

## 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.fisherregulators.com](http://www.fisherregulators.com). For further information refer to: Type FL Pressure Reducing Regulators Instruction Manual, D103068X012.

## P.E.D. Categories

This product may be used as a safety accessory with pressure equipment in the following Pressure Equipment Directive 97/23/EC categories. It may also be used outside of the Pressure Equipment Directive using sound engineering practice (SEP) per table below.

PRODUCT SIZE	BODY MATERIAL	CATEGORY
All sizes available	Steel	IV

## Specifications

### Available Configuration

**Type FL:** Pilot-operated pressure reducing regulator from 1.0 to 80.0 bar / 14.5 to 1160 psig outlet pressures

### Body Size

**Type FL:** DN 25, 50, 80, 100, 150, 200 and 250 / NPS 1, 2, 3, 4, 6, 8 and 10

**Type FL with Type SRS Silencer (Inlet x Outlet):**

DN 25 x 100, 50 x 150, 80 x 250, 100 x 250, 150 x 300 and 200 x 400 / NPS 1 x 4, 2 x 6, 3 x 10, 4 x 10, 6 x 12 and 8 x 16

### Main Valve End Connection Style and Pressure Ratings<sup>(1)</sup>

**CL300 RF:** 51.0 bar / 740 psig<sup>(4)</sup>

**CL600 RF:** 102 bar / 1480 psig<sup>(4)</sup>

### Maximum Inlet and Outlet (Casing) Pressure<sup>(1)</sup>

102 bar / 1480 psig<sup>(4)</sup>

### Minimum Operating Differential Pressure<sup>(2)</sup>

**Start Open:**

*DN 25 to 100 / NPS 1 to 4:* 0.50 bar d / 7.3 psid

*DN 150 and 200 / NPS 6 and 8:* 0.21 bar d / 3 psid

*DN 250 / NPS 10:* 0.2 bar d / 2.9 psid

### Minimum Operating Differential Pressure (continued)<sup>(2)</sup>

**Full Open:**

*DN 25 to 100 / NPS 1 to 4:* 1.00 bar d / 14.5 psid

*DN 150 and 200 / NPS 6 and 8:*

0.50 bar d / 7.3 psid

*DN 250 / NPS 10:* 0.6 bar d / 8.7 psid

### Outlet Pressure Ranges

See Table 1

### Pressure Registration

External

### Temperature Capabilities<sup>(1)(3)</sup>

**Nitrile (NBR), Fluorocarbon (FKM) or Polyurethane (PU) Disk:**

-20 to 60°C / -4 to 140°F

**Nitrile (NBR) or Polyurethane (PU) Disk:**

-29 to 60°C / -20 to 140°F<sup>(5)</sup>

### Approximate Weights (Including Pilot)

#### Types FL-SR and FL-SRII

*DN 25 / NPS 1:* 31 kg / 68 lbs

*DN 50 / NPS 2:* 60 kg / 132 lbs

*DN 80 / NPS 3:* 148 kg / 326 lbs

*DN 100 / NPS 4:* 201 kg / 443 lbs

*DN 150 / NPS 6:* 480 kg / 1058 lbs

*DN 200 / NPS 8:* 620 kg / 1367 lbs

*DN 250 / NPS 10:* 1190 kg / 2623 lbs

#### Types FL-SR/SRS and FL-SRII/SRS

*DN 25 x 100 / NPS 1 x 4:* 45 kg / 99 lbs

*DN 50 x 150 / NPS 2 x 6:* 87 kg / 192 lbs

*DN 80 x 250 / NPS 3 x 10:* 233 kg / 514 lbs

*DN 100 x 250 / NPS 4 x 10:* 286 kg / 631 lbs

*DN 150 x 300 / NPS 6 x 12:* 620 kg / 1367 lbs

*DN 200 x 400 / NPS 8 x 16:* 900 kg / 1984 lbs

## Installation



**WARNING**

Only qualified personnel shall 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.

1. The pressure/temperature limits in this Installation Guide and any applicable standard or code limitation should not be exceeded.

2. When using a Type SA/2 pilot supply filter regulator, the differential pressure across the regulator must be at least 3.1 bar d / 45 psid for optimum regulator performance.

