 (Alloy 6), S31600 Nitride                                                                                        |
| Packing           | PTFE/carbon-filled PTFE (standard), graphite die-molded ribbon, ENVIRO-SEAL PTFE packing, ENVIRO-SEAL graphite packing             |
| Follower Spring   | N07718 with carbon-filled PEEK or S31600 spring seats                                                                              |
| Bolting           | B8M Class 2, B7M, N05500, N07718                                                                                                   |
| Nuts              | 8M, 2HM, N04400, N10276                                                                                                            |

**Table 3. Trim Combinations with Standard Construction Materials**

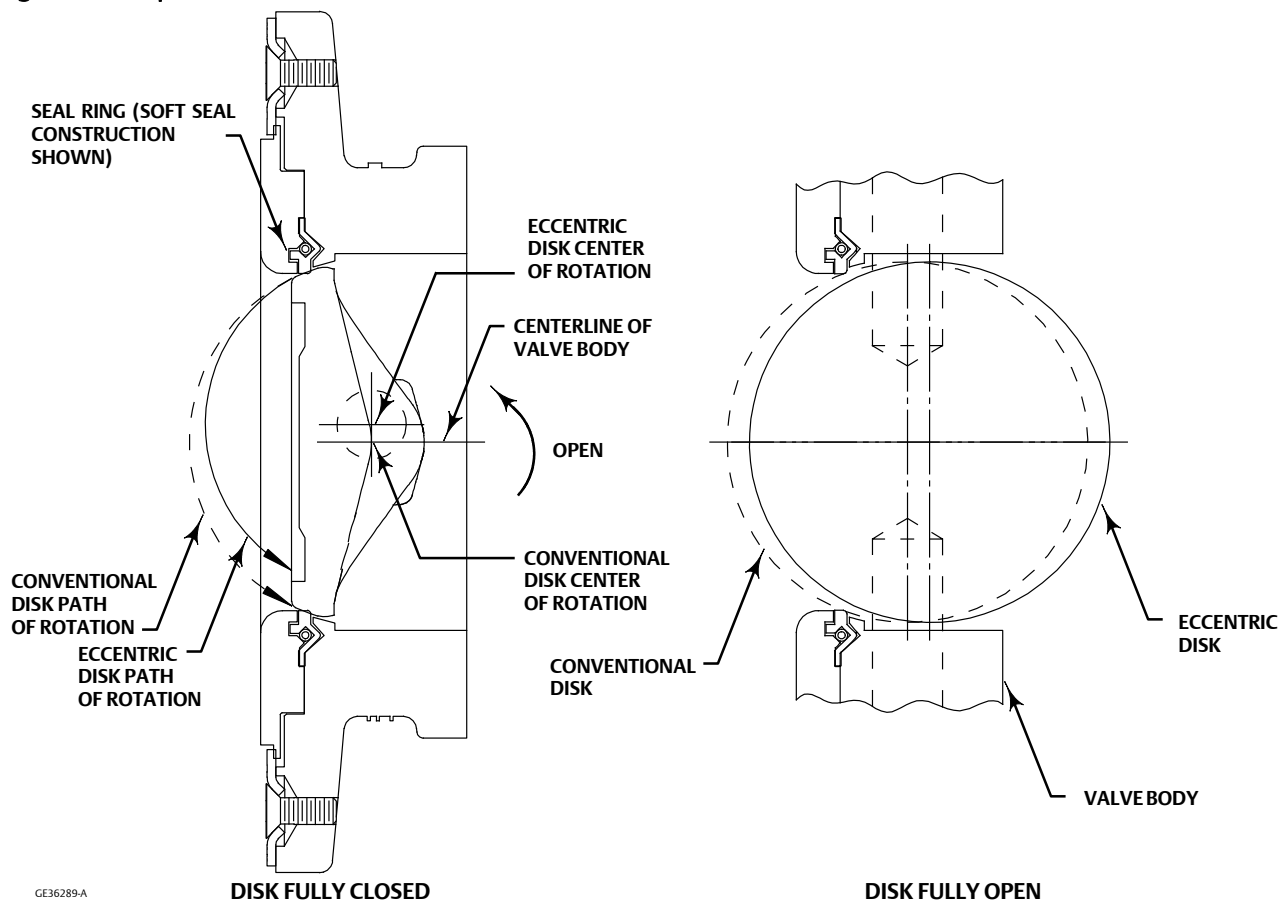
| Valve Body Material | Shaft Material | Disk Material               | Bearings                  | Seal Material   |
|---------------------|----------------|-----------------------------|---------------------------|-----------------|
| 1.0619 & WCC        | S17400 H1075   | 1.4409 & CF3M               | PEEK/PTFE                 | PTFE or RPTFE   |
|                     |                | 1.4409 & CF3M Chrome-Plated | PEEK/PTFE                 | UHMWPE or Metal |
| LCC                 | S17400 H1075   | 1.4409 & CF3M               | Alloy 6 or S31600 Nitride | Metal           |
|                     |                | 1.4409 & CF3M               | PEEK/PTFE                 | PTFE            |
| 1.4409 & CF3M       | S20910         | 1.4409 & CF3M               | PEEK/PTFE                 | PTFE or RPTFE   |
|                     |                | 1.4409 & CF3M Chrome-Plated | PEEK/PTFE                 | UHMWPE or Metal |
| CW2M                | N10276         | CW2M                        | Alloy 6 or S31600 Nitride | Metal           |
| M35-2               | N05500         | M35-2                       | PEEK/PTFE                 | PTFE or RPTFE   |
|                     |                |                             | PEEK/PTFE                 | PTFE or RPTFE   |

Figure 1. Typical Fisher A81 Valve Construction Detail



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**Figure 2. Comparison of Disk Action**



**Figure 3. Available Seal Configuration**

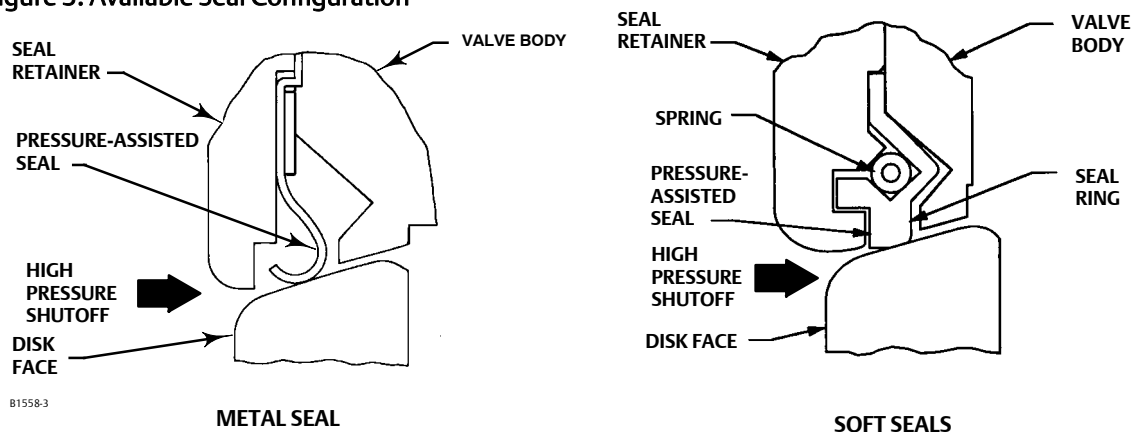
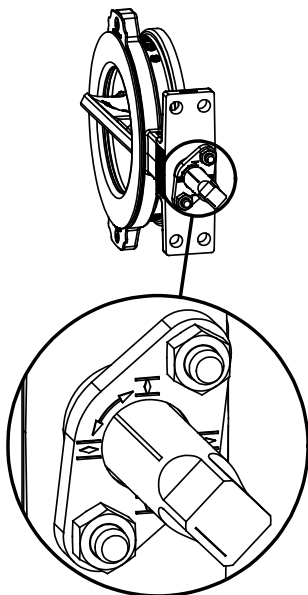


