

December 2019

Type FL Pressure Reducing Regulators



WARNING

Failure to follow these instructions or to properly install and maintain this equipment could result in an explosion and/or fire causing property damage and personal injury or death.

Tartarini™ regulators must be installed, operated and maintained in accordance with federal, state and local codes, rules and regulations and Emerson Process Management Regulator Technologies, Inc. instructions.

If the regulator vents gas or a leak develops in the system, service to the unit may be required. Failure to correct trouble could result in a hazardous condition.

Call a gas service person to service the unit. Only a qualified person must install or service the regulator.

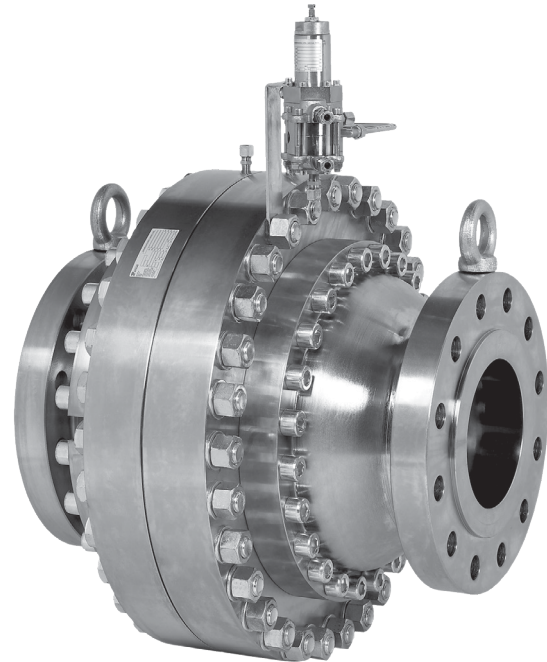


Figure 1. Type FL Regulator with PRX Series Pilot

Introduction

Scope of the Manual

This manual provides instructions for installation, adjustment, maintenance and parts ordering information for the Type FL regulators sold in North America.

Description

The Type FL is an accurate pilot-operated regulator designed for high-pressure transmission/city gate, large capacity distribution systems and power plant feeds. The Type FL provides smooth, quiet operation, tight shutoff and long life. The regulator is comprised of a main valve actuator, a Type PRX/120 pressure reducing pilot and a Type SA/2 pilot supply pressure regulator.

North America Only

Type FL

Specifications

The Specifications section gives some general specifications for the Type FL regulators. The nameplates give detailed information for a particular regulator as it comes from the factory.

