

## Introduction

This installation guide provides instructions for installation, startup and adjustment. To receive a copy of the instruction manual, contact your local Sales Office or view a copy at [www.fisher.com](http://www.fisher.com). For further information refer to: Type EZR Instruction Manual, D102600X012.

## PED/PE(S)R Categories

This product may be used as a safety accessory with pressure equipment in the following categories. It may also be used outside of these Directives using Sound Engineering Practice (SEP) per table below. For information on the current PED/PE(S)R revision, see Bulletin: [D103053X012](#).

| PRODUCT SIZE                                                                      | CATEGORIES | FLUID GROUP |
|-----------------------------------------------------------------------------------|------------|-------------|
| DN 25 / NPS 1                                                                     | SEP        | 1           |
| DN 50, 50 x 25, 80, 100, 150, 200 and 200 x 150 / NPS 2, 2 x 1, 3, 4, 6, 8, 8 x 6 | I, II, III |             |

## Specifications

### Main Valve Body Sizes, End Connection Styles and Structural Design Ratings<sup>(1)(2)</sup>

See Table 1

### Maximum Inlet Pressures and Pressure Drops<sup>(1)</sup>

**Main Valve:** See Table 6

**Pilots:** See Table 3

**Restrictor:** 103 bar / 1500 psig

### Outlet (Control) Pressure Ranges

See Table 2

### Minimum and Maximum Differential Pressures<sup>(1)</sup>

See Tables 4 and 6

### Proof Test Pressure

All Pressure Retaining Components have been proof tested per Pressure Equipment Directive and Pressure Equipment (Safety) Regulation.

### Process Temperature Capabilities<sup>(1)</sup>

See Table 5

## Pilot Type Descriptions

**Type 161AY**—Low-pressure pilot with an outlet pressure range of 15 mbar to 0.48 bar / 6 in. w.c. to 7 psig. Pilot bleeds (exhausts) downstream through the sense (control) line.

**Type 161AYM**—The monitor version of the Type 161AY pilot. The pilot bleed (exhaust) is isolated from the sense (control) line. This pilot is used in monitoring systems requiring an isolated pilot bleed (exhaust).

**Type 161EB**—High accuracy pilot with an outlet pressure range of 0.34 to 24.1 bar / 5 to 350 psig. Pilot bleeds (exhausts) downstream through the sense (control) line.

**Type 161EBM**—The monitor version of the Type 161EB pilot. The pilot bleed (exhaust) is isolated from the sense (control) line. This pilot is used in monitoring systems requiring an isolated pilot bleed (exhaust).

**Type 161EBH**—The high pressure version of the Type 161EB pilot with an outlet pressure range from 17.2 to 48.3 bar / 250 to 700 psig.

**Type 161EBHM**—The high pressure version of the Type 161EBM pilot with an outlet pressure range from 17.2 to 48.3 bar / 250 to 700 psig.

**Type PRX/120**—Outlet pressure range of 1.00 to 30.0 bar / 14.5 to 435 psig. The Type PRX/120 can be used as the pilot on single-stage pressure reducing regulators or as the monitor pilot or working pilot in wide-open monitor systems. The Type PRX has a double diaphragm which provides increased accuracy and sensitivity, an integral restrictor adjustment which allows adjustable opening and closing speeds and a damper adjustment which adjusts inlet pressure variability and loading pressure oscillations.

**Type PRX/120-AP**—Outlet pressure range of 30.0 to 69.0 bar / 435 to 1000 psig. The Type PRX/120-AP can be used as the pilot on single-stage pressure reducing regulators, as the monitor pilot or working pilot in wide-open monitor systems or as the working pilot for monitoring and working regulators in the working monitoring systems.

**Type PRX/125**—Identical to the Type PRX/120 except the restriction screw is removed. The Type PRX/125 can only be used as the monitor override pilot on working monitor applications.

**Type PRX/125-AP**—Identical to the Type PRX/120-AP except the restriction screw is removed. The Type PRX/125-AP can only be used as the monitor override pilot on working monitor applications.

## Installation



### WARNING

**Only qualified personnel should install or service a regulator. Regulators should be installed, operated and maintained in accordance with international and applicable codes and regulations and Emerson Process Management Regulator Technologies, Inc. instructions.**

**If the regulator vents fluid or a leak develops in the system, it indicates that service is required. Failure to take the regulator out of service immediately may create a hazardous condition.**

1. The pressure/temperature limits in this Instruction Guide and any applicable standard or code limitation should not be exceeded.  
2. End connections for other than ASME standard can usually be provided, contact your local Sales Office for assistance.

# Type EZR

**Table 1. Main Valve Body Sizes, End Connection Styles and Body Ratings**

| MAIN VALVE BODY SIZE, DN / NPS                                                                                                                                                                                                        | MAIN VALVE BODY MATERIAL | END CONNECTION STYLE <sup>(1)</sup>                          | STRUCTURAL DESIGN RATING <sup>(2)</sup> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------------------------------------------|-----------------------------------------|
| 50 x 25, 50, 80, 100 and 150 / 2 x 1, 2, 3, 4 and 6                                                                                                                                                                                   | Cast iron                | NPT (DN 50 x 25 and 50 / NPS 2 x 1 and 2 only)               | 27.6 bar / 400 psig                     |
|                                                                                                                                                                                                                                       |                          | CL125 FF                                                     | 13.8 bar / 200 psig                     |
| 25, 32 x 25, 50 x 25, 50, 80, 100, 150 x 100, 200 x 100, 150, 200 x 150 and 300 x 150 / 1, 1-1/4 x 1 <sup>(3)</sup> , 2 x 1, 2, 3, 4, 6 x 4 <sup>(4)</sup> , 8 x 4 <sup>(4)</sup> , 6, 8 x 6 <sup>(4)</sup> and 12 x 6 <sup>(4)</sup> | WCC Steel                | NPT or SWE (DN 25, 50 x 25 and 50 / NPS 1, 2 x 1 and 2 only) | 103 bar / 1500 psig                     |
|                                                                                                                                                                                                                                       |                          | CL150 RF                                                     | 20.0 bar / 290 psig                     |
|                                                                                                                                                                                                                                       |                          | CL300 RF                                                     | 51.7 bar / 750 psig                     |
|                                                                                                                                                                                                                                       |                          | CL600 RF or BWE                                              | 103 bar / 1500 psig                     |
| 200 / 8                                                                                                                                                                                                                               | LCC Steel                | CL150 RF                                                     | 20.0 bar / 290 psig                     |
|                                                                                                                                                                                                                                       |                          | CL300 RF                                                     | 51.7 bar / 750 psig                     |
|                                                                                                                                                                                                                                       |                          | CL600 RF                                                     | 103 bar / 1500 psig                     |

1. Ratings and end connections for other than ASME standard can usually be provided. Contact your local Sales Office for assistance.

2. See Tables 3, 5 and 6 for diaphragm materials and additional pressure ratings.

3. Available in steel NPT only.

4. DN 150 x 100, 200 x 100, 200 x 150, 300 x 150 / NPS 6 x 4, 8 x 4, 8 x 6, 12 x 6 Types EZR and 399 bodies are not the same as the EW valve bodies and are not interchangeable.