Figure 4. Travel Indication



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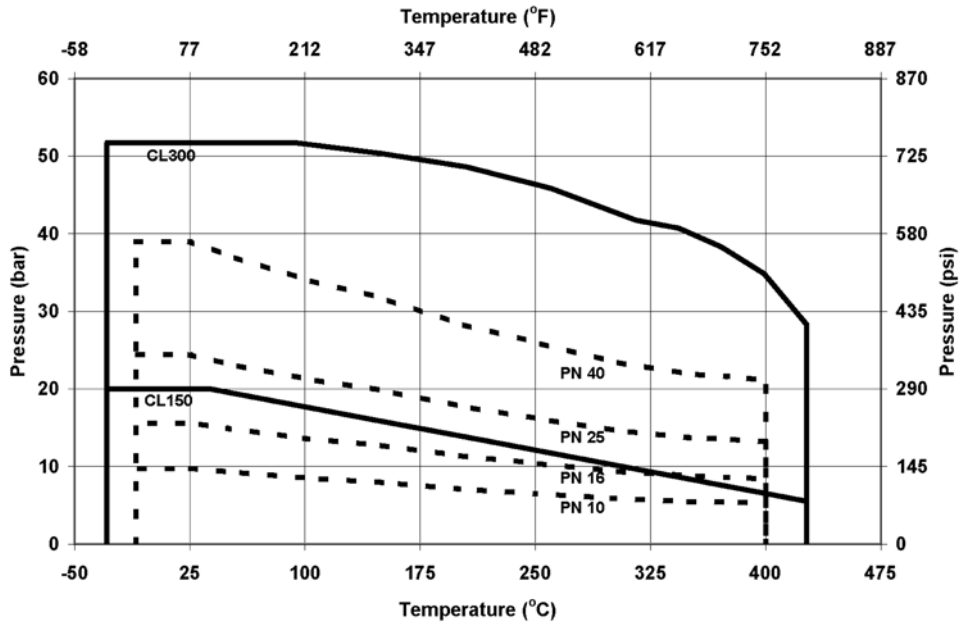
Table 4. Material Temperature Capabilities

| MATERIAL                                                                                                                                   |                  |                                    |               |                  | TEMPERATURE LIMITS        |                           |
|--------------------------------------------------------------------------------------------------------------------------------------------|------------------|------------------------------------|---------------|------------------|---------------------------|---------------------------|
| PN FLANGES                                                                                                                                 |                  |                                    |               |                  |                           |                           |
| Valve Body                                                                                                                                 | Shaft            | Bearing Lining and Jacket          | Seal          | Packing          | °C                        | °F                        |
| 1.0619 Steel                                                                                                                               | S17400 or S20910 | PEEK / PTFE                        | PTFE or RPTFE | PTFE or Graphite | -10 to 232                | 14 to 450                 |
|                                                                                                                                            |                  |                                    | UHMWPE        | PTFE or Graphite | -10 to 93                 | 14 to 200                 |
|                                                                                                                                            |                  |                                    | Metal         | PTFE             | -10 to 232                | 14 to 450                 |
|                                                                                                                                            |                  | Graphite                           |               | -10 to 260       | 14 to 500                 |                           |
|                                                                                                                                            |                  | R30006 (Alloy 6) or S31600 Nitride | Metal         | Graphite         | -10 to 400 <sup>(1)</sup> | 14 to 752 <sup>(1)</sup>  |
| LCC                                                                                                                                        | S17400 or S20910 | PEEK / PTFE                        | PTFE          | PTFE             | -46 to 232                | -50 to 450                |
| 1.4409 Stainless Steel                                                                                                                     | S20910           | PEEK / PTFE                        | PTFE or RPTFE | PTFE or Graphite | -46 to 232                | -50 to 450                |
|                                                                                                                                            |                  |                                    | UHMWPE        | PTFE or Graphite | -18 to 93                 | 0 to 200                  |
|                                                                                                                                            |                  |                                    | Metal         | PTFE             | -46 to 232                | -50 to 450                |
|                                                                                                                                            |                  | Graphite                           |               | -46 to 260       | -50 to 500                |                           |
|                                                                                                                                            |                  | R30006 (Alloy 6) or S31600 Nitride | Metal         | Graphite         | -46 to 500 <sup>(1)</sup> | -50 to 932 <sup>(1)</sup> |
| CW2M                                                                                                                                       | N10276           | PEEK / PTFE                        | PTFE or RPTFE | PTFE             | -10 to 232                | 14 to 450                 |
| M35-2                                                                                                                                      | N05500           | PEEK / PTFE                        | PTFE or RPTFE | PTFE             | -10 to 232                | 14 to 450                 |
| ASME FLANGES                                                                                                                               |                  |                                    |               |                  |                           |                           |
| Valve Body                                                                                                                                 | Shaft            | Bearing Lining and Jacket          | Seal          | Packing          | °C                        | °F                        |
| WCC steel                                                                                                                                  | S17400 or S20910 | PEEK / PTFE                        | PTFE or RPTFE | PTFE or Graphite | -29 to 232                | -20 to 450                |
|                                                                                                                                            |                  |                                    | UHMWPE        | PTFE or Graphite | -18 to 93                 | 0 to 200                  |
|                                                                                                                                            |                  |                                    | Metal         | PTFE             | -29 to 232                | -20 to 450                |
|                                                                                                                                            |                  | Graphite                           |               | -29 to 260       | -20 to 500                |                           |
|                                                                                                                                            |                  | R30006 (Alloy 6) or S31600 Nitride | Metal         | Graphite         | -29 to 427 <sup>(1)</sup> | -20 to 800 <sup>(1)</sup> |
| LCC                                                                                                                                        | S17400 or S20910 | PEEK / PTFE                        | PTFE          | PTFE             | -46 to 232                | -50 to 450                |
| CF3M Stainless Steel                                                                                                                       | S20910           | PEEK / PTFE                        | PTFE or RPTFE | PTFE or Graphite | -46 to 232                | -50 to 450                |
|                                                                                                                                            |                  |                                    | UHMWPE        | PTFE or Graphite | -18 to 93                 | 0 to 200                  |
|                                                                                                                                            |                  |                                    | Metal         | PTFE             | -46 to 232                | -50 to 450                |
|                                                                                                                                            |                  | Graphite                           |               | -46 to 260       | -50 to 500                |                           |
|                                                                                                                                            |                  | R30006 (Alloy 6) or S31600 Nitride | Metal         | Graphite         | -46 to 454 <sup>(1)</sup> | -50 to 850 <sup>(1)</sup> |
| CW2M                                                                                                                                       | N10276           | PEEK / PTFE                        | PTFE or RPTFE | PTFE             | -46 to 232                | -50 to 450                |
| M35-2                                                                                                                                      | N05500           | PEEK / PTFE                        | PTFE or RPTFE | PTFE             | -46 to 232                | -50 to 450                |
| 1. For applications exceeding 316°C (600°F), consult your Emerson Process Management sales office for appropriate disk material selection. |                  |                                    |               |                  |                           |                           |

1. For applications exceeding 316°C (600°F), consult your Emerson Process Management sales office for appropriate disk material selection.