3. Types PRX and SA/2 Fluorocarbon (FKM) elastomer are limited to -18°C / 0°F.

4. At average ambient temperature.

5. Meets or exceeds ANSI/FCI 70-3 Class VI/VII leakage limits at maximum operating differential pressure.

# Type FL

**Table 1. Outlet Pressure Ranges**

TYPE	OUTLET PRESSURE RANGE		AC (ACCURACY CLASS)	PILOT CONTROL SPRING INFORMATION
	bar	psig		Spring Color
PRX/120 PRX/125 PRX/131	1.0 to 1.8 1.6 to 3.0 2.8 to 5.5 5.0 to 8.5	14.5 to 26 23 to 44 41 to 80 73 to 123	2.5% 2.5% 2.5% 2.5%	Yellow Green Blue Black
	8.0 to 14.5 14.0 to 23.0 22.0 to 30.0	116 to 210 203 to 334 319 to 435	1% 1% 1%	Silver Gold Aluminum
PRX/120-AP PRX/125-AP	30.0 to 80.0	435 to 1160	1%	Clear

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.

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 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.

**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

The adjustment of setpoint is performed using the pilot adjusting screw. To change the outlet pressure, loosen the jam nut and turn the adjusting screw clockwise to increase outlet pressure or counterclockwise to decrease it. Monitor the outlet pressure with a test gauge during the adjustment. Tighten the jam nut 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.

## Parts List

### Type FL Main Valve (Figure 1)

Key	Description
1	Inlet Flange
2*	Anti-Friction Ring, (6 required)
3*	O-ring (3 required)
4*	Body O-ring DN 25, 50, 80 and 100 / NPS 1, 2, 3 and 4 (2 required) DN 150 and 200 / NPS 6 and 8
5	Socket Head Screw DN 25, 50, 80, 100 and 150 / NPS 1, 2, 3, 4 and 6 (16 required) DN 200 and 250 / NPS 8 and 10 (24 required)
6	Spring
7	Tube Fitting
8	Inlet Plate
9	Flange Bolt DN 25, 50, 80 and 100 / NPS 1, 2, 3 and 4 (16 required) DN 150 / NPS 6 (24 required) DN 200 / NPS 8 (30 required) DN 250 / NPS 10 (36 required)
10*	Diaphragm
11	Inlet Body Cover, not available for DN 250 / NPS 10
12	Outlet Plate
13	Outlet Body Cover
14	Washer DN 25, 50, 80 and 100 / NPS 1, 2, 3 and 4 (16 required) DN 150 / NPS 6 (24 required) DN 200 / NPS 8 (30 required) DN 250 / NPS 10 (36 required)
15	Nut DN 25, 50, 80 and 100 / NPS 1, 2, 3 and 4 (16 required) DN 150 / NPS 6 (24 required) DN 200 / NPS 8 (30 required) DN 250 / NPS 10 (36 required)
16	Sleeve
17	Tube Fitting
18*	O-ring
19	Disk Holder Type FL Type FL-SR, FL-SRII, FL-SR/SRS or FL-SRII/SRS <sup>(1)</sup>
20*	Disk
21	Disk Retainer
22	Outlet Flange
23	Gasket
24	Spacer <sup>(2)</sup>
25	Socket Head Screw
26*	O-ring

Key	Description
27	Socket Head Screw DN 25 and 50 / NPS 1 and 2 (6 required) DN 80 and 100 / NPS 3 and 4 (12 required) DN 150 / NPS 6 (8 required) DN 200 / NPS 8 (16 required) DN 250 / NPS 10 (20 required)
28*	O-ring
29	Nameplate
30	Nameplate Sticker
31	Drive Screw (4 required)
32	Flow Arrow
33	Spring Collet, not available for DN 250 / NPS 10
34	Indicator Stem, not available for DN 250 / NPS 10
35*	O-ring
36	Indicator Fitting
37A*	O-ring
37B*	O-ring
38	Indicator Bushing
39	Indicator Scale
40	Indicator Cover, not available for DN 250 / NPS 10
43	Type SR Silencer
46*	O-ring
47*	O-ring
48	Washer, not available for DN 250 / NPS 10
59	Eyebolt DN 150 / NPS 6 (2 required) DN 200 / NPS 8 (2 required) DN 250 / NPS 10 (2 required)
61	Pin (DN 150 / NPS 6 only) (8 required)
62	Screw DN 200 and 250 / NPS 8 and 10 only (6 required)
63	Washer DN 200 and 250 / NPS 8 and 10 only (6 required)
64	Socket Head Screw DN 150 / NPS 6 (16 required) DN 200 / NPS 8 (20 required)
65	Spring Pin DN 200 and 250 / NPS 8 and 10 only
66*	Back-up Rings (2 required)
67	Disk Support (2 required)