**Table 2. Outlet (Control) Pressure Ranges, Proportional Bands and Pilot Control Spring Information**

| TYPE                  | OUTLET (CONTROL) PRESSURE RANGE |                  | PROPORTIONAL BAND <sup>(1)(3)</sup> |            | PILOT CONTROL SPRING INFORMATION |             |               |       |             |      |
|-----------------------|---------------------------------|------------------|-------------------------------------|------------|----------------------------------|-------------|---------------|-------|-------------|------|
|                       |                                 |                  |                                     |            | Part Number                      | Color Code  | Wire Diameter |       | Free Length |      |
|                       | bar                             | psig             | bar                                 | psig       |                                  |             | mm            | In.   | mm          | In.  |
| 161AY or 161AYM       | 15 to 37 mbar                   | 6 to 15 in. w.c. | 3 mbar <sup>(2)</sup>               | 1 in. w.c. | 1B653927022                      | Olive drab  | 2.67          | 0.105 | 95.2        | 3.75 |
|                       | 34 to 83 mbar                   | 0.5 to 1.2       | 3 mbar <sup>(2)</sup>               | 1 in. w.c. | 1B537027052                      | Yellow      | 2.90          | 0.114 | 109         | 4.31 |
|                       | 83 mbar to 0.17 bar             | 1.2 to 2.5       | 34 mbar <sup>(2)</sup>              | 0.5        | 1B537127022                      | Light green | 3.96          | 0.156 | 105         | 4.13 |
|                       | 0.17 to 0.31                    | 2.5 to 4.5       | 34 mbar <sup>(2)</sup>              | 0.5        | 1B537227022                      | Light blue  | 4.75          | 0.187 | 100         | 3.94 |
|                       | 0.31 to 0.48                    | 4.5 to 7         | 34 mbar <sup>(2)</sup>              | 0.5        | 1B537327052                      | Black       | 5.54          | 0.218 | 105         | 4.13 |
|                       |                                 |                  |                                     |            |                                  |             |               |       |             |      |
| 161EB or 161EBM       | 0.34 to 1.0                     | 5 to 15          | 34 mbar <sup>(2)</sup>              | 0.5        | 17B1260X012                      | White       | 3.05          | 0.120 | 95.2        | 3.75 |
|                       | 0.69 to 2.8                     | 10 to 40         | 34 mbar <sup>(2)</sup>              | 0.5        | 17B1262X012                      | Yellow      | 3.76          | 0.148 | 95.2        | 3.75 |
|                       | 2.1 to 5.2                      | 30 to 75         | 41 mbar <sup>(2)</sup>              | 0.6        | 17B1259X012                      | Black       | 4.75          | 0.187 | 102         | 4.00 |
|                       | 4.8 to 9.7                      | 70 to 140        | 90 mbar <sup>(2)</sup>              | 1.3        | 17B1261X012                      | Green       | 5.71          | 0.225 | 94.0        | 3.70 |
|                       | 9.0 to 13.8                     | 130 to 200       | 0.10 <sup>(2)</sup>                 | 1.5        | 17B1263X012                      | Blue        | 6.65          | 0.262 | 97.8        | 3.85 |
|                       | 13.8 to 24.1                    | 200 to 350       | 0.21 <sup>(2)</sup>                 | 3          | 17B1264X012                      | Red         | 7.47          | 0.294 | 107         | 4.22 |
| 161EBH or 161EBHM     | 17.2 to 31.0                    | 250 to 450       | 0.24 <sup>(5)</sup>                 | 3.5        | 17B1263X012                      | Blue        | 6.66          | 0.262 | 97.8        | 3.85 |
|                       | 27.6 to 48.2                    | 400 to 700       | 0.48 <sup>(5)</sup>                 | 7          | 17B1264X012                      | Red         | 7.47          | 0.294 | 107         | 4.22 |
| 161EB <sup>(4)</sup>  | 2.1 to 20.7                     | 30 to 300        | 0.41                                | 6          | 15A9258X012                      | Green       | 6.17          | 0.243 | 47.7        | 1.88 |
| TYPE                  | OUTLET (CONTROL) PRESSURE RANGE |                  | ACCURACY CLASS (AC) <sup>(1)</sup>  |            | PILOT CONTROL SPRING INFORMATION |             |               |       |             |      |
|                       |                                 |                  |                                     |            | Part Number                      | Color Code  | Wire Diameter |       | Free Length |      |
|                       | bar                             | psig             |                                     |            |                                  |             | mm            | In.   | mm          | In.  |
| PRX/120 PRX/125       | 1.00 to 1.8                     | 14.5 to 26       | 2.5%                                |            | M0255240X12                      | Yellow      | 2.79          | 0.110 | 54.9        | 2.16 |
|                       | 1.6 to 3.0                      | 23 to 44         | 2.5%                                |            | M0255230X12                      | Green       | 3.20          | 0.126 |             |      |
|                       | 2.8 to 5.5                      | 41 to 80         | 2.5%                                |            | M0255180X12                      | Blue        | 3.50          | 0.138 |             |      |
|                       | 5.0 to 8.5                      | 73 to 123        | 2.5%                                |            | M0255220X12                      | Black       | 3.99          | 0.157 |             |      |
|                       | 8.0 to 14.5                     | 116 to 210       | 1%                                  |            | M0255210X12                      | Silver      | 4.50          | 0.177 | 54.9        | 2.16 |
|                       | 14.0 to 23.0                    | 203 to 334       | 1%                                  |            | M0255200X12                      | Gold        | 5.00          | 0.197 | 50.8        | 2.00 |
| PRX/120-AP PRX/125-AP | 22.0 to 30.0                    | 319 to 435       | 1%                                  |            | M0255860X12                      | Aluminum    | 5.99          | 0.236 | 50.8        | 2.00 |
|                       | 30.0 to 69.0                    | 435 to 1000      | 1%                                  |            | M0273790X12                      | Clear       | 8.51          | 0.335 | 99.8        | 3.93 |

1. Proportional band and Accuracy Class include outlet pressure drop plus hysteresis (friction), but do not include lockup.

2. Proportional band was determined with a pressure drop ranging from 3.5 to 10.3 bar / 50 to 150 psig. Approximately double the proportional band if the pressure drop is less than 3.5 bar / 50 psig.

3. With Type 112 restrictor set on 2. With Type PRX restrictor turn the restrictor screw one turn counterclockwise from fully seated.

4. Should only be used as the intermediate reduction pilot on the Type EZR working monitor systems.

5. Proportional band was determined with a pressure drop ranging from 6.9 to 20.7 bar / 100 to 300 psig. Approximately double the proportional band if the pressure drop is less than 6.9 bar / 100 psi.

**Table 3. Pilot Pressure Ratings**

| TYPE               | MAXIMUM INLET PRESSURE |      | MAXIMUM EMERGENCY OUTLET PRESSURE OR MAXIMUM EMERGENCY SENSE PRESSURE <sup>(1)</sup> |      | MAXIMUM BLEED (EXHAUST) PRESSURE FOR MONITOR PILOTS |      |
|--------------------|------------------------|------|--------------------------------------------------------------------------------------|------|-----------------------------------------------------|------|
|                    | bar                    | psig | bar                                                                                  | psig | bar                                                 | psig |
| 161AY              | 10.3                   | 150  | 10.3                                                                                 | 150  | ----                                                |      |
| 161EB and 161EBH   | 103                    | 1500 | 82.7                                                                                 | 1200 |                                                     |      |
| 161AYM             | 10.3                   | 150  | 10.3                                                                                 | 150  | 10.3                                                | 150  |
| 161EBM and 161EBHM | 103                    | 1500 | 82.7                                                                                 | 1200 | 103                                                 | 1500 |
| PRX Series         | 102                    | 1480 | 102                                                                                  | 1480 | 102                                                 | 1480 |

1. Maximum pressure to prevent the casings from bursting during abnormal operation (leaking to atmosphere and internal parts damage may occur).