Figure 5. Material Pressure/Temperature Curves

**Pressure-Temperature Chart for WCC/1.0619**



**Pressure-Temperature Chart for CF3M/1.4409**

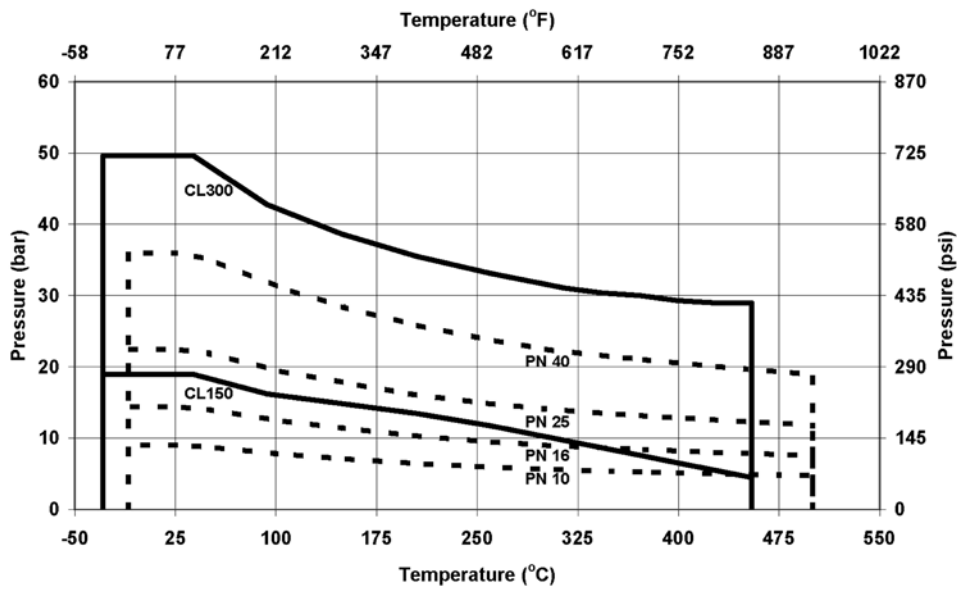
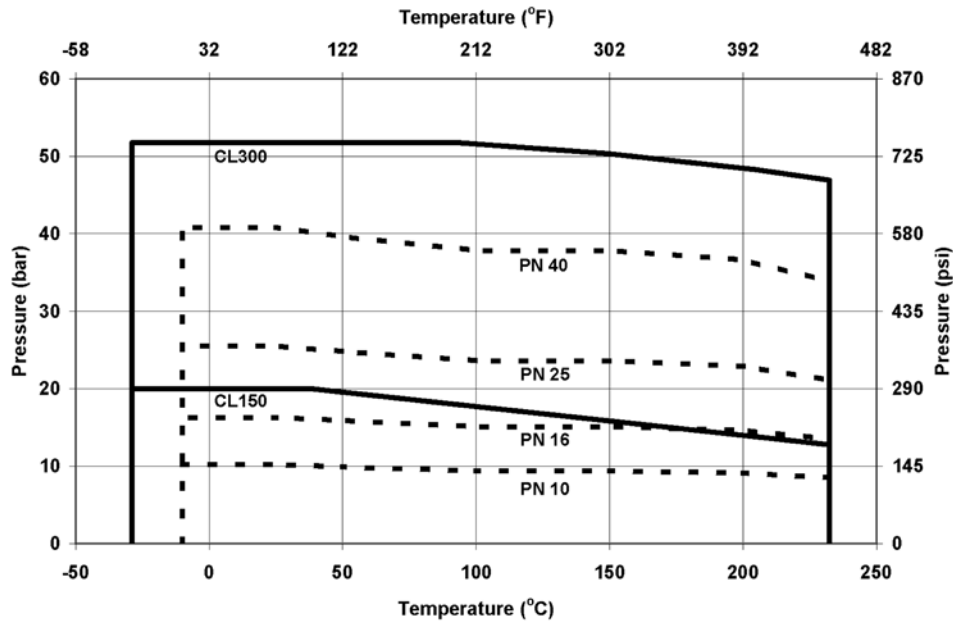
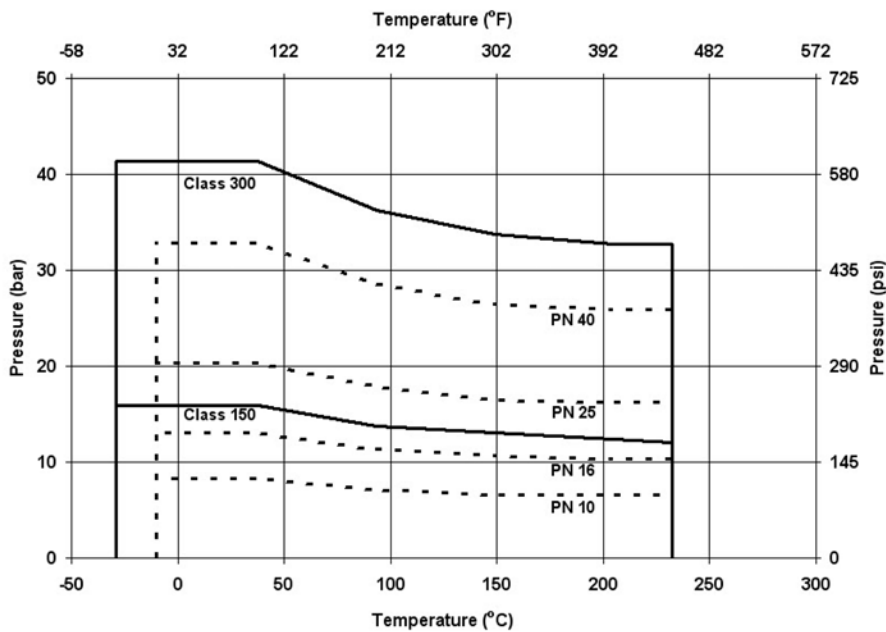


Figure 6. Material Pressure/Temperature Curves

**Pressure-Temperature Chart for CW2M** 1



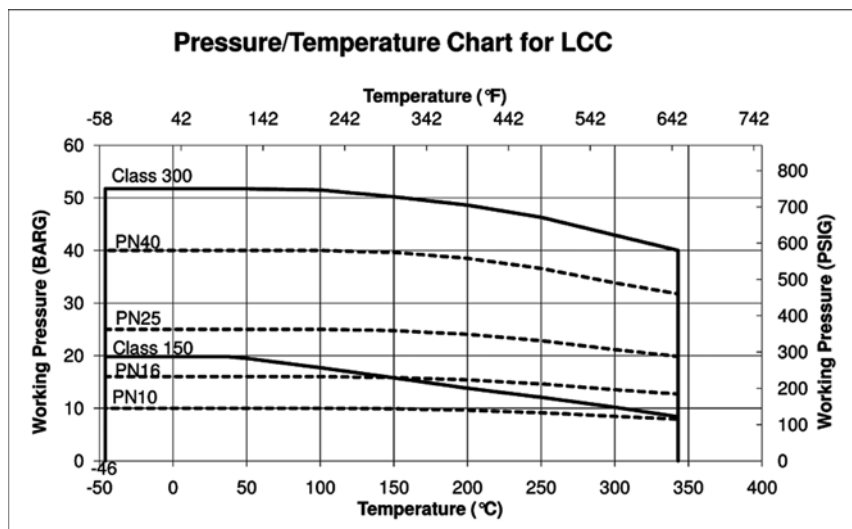
**Pressure-Temperature Chart for M35-2** 2



1. CW2M is not listed in EN 12516-1 or ASME B16.34. The PN and CL designations are used only to indicate relative pressure-retaining capabilities.  
2. M35-2 is not listed in EN 12516-1. The PN designations are used only to indicate relative pressure-retaining capabilities.