### Type SRS Main Valve (Figure 3)

Key	Description
200	Body
201	Retainer
202	Stud, not available for DN 200 / NPS 8 body
202	Nut, for DN 200 / NPS 8 body only
203	Attenuator Plate, not available for DN 200 / NPS 8 body
204	Spring Pin DN 25, 50 and 80 / NPS 1, 2 and 3 (2 required) DN 100 and 150 / NPS 4 and 6
205	Ring
206	Nut (3 required), not available for DN 200 / NPS 8 body
206	Spacer, for DN 200 / NPS 8 body only
207	Attenuator Plate
208	Attenuator Plate

\*Recommended Spare Part

1. DN 200 and 250 / NPS 8 and 10 are available only with Types SRII and SRII/SRS silencers.

2. For DN 200 / NPS 8 Type FL with Type SRS, the spacer will be installed upstream and not downstream. Please see DN 200 / NPS 8 for Part Number.

# Type FL

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## Type SRS Main Valve (Figure 3) (continued)

Key	Description
209	Spacer, not available for DN 200 / NPS 8 body
209	Stud Bolt, for DN 200 / NPS 8 body only
210	Spring Cage, not available for DN 200 / NPS 8 body
210	Spacer, for DN 200 / NPS 8 body only
211	Spring DN 25 and 50 / NPS 1 and 2 (50 required) DN 80 / NPS 3 (600 required) DN 100, 150 and 200 / NPS 4, 6 and 8 (3250 required)
213	Attenuator Plate, for DN 200 / NPS 8 body only
215	O-ring, for DN 200 / NPS 8 body only
216	Spacer, for DN 200 / NPS 8 body only
217	Spacer, for DN 200 / NPS 8 body only
218	O-ring, for DN 200 / NPS 8 body only
219	Screw, for DN 200 / NPS 8 body only
220	Washer, for DN 200 / NPS 8 body only

## PRX Series Pilot (Figure 4)

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
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 Nut
27	Damper Adjusting Screw with Hole
28*	Restrictor/Damper O-ring
29	Damper/Restrictor Plate Types PRX/120 and PRX/120-AP Types PRX/125 and PRX/125-AP
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

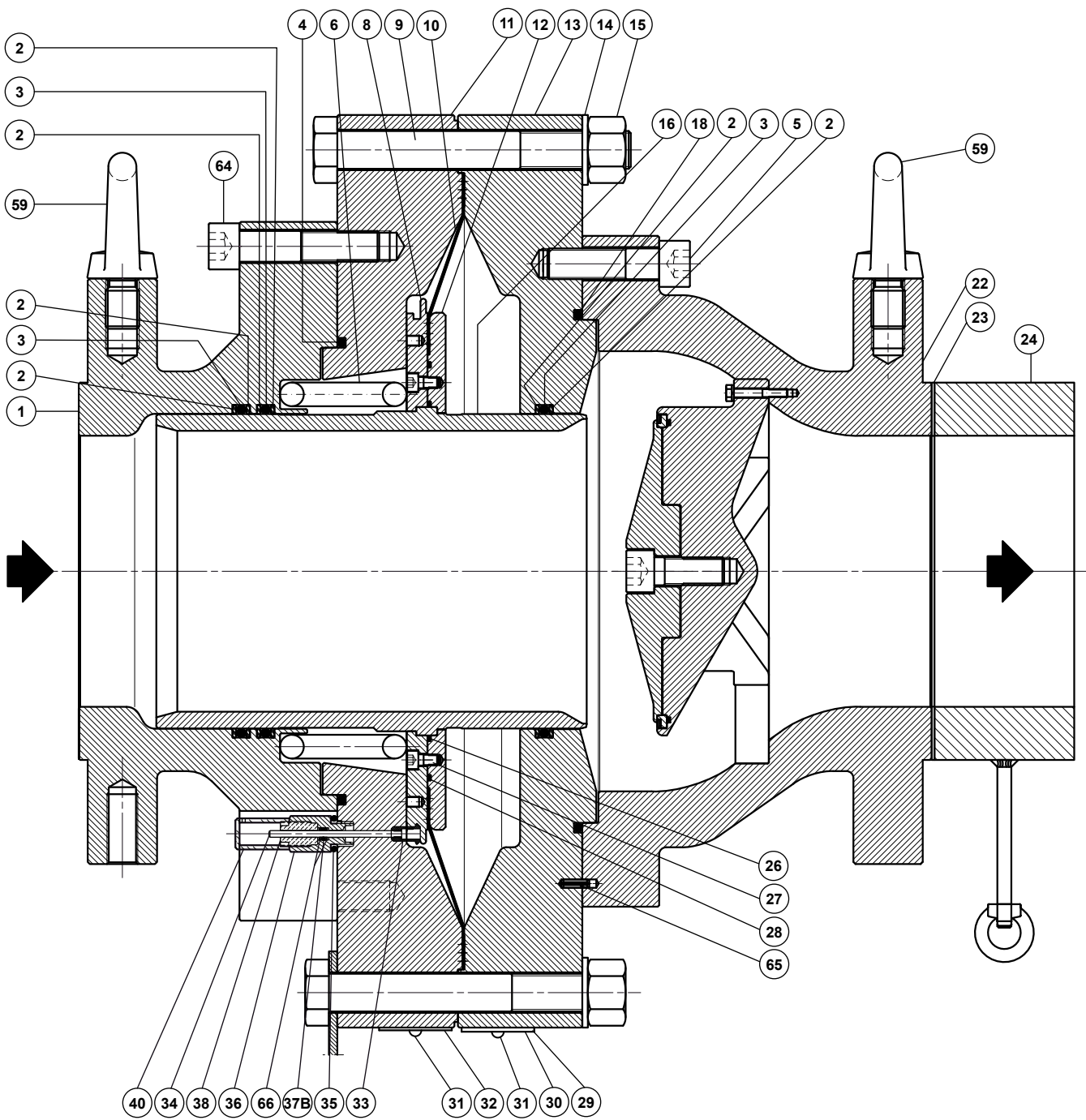
## Mounting Parts (Figure 5)