Table 4. Main Valve Minimum Differential Pressures<sup>(1)</sup>

| MAIN VALVE<br>BODY SIZE,<br>DN / NPS                        | MAIN SPRING<br>PART NUMBER AND<br>COLOR CODE                                | DIAPHRAGM<br>MATERIAL | MINIMUM DIFFERENTIAL, PERCENT OF CAGE CAPACITY |     |          |     |          |     |                   |     |          |     |          |     |
|-------------------------------------------------------------|-----------------------------------------------------------------------------|-----------------------|------------------------------------------------|-----|----------|-----|----------|-----|-------------------|-----|----------|-----|----------|-----|
|                                                             |                                                                             |                       | FOR 90% CAPACITY                               |     |          |     |          |     | FOR 100% CAPACITY |     |          |     |          |     |
|                                                             |                                                                             |                       | 100% Trim                                      |     | 60% Trim |     | 30% Trim |     | 100% Trim         |     | 60% Trim |     | 30% Trim |     |
|                                                             |                                                                             |                       | bar                                            | psi | bar      | psi | bar      | psi | bar               | psi | bar      | psi | bar      | psi |
| 25 and 32 x 25 /<br>1 and 1-1/4 x 1                         | 19B2400X012, Light Blue                                                     | 17E68 and 17E88       | 1.7                                            | 24  | 2.0      | 29  | 2.2      | 31  | 1.7               | 24  | 2.2      | 31  | 2.8      | 40  |
|                                                             | GE12727X012, Black                                                          | 17E97                 | 2.5                                            | 35  | 2.7      | 38  | 2.9      | 42  | 2.5               | 35  | 2.7      | 39  | 3.6      | 52  |
|                                                             |                                                                             | 17E68 and 17E88       | 2.1                                            | 30  | 2.4      | 35  | 2.7      | 39  | 2.1               | 30  | 2.5      | 36  | 3.6      | 52  |
|                                                             | 19B2401X012,<br>Black with White Stripe <sup>(3)</sup>                      | 17E88 and 17E97       | 3.0                                            | 43  | 3.4      | 50  | 3.9      | 56  | 3.0               | 43  | 3.7      | 53  | 4.7      | 68  |
| 50 x 25 / 2 x 1                                             | 19B2400X012, Light Blue                                                     | 17E68 and 17E88       | 1.7                                            | 24  | 2.0      | 29  | 2.2      | 31  | 1.7               | 24  | 2.2      | 31  | 2.8      | 40  |
|                                                             | 19B2401X012,<br>Black with White Stripe                                     | 17E97                 | 3.0                                            | 43  | 3.4      | 50  | 3.9      | 56  | 3.0               | 43  | 3.7      | 53  | 4.7      | 68  |
|                                                             |                                                                             | 17E68 and 17E88       | 3.0                                            | 43  | 3.4      | 50  | 3.9      | 56  | 3.0               | 43  | 3.7      | 53  | 4.7      | 68  |
|                                                             | GE12501X012,<br>Red Stripe <sup>(3)</sup>                                   | 17E97                 | 4.7                                            | 68  | 5.0      | 73  | 6.1      | 88  | 5.0               | 72  | 5.6      | 81  | 7.0      | 102 |
| 50 / 2                                                      | 19B0951X012, Yellow <sup>(2)</sup>                                          | 17E68 and 17E88       | 0.83                                           | 12  | 1.0      | 15  | 1.0      | 15  | 0.83              | 12  | 1.7      | 25  | 1.4      | 20  |
|                                                             | 18B2126X012, Green                                                          | 17E97                 | 1.7                                            | 24  | 1.7      | 25  | 1.8      | 26  | 1.7               | 24  | 2.1      | 30  | 2.6      | 37  |
|                                                             |                                                                             | 17E68 and 17E88       | 1.2                                            | 18  | 1.4      | 20  | 1.5      | 22  | 1.3               | 19  | 1.8      | 26  | 1.9      | 28  |
|                                                             | 18B5955X012, Red <sup>(3)(4)</sup><br>GE05504X012, Purple <sup>(3)(4)</sup> | 17E88 and 17E97       | 2.0                                            | 29  | 2.0      | 29  | 2.1      | 31  | 2.1               | 31  | 2.4      | 35  | 3.03     | 43  |
| 80 / 3                                                      | T14184T0012, Yellow <sup>(2)</sup>                                          | 17E68 and 17E88       | 1.1                                            | 16  | 1.3      | 19  | 1.7      | 24  | 1.6               | 23  | 1.6      | 23  | 2.0      | 29  |
|                                                             | 19B0781X012, Light Blue                                                     | 17E97                 | 1.6                                            | 23  | 1.6      | 23  | 1.6      | 23  | 1.6               | 23  | 1.6      | 23  | 1.7      | 25  |
|                                                             |                                                                             | 17E68 and 17E88       | 1.5                                            | 21  | 1.5      | 22  | 1.9      | 28  | 1.9               | 28  | 1.9      | 28  | 2.3      | 33  |
|                                                             | 19B0782X012, Black <sup>(3)</sup>                                           | 17E88 and 17E97       | 2.2                                            | 32  | 2.3      | 33  | 3.0      | 43  | 2.6               | 38  | 2.6      | 38  | 3.4      | 50  |
| 100, 150 x 100<br>and 200 x 100 /<br>4, 6 x 4 and, 8 x 4    | T14184T0012, Yellow <sup>(2)</sup>                                          | 17E68 and 17E88       | 0.69                                           | 10  | 0.83     | 12  | 0.97     | 14  | 1.7               | 25  | 1.7      | 25  | 1.7      | 25  |
|                                                             | 18B8501X012, Green                                                          | 17E97                 | 1.1                                            | 16  | 1.2      | 17  | 1.5      | 21  | 2.3               | 34  | 2.3      | 34  | 2.3      | 34  |
|                                                             |                                                                             | 17E68 and 17E88       | 1.1                                            | 16  | 1.2      | 17  | 1.4      | 20  | 2.1               | 30  | 2.1      | 30  | 2.1      | 30  |
|                                                             | 18B8502X012, Red <sup>(3)</sup>                                             | 17E88 and 17E97       | 1.5                                            | 21  | 1.7      | 24  | 1.8      | 26  | 2.8               | 40  | 2.8      | 40  | 2.8      | 40  |
| 150, 200 x 150<br>and 300 x 150 /<br>6, 8 x 6 and<br>12 x 6 | 19B0364X012, Yellow <sup>(2)</sup>                                          | 17E97                 | 0.69                                           | 10  | 0.76     | 11  | 0.97     | 14  | 0.83              | 12  | 1.1      | 16  | 1.1      | 16  |
|                                                             |                                                                             | 17E88                 | 0.69                                           | 10  | 0.90     | 13  | 0.90     | 13  | 0.83              | 12  | 1.5      | 21  | 1.5      | 21  |
|                                                             | 19B0366X012, Green                                                          | 17E97                 | 0.97                                           | 14  | 1.5      | 22  | 1.5      | 22  | 1.3               | 19  | 2.0      | 29  | 2.0      | 29  |
|                                                             |                                                                             | 17E88                 | 1.2                                            | 17  | 1.5      | 21  | 1.5      | 21  | 1.4               | 20  | 2.5      | 36  | 2.5      | 36  |
| 200 / 8                                                     | 19B0365X012, Red <sup>(3)</sup>                                             | 17E88 and 17E97       | 1.6                                            | 23  | 2.0      | 29  | 2.0      | 29  | 2.1               | 30  | 2.8      | 41  | 2.8      | 41  |
|                                                             | GE09393X012, Yellow <sup>(2)</sup>                                          | 17E97                 | 1.1                                            | 16  | ----     |     | ----     |     | 1.3               | 19  | ----     |     | ----     |     |
|                                                             | GE09396X012, Green                                                          |                       | 1.4                                            | 20  |          |     |          |     | 1.6               | 23  |          |     |          |     |
|                                                             | GE09397X012, Red <sup>(3)</sup>                                             |                       | 1.8                                            | 26  |          |     |          |     | 2.1               | 30  |          |     |          |     |

1. See Table 1 for structural design ratings, Table 3 for pilot ratings and Table 6 for maximum pressure ratings.

2. The yellow spring is only recommended for inlet pressures under 6.9 bar / 100 psig.

3. The red, black, purple, red stripe and black with white stripe springs are only recommended for applications where the maximum inlet pressure can exceed 34.5 bar / 500 psig.