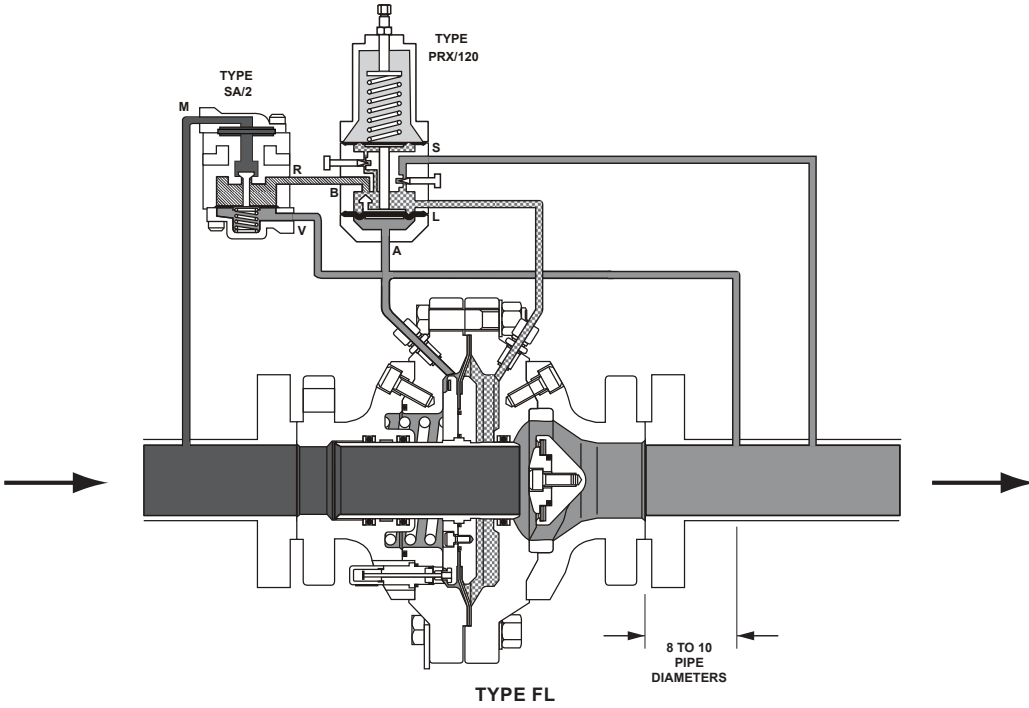
<p>Available Configuration Type FL: Pilot-operated pressure reducing regulator from 14.5 to 1160 psig / 1.00 to 80.0 bar outlet pressures</p> <p>Body Size Type FL: NPS 1, 2, 3, 4, 6, 8 and 10 / DN 25, 50, 80, 100, 150, 200 and 250 Type FL with Type SRS Silencer (Inlet x Outlet): NPS 1 x 4, 2 x 6, 3 x 10, 4 x 10, 6 x 12 and 8 x 16 / DN 25 x 100, 50 x 150, 80 x 250, 100 x 250, 150 x 300 and 200 x 400</p> <p>Main Valve End Connection Style and Pressure Ratings⁽¹⁾ CL300 RF: 740 psig / 51.0 bar⁽³⁾ CL600 RF: 1480 psig / 102 bar⁽³⁾</p> <p>Maximum Inlet and Outlet (Casing) Pressure⁽¹⁾ 1480 psig / 102 bar⁽³⁾</p> <p>Minimum Operating Differential Pressure Start Open: <i>NPS 1 to 4 / DN 25 to 100:</i> 7.3 psid / 0.50 bar d <i>NPS 6 and 8 / DN 150 and 200:</i> 3 psid / 0.21 bar d <i>NPS 10 / DN 250:</i> 2.9 psid / 0.2 bar d Full Open: <i>NPS 1 to 4 / DN 25 to 100:</i> 14.5 psid / 1.00 bar d <i>NPS 6 and 8 / DN 150 and 200:</i> 7.3 psid / 0.50 bar d <i>NPS 10 / DN 250:</i> 8.7 psid / 0.6 bar d</p>	<p>Outlet Pressure Ranges See Table 1</p> <p>Pressure Registration External</p> <p>Process Temperature Capabilities⁽¹⁾⁽²⁾ Nitrile (NBR), Fluorocarbon (FKM) or Polyurethane (PU) Disk <i>ANSI/FCI 70-3 Class VIII:</i> -4 to 140°F / -20 to 60°C Nitrile (NBR) or Polyurethane (PU) Disk <i>ANSI/FCI 70-3 Class VI:</i> -20 to 140°F / -29 to 60°C</p> <p>Approximate Weights (Including Pilot) Types FL-SR and FL-SRII <i>NPS 1 / DN 25:</i> 68 lbs / 31 kg <i>NPS 2 / DN 50:</i> 132 lbs / 60 kg <i>NPS 3 / DN 80:</i> 326 lbs / 148 kg <i>NPS 4 / DN 100:</i> 443 lbs / 201 kg <i>NPS 6 / DN 150:</i> 1058 lbs / 480 kg <i>NPS 8 / DN 200:</i> 1367 lbs / 620 kg <i>NPS 10 / DN 250:</i> 2623 lbs / 1190 kg Types FL-SR/SRS and FL-SRII/SRS <i>NPS 1 x 4 / DN 25 x 100:</i> 99 lbs / 45 kg <i>NPS 2 x 6 / DN 50 x 150:</i> 192 lbs / 87 kg <i>NPS 3 x 10 / DN 80 x 250:</i> 514 lbs / 233 kg <i>NPS 4 x 10 / DN 100 x 250:</i> 631 lbs / 286 kg <i>NPS 6 x 12 / DN 150 x 300:</i> 1367 lbs / 620 kg <i>NPS 8 x 16 / DN 200 x 400:</i> 1984 lbs / 900 kg</p>
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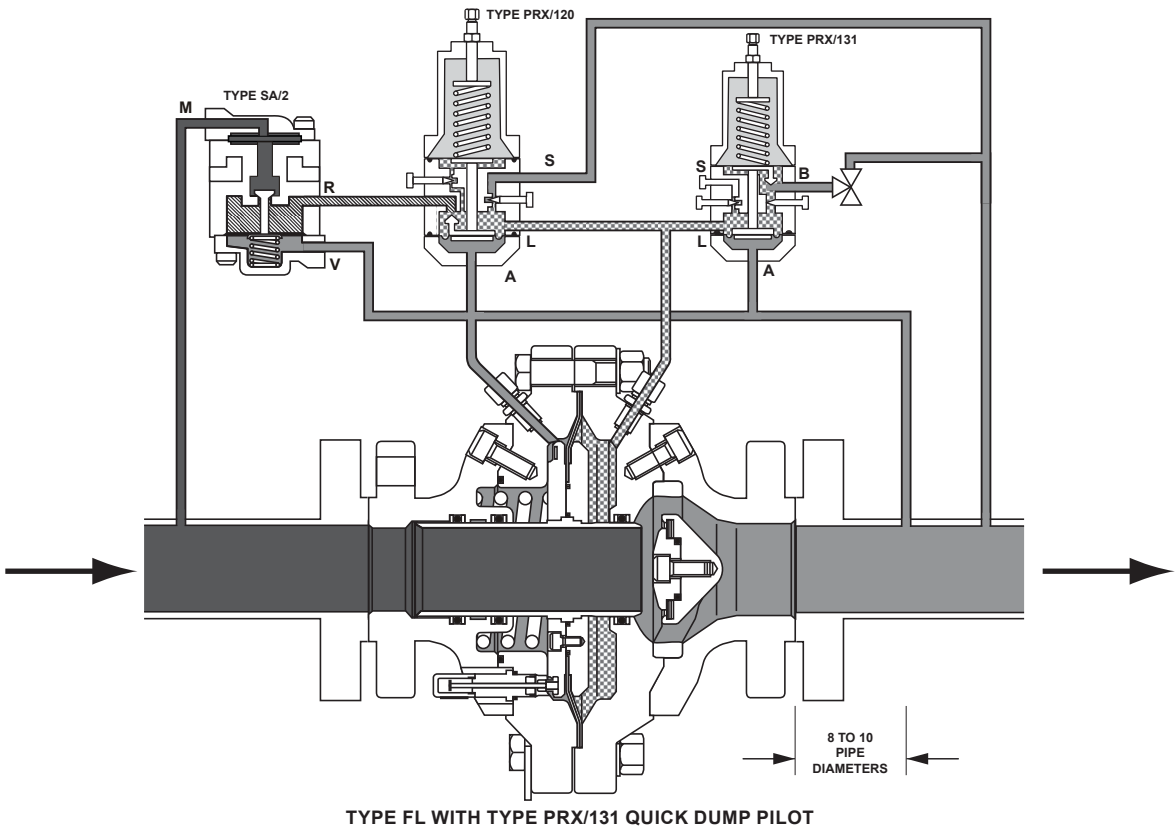
1. The pressure/temperature limits in this Instruction Manual and any applicable standard or code limitation should not be exceeded.
 2. Types PRX and SA/2 Fluorocarbon (FKM) elastomer are limited to 0°F / -18°C.
 3. At average ambient temperature.

Table 1. Outlet Pressure Ranges

TYPE	OUTLET PRESSURE RANGE		AC (ACCURACYCLASS)	PILOT CONTROL SPRING INFORMATION					
				Spring Color	Part Number	Wire Diameter		Free Length	
	psig	bar				In.	cm	In.	cm
PRX/120 PRX/125 PRX/131	14.5 to 26	1.00 to 1.8	2.5%	Yellow	M0255240X12	0.110	0.28	2.16	5.49
	23 to 44	1.6 to 3.0	2.5%	Green	M0255230X12	0.126	0.32		
	41 to 80	2.8 to 5.5	2.5%	Blue	M0255180X12	0.138	0.35		
	73 to 123	5.0 to 8.5	2.5%	Black	M0255220X12	0.157	0.40		
	116 to 210	8.0 to 14.5	1%	Silver	M0255210X12	0.177	0.45	2.16	5.49
	203 to 334	14.0 to 23.0	1%	Gold	M0255200X12	0.197	0.50	2.00	5.10
319 to 435	22.0 to 30.0	1%	Aluminum	M0255860X12	0.236	0.60	2.00	5.10	
PRX/120-AP PRX/125-AP	435 to 1160	30.0 to 80.0	1%	Clear	M0273790X12	0.335	0.85	3.93	10.0