Figure 7. Material Pressure/Temperature Curves



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**Table 5. Maximum Allowable Shutoff Pressure Drops based on Trim (Seal, Shaft, and Bearings), Bar**

Note: Do not exceed the EN or ASME pressure/temperature rating of the valve or mating flanges.

| TRIM                                                    | TEMPERATURE, °C | DN   |      |      |      |      |      |      |
|---------------------------------------------------------|-----------------|------|------|------|------|------|------|------|
|                                                         |                 | 50   | 80   | 100  | 150  | 200  | 250  | 300  |
|                                                         |                 | Bar  |      |      |      |      |      |      |
| PTFE or RPTFE Seal<br>PEEK/PTFE Bearings                | -46 to 65       | 51.7 | 51.7 | 51.7 | 51.7 | 51.7 | 35.2 | 41.4 |
|                                                         | 93              | 48.5 | 48.5 | 48.5 | 48.5 | 48.5 | 35.0 | 38.8 |
|                                                         | 121             | 38.6 | 38.6 | 38.6 | 38.6 | 38.6 | 33.8 | 35.7 |
|                                                         | 149             | 28.7 | 28.7 | 28.7 | 28.7 | 28.7 | 28.7 | 28.7 |
|                                                         | 191             | 13.8 | 13.8 | 13.8 | 13.8 | 13.8 | 13.8 | 13.8 |
|                                                         | 204             | 10.3 | 10.3 | 10.3 | 10.3 | 10.3 | 10.3 | 10.3 |
|                                                         | 232             | 3.4  | 3.4  | 3.4  | 3.4  | 3.4  | 3.4  | 3.4  |
| UHMWPE Seal<br>PEEK/PTFE Bearings                       | -17 to 37       | 51.7 | 51.7 | 51.7 | 51.7 | 51.7 | 35.2 | 41.4 |
|                                                         | 66              | 38.6 | 38.6 | 38.6 | 38.6 | 38.6 | 35.1 | 38.6 |
|                                                         | 93              | 25.9 | 25.9 | 25.9 | 25.9 | 25.9 | 25.9 | 25.9 |
| Metal Seal <sup>(1)</sup><br>Alloy 6 Bearings           | -46 to 37       | 18.5 | 16.5 | 13.9 | 12.8 | 11.0 | 6.8  | 7.0  |
|                                                         | 93              | 17.0 | 15.1 | 12.8 | 11.7 | 10.1 | 6.3  | 6.5  |
|                                                         | 149             | 16.0 | 14.2 | 12.0 | 11.0 | 9.4  | 5.9  | 6.1  |
|                                                         | 204             | 15.1 | 13.4 | 11.4 | 10.4 | 9.0  | 5.6  | 5.7  |
|                                                         | 260             | 14.3 | 12.8 | 10.8 | 9.9  | 8.5  | 5.3  | 5.4  |
|                                                         | 316             | 13.8 | 12.3 | 10.3 | 9.5  | 8.2  | 5.1  | 5.2  |
|                                                         | 371             | 13.2 | 11.9 | 10.0 | 9.2  | 7.9  | 5.0  | 5.0  |
|                                                         | 427             | 12.5 | 11.6 | 9.8  | 9.0  | 7.7  | 4.8  | 5.0  |
| Metal Seal <sup>(1)</sup><br>S31600/Nitride<br>Bearings | 454             | 12.1 | 11.5 | 9.7  | 8.9  | 7.7  | 4.8  | 4.9  |
|                                                         | -46 to 37       | 19.5 | 22.4 | 26.1 | 20.8 | 27.6 | 12.8 | 8.0  |
|                                                         | 93              | 19.3 | 22.4 | 26.0 | 20.6 | 27.6 | 12.8 | 7.9  |
|                                                         | 149             | 17.0 | 22.4 | 23.7 | 18.7 | 27.6 | 12.8 | 7.1  |
|                                                         | 204             | 15.9 | 22.4 | 22.7 | 17.8 | 26.3 | 12.8 | 6.8  |
|                                                         | 260             | 14.5 | 22.4 | 21.4 | 16.8 | 24.6 | 12.5 | 6.3  |
|                                                         | 316             | 13.8 | 22.1 | 20.8 | 16.2 | 23.2 | 12.1 | 6.1  |
|                                                         | 371             | 13.2 | 21.5 | 20.2 | 15.7 | 22.4 | 11.8 | 5.9  |
| Metal Seal <sup>(1)</sup><br>PEEK/PTFE Bearings         | 427             | 12.5 | 20.7 | 19.5 | 15.2 | 21.8 | 11.4 | 5.6  |
|                                                         | 454             | 12.1 | 20.3 | 19.2 | 14.9 | 21.6 | 11.2 | 5.4  |
|                                                         | -46 to 37       | 51.7 | 51.7 | 51.7 | 51.7 | 31.0 | 17.2 | 17.2 |
|                                                         | 93              | 51.7 | 51.7 | 51.7 | 51.7 | 31.0 | 17.2 | 17.2 |
|                                                         | 149             | 50.3 | 50.3 | 50.3 | 50.3 | 31.0 | 17.2 | 17.2 |
|                                                         | 204             | 48.6 | 48.6 | 48.6 | 48.2 | 31.0 | 17.2 | 17.2 |
|                                                         | 232             | 47.2 | 47.2 | 46.3 | 42.6 | 31.0 | 17.2 | 17.2 |
|                                                         | 260             | 24.7 | 21.9 | 18.5 | 17.0 | 14.6 | 9.1  | 9.4  |

1. Pressure drops shown for metal seals are for forward flow only.

**Table 6. Maximum Allowable Shutoff Pressure Drops based on Trim (Seal, Shaft, and Bearings), Psi**

Note: Do not exceed the EN or ASME pressure/temperature rating of the valve or mating flanges.

| TRIM                                                 | TEMPERATURE, °F | NPS |     |     |     |     |     |     |
|------------------------------------------------------|-----------------|-----|-----|-----|-----|-----|-----|-----|
|                                                      |                 | 2   | 3   | 4   | 6   | 8   | 10  | 12  |
|                                                      |                 | Psi |     |     |     |     |     |     |
| PTFE or RPTFE Seal<br>PEEK/PTFE Bearings             | -50 to 150      | 750 | 750 | 750 | 750 | 750 | 511 | 600 |
|                                                      | 200             | 704 | 704 | 704 | 704 | 704 | 508 | 563 |
|                                                      | 250             | 560 | 560 | 560 | 560 | 560 | 490 | 518 |
|                                                      | 300             | 416 | 416 | 416 | 416 | 416 | 416 | 416 |
|                                                      | 375             | 200 | 200 | 200 | 200 | 200 | 200 | 200 |
|                                                      | 400             | 150 | 150 | 150 | 150 | 150 | 150 | 150 |
|                                                      | 450             | 50  | 50  | 50  | 50  | 50  | 50  | 50  |
| UHMWPE Seal<br>PEEK/PTFE Bearings                    | 0 to 100        | 750 | 750 | 750 | 750 | 750 | 511 | 600 |
|                                                      | 150             | 560 | 560 | 560 | 560 | 560 | 509 | 560 |
|                                                      | 200             | 375 | 375 | 375 | 375 | 375 | 375 | 375 |
| Metal Seal <sup>(1)</sup><br>Alloy 6 Bearings        | -50 to 100      | 268 | 239 | 202 | 185 | 159 | 99  | 102 |
|                                                      | 200             | 246 | 219 | 185 | 170 | 146 | 91  | 94  |
|                                                      | 300             | 232 | 206 | 174 | 160 | 137 | 86  | 88  |
|                                                      | 400             | 219 | 195 | 165 | 151 | 130 | 81  | 83  |
|                                                      | 500             | 208 | 186 | 157 | 144 | 124 | 77  | 79  |
|                                                      | 600             | 200 | 178 | 150 | 138 | 119 | 74  | 76  |
|                                                      | 700             | 192 | 172 | 145 | 134 | 115 | 72  | 73  |
|                                                      | 800             | 181 | 168 | 142 | 130 | 112 | 70  | 72  |
|                                                      | 850             | 176 | 167 | 141 | 129 | 111 | 69  | 71  |
| Metal Seal <sup>(1)</sup><br>S31600/Nitride Bearings | -50 to 100      | 283 | 325 | 379 | 301 | 400 | 185 | 116 |
|                                                      | 200             | 280 | 325 | 377 | 299 | 400 | 185 | 115 |
|                                                      | 300             | 246 | 325 | 344 | 271 | 400 | 185 | 103 |
|                                                      | 400             | 230 | 325 | 329 | 258 | 382 | 185 | 98  |
|                                                      | 500             | 211 | 325 | 311 | 243 | 357 | 182 | 91  |
|                                                      | 600             | 200 | 321 | 301 | 235 | 337 | 176 | 88  |
|                                                      | 700             | 192 | 312 | 293 | 228 | 325 | 171 | 85  |
|                                                      | 800             | 181 | 300 | 283 | 220 | 316 | 165 | 81  |
|                                                      | 850             | 176 | 295 | 278 | 216 | 313 | 162 | 79  |
| Metal Seal <sup>(1)</sup><br>PEEK/PTFE Bearings      | -50 to 100      | 750 | 750 | 750 | 750 | 450 | 250 | 250 |
|                                                      | 200             | 750 | 750 | 750 | 750 | 450 | 250 | 250 |
|                                                      | 300             | 730 | 730 | 730 | 730 | 450 | 250 | 250 |
|                                                      | 400             | 705 | 705 | 705 | 699 | 450 | 250 | 250 |
|                                                      | 450             | 685 | 685 | 672 | 618 | 450 | 250 | 250 |
|                                                      | 500             | 358 | 318 | 269 | 247 | 212 | 132 | 136 |