4. 18B5955X012 (Red) is used on constructions with travel indicator while GE05504X012 (Purple) is used on non-travel indicator constructions.

**Personal injury, equipment damage or leakage due to escaping fluid or bursting of pressure-containing parts may result if this regulator is overpressured or is installed where service conditions could exceed the limits given in the Specifications section or where conditions exceed any ratings of the adjacent piping or piping connections.**

**To avoid such injury or damage, provide pressure-relieving or pressure-limiting devices (as required by the appropriate code, regulation or standard) to prevent service conditions from exceeding limits.**

**Additionally, physical damage to the regulator could result in personal injury and property damage due to escaping fluid. To avoid such injury and damage, install the regulator in a safe location.**

Clean out all pipelines before installation of the regulator and check to be sure the regulator has not been damaged or has

collected foreign material during shipping. For NPT bodies, apply pipe compound to the external pipe threads. For flanged bodies, use suitable line gaskets and approved piping and bolting practices. Install the regulator in any position desired, unless otherwise specified, but be sure flow through the body is in the direction indicated by the arrow on the body.

## CAUTION

**When using an inlet strainer (key 23), do not use the shim (key 23) and vise versa.**

**When installing a Type EZR trim package in an existing E-body, make sure flow is up through the center of the cage and down through the cage slots. In some cases, correct flow path is achieved by removing the body from the line and turning it around. If this is done, change the flow arrow to indicate the correct direction. Damage may result if flow is not in the correct direction. After assembly, check the regulator for shutoff and leakage to atmosphere.**

# Type EZR

**Table 5. Temperature Capabilities**

| 17E68 NITRILE (NBR)        | 17E97 NITRILE (NBR) <sup>(1)</sup> | 17E88 FLUOROCARBON (FKM)                 |
|----------------------------|------------------------------------|------------------------------------------|
| -29 to 66°C / -20 to 150°F | -18 to 66°C / 0 to 150°F           | -18 to 127°C / 0 to 260°F <sup>(2)</sup> |

1. The DN 150 / NPS 6, 17E97 diaphragm will perform in gas temperatures as low as -29°C / -20°F.  
2. For differential pressures above 27.6 bar / 400 psig diaphragm temperature is limited to 66°C / 150°F.

**Table 6. Main Valve Maximum Pressure Ratings, Diaphragm Selection Information and Main Spring Selection<sup>(1)</sup>**

| BODY SIZE<br>DN / NPS                                        | DIAPHRAGM<br>MATERIAL                                                       | MAXIMUM OPERATING<br>INLET PRESSURE <sup>(4)</sup> |      | MAXIMUM OPERATING<br>DIFFERENTIAL<br>PRESSURE <sup>(4)</sup> |                    | MAXIMUM<br>EMERGENCY INLET<br>AND DIFFERENTIAL<br>PRESSURE |      | MAIN SPRING<br>COLOR CODE                   | DIAPHRAGM<br>DESIGNATION |
|--------------------------------------------------------------|-----------------------------------------------------------------------------|----------------------------------------------------|------|--------------------------------------------------------------|--------------------|------------------------------------------------------------|------|---------------------------------------------|--------------------------|
|                                                              |                                                                             | bar                                                | psig | bar d                                                        | psid               | bar d                                                      | psid |                                             |                          |
| 25 and 32 x 25 /<br>1 and 1-1/4 x 1                          | 17E68 Nitrile (NBR)<br>Low temperature                                      | 6.9                                                | 100  | 6.9                                                          | 100                | 6.9                                                        | 100  | Light Blue                                  | 130                      |
|                                                              |                                                                             | 31.7                                               | 460  | 27.6                                                         | 400                | 31.7                                                       | 460  | Black                                       |                          |
|                                                              | 17E97 Nitrile (NBR) High pressure<br>and/or erosion resistance              | 34.5                                               | 500  | 34.5                                                         | 500                | 72.4                                                       | 1050 | Black                                       |                          |
|                                                              |                                                                             | 72.4                                               | 1050 | 55.2                                                         | 800                | 72.4                                                       | 1050 | Black with White Stripe <sup>(2)</sup>      |                          |
|                                                              | 17E88 Fluorocarbon (FKM)<br>High aromatic hydrocarbon<br>content resistance | 6.9                                                | 100  | 6.9                                                          | 100                | 6.9                                                        | 100  | Light Blue                                  |                          |
|                                                              |                                                                             | 34.5                                               | 500  | 34.5 <sup>(3)</sup>                                          | 500 <sup>(3)</sup> | 51.7                                                       | 750  | Black                                       |                          |
|                                                              |                                                                             | 51.7                                               | 750  | 34.5 <sup>(3)</sup>                                          | 500 <sup>(3)</sup> | 51.7                                                       | 750  | Black with White Stripe <sup>(2)</sup>      |                          |
| 50 x 25 / 2 x 1                                              | 17E68 Nitrile (NBR)<br>Low temperature                                      | 6.9                                                | 100  | 6.9                                                          | 100                | 6.9                                                        | 100  | Light Blue                                  |                          |
|                                                              |                                                                             | 24.8                                               | 360  | 20.7                                                         | 300                | 24.8                                                       | 360  | Black with White Stripe                     |                          |
|                                                              | 17E97 Nitrile (NBR) High pressure<br>and/or erosion resistance              | 34.5                                               | 500  | 34.5                                                         | 500                | 34.5                                                       | 500  | Black with White Stripe                     |                          |
|                                                              |                                                                             | 72.4                                               | 1050 | 55.2                                                         | 800                | 72.4                                                       | 1050 | Red Stripe <sup>(2)</sup>                   |                          |
|                                                              | 17E88 Fluorocarbon (FKM) High aromatic<br>hydrocarbon content resistance    | 6.9                                                | 100  | 6.9                                                          | 100                | 6.9                                                        | 100  | Light Blue                                  |                          |
|                                                              |                                                                             | 51.7                                               | 750  | 34.5 <sup>(3)</sup>                                          | 500 <sup>(3)</sup> | 51.7                                                       | 750  | Black with White Stripe                     |                          |
| 50 / 2                                                       | 17E68 Nitrile (NBR)<br>Low temperature                                      | 6.9                                                | 100  | 6.9                                                          | 100                | 6.9                                                        | 100  | Yellow                                      |                          |
|                                                              |                                                                             | 31.7                                               | 460  | 27.6                                                         | 400                | 31.7                                                       | 460  | Green                                       |                          |
|                                                              | 17E97 Nitrile (NBR) High pressure<br>and/or erosion resistance              | 34.5                                               | 500  | 34.5                                                         | 500                | 72.4                                                       | 1050 | Green                                       |                          |
|                                                              |                                                                             | 72.4                                               | 1050 | 55.2                                                         | 800                | 72.4                                                       | 1050 | Red <sup>(2)</sup> or Purple <sup>(2)</sup> |                          |
|                                                              | 17E88 Fluorocarbon (FKM)<br>High aromatic hydrocarbon<br>content resistance | 6.9                                                | 100  | 6.9                                                          | 100                | 6.9                                                        | 100  | Yellow                                      |                          |
|                                                              |                                                                             | 34.5                                               | 500  | 34.5 <sup>(3)</sup>                                          | 500 <sup>(3)</sup> | 51.7                                                       | 750  | Green                                       |                          |
| 80 / 3                                                       | 17E68 Nitrile (NBR)<br>Low temperature                                      | 6.9                                                | 100  | 6.9                                                          | 100                | 6.9                                                        | 100  | Yellow                                      |                          |
|                                                              |                                                                             | 24.8                                               | 360  | 20.7                                                         | 300                | 34.5                                                       | 500  | Light Blue                                  |                          |
|                                                              | 17E97 Nitrile (NBR) High pressure<br>and/or erosion resistance              | 34.5                                               | 500  | 34.5                                                         | 500                | 72.4                                                       | 1050 | Light Blue                                  |                          |
|                                                              |                                                                             | 72.4                                               | 1050 | 55.2                                                         | 800                | 72.4                                                       | 1050 | Black <sup>(2)</sup>                        |                          |
|                                                              | 17E88 Fluorocarbon (FKM)<br>High aromatic hydrocarbon<br>content resistance | 6.9                                                | 100  | 6.9                                                          | 100                | 6.9                                                        | 100  | Yellow                                      |                          |
|                                                              |                                                                             | 34.5                                               | 500  | 34.5 <sup>(3)</sup>                                          | 500                | 51.7                                                       | 750  | Light Blue                                  |                          |
| 100, 150 x 100<br>and 200 x 100 /<br>4, 6 x 4<br>and 8 x 4 / | 17E68 Nitrile (NBR)<br>Low temperature                                      | 6.9                                                | 100  | 6.9                                                          | 100                | 6.9                                                        | 100  | Yellow                                      |                          |
|                                                              |                                                                             | 24.8                                               | 360  | 20.7                                                         | 300                | 34.5                                                       | 500  | Green                                       |                          |
|                                                              | 17E97 Nitrile (NBR) High pressure<br>and/or erosion resistance              | 34.5                                               | 500  | 34.5                                                         | 500                | 72.4                                                       | 1050 | Green                                       |                          |
|                                                              |                                                                             | 72.4                                               | 1050 | 55.2                                                         | 800                | 72.4                                                       | 1050 | Red <sup>(2)</sup>                          |                          |
|                                                              | 17E88 Fluorocarbon (FKM)<br>High aromatic hydrocarbon<br>content resistance | 6.9                                                | 100  | 6.9                                                          | 100                | 6.9                                                        | 100  | Yellow                                      |                          |
|                                                              |                                                                             | 34.5                                               | 500  | 34.5 <sup>(3)</sup>                                          | 500 <sup>(3)</sup> | 51.7                                                       | 750  | Green                                       |                          |
| 150, 200 x 150 and<br>300 x 150 /<br>6, 8 x 6<br>and 12 x 6  | 17E97 Nitrile (NBR)<br>High pressure and/or<br>erosion resistance           | 51.7                                               | 750  | 34.5 <sup>(3)</sup>                                          | 500 <sup>(3)</sup> | 51.7                                                       | 750  | Red <sup>(2)</sup>                          |                          |
|                                                              |                                                                             | 6.9                                                | 100  | 6.9                                                          | 100                | 6.9                                                        | 100  | Yellow                                      |                          |
|                                                              |                                                                             | 34.5                                               | 500  | 34.5                                                         | 500                | 72.4                                                       | 1050 | Green                                       |                          |
|                                                              | 17E88 Fluorocarbon (FKM)<br>High aromatic hydrocarbon<br>content resistance | 72.4                                               | 1050 | 55.2                                                         | 800                | 72.4                                                       | 1050 | Red <sup>(2)</sup>                          |                          |
|                                                              |                                                                             | 6.9                                                | 100  | 6.9                                                          | 100                | 6.9                                                        | 100  | Yellow                                      |                          |
|                                                              |                                                                             | 34.5                                               | 500  | 34.5 <sup>(3)</sup>                                          | 500 <sup>(3)</sup> | 51.7                                                       | 750  | Green                                       |                          |
| 200 / 8                                                      | 17E97 Nitrile (NBR)<br>High pressure and/or<br>erosion resistance           | 51.7                                               | 750  | 34.5 <sup>(3)</sup>                                          | 500 <sup>(3)</sup> | 51.7                                                       | 750  | Red <sup>(2)</sup>                          |                          |
|                                                              |                                                                             | 6.9                                                | 100  | 6.9                                                          | 100                | 6.9                                                        | 100  | Yellow                                      |                          |
|                                                              |                                                                             | 34.5                                               | 500  | 34.5                                                         | 500                | 72.4                                                       | 1050 | Green                                       |                          |
|                                                              |                                                                             | 72.4                                               | 1050 | 55.2                                                         | 800                | 72.4                                                       | 1050 | Red <sup>(2)</sup>                          |                          |