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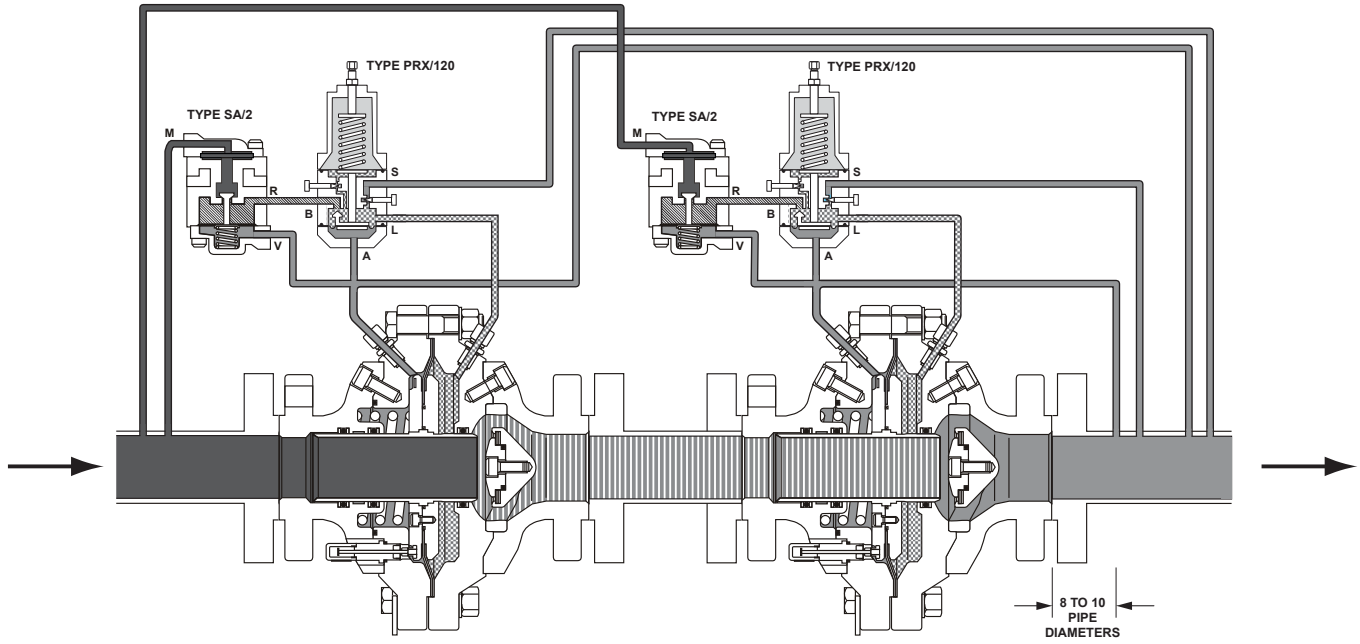
- INLET PRESSURE
- OUTLET PRESSURE
- LOADING PRESSURE
- PILOT SUPPLY PRESSURE
- ATMOSPHERIC PRESSURE

- TYPE PRX/120:
 S - BLEED PORT
 B - SUPPLY PORT
 L - LOADING PORT
 A - SENSING PORT
- TYPE SA/2:
 V - SENSING PORT
 R - PILOT SUPPLY PORT
 M - INLET PORT

Figure 2. Type FL Operational Schematics

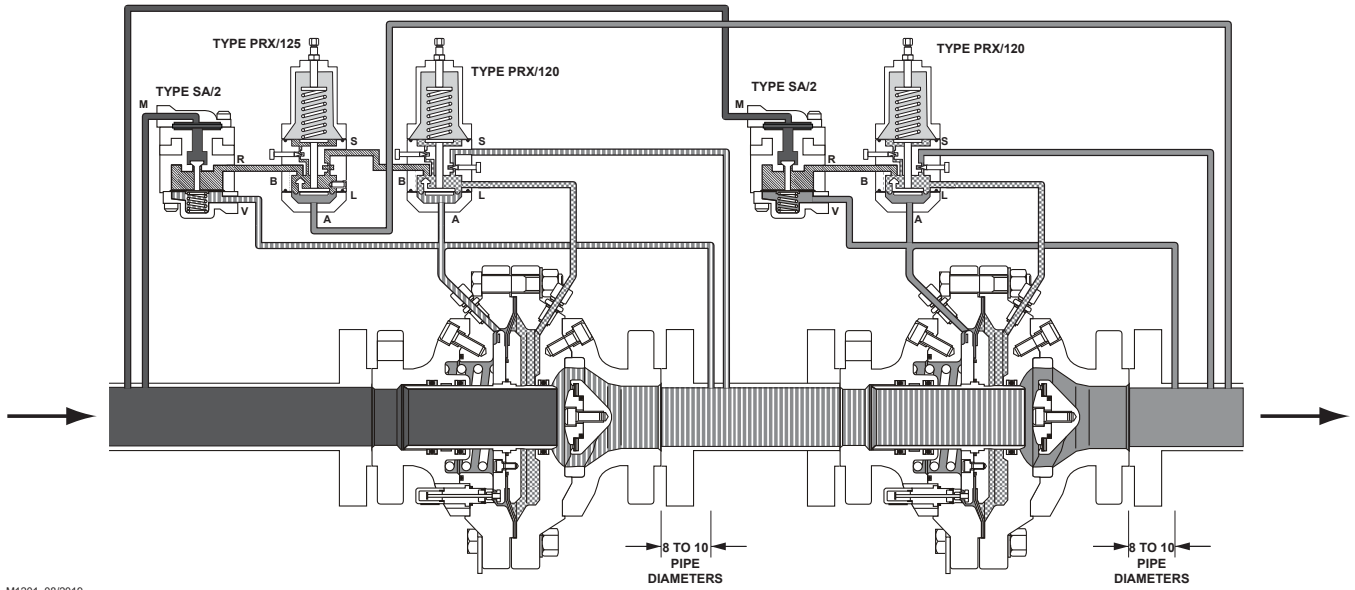
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Type FL



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TYPE FL WIDE-OPEN MONITOR



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- INLET PRESSURE
- OUTLET PRESSURE
- ATMOSPHERIC PRESSURE
- LOADING PRESSURE
- INTERMEDIATE PRESSURE
- PILOT SUPPLY PRESSURE

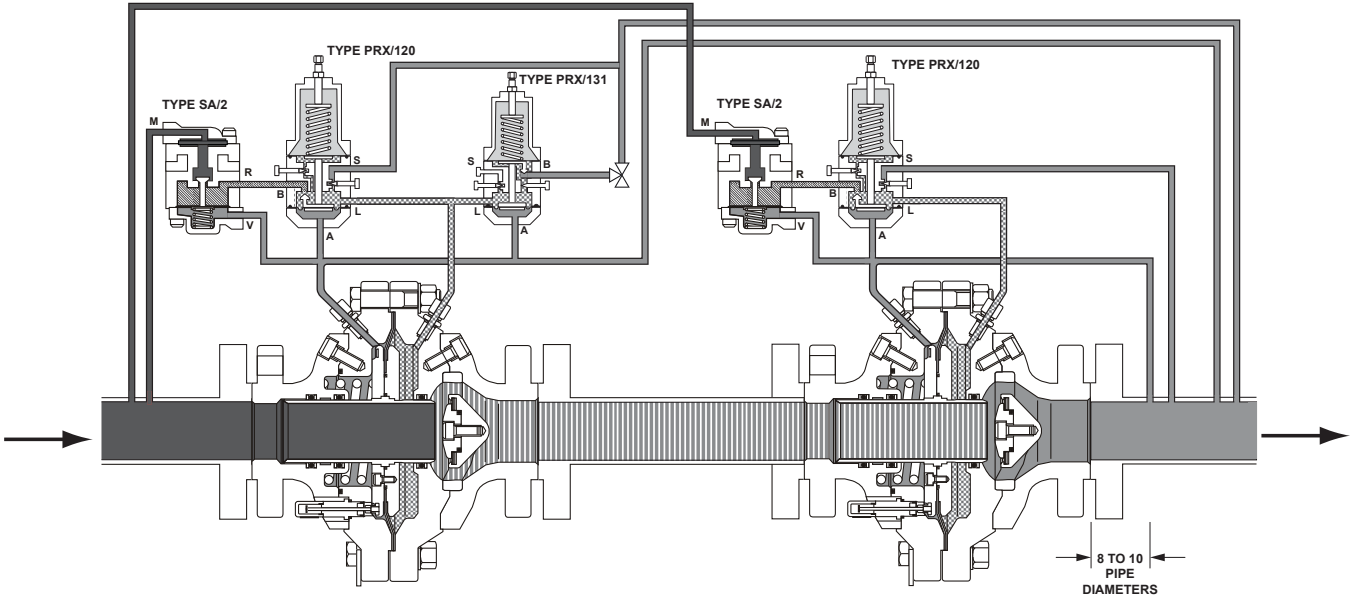
- TYPE PRX:**
 S - BLEED PORT
 B - SUPPLY PORT
 L - LOADING PORT
 A - SENSING PORT