1. Pressure drops shown for metal seals are for forward flow only.

**Table 7. ISO 5211 F Sizes Available with Optional Mounting Bracket**

| VALVE SIZE |     | ISO 5211 F SIZES        |
|------------|-----|-------------------------|
| DN         | NPS |                         |
| 50         | 2   | F07, F10                |
| 80         | 3   | F07, F10                |
| 100        | 4   | F07, F10, F12, F14, F16 |
| 150        | 6   | F07, F10, F12, F14, F16 |
| 200        | 8   | F10, F12, F14, F16      |
| 250        | 10  | F10, F12, F14, F16      |
| 300        | 12  | F10, F12, F14, F16      |

Table 8. Dimensions and Weights

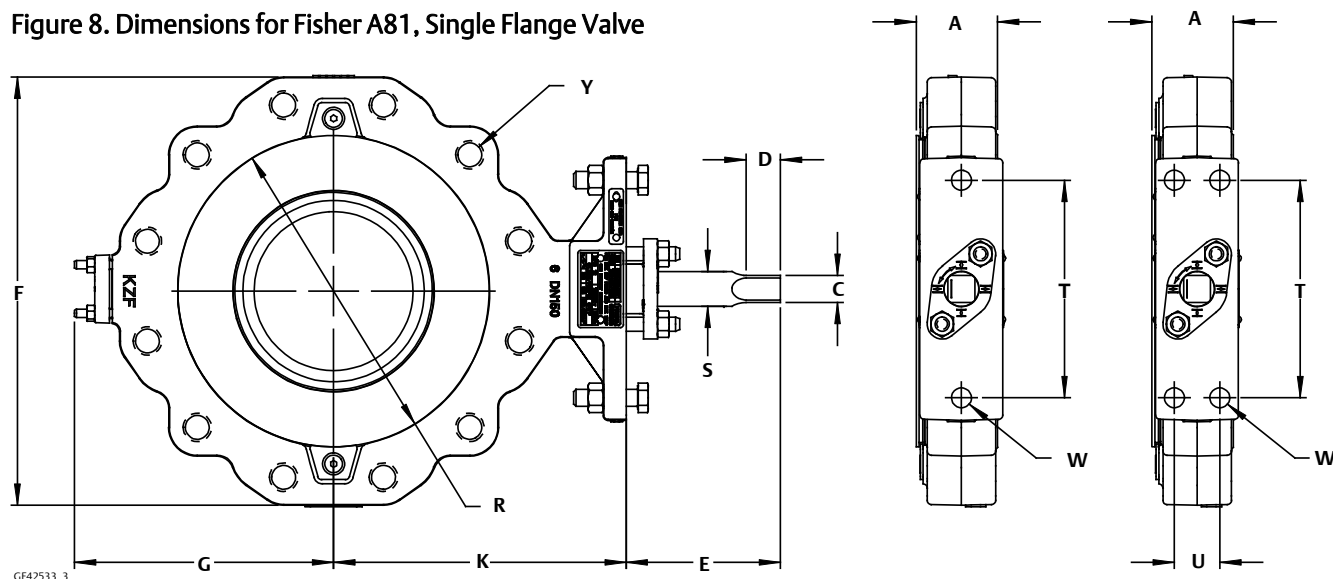
| VALVE SIZE /<br>PRESSURE RATING                                                                                                                                                                                                                       |                           | A                    | C    | D    | E    | F     |       | G     |       | K     | R     | S(1) | T    | U    | W    | APPROX-<br>IMATE<br>WEIGHT(2) |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|----------------------|------|------|------|-------|-------|-------|-------|-------|-------|------|------|------|------|-------------------------------|------|
|                                                                                                                                                                                                                                                       |                           |                      |      |      |      | (4)   | (5)   | (4)   | (5)   |       |       |      |      |      |      | (4)                           | (5)  |
|                                                                                                                                                                                                                                                       |                           |                      |      |      |      | mm    |       |       |       |       |       |      |      |      |      | kg                            |      |
| DN50/<br>NPS 2                                                                                                                                                                                                                                        | PN10-40/<br>CL150-<br>300 | 43                   | 9    | 15   | 74   | 150   | ---   | 109   | ---   | 125   | 102   | 12.7 | 117  | ---  | 14   | 4.7                           | 6.7  |
| DN80/<br>NPS 3                                                                                                                                                                                                                                        | PN10-40/<br>CL150-<br>300 | 47/<br>48<br>(3)     | 11   | 15   | 76   | 196   | 196   | 133   | 133   | 130   | 134   | 15.9 | 117  | ---  | 14   | 7.5                           | 11.2 |
| DN100/<br>NPS 4                                                                                                                                                                                                                                       | PN10-40/<br>CL150-<br>300 | 53                   | 14   | 19   | 103  | 222   | 226   | 122   | 147   | 172   | 162   | 19.1 | 152  | 32   | 14   | 12.5                          | 17.6 |
| DN150/<br>NPS 6                                                                                                                                                                                                                                       | PN10-40/<br>CL150-<br>300 | 57                   | 19   | 25   | 108  | 270   | 300   | 147   | 182   | 205   | 218   | 25.4 | 152  | 32   | 14   | 15.7                          | 26.5 |
| DN200/<br>NPS 8                                                                                                                                                                                                                                       | PN10-16/<br>CL150         | 61                   | 22   | 30   | 107  | 327   | 342   | 225   | 225   | 258   | 271   | 31.8 | 235  | 46   | 18   | 30.2                          | 40.2 |
|                                                                                                                                                                                                                                                       | PN25-40/<br>CL300         | 73                   | 22   | 30   | 107  | 358   | 364   | 225   | 225   | 258   | 285   | 31.8 | 235  | 46   | 18   | 33.9                          | 46.0 |
| DN250/<br>NPS 10                                                                                                                                                                                                                                      | PN10-16/<br>CL150         | 69                   | 22   | 30   | 109  | 390   | 395   | 218   | 250   | 270   | 324   | 31.8 | 235  | 46   | 18   | 38.9                          | 50.5 |
|                                                                                                                                                                                                                                                       | PN25-40/<br>CL300         | 83                   | 22   | 30   | 109  | 400   | 450   | 265   | 265   | 270   | 345   | 31.8 | 235  | 46   | 18   | 51.8                          | 79.2 |
| DN300/<br>NPS 12                                                                                                                                                                                                                                      | PN10-16/<br>CL150         | 78                   | 27   | 35   | 114  | 381   | 467   | 309   | 309   | 304   | 381   | 38.1 | 235  | 46   | 18   | 68.7                          | 98.3 |
|                                                                                                                                                                                                                                                       | PN25-40/<br>CL300         | 92                   | 27   | 35   | 114  | 410   | 512   | 309   | 309   | 304   | 410   | 38.1 | 235  | 46   | 18   | 76.6                          | 105  |
|                                                                                                                                                                                                                                                       |                           | Inches               |      |      |      |       |       |       |       |       |       |      |      |      |      | lbs                           |      |
| DN50/<br>NPS 2                                                                                                                                                                                                                                        | PN10-40/<br>CL150-<br>300 | 1.69                 | 0.35 | 0.59 | 2.91 | 5.91  | ---   | 4.29  | ---   | 4.92  | 4.02  | 0.50 | 4.62 | ---  | 0.55 | 10                            | 15   |
| DN80/<br>NPS 3                                                                                                                                                                                                                                        | PN10-40/<br>CL150-<br>300 | 1.85/<br>1.89<br>(3) | 0.43 | 0.59 | 2.99 | 7.72  | 7.72  | 5.24  | 5.24  | 5.12  | 5.28  | 0.63 | 4.62 | ---  | 0.55 | 17                            | 25   |
| DN100/<br>NPS 4                                                                                                                                                                                                                                       | PN10-40/<br>CL150-<br>300 | 2.09                 | 0.55 | 0.75 | 4.06 | 8.74  | 8.90  | 4.80  | 5.79  | 6.77  | 6.38  | 0.75 | 6.00 | 1.25 | 0.55 | 28                            | 39   |
| DN150/<br>NPS 6                                                                                                                                                                                                                                       | PN10-40/<br>CL150-<br>300 | 2.24                 | 0.75 | 0.94 | 4.25 | 10.63 | 11.81 | 5.79  | 7.17  | 8.07  | 8.58  | 1.00 | 6.00 | 1.25 | 0.55 | 35                            | 58   |
| DN200/<br>NPS 8                                                                                                                                                                                                                                       | PN10-16/<br>CL150         | 2.40                 | 0.87 | 1.18 | 4.21 | 12.87 | 13.46 | 8.86  | 8.86  | 10.16 | 10.67 | 1.25 | 9.25 | 1.81 | 0.71 | 67                            | 89   |
|                                                                                                                                                                                                                                                       | PN25-40/<br>CL300         | 2.87                 | 0.87 | 1.18 | 4.21 | 14.09 | 14.33 | 8.86  | 8.86  | 10.16 | 11.22 | 1.25 | 9.25 | 1.81 | 0.71 | 75                            | 102  |
| DN250/<br>NPS 10                                                                                                                                                                                                                                      | PN10-16/<br>CL150         | 2.72                 | 0.87 | 1.18 | 4.29 | 15.35 | 15.55 | 8.58  | 9.84  | 10.63 | 12.76 | 1.25 | 9.25 | 1.81 | 0.71 | 86                            | 111  |
|                                                                                                                                                                                                                                                       | PN25-40/<br>CL300         | 3.27                 | 0.87 | 1.18 | 4.29 | 15.75 | 17.72 | 10.43 | 10.43 | 10.63 | 13.58 | 1.25 | 9.25 | 1.81 | 0.71 | 114                           | 175  |
| DN300/<br>NPS 12                                                                                                                                                                                                                                      | PN10-16/<br>CL150         | 3.07                 | 1.06 | 1.38 | 4.49 | 15.00 | 18.39 | 12.17 | 12.17 | 11.97 | 15.00 | 1.50 | 9.25 | 1.81 | 0.71 | 151                           | 217  |
|                                                                                                                                                                                                                                                       | PN25-40/<br>CL300         | 3.62                 | 1.06 | 1.38 | 4.49 | 16.14 | 20.16 | 12.17 | 12.17 | 11.97 | 16.14 | 1.50 | 9.25 | 1.81 | 0.71 | 169                           | 231  |
| 1. This nominal valve shaft diameter is the shaft diameter through the packing box. Use this diameter when selecting Fisher actuators.<br>2. Valve assembly only.<br>3. 48 mm for CL150 and CL300 single flange only.<br>4. Wafer<br>5. Single Flange |                           |                      |      |      |      |       |       |       |       |       |       |      |      |      |      |                               |      |