1. See Table 1 for main valve structural design ratings and Table 3 for pilot ratings.

2. The red, black, purple, red stripe and black with white stripe springs are only recommended for applications where the maximum inlet pressure can exceed 34.5 bar / 500 psig.

3. For differential pressures above 27.6 bar d / 400 psid diaphragm temperatures are limited to 66°C / 150°F.

4. These are recommendations that provide the best regulator performance for a typical application. Please contact your local Sales Office for further information if a deviation from the standard recommendations is required.

**Note**

It is important that the regulator be installed so that the vent hole in the spring case is unobstructed at all times. For outdoor installations, the regulator should be located away from vehicular traffic and positioned so that water, ice and other foreign materials cannot enter the spring case through the vent. Avoid placing the regulator beneath eaves or downspouts and be sure it is above the probable snow level.

**Overpressure Protection**

The recommended pressure limitations are stamped on the regulator nameplate. Some type of overpressure protection is needed if the actual inlet pressure exceeds the maximum operating outlet pressure rating. Overpressure protection should also be provided if the regulator inlet pressure is greater than the safe working pressure of the downstream equipment.

Regulator operation below the maximum pressure limitations does not preclude the possibility of damage from external sources or debris in the line. The regulator should be inspected for damage after any overpressure condition.

**Startup**

The regulator is factory set at approximately the midpoint of the spring range or the pressure requested, so an initial adjustment may be required to give the desired results. With proper installation completed and relief valves properly adjusted, slowly open the upstream and downstream shutoff valves.

**Adjustment**

To change the outlet pressure, remove the closing cap or loosen the locknut and turn the adjusting screw clockwise to increase outlet pressure or counterclockwise to decrease pressure. Monitor the outlet pressure with a test gauge during the adjustment. Replace the closing cap or tighten the locknut to maintain the desired setting.

**Taking Out of Service (Shutdown)****WARNING**

To avoid personal injury resulting from sudden release of pressure, isolate the regulator from all pressure before attempting disassembly.

**CAUTION**

Make sure to use a Type EZR bonnet. The Type EZR bonnet is NOT interchangeable with other Fisher™ E-body bonnets. Installing an improper bonnet can result in stem assembly breakage and unit failure. The bonnet can be identified by the Type EZR markings on the top.