- TYPE SA/2:**
 V - SENSING PORT
 R - PILOT SENSING PORT
 M - INLET PORT

TYPE FL WORKING MONITOR WITH TYPE PRX-125

Figure 3. Installation Schematics

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- INLET PRESSURE
- OUTLET PRESSURE
- ATMOSPHERIC PRESSURE
- LOADING PRESSURE
- INTERMEDIATE PRESSURE
- PILOT SUPPLY PRESSURE

- TYPE PRX:
- S - BLEED PORT
 - B - SUPPLY PORT
 - L - LOADING PORT
 - A - SENSING PORT

- TYPE SA/2:
- V - SENSING PORT
 - R - PILOT SENSING PORT
 - M - INLET PORT

TYPE FL WIDE-OPEN MONITOR WITH TYPE PRX/131 QUICK DUMP PILOT

Figure 3. Installation Schematics (continued)

Principle of Operation

The pilot-operated Type FL (Figure 2) uses inlet pressure as the operating medium, which is reduced through pilot operation to load the actuator diaphragm. Outlet pressure opposes loading pressure in the actuator and also opposes the pilot control spring.

When outlet pressure drops below the setting of the pilot control spring, pilot control spring force on the pilot diaphragm opens the pilot valve plug, providing additional loading pressure to the actuator diaphragm. This diaphragm loading pressure opens the main valve plug, supplying the required flow to the downstream system. Any excess loading pressure on the actuator diaphragm escapes downstream through the exhaust restriction in the pilot.

When the gas demand in the downstream system has been satisfied, the outlet pressure increases. The increased pressure is transmitted through the downstream control line and acts on the pilot diaphragm. This pressure exceeds the pilot spring setting and moves the diaphragm, closing the orifice. The loading pressure

acting on the main diaphragm bleeds to the downstream system through the exhaust restriction in the pilot.

Figure 2 also shows a Type FL regulator with a Type PRX/131 pilot included. The Type PRX/131 pilot is referred to as a quick dump or booster pilot as it helps to boost the closing speed. When the Type PRX/131 pilot detects an increase in downstream pressure, it allows the Type FL regulator to release pressure off the downstream side of the diaphragm so it closes faster.

Type SA/2 Pilot Supply Filter Regulator

The PRX Series pilot are usually used together with the Type SA/2 pilot supply filter regulator. The Type SA/2 acts as a pressure stabilizer that provides a constant supply pressure to the PRX Series pilot that is approximately 45 psi / 3.1 bar over set pressure. The Type SA/2 has an integral 5 micron filter. The integral filter acts only as an emergency filter; gas must be cleaned upstream of the regulator.

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Monitoring Systems

Monitoring regulation is overpressure protection by containment, therefore, there is no relief valve to vent to the atmosphere. When the working regulator fails to control the pressure, a monitor regulator installed in series, sensing the downstream pressure, goes into operation to maintain the downstream pressure at a slightly higher than normal pressure. During an overpressure situation, monitoring keeps the customer on line. Also, testing is relatively easy and safe. To perform a periodic test on a monitoring regulator, increase the outlet set pressure of the working regulator and watch the outlet pressure to determine if the monitoring regulator takes over at the appropriate outlet pressure.

Wide-Open Monitoring Systems (Figure 3)

There are two types of wide-open monitoring systems: upstream and downstream. The difference between upstream and downstream monitoring is that the functions of the regulators are reversed. Systems can be changed from upstream to downstream monitoring and vice-versa, by simply reversing the setpoints of the two regulators. The decision to use either an upstream or downstream monitoring system is largely a matter of personal preference or company policy.

In normal operation of a wide-open configuration, the working regulator controls the system's outlet pressure. With a higher outlet pressure setting, the monitor regulator senses a pressure lower than its setpoint and tries to increase outlet pressure by going wide open. If the working regulator fails, the monitoring regulator assumes control and holds the outlet pressure at its outlet pressure setting.

Figure 3 shows a Type FL Wide-Open Monitor configuration with a Type PRX/131 pilot included. The Type PRX/131 pilot is referred to as a quick dump or booster pilot as it helps to boost the pressure release. The Type PRX/131 is fitted to the monitor regulator and allows the regulator to operate faster. When the Type PRX/131 detects an increase in downstream pressure, it allows the Type FL monitor regulator to release pressure off the downstream side of the diaphragm so it closes faster. The Type PRX/131 pilot is always attached to the monitor regulator in a Wide Open Monitor or Working Monitor configuration. The Type PRX/131 should have a setpoint about 5 to 10 psig / 0.34 to 0.69 bar above the monitor pilot setpoint.

Working Monitoring Regulators (Figure 3)

In a working monitoring system, the upstream regulator requires two pilots and it is always the monitoring regulator. The additional pilot permits the monitoring regulator to act as a series regulator to control an intermediate pressure during normal operation. In this way, both units are always operating and can be easily checked for proper operation.

In normal operation, the working regulator controls the outlet pressure of the system. The monitoring regulator's working pilot controls the intermediate pressure and the monitoring pilot senses the system's outlet pressure. If the working regulator fails, the monitoring pilot will sense the increase in outlet pressure and take control.

Note

The working regulator must be rated for the maximum allowable operating pressure of the system because this will be its inlet pressure if the monitoring regulator fails. Also, the outlet pressure rating of the monitoring pilot and any other components that are exposed to the intermediate pressure must be rated for full inlet pressure.

Working monitor installations require a Type FL main valve with a Type PRX/120 or PRX/120-AP working pilot and a Type PRX/125 or PRX/125-AP monitoring pilot for the upstream regulator and a Type FL with the appropriate Type PRX/120 or PRX/120-AP pilot for the downstream regulator.

Installation



WARNING

Personal injury or equipment damage, due to 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 Specification section and on the appropriate nameplate or where conditions exceed any rating of the adjacent piping or piping connections. To avoid such injury or damage, provide pressure-relieving or pressure-limiting devices to prevent service conditions from exceeding those limits. Also, be sure the installation is in compliance with all applicable codes and regulations.