### Standard Configurations for Single Pilot

Key	Description
50	Mounting Bracket
51	Lifting Bracket
52	Pipe Nipple (4 required)
53	Tube Elbow (2 required)
54	Tube Connector (4 required)
55	Pipe Cross
56	Tubing
57	45° Pipe Elbow (2 required)

## Type SA/2 Pilot Supply Filter Regulator (Figure 6)

Key	Description
1	Spring
2	Socket Head Cap Screw
3	Washer
4	Plate
5	Regulator Seat
6*	O-ring
7	Body
8	Filter Net
9	Washer
10	Nut
11	Filter Cover
12*	Felt
13*	O-ring
14	Spring
15*	Pad Holder Unit
16	Nameplate
17	Screw Unit
18*	Diaphragm
19	Regulator Cover
20	Spring Washer
21	Nut



LM/1403

DN 200 / NPS 8

Figure 1. Type FL Main Valve Assembly

# Type FL

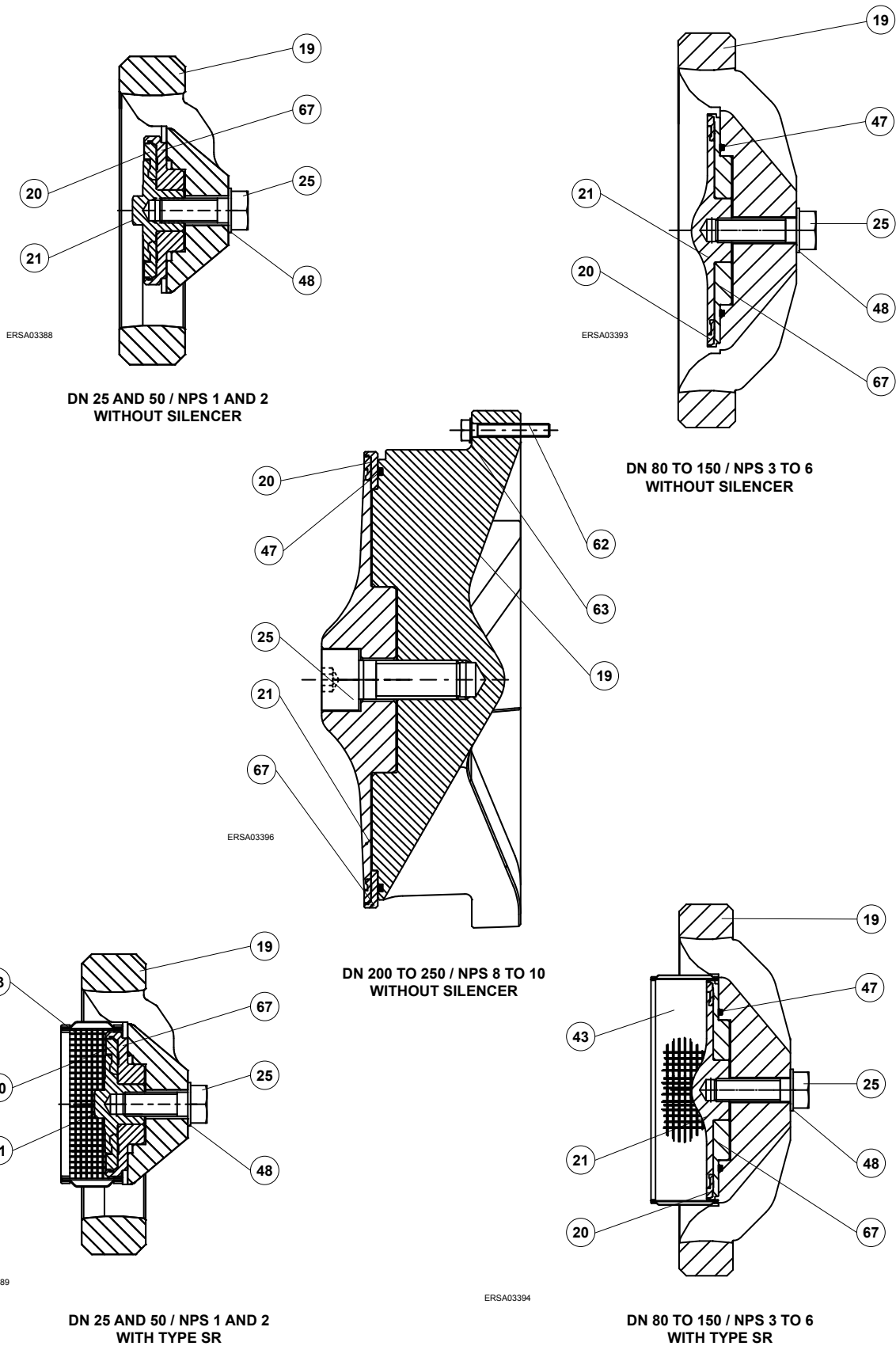
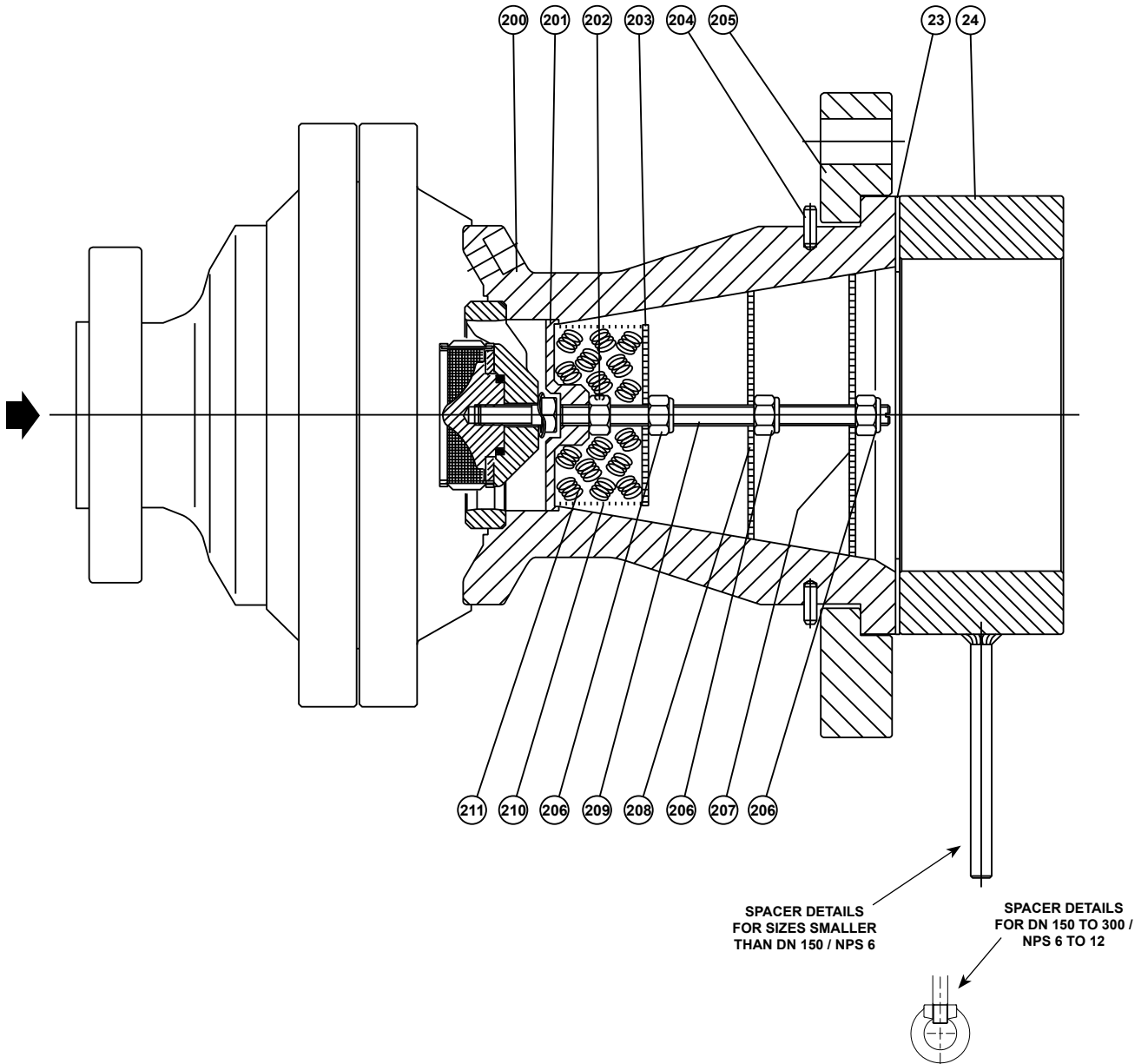