**Parts List****Main Valve**

| Key  | Description                                                                                |
|------|--------------------------------------------------------------------------------------------|
| 1    | Valve Body                                                                                 |
| 2    | Bonnet Assembly                                                                            |
| 3    | Cap Screw                                                                                  |
| 4    | Hex Nut                                                                                    |
| 5    | Top Plug                                                                                   |
| 6*   | O-ring                                                                                     |
| 7    | Cage                                                                                       |
| 8*   | Cage O-ring                                                                                |
| 9*   | Diaphragm                                                                                  |
| 10*  | O-ring                                                                                     |
| 11   | Bottom Plug                                                                                |
| 12   | Main Spring                                                                                |
| 13*  | Flanged Locknut                                                                            |
| 14*  | Top Plug O-ring                                                                            |
| 15   | Stem                                                                                       |
| 16   | Backup Ring                                                                                |
| 17   | Upper Spring Seat                                                                          |
| 18*  | O-ring                                                                                     |
| 19   | Indicator Fitting                                                                          |
| 19   | Indicator Plug                                                                             |
| 20   | Indicator Washer                                                                           |
| 21   | Indicator Cover                                                                            |
| 22   | Indicator Protector                                                                        |
| 23   | Inlet Strainer                                                                             |
| 23   | Strainer Replacement Shim                                                                  |
| 24   | Nameplate                                                                                  |
| 25   | Flow Arrow                                                                                 |
| 26   | Drive Screw                                                                                |
| 28*  | O-ring                                                                                     |
| 47   | Hex Nut, SA194-2H<br>(DN 200 / NPS 8 body only)                                            |
| 63   | Pilot Supply Pipe Plug                                                                     |
| 64   | Bonnet Pipe Plug                                                                           |
| 66   | O-ring                                                                                     |
| 67   | O-ring                                                                                     |
| 70*  | O-ring                                                                                     |
| 71   | Restrictor Plate                                                                           |
| 72   | E-Ring                                                                                     |
| 79   | Washer                                                                                     |
| 121  | O-ring                                                                                     |
| 126  | Cap Screw                                                                                  |
| 129  | Socket Head Screw                                                                          |
| 130  | Lock Washer                                                                                |
| 131  | Upper Adaptor (DN 50 x 25 / NPS 2 x 1 body only)                                           |
| 132  | Lower Adaptor (DN 50 x 25 / NPS 2 x 1 body only)                                           |
| 133* | O-ring (DN 50 x 25 and 200 / NPS 2 x 1 and 8 bodies only)                                  |
| 136  | Stud (DN 200 / NPS 8 body only)                                                            |
| 137  | Lower Spring Seat (DN 200 / NPS 8 body only)                                               |
| 140  | Bushing (DN 150, 200 x 150 and 300 x 150, 200 /<br>NPS 6, 8 x 6 and 12 x 6, 8 bodies only) |
| 143  | Lifting Flange (DN 200 / NPS 8 body only)                                                  |
| 144  | Yoke Locknut (DN 200 / NPS 8 body only)                                                    |

\* Recommended spare part

# Type EZR

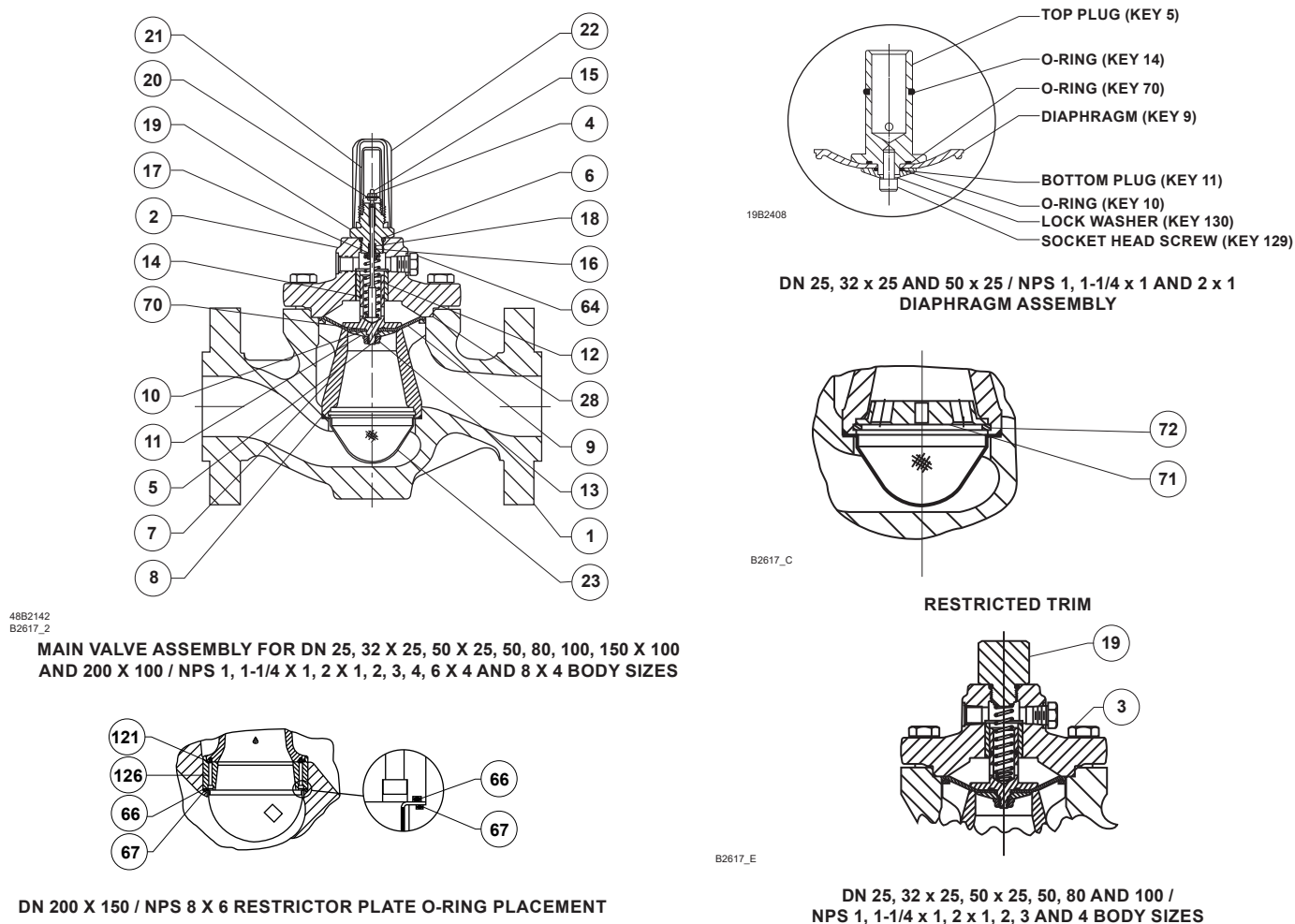


Figure 1. Type EZR Main Valve Assembly

## 161EB Series

### Key Description

|     |                                                         |
|-----|---------------------------------------------------------|
| 1   | Body Assembly (Types 161EB, 161EBH, 161EBM and 161EBHM) |
| 2   | Spring Case                                             |
| 3   | Body Plug                                               |
| 4*  | Valve Plug                                              |
| 6   | Plug Spring                                             |
| 7*  | Diaphragm Assembly                                      |
| 8   | Control Spring Seat                                     |
| 9   | Control Spring                                          |
| 10  | Diaphragm Limiter                                       |
| 11  | Adjusting Screw                                         |
| 12  | Locknut                                                 |
| 13  | Machine Screw (Types 161EB, 161EBH, 161EBM and 161EBHM) |
| 14  | Pipe Plug (Type 161EB and 161EBH)                       |
| 15  | Body Plug O-ring                                        |
| 16  | Closing Cap (Types 161EB and 161EBM only)               |
| 17* | Closing Cap Gasket (Types 161EB and 161EBM only)        |
| 18  | Type Y602-12 Vent Assembly                              |
| 19* | Stem Guide Seal Assembly                                |
| 22  | O-ring (Type 161EBM and 161EBHM)                        |
| 38  | Lower Spring Seat (Type 161EBM and 161EBHM)             |

\* Recommended spare part

## Types 161AY and 161AYM

### Key Description

|    |                                       |
|----|---------------------------------------|
| 1  | Body                                  |
| 2  | Cap Screw                             |
| 3  | Spring Case Assembly                  |
| 4  | Lower Casing (Types 161AY and 161AYM) |
| 5  | Orifice                               |
| 6  | Control Spring                        |
| 7  | Diaphragm Head                        |
| 8  | Pusher Post                           |
| 10 | Diaphragm                             |
| 11 | Body Seal                             |
| 12 | Insert Seal                           |
| 13 | Disk Assembly                         |
| 14 | Stem                                  |
| 15 | Cotter Pin                            |
| 16 | Lever Assembly                        |
| 17 | Machine Screws                        |
| 18 | Guide Insert                          |
| 21 | Hex Nut                               |
| 22 | Closing Cap                           |
| 23 | Hex Nut                               |
| 24 | Cap Screw                             |
| 25 | Closing Cap                           |