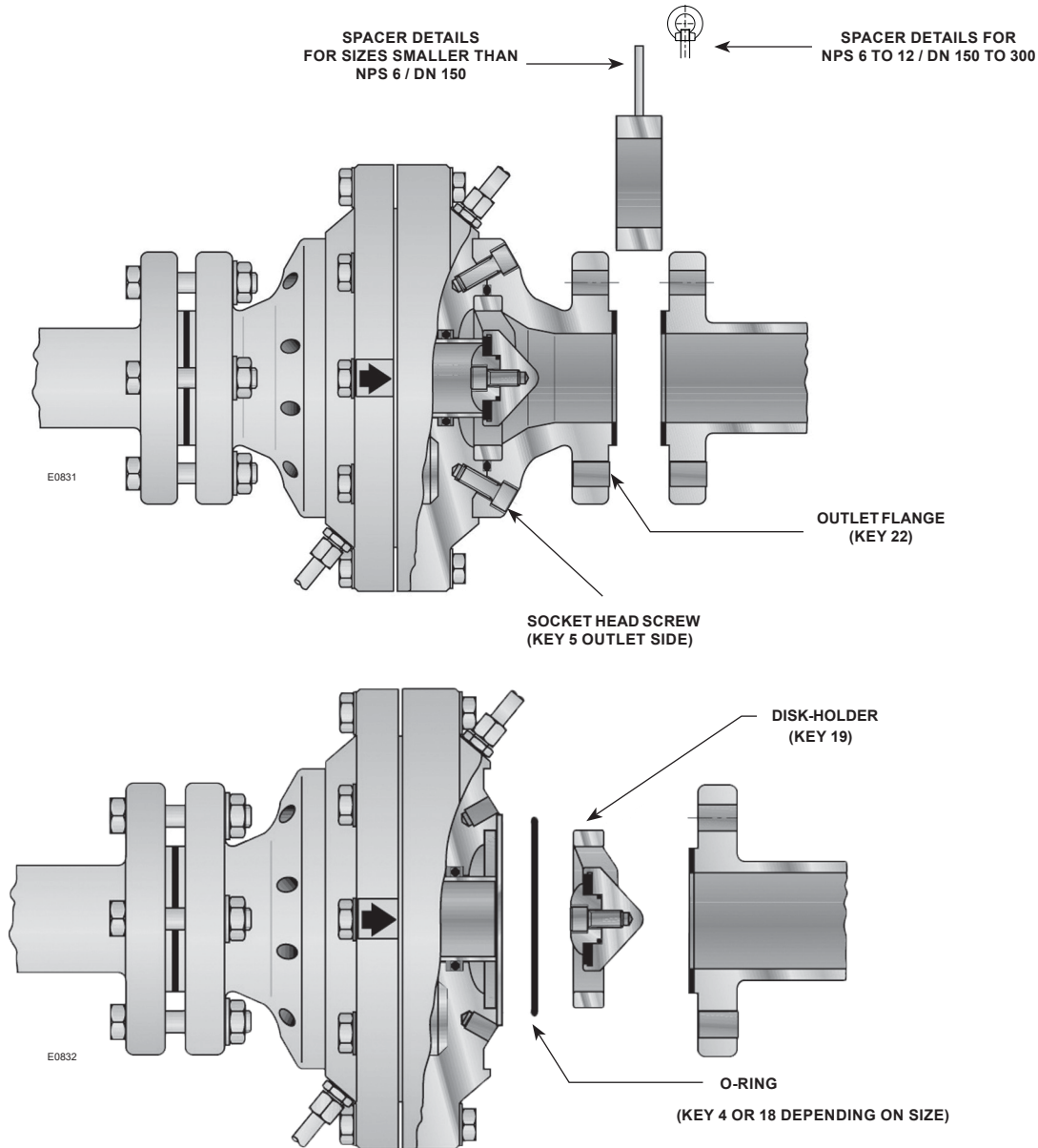


Figure 4. Outlet Flange Spacer Installation

Table 2. Maximum Torque Values

BODY SIZE		TORQUE										TOOLS NEEDED	
NPS	DN	Flange Bolt (key 9)		Socket Head Screw (key 5 or 64)		Socket Head Screw (key 25)		Hex Head Screw (key 62)		Socket Head Screw (key 27)		Open End Wrench	Allen Wrench
		Ft-lbs	N•m	Ft-lbs	N•m	Ft-lbs	N•m	Ft-lbs	N•m	Ft-lbs	N•m		
1	25	62.7	85	14.7	20	8.11	11	----	----	4.42	6.0	18	4, 5, 8
2	50	129	175	22.1	30	36.9	50	----	----	5.16	7.0	24	5, 8, 10
3	80	287	390	59.0	80	66.4	90	----	----	5.16	7.0	34	5, 10, 14
4	100	490	665	73.8	100	66.4	90	----	----	11.8	16	41	6, 14
6	150	490	665	88.5	120	147	199	----	----	20.0	27	41	8, 17
8	200	490	665	88.5	120	147	199	7.4	10	14.7	20	41	6, 17
10	250	634	860	111	150	148	200	88.5	120	14.7	20	45	6, 17, 19

North America Only

Type FL

Additionally, physical damage to the regulator could break the pilot off the main valve, causing personal injury and property damage due to bursting of pressure-containing parts. To avoid such injury and damage, install the regulator in a safe location.

All Installations

A Type FL regulator bleeds no gas to atmosphere during normal operation, making it suitable for installation in pits and other enclosed locations without elaborate venting systems. This regulator also can be installed in pits subject to flooding by venting the pilot spring case above the expected flood level so that the pilot diaphragm is exposed to atmospheric pressure.

1. Only personnel qualified through training and experience should install, operate and maintain a regulator. Before installation, make sure that there is no damage to or debris in the regulator. Also, make sure that all tubing and piping are clean and unobstructed.
2. Install the regulator so that the flow arrow on the main valve matches the flow direction of process fluid through the regulator. The Type FL may be installed in any position, but it is normally installed in a horizontal pipeline with the pilot or pilots above the body.
3. Apply pipe compound to the external pipeline threads before installing a regulator with threaded NPT end connections. Use gaskets between pipeline and regulator flanges when installing a regulator with flanged end connections. When installing butt weld end connections, remove trim before welding and make sure to use approved welding practices. Use approved piping procedures when installing the regulator.
4. The optimal location of the sense and bleed lines is between the Type FL and the Downstream block valve. The tap location should be in a straight section of pipe that is 8 to 10 pipe diameters downstream of the outlet flange. These guidelines are not mandatory but have been used to improve stability at low flow conditions in some systems.



CAUTION

To prevent damage to the pilot during Startup, the sense and bleed lines should be located on the same side of the downstream block valve.

5. Connect inlet supply pressure to the Type SA/2 1/4 NPT inlet, Port M.



WARNING

A regulator may vent some gas to the atmosphere. In hazardous or flammable gas service, vented gas may accumulate, causing personal injury, death or property damage due to bursting of pressure-retaining parts. Vent a regulator in hazardous gas service to a remote, safe location away from air intakes or any hazardous location. The vent line or stack opening must be protected against condensation or clogging.