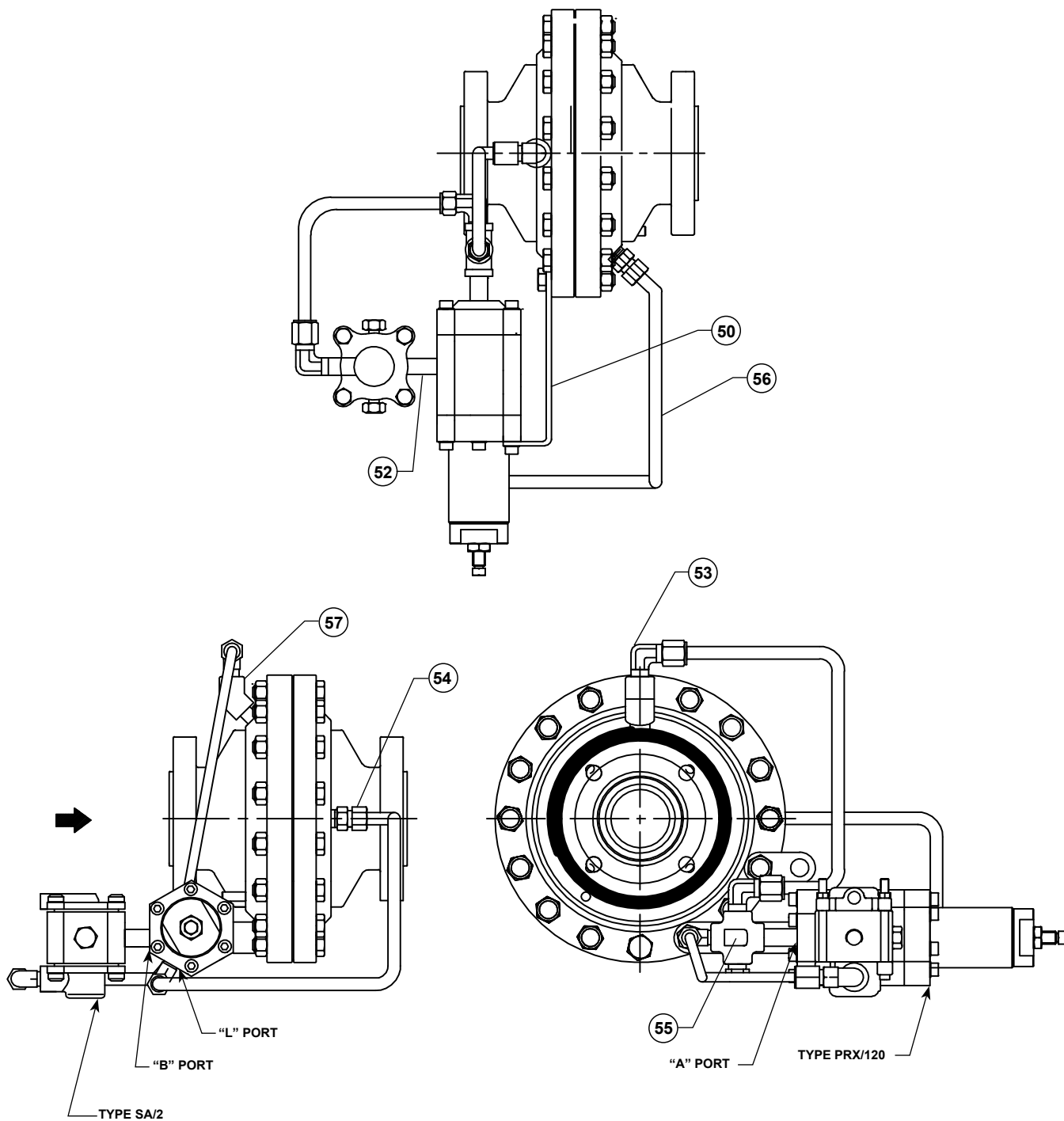
Figure 2. Polyurethane (PU) Main Valve Assembly