**Table 9. Line Bolting Dimensions**

| VALVE SIZE     | Y               |             |             |             |                         |                            |
|----------------|-----------------|-------------|-------------|-------------|-------------------------|----------------------------|
|                | Pressure Rating |             |             |             |                         |                            |
|                | CL150           | CL300       | PN10        | PN16        | PN25                    | PN40                       |
| DN80 / NPS 3   | 4X 5/8-11       | 8X 3/4-10   | 8X M20X2.5  |             |                         |                            |
| DN100 / NPS 4  | 8X 5/8-11       | 8X 3/4-10   | 8X M16X2    |             | 8X M20X2.5              |                            |
| DN150 / NPS 6  | 8X 3/4-10       | 12X 3/4-10  | 8X M20X2.5  |             | 8X M24X3 <sup>(1)</sup> |                            |
| DN200 / NPS 8  | 8X 3/4-10       | 12X 7/8-9   | 8X M20X2.5  | 12X M20X2.5 | 12X M24X3               | 12X M27X3 <sup>(1)</sup>   |
| DN250 / NPS 10 | 12X 7/8-9       | 16X 1-8     | 12X M20X2.5 | 12X M24X3   | 12X M27X3               | 12X M30X3.5 <sup>(1)</sup> |
| DN300 / NPS 12 | 12X 7/8-9       | 16X 1-1/8-8 | 12X M20X2.5 | 12X M24X3   | 16X M27X3               | 16X M30X3.5                |

1. Not available in single flange with threaded holes.

**Figure 8. Dimensions for Fisher A81, Single Flange Valve**



**Figure 9. Dimensions for Fisher A81, Wafer Style Valve**

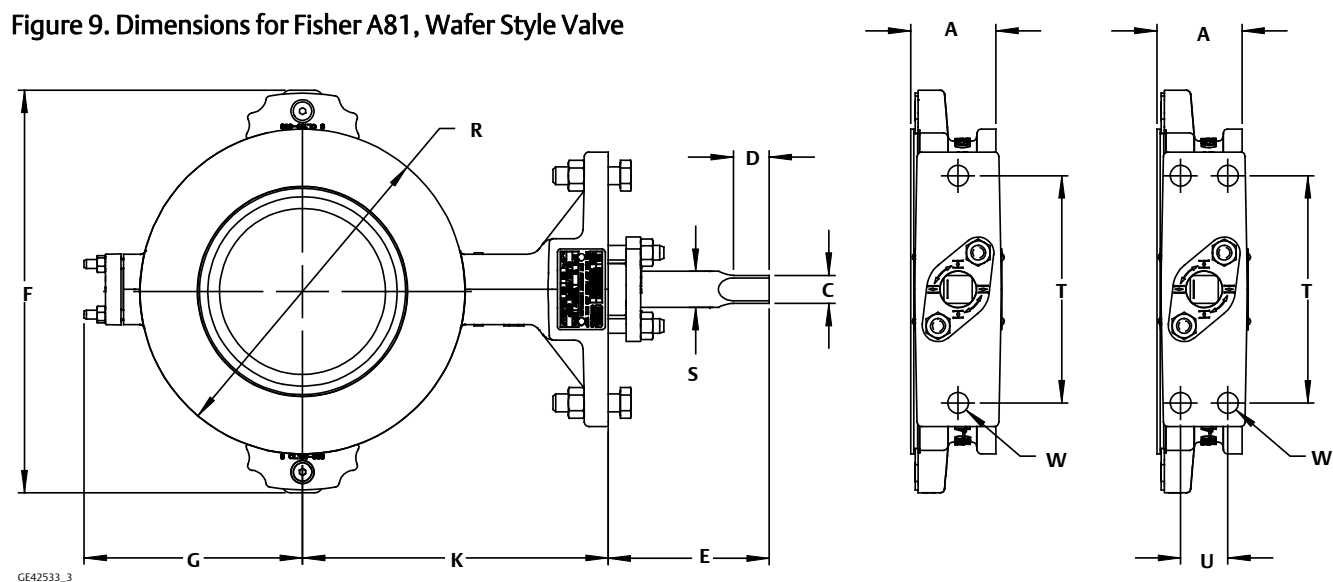
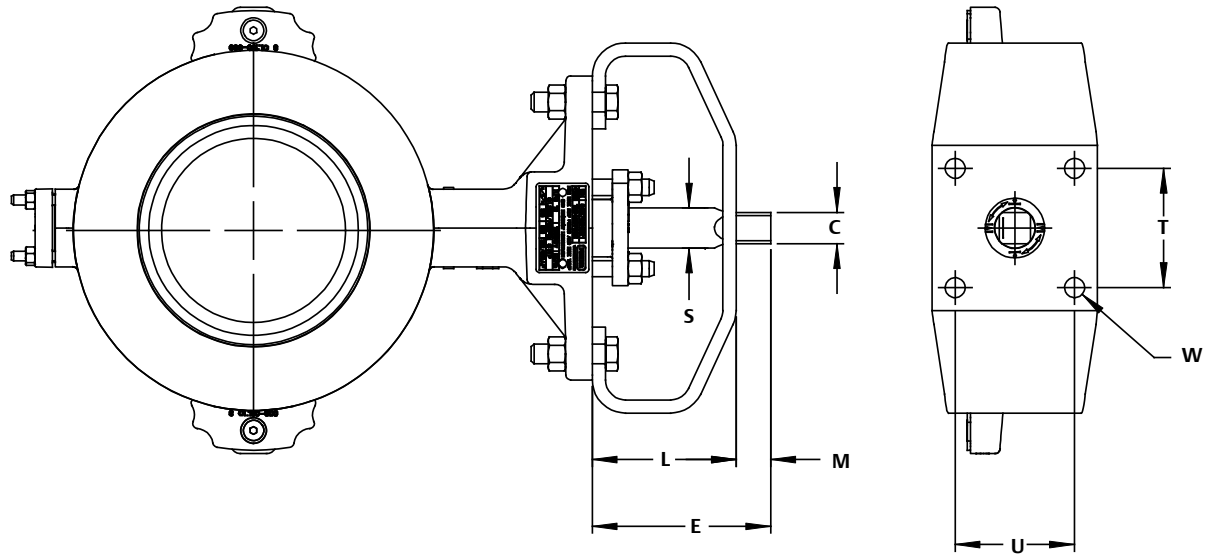