6. PRX Series pilots have a 1/4 NPT vent connection in the spring case. To remotely vent gas from the spring case, remove the screened vent and connect 1/4 in. / 6.4 mm piping or tubing to the spring case connection. The piping or tubing should vent to a safe location, have as few elbows as possible and have a screened vent on its exhaust. Install the regulator and any remote vent piping or tubing so that the vent is protected from condensation, freezing or substances that may clog it.



CAUTION

To avoid freeze-up because of pressure drop and moisture in the gas, use anti-freeze practices, such as heating the supply gas or adding a de-icing agent to the supply gas.

7. The PRX Series pilot connections are 1/4 NPT. Connect a downstream control (sense) line to a straight run of pipe 6 to 10 pipe diameters from the regulator outlet as shown in Figure 3, using 3/8 in. / 9.5 mm or larger outside diameter tubing. If such a distance is not practical, connect the control line away from elbows, swages, nipples or any area where abnormal flow velocities occur. Connect the other end of the control line to the "A" port on the bottom of the PRX Series pilot.

Note

The optimal location for the sense and bleed lines is between the regulator and the downstream block valve. To prevent damage to the pilot during startup, the sense and bleed lines should be located on the same side of the downstream block valve.

**CAUTION**

To prevent damage to the pilot during startup, the sense and bleed lines should be located on the same side of the downstream block valve.

8. The PRX Series pilot connections are 1/4 NPT. Connect a downstream bleed line from the “S” port on the PRX Series pilot to a straight run of pipe 6 to 10 pipe diameters from the regulator outlet as shown in Figure 3, using 3/8 in. / 9.5 mm or larger outside diameter tubing.
9. Install hand valves in the downstream sense and bleed lines if desired. If hand valves are installed, they should be full flow valves, such as a full port ball valve.
10. For optional remote pneumatic loading of a PRX Series pilot, make the spring case piping connections just as they would be made for remote venting.
11. If extra support is needed for the Type FL regulator due to its weight, then support the regulator using a Y-style support underneath the inlet body cover (key 11) and the outlet body cover (key 13).

Wide-Open Monitor Regulator

1. Follow the procedures in the All Installations section and then continue with step 2 of this section. The sense and bleed control lines of both the upstream and downstream pilots will be connected to the downstream piping (see Figure 3).
2. Connect the pilot supply line for the downstream regulator to the outlet “R” port of the Type SA/2 pilot supply filter regulator (both upstream and downstream pilots are connected to a single Type SA/2).

Working Monitor Regulator

1. Follow the procedure in the All Installations section and then continue with step 2 of this section. The sense line of the upstream monitor pilot and the bleed and sense lines of the downstream pilot will be connected to the downstream piping (see Figure 3).
2. Connect an inlet supply line from the upstream piping to the inlet “M” port of the downstream Type SA/2 pilot supply filter regulator.

3. Connect a control (sense) line from the “A” port of the upstream working PRX Series pilot to the intermediate pressure portion of piping, using 3/8 in. / 9.5 mm or larger outside diameter tubing.
4. Connect a downstream bleed line from the “S” port of the upstream working PRX Series pilot to the intermediate pressure portion of piping, using 3/8 in. / 9.5 mm or larger outside diameter tubing.

Startup and Adjustment**Pre-startup Considerations**

Each regulator is factory-set for the outlet pressure specified on the order. If no setting was specified, outlet pressure was factory-set at the mid-range of the pilot control spring. Before beginning the startup procedure in this section, make sure the following conditions are in effect:

- Block valves isolate the regulator
- Vent valves are closed
- A bypass, if any, is in operation

In all cases, check the control spring setting to make sure it is correct for the application.

**CAUTION**

Be sure to slowly introduce pressure into the system to prevent downstream overpressure due to potential rapid pressure increase. Pressure gauges should always be used to monitor downstream pressure during startup. Procedures used in putting this regulator into operation must be planned accordingly if the downstream system is pressurized by another regulator or by a manual bypass.

Note

When using a Type SA/2 pilot supply filter regulator, the differential pressure across the regulator must be at least 45 psid / 3.1 bar d for optimum regulator performance. The Type SA/2 can be removed if differential pressure across the regulator is less than 45 psid / 3.1 bar d and inlet pressure stays at or below 200 psig / 13.8 bar.

Startup

1. Make sure all block valves, vent valves and control line valve(s) are closed.
2. Back out the pilot adjusting screw(s).
3. **Slowly open** the valves in the following order:
 - a. Pilot supply and control line valve(s), if used
 - b. Inlet block valves
4. Crack open the outlet block valve or bypass valve to allow minimum flow.
5. **For a single regulator**, set the pilot to the desired outlet (control) pressure according to the Pilot Adjustment procedure.

For a single regulator with a Type PRX/131 pilot, turn the adjusting screw on the Type PRX/131 all the way into the spring case. Adjust the Type PRX/120 pilot to the desired setpoint of the Type PRX/131, which should be 5 to 10 psi / 0.34 to 0.69 bar above the desired Type PRX/120 control pressure. Adjust the three-way valve (key 77) to vent-to-atmosphere to be able to hear when gas starts flowing from the port. Turn the Type PRX/131 out of the spring case until you hear audible flow, then return the three-way valve handle to vent downstream. Then adjust the Type PRX/120 pilot to the desired outlet (control) pressure according to the Pilot Adjustment procedure.

For a wide-open downstream monitor installation, turn in the upstream working pilot's adjusting screw and wait until intermediate pressure is higher than the desired setpoint of the monitor pilot. Adjust the downstream monitoring pilot to the desired monitoring takeover pressure. Reduce the upstream pilot to the normal outlet pressure setting.

For a wide-open upstream monitor installation, adjust the downstream working pilot to a setpoint higher than the setpoint of the monitor pilot. Adjust the upstream monitoring pilot to the desired monitoring takeover pressure. Reduce the downstream pilot to the normal outlet pressure setting.

For a working monitor installation, turn out the adjusting screw of the downstream pilot, removing spring tension. Adjust the upstream working pilot to the desired intermediate pressure setting. Turn out the adjusting screw of the upstream monitor pilot, removing spring tension. Turn in the adjusting screw of the downstream pilot. Adjust the upstream monitor pilot to its desired setpoint. Establish final desired downstream pressure by adjusting the downstream working regulator pilot.

For a wide-open monitor installation with a Type PRX/131 pilot (Figure 3), turn the adjusting screw on the Type PRX/131 all the way into the spring case. Adjust the Type PRX/120 working pilot to a

setpoint higher than the Type PRX/120 monitor pilot. Set the Type PRX/120 monitor pilot to the desired setpoint of the Type PRX/131 pilot, which should be 5 to 10 psi / 0.34 to 0.69 bar above the monitor pilot setpoint. Adjust the three-way valve (key 77) to vent to atmosphere to be able to hear when gas starts flowing from the port. Turn the Type PRX/131 adjusting screw out of the spring case until you hear audible flow, then return the three-way valve handle to vent downstream. Reduce the Type PRX/120 monitor pilot to the desired monitor takeover pressure. Reduce the Type PRX/120 working pilot to the normal outlet pressure setting.