DN 25 TO 150 / NPS 1 TO 6

Figure 3. Type SRS Assembly

# Type FL

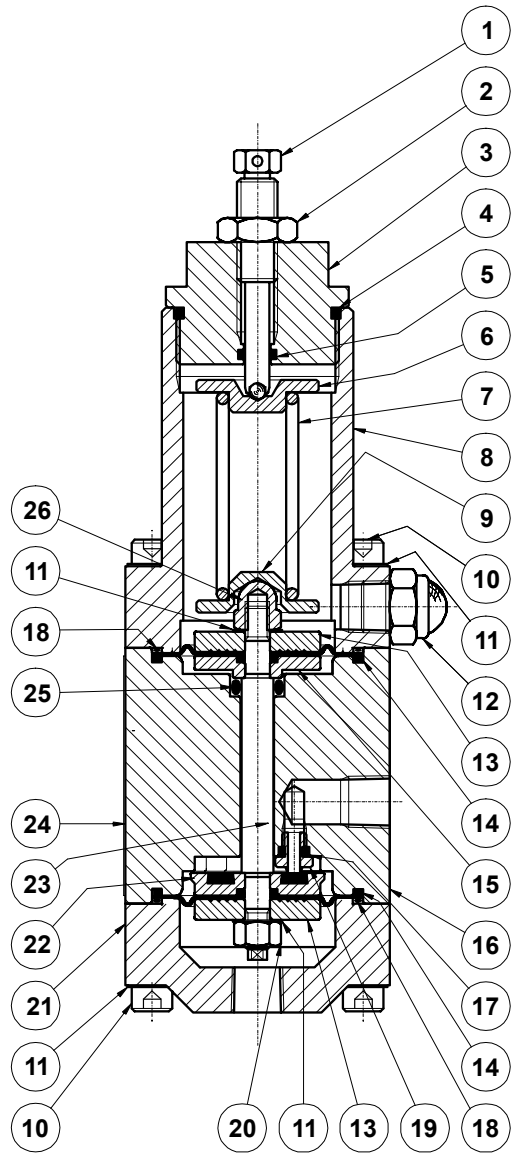


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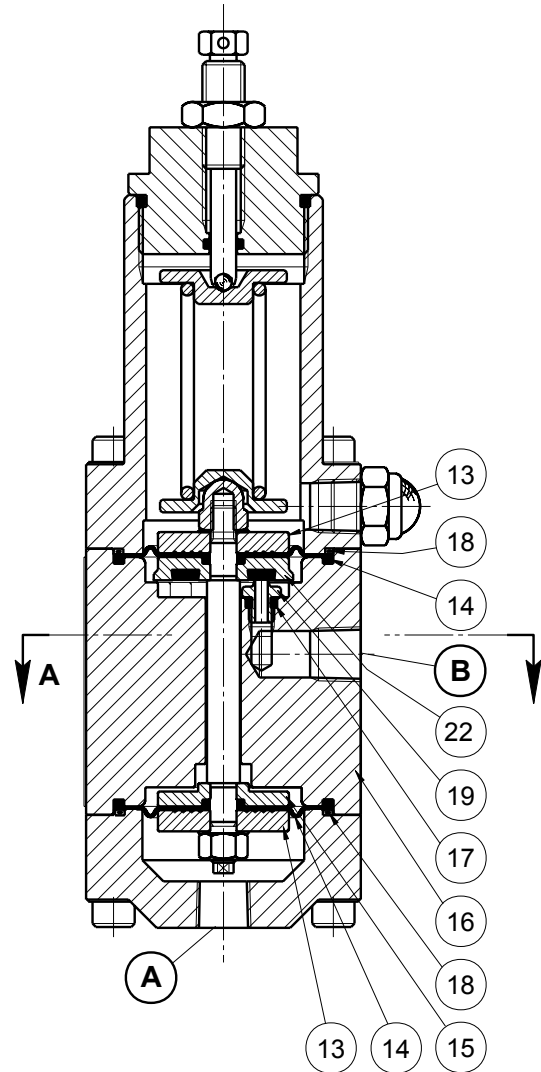
DN 25 TO 50 / NPS 1 TO 2