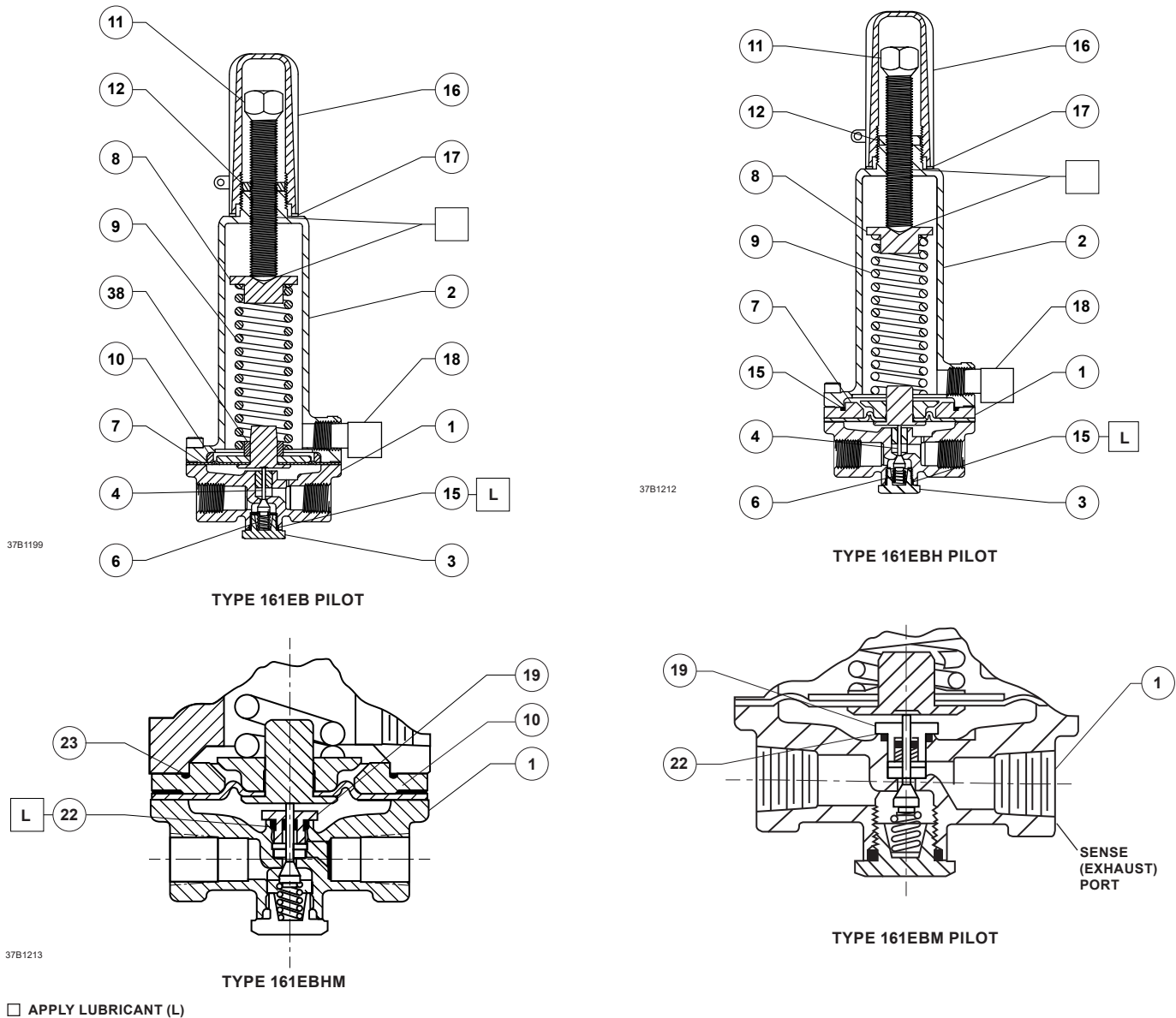


Figure 2. 161EB Series Pilots

## Types 161AY and 161AYM (continued)

| Key | Description                         |
|-----|-------------------------------------|
| 26  | Vent Assembly                       |
| 27  | Pipe Plug (Type 161AY only)         |
| 30  | Stem Seal O-ring (Type 161AYM only) |
| 31  | Throat Seal (Type 161AYM only)      |
| 33  | Machine Screw (Type 161AYM only)    |
| 35  | Adjusting Screw                     |
| 37  | Spring Holder                       |
| 38  | Machine Screw                       |
| 39  | Overpressure Spring                 |
| 40  | Pusher Post Connector               |
| 46  | Nameplate                           |
| 47  | Drive Screw                         |
| 48  | Post Seal                           |
| 49  | Connector Seal                      |
| 50  | Backup Ring                         |
| 55  | Restriction                         |
| 56  | Baffle Plate                        |

## PRX Series Pilots

| Key | Description           |
|-----|-----------------------|
| 1   | Adjusting Screw       |
| 2   | Locknut               |
| 3   | Cap                   |
| 4*  | Upper Cover O-ring    |
| 5*  | O-ring                |
| 6   | Upper Spring Seat     |
| 7   | Spring                |
| 8   | Upper Cover           |
| 9   | Lower Spring Seat     |
| 10  | Machine Screw         |
| 11  | Washer                |
| 12  | Filter                |
| 13  | Upper Diaphragm Plate |
| 14* | Diaphragm             |
| 15  | Lower Diaphragm Plate |
| 16  | Body                  |
| 17* | Orifice O-ring        |