6. After adjusting the PRX Series pilot(s) to the desired pressure setting(s), slowly open the downstream block valve wide open.
7. Close the bypass valve, if used.

Pilot Adjustment

The adjustment of the regulators is performed by means of the pilot adjustment screw, which varies the compression of the control spring. Adjustment is performed while the regulator is in operation with the aid of a pressure gauge to monitor downstream pressure. The shutoff valve downstream of the regulator must not be completely closed, as it is necessary that a small quantity of gas flows downstream to allow the outlet side to vent, when it is necessary to lower the pressure.

For PRX Series pilot (Figure 10), loosen locknut (key 2) and turn the adjusting screw into the spring case (clockwise) to increase and out of the spring case (counterclockwise) to decrease the downstream pressure. When the desired setpoint adjustment is completed and verified, tighten the locknut to lock the adjusting screw in position.

No adjustment is needed to the Type SA/2 pilot supply filter regulator.

Adjusting the monitor regulator (Figure 3) is the same as adjusting the main regulator. Monitor setpoints are set slightly higher than the main regulator. The monitor pressure setting should be adjusted so it is at minimum two times the pilot accuracy band pressure above the working regulator pressure setting.

PRX Series Pilot Restrictor and Damper Screw Adjustment

Note

The Type PRX/125 (upstream monitor pilot in working monitor installations) does not have a restrictor screw.

The Restrictor and Damper screws on the PRX Series pilot control the regulator's proportional band (droop) and speed of response. To tune, follow the steps outlined below:

1. Start with the restrictor screw 1 turn counterclockwise from fully seated (turn restrictor fully clockwise then 1 turn counterclockwise) and the damper screw fully counterclockwise.
2. Turn damper screw clockwise until desired performance is achieved. This reduces the flow path of the damper. If the damper becomes fully seated (no longer able to turn clockwise) and the desired performance has not been achieved, return the damper screw to the fully counterclockwise position.
3. Turn the restrictor screw an additional turn counterclockwise from fully seated. This increases the flow path of the restrictor. If additional tuning is required, repeat step 2. Follow this method until desired performance is achieved.

Shutdown



CAUTION

If the pilot bleed control line pressure is shut down first, the downstream system may be subjected to full inlet pressure.

1. If the pilot setting must be disturbed, be sure to keep some tension on the spring. This will prevent trapping inlet pressure during blow down.
2. Slowly close the valves in the following order:
 - a. Inlet block valve
 - b. Outlet block valve
 - c. Control line valve(s), if used.
3. Open the vent valves to depressurize the system.

Maintenance

The regulator parts are subject to normal wear and must be inspected periodically and replaced as necessary. The frequency of inspection and replacement depends on the severity of service conditions and on applicable federal, state and local codes and regulations.



WARNING

To avoid personal injury or property damage from sudden release of pressure, isolate the regulator from the pressure

system and release all pressure from the pilot and main valve before performing maintenance operations.

To prevent personal injury or damage to the equipment during storage, installation or maintenance operations, proper supports shall be used to keep the Type FL Regulator from rolling while it is sitting on a flat surface.

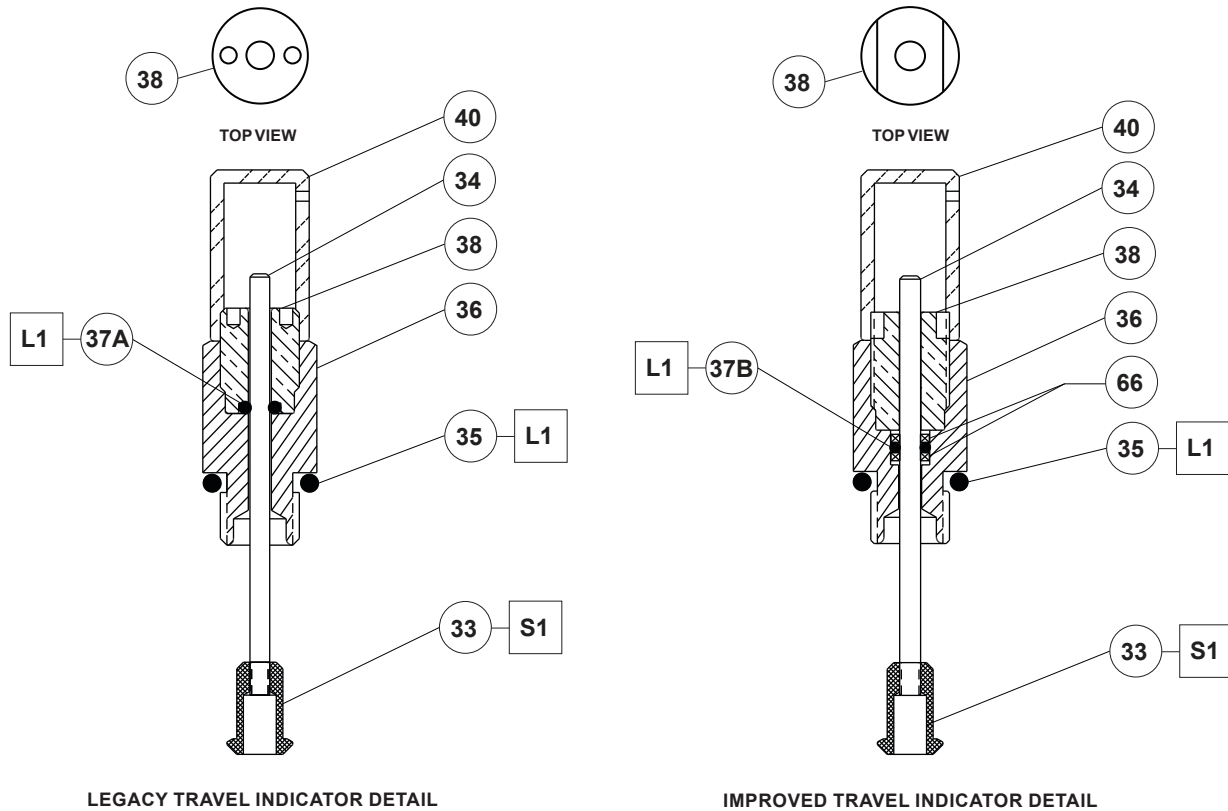
Main Valve (Refer to Figure 4)

Main Valve Pad/Disk Replacement

1. Disconnect the control lines from the regulator. Pressurize the loading chamber in the regulator with 15 psig / 1.0 bar. This will force the spring back and make it easier to work on the regulator.
2. Remove outlet flange (key 22) by removing socket head cap screws (key 5).
3. Remove pad/disk holder assembly and O-ring (key 18). For NPS 8 and 10 / DN 200 and 250, the pad/disk holder remains attached to the outlet flange and no dismounting is necessary.
4. Remove pad/disk (key 20) from pad/disk holder (key 19) by removing cap screw (key 25) and pad/disk retainer (key 21), replace pad/disk if necessary.
5. Reinstall the pad.
6. Reassemble in reverse order. Refer to Table 2 for torque values. Tighten all bolts using a star pattern and repeat 2 to 3 times to ensure proper torque.
7. Then bleed off the pressure from the loading chamber.
8. Reconnect all of the control lines.