Figure 4. Type FL Single Pilot Mounting Assembly

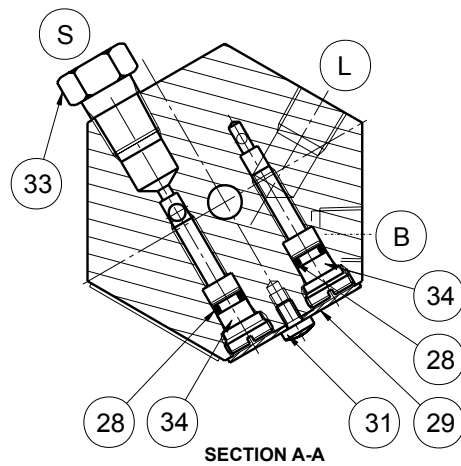




TYPE PRX/120 OR PRX/125



TYPE PRX/131 OR PRX/131-AP ASSEMBLY



SECTION A-A

Figure 5. PRX Series Pilot Assembly

# Type FL

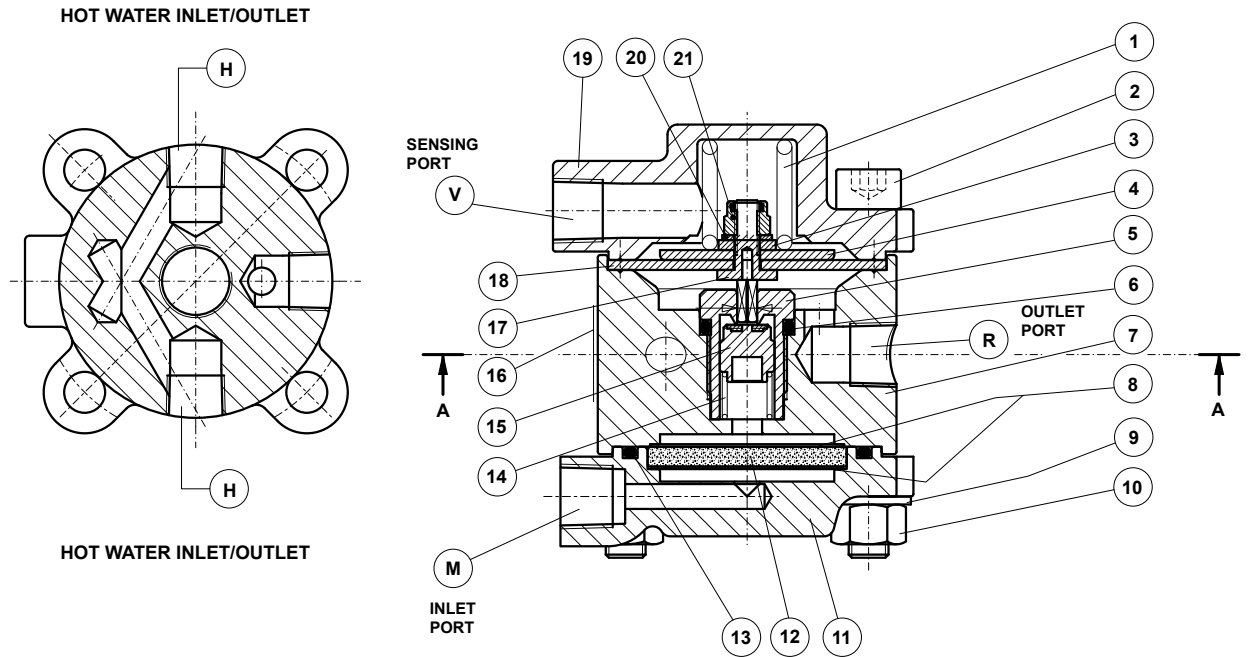


Figure 6. Type SA/2 Pilot Supply Filter Assembly

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