Table 10. Dimensions and Weights, Optional Mounting Bracket

| VALVE SIZE /<br>PRESSURE RATING |                       | S <sup>(1)</sup> |      | C  |      | E   |      | L  |      | M  |      | T      |      | U      |      | W  |      | ISO<br>5211 |
|---------------------------------|-----------------------|------------------|------|----|------|-----|------|----|------|----|------|--------|------|--------|------|----|------|-------------|
|                                 |                       | mm               | inch | mm | inch | mm  | inch | mm | inch | mm | inch | mm     | inch | mm     | inch | mm | inch |             |
| DN50/<br>NPS 2                  | PN10-40/<br>CL150-300 | 12.7             | 0.50 | 9  | 0.35 | 74  | 2.91 | 64 | 2.52 | 10 | 0.39 | 49.50  | 1.95 | 49.50  | 1.95 | 10 | 0.39 | F07         |
|                                 |                       |                  |      |    |      |     |      |    |      |    |      | 72.12  | 2.84 | 72.12  | 2.84 | 12 | 0.47 | F10         |
| DN80/<br>NPS 3                  | PN10-40/<br>CL150-300 | 15.9             | 0.63 | 11 | 0.43 | 76  | 2.99 | 64 | 2.52 | 12 | 0.47 | 49.50  | 1.95 | 49.50  | 1.95 | 10 | 0.39 | F07         |
|                                 |                       |                  |      |    |      |     |      |    |      |    |      | 72.12  | 2.84 | 72.12  | 2.84 | 12 | 0.47 | F10         |
| DN100/<br>NPS 4                 | PN10-40/<br>CL150-300 | 19.1             | 0.75 | 14 | 0.55 | 103 | 4.06 | 87 | 3.43 | 16 | 0.63 | 49.50  | 1.95 | 49.50  | 1.95 | 10 | 0.39 | F07         |
|                                 |                       |                  |      |    |      |     |      |    |      |    |      | 72.12  | 2.84 | 72.12  | 2.84 | 12 | 0.47 | F10         |
|                                 |                       |                  |      |    |      |     |      |    |      |    |      | 88.39  | 3.48 | 88.39  | 3.48 | 14 | 0.55 | F12         |
| DN150/<br>NPS 6                 | PN10-40/<br>CL150-300 | 25.4             | 1.00 | 19 | 0.75 | 108 | 4.25 | 87 | 3.43 | 21 | 0.82 | 49.50  | 1.95 | 49.50  | 1.95 | 10 | 0.39 | F07         |
|                                 |                       |                  |      |    |      |     |      |    |      |    |      | 72.12  | 2.84 | 72.12  | 2.84 | 12 | 0.47 | F10         |
|                                 |                       |                  |      |    |      |     |      |    |      |    |      | 88.39  | 3.48 | 88.39  | 3.48 | 14 | 0.55 | F12         |
|                                 |                       |                  |      |    |      |     |      |    |      |    |      | 99.00  | 3.90 | 99.00  | 3.90 | 18 | 0.71 | F14         |
| DN200/<br>NPS 8                 | PN10-16/<br>CL150     | 31.8             | 1.25 | 22 | 0.87 | 107 | 4.21 | 85 | 3.35 | 22 | 0.87 | 72.12  | 2.84 | 72.12  | 2.84 | 12 | 0.47 | F10         |
|                                 |                       |                  |      |    |      |     |      |    |      |    |      | 88.39  | 3.48 | 88.39  | 3.48 | 14 | 0.55 | F12         |
|                                 | PN25-40/<br>CL300     | 31.8             | 1.25 | 22 | 0.87 | 107 | 4.21 | 85 | 3.35 | 22 | 0.87 | 99.00  | 3.90 | 99.00  | 3.90 | 18 | 0.71 | F14         |
|                                 |                       |                  |      |    |      |     |      |    |      |    |      | 116.67 | 4.59 | 116.67 | 4.59 | 22 | 0.87 | F16         |
| DN250/<br>NPS 10                | PN10-16/<br>CL150     | 31.8             | 1.25 | 22 | 0.87 | 109 | 4.29 | 85 | 3.35 | 24 | 0.94 | 72.12  | 2.84 | 72.12  | 2.84 | 12 | 0.47 | F10         |
|                                 |                       |                  |      |    |      |     |      |    |      |    |      | 88.39  | 3.48 | 88.39  | 3.48 | 14 | 0.55 | F12         |
|                                 | PN25-40/<br>CL300     | 31.8             | 1.25 | 22 | 0.87 | 109 | 4.29 | 85 | 3.35 | 24 | 0.94 | 99.00  | 3.90 | 99.00  | 3.90 | 18 | 0.71 | F14         |
|                                 |                       |                  |      |    |      |     |      |    |      |    |      | 116.67 | 4.59 | 116.67 | 4.59 | 22 | 0.87 | F16         |
| DN300/<br>NPS 12                | PN10-16/<br>CL150     | 38.1             | 1.50 | 27 | 1.06 | 114 | 4.49 | 85 | 3.35 | 29 | 1.14 | 72.12  | 2.84 | 72.12  | 2.84 | 12 | 0.47 | F10         |
|                                 |                       |                  |      |    |      |     |      |    |      |    |      | 88.39  | 3.48 | 88.39  | 3.48 | 14 | 0.55 | F12         |
|                                 | PN25-40/<br>CL300     | 38.1             | 1.50 | 27 | 1.06 | 114 | 4.49 | 85 | 3.35 | 29 | 1.14 | 99.00  | 3.90 | 99.00  | 3.90 | 18 | 0.71 | F14         |
|                                 |                       |                  |      |    |      |     |      |    |      |    |      | 116.67 | 4.59 | 116.67 | 4.59 | 22 | 0.87 | F16         |

1. This nominal valve shaft diameter is the shaft diameter through the packing box. Use this diameter when selecting Fisher actuators.