# Type EZR

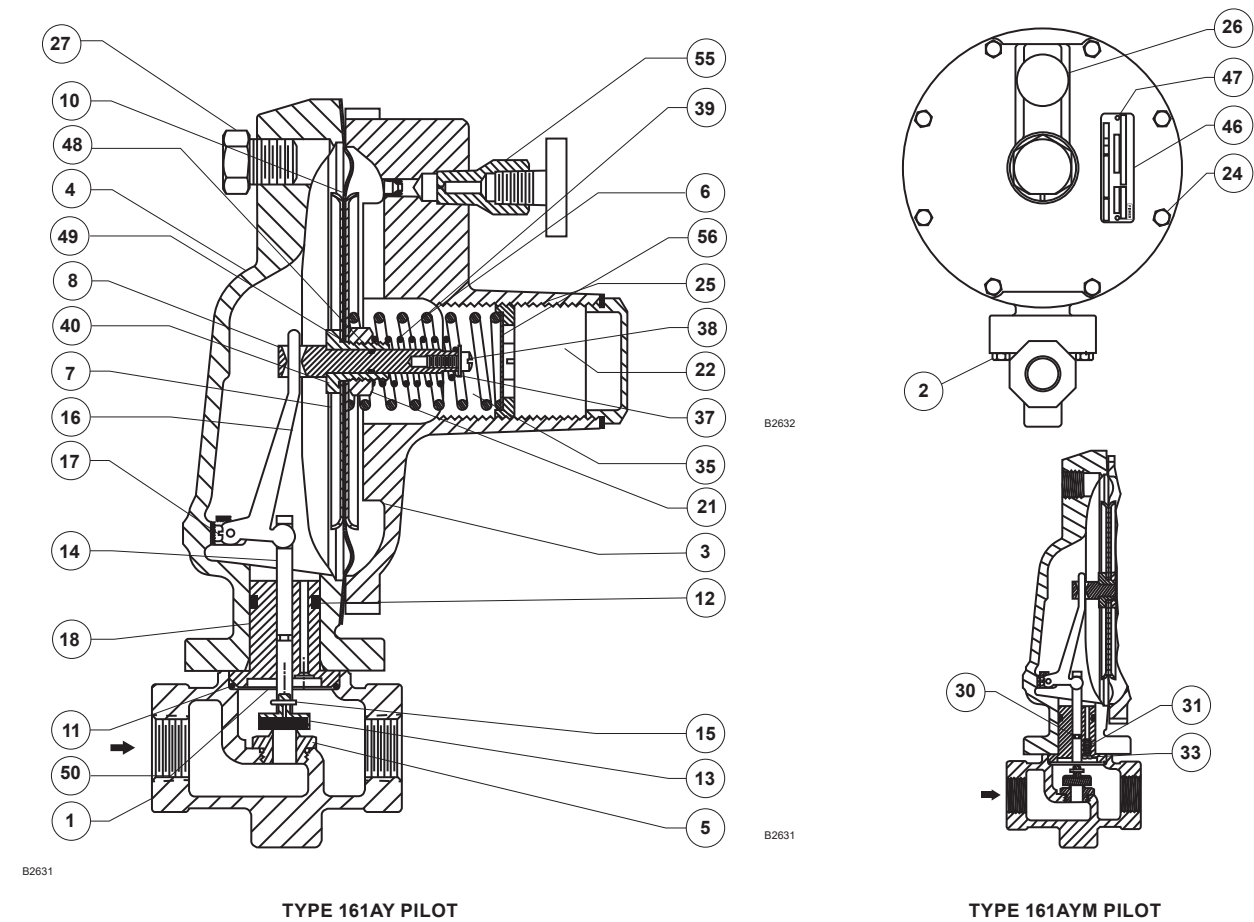


Figure 3. Types 161AY and 161AYM Pilots

## PRX Series Pilots (continued)

| Key | Description                      |
|-----|----------------------------------|
| 18* | Lower Cover O-ring               |
| 19  | Orifice                          |
| 20  | Nut                              |
| 21  | Lower Cover                      |
| 22* | Pad Holder                       |
| 23  | Stem                             |
| 24  | Nameplate                        |
| 25* | Stem O-ring                      |
| 26  | Upper Diaphragm                  |
| 27  | Damper Adjusting Screw with Hole |
| 28* | Restrictor/Damper O-ring         |
| 29  | Plate                            |
| 29  | Damper/Restrictor Plate          |
|     | Types PRX/120 and PRX/120-AP     |
|     | Types PRX/125 and PRX/125-AP     |

## PRX Series Pilots (continued)

| Key | Description                              |
|-----|------------------------------------------|
| 30  | Ring Nut                                 |
| 31  | Nameplate Screw                          |
| 32  | Restrictor Adjusting Screw with Hole     |
| 33  | Plug (Types PRX/125 and PRX/125-AP Only) |
| 34  | Plug (Types PRX/125 and PRX/125-AP Only) |
| 35  | Spring Barrel Extension for AP           |

## Type 112 Restrictor

| Key | Description         |
|-----|---------------------|
| 14  | Pipe Plug           |
| 21  | Body                |
| 22  | Groove Valve        |
| 23  | Retainer            |
| 24* | Groove Valve O-ring |

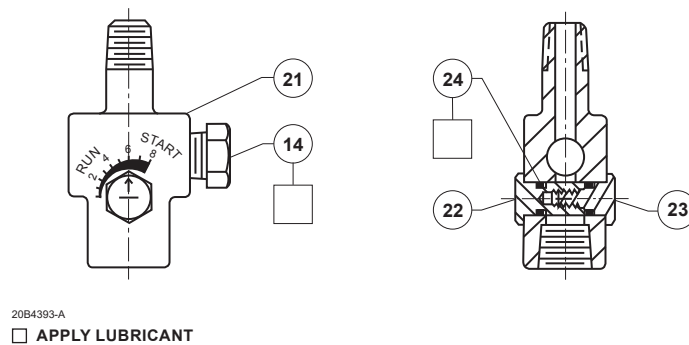


Figure 4. Type 112 Restrictor

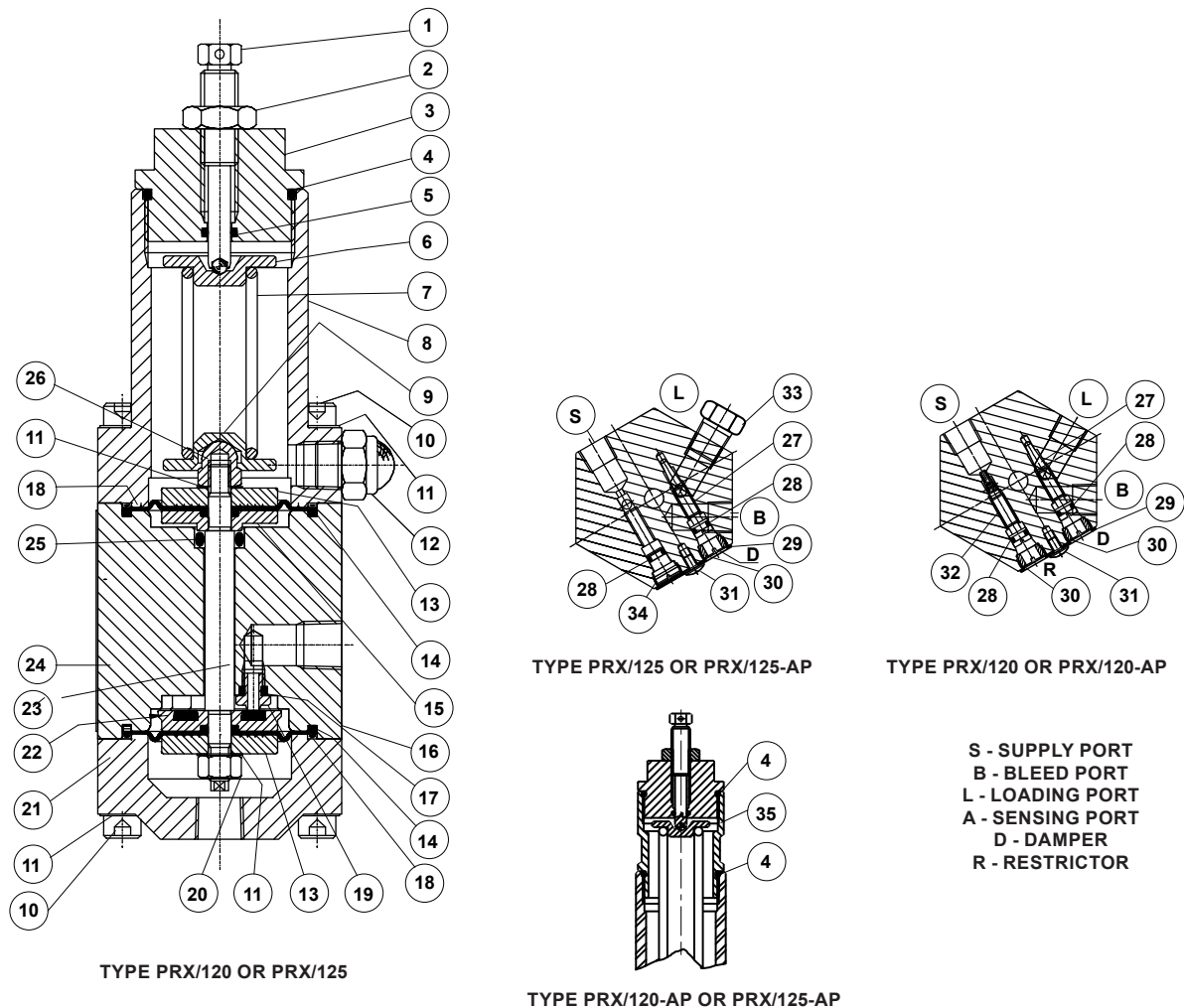


Figure 5. PRX Series Pilot Assembly

# Type EZR

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