Figure 10. Dimensions for Fisher A81, Wafer Style Valve with Optional Mounting Bracket



GE42533\_3

**Table 11. Fisher A81 Valve Breakout Torque Requirements**

| TRIM CONFIGURATION: SOFT SEAL WITH PEEK/PTFE BEARINGS |           |                          |          |          |          |          |          |          |          |          |
|-------------------------------------------------------|-----------|--------------------------|----------|----------|----------|----------|----------|----------|----------|----------|
| VALVE SIZE                                            | SHAFT DIA | TORQUE, N•m              |          |          |          |          |          |          |          |          |
|                                                       |           | Shutoff $\Delta P_{max}$ |          |          |          |          |          |          |          |          |
| DN                                                    | mm        | 3 bar                    | 7 bar    | 10 bar   | 15 bar   | 20 bar   | 25 bar   | 35 bar   | 45 bar   | 50 bar   |
| 50                                                    | 12.7      | 12.8                     | 14.7     | 16.2     | 18.7     | 21.1     | 23.6     | 28.5     | 33.4     | 35.9     |
| 80                                                    | 15.9      | 19.7                     | 23.4     | 26.1     | 30.7     | 35.3     | 39.9     | 49.1     | 58.2     | 62.8     |
| 100                                                   | 19.1      | 31.1                     | 37.6     | 42.4     | 50.5     | 58.7     | 66.8     | 83.0     | 99.2     | 107      |
| 150                                                   | 25.4      | 60.8                     | 75.9     | 87.2     | 106      | 125      | 144      | 181      | 219      | 238      |
| 200                                                   | 31.8      | 103                      | 135      | 158      | 198      | 237      | 276      | 355      | 434      | 473      |
| 250                                                   | 31.8      | 159                      | 212      | 252      | 318      | 385      | 451      | 584      | ---      | ---      |
| 300                                                   | 38.1      | 228                      | 310      | 371      | 473      | 576      | 678      | 883      | ---      | ---      |
| VALVE SIZE                                            | SHAFT DIA | TORQUE, Lbf•in           |          |          |          |          |          |          |          |          |
|                                                       |           | Shutoff $\Delta P_{max}$ |          |          |          |          |          |          |          |          |
| NPS                                                   | Inch      | 50 psid                  | 100 psid | 150 psid | 200 psid | 300 psid | 400 psid | 500 psid | 600 psid | 750 psid |
| 2                                                     | 1/2       | 115                      | 130      | 145      | 160      | 190      | 220      | 250      | 280      | 325      |
| 3                                                     | 5/8       | 178                      | 206      | 234      | 262      | 318      | 374      | 430      | 486      | 570      |
| 4                                                     | 3/4       | 282                      | 331      | 381      | 430      | 529      | 628      | 727      | 826      | 975      |
| 6                                                     | 1         | 553                      | 668      | 783      | 898      | 1130     | 1360     | 1590     | 1820     | 2160     |
| 8                                                     | 1-1/4     | 945                      | 1190     | 1430     | 1670     | 2150     | 2630     | 3110     | 3590     | 4310     |
| 10                                                    | 1-1/4     | 1460                     | 1870     | 2270     | 2680     | 3490     | 4300     | 5110     | ---      | ---      |
| 12                                                    | 1-1/2     | 2100                     | 2720     | 3350     | 3970     | 5220     | 6470     | 7720     | 8970     | ---      |
| TRIM CONFIGURATION: METAL SEAL WITH METAL BEARINGS    |           |                          |          |          |          |          |          |          |          |          |
| VALVE SIZE                                            | SHAFT DIA | TORQUE, N•m              |          |          |          |          |          |          |          |          |
|                                                       |           | Shutoff $\Delta P_{max}$ |          |          |          |          |          |          |          |          |
| DN                                                    | mm        | 3 bar                    | 7 bar    | 10 bar   | 15 bar   | 20 bar   | 25 bar   | 35 bar   | 45 bar   | 50 bar   |
| 50                                                    | 12.7      | 37.3                     | 42.4     | 46.2     | 52.5     | ---      | ---      | ---      | ---      | ---      |
| 80                                                    | 15.9      | 67.7                     | 78.9     | 87.3     | 101      | 115      | ---      | ---      | ---      | ---      |
| 100                                                   | 19.1      | 112                      | 134      | 151      | 178      | 208      | 233      | ---      | ---      | ---      |
| 150                                                   | 25.4      | 241                      | 292      | 331      | 395      | 458      | ---      | ---      | ---      | ---      |
| 200                                                   | 31.8      | 310                      | 422      | 506      | 646      | 786      | 927      | ---      | ---      | ---      |
| 250                                                   | 31.8      | 598                      | 761      | 884      | ---      | ---      | ---      | ---      | ---      | ---      |
| 300                                                   | 38.1      | 926                      | 1270     | ---      | ---      | ---      | ---      | ---      | ---      | ---      |
| VALVE SIZE                                            | SHAFT DIA | TORQUE, Lbf•in           |          |          |          |          |          |          |          |          |
|                                                       |           | Shutoff $\Delta P_{max}$ |          |          |          |          |          |          |          |          |
| NPS                                                   | Inch      | 50 psid                  | 100 psid | 150 psid | 200 psid | 300 psid | 400 psid | 500 psid | 600 psid | 750 psid |
| 2                                                     | 1/2       | 336                      | 374      | 413      | 451      | ---      | ---      | ---      | ---      | ---      |
| 3                                                     | 5/8       | 611                      | 696      | 782      | 867      | 1040     | ---      | ---      | ---      | ---      |
| 4                                                     | 3/4       | 1020                     | 1180     | 1350     | 1520     | 1850     | ---      | ---      | ---      | ---      |
| 6                                                     | 1         | 2190                     | 2580     | 2970     | 3360     | 4140     | ---      | ---      | ---      | ---      |
| 8                                                     | 1-1/4     | 2860                     | 3710     | 4570     | 5420     | 7130     | ---      | ---      | ---      | ---      |
| 10                                                    | 1-1/4     | 5450                     | 6700     | 7950     | ---      | ---      | ---      | ---      | ---      | ---      |
| 12                                                    | 1-1/2     | 8540                     | 11200    | ---      | ---      | ---      | ---      | ---      | ---      | ---      |

## FieldQ Actuator Features

- **Simple, modular construction**—Makes operation and maintenance easier. The basic actuator module includes the pistons, rack and pinion gear, springs (for spring-return actuators), housing, and position indicator. Pneumatic operation is accomplished with an ASCO 8551 solenoid valve. The solenoid is activated by a 120 VAC 60 Hz or 110 VAC 50 Hz signal. It is pad mounted and does not require a bracket. The basic actuator features built-in visual position indication, travel stops for both directions, and a balanced pinion design.
  - **Three Point Suspension System**—Three carbon-filled PTFE guide bands provide a low friction bearing surface for piston alignment and rack support. Elimination of metal-to-metal contact between pistons and cylinder wall reduces friction for outstanding cycle life, smooth piston travel, and maximum power.
  - **Balanced Piston Design**—As part of the design, three equally spaced bearing surfaces are cast into each piston. The rack and pinion construction results in even distribution of bearing loads, optimum gear engagement, and reduced piston tilt. Equal spring force applied to each piston enhances actuator life.
  - **Multiple Constructions**—Conversion from double acting to spring return, or vice versa, is simple and safe, thus reducing spare part requirements. Valve/actuator action is also field reversible.
  - **Dual Stop Adjustment**—This adjustment is standard on all E Series actuators. The P Series actuators are supplied with a limit plate adjustment feature.
  - **Dual Piston Design**—Air pressure applies a balanced force across the common pinion gear. Symmetrically balanced center mount construction eliminates undue stress on the valve stem, bearings, and disk.
- For further information, refer to:  
<http://www.emersonprocess.com/valveautomation/fieldq/index.html>

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