Main Valve Diaphragm Maintenance

1. Place main valve with inlet side up.
2. Remove the travel indicator assembly by removing the indicator cover (key 40) and O-ring (key 35). Please see the Travel Indicator Maintenance section on page 12 for the complete maintenance procedure.
3. Remove inlet flange (key 1) by removing socket head cap screws (key 5). Due to force created by the spring (key 6), take care when removing inlet flange.
4. Lift out spring (key 6). Remove hex head cap screws, washers and nuts (keys 9, 14 and 15). Lift off the inlet cover (key 11).
5. Remove diaphragm assembly by removing screws (key 27) to separate the outlet and the inlet plates (keys 12 and 8). Check diaphragm (key 10) and



P1764

□ APPLY LUBRICANT (L) / SEALANT (S)⁽¹⁾:
 L1 = LITHIUM HYDROXYSTEGRATE NLGI 2 GRADE GREASE
 S1 = ANAEROBIC METHACRYLATE SEALANT FOR NUTS AND BOLTS

1. Lubricant and sealant must be selected such that they meet the temperature requirements.

Figure 5. Type FL Travel Indicator Assembly

O-rings (keys 26 and 28) for damage and replace if necessary. Check sleeve (key 16) seating surface for damage. Check O-rings (keys 3 and 4) and anti-friction rings (key 2), replace if necessary.

6. Reassemble in reverse order. Refer to Table 2 for torque values. Tighten all bolts using a star pattern and repeat 2 to 3 times to ensure proper torque.

Type FL Travel Indicator Maintenance

A new and improved version of the travel indicator has been phased in during 2013. The new version improves the O-ring stem seal to minimize leakage and extend service life. The components of the legacy and new versions are not interchangeable. If maintenance is performed on the travel indicator, it is recommended to replace the entire travel indicator assembly with the new version. Part numbers for the assemblies are shown in the parts list. Figure 5 shows the difference between the designs. The spare parts kits will support either design. Take care to use the correct O-ring (key 37A or 37B) when performing maintenance, see parts list for the appropriate part number.

1. Remove plastic travel indicator cover (key 40).
2. Loosen travel indicator bushing (key 38) and remove it by sliding it over the travel indicator stem (key 34).
3. Remove indicator fitting (key 36) and inspect O-ring (key 35). Remove O-ring (key 37B) and back-up rings (key 66). Replace and lubricate O-ring if damaged. Pull up on the travel indicator stem (key 34) to force the spring collet (key 33) out of the diaphragm head groove. Examine these parts and the stem for wear and replace if necessary.
4. Insert the travel indicator stem (key 34) and spring collet (key 33) back into the diaphragm head groove. Replace the indicator fitting (key 36) and O-ring (key 35) and tighten with a reference torque of 20 ft-lbs / 27.1 N•m.
5. Lubricate the O-ring (key 37B) and back-up rings (key 66, 2 required). Place one back-up ring on the stem (key 34) followed by the O-ring and then the other back-up ring. Push into groove of the indicator fitting (key 36).

6. Slide the travel indicator bushing (key 38) over the travel indicator stem (key 34) and tighten firmly in place with a torque of 3.7 ft-lbs / 5.0 N•m.
7. Replace the travel indicator cover (key 40) and tighten firmly in place.

PRX Series Pilot Maintenance



CAUTION

Always remove spring (key 7) tension before performing maintenance on this unit. To remove spring tension, loosen locknut (key 2) and back out adjusting screw (key 1) until compression is removed from the spring.

Note

Apply an anti-seize compound to the adjusting screw threads and other areas as needed.

Lower Case Maintenance

1. Remove pressure from the pilot.
2. Remove screws (key 10) from lower cover (key 21) and the separate lower cover from the body (key 16).
3. Use a wrench to hold the stem (key 23) and break loose the stem nut (key 20). Remove the stem nut and washer (key 11).
4. Remove the upper diaphragm plate (key 13), diaphragm (key 14), pad holder (key 22) and O-ring (key 18). Inspect the parts for damage or wear and replace if necessary.
5. Remove orifice (key 19) and O-ring (key 17). Inspect the parts for damage or wear and replace if necessary. Lightly lubricate the O-ring and place in the body (key 16). Install the orifice.
6. Set the pad holder (key 22) in the body (key 16).
7. Lightly lubricate the rims of the diaphragm (key 14) and place it on top of the pad holder (key 22). Set the upper diaphragm plate (key 13) on the diaphragm (key 14).
8. Lightly lubricate the O-ring (key 18) and place it in the lower case (key 21).
9. Place the washer (key 11) and stem nut (key 20) on the stem (key 23) and tighten. *If also performing Upper Case Maintenance, skip to step 2 of the Upper Case Maintenance section.*
10. Insert machine screws (key 10) in the lower cover (key 21) and tighten uniformly to ensure proper seal.

Upper Case Maintenance

1. Remove pressure from the pilot.
2. Loosen locknut (key 2) and back out adjusting screw (key 1) until compression is removed from the spring. Remove cap (key 3).
3. Lift the upper spring seat (key 6), spring (key 7) and O-ring (key 4) out of the upper cover (key 8). Inspect O-ring and replace if necessary.
4. Remove machine screws (key 10) from lower cover (key 21) and the separate lower cover from the body (key 16), unless removed during lower diaphragm maintenance. Use a wrench to hold stem (key 23) securely while removing the stem nut (key 26).
5. Remove remaining loose components: washer, upper diaphragm plate, diaphragm, lower diaphragm plate and O-rings (keys 11, 13, 14, 15, 18 and 25). Inspect diaphragm and O-rings for damage or wear and replace if necessary.
6. Lightly lubricate the O-ring (key 25). Place O-ring over the stem (key 23) and press it down into the body (key 16).
7. Set the lower diaphragm plate (key 15) into the body (key 16).
8. Lightly lubricate the rims of the diaphragm (key 14) and place it in the body (key 16) on top of the lower diaphragm plate (key 15).
9. Set the upper diaphragm plate (key 13) on top of the diaphragm (key 14).
10. Place washer (key 11) and stem nut (key 26) on the stem (key 23) and tighten using a wrench to hold the stem.
11. Place the lower spring seat (key 9) on the upper diaphragm nut (key 26) and mount the upper cover (key 8) on top of the body (key 24) and the diaphragm (key 14).
12. Place and uniformly tighten the machine screws (key 10) to hold the body (key 24) and upper cover (key 8) together. Position the diaphragm convolution facing down and make sure that the diaphragm is not deformed and is properly installed.
13. Install spring (key 7) and upper spring seat (key 6) on top of the lower spring seat (key 9) inside the upper cover (key 8). Install cap (key 3).

Type FL

14. Screw in adjusting screw (key 1) at desired spring compression and use the lock nut (key 2) to lock the adjusting screws position. Refer to Pilot Adjustment section (page 10) to adjust pilot settings.

Damper and Restrictor Maintenance

1. Remove screw (key 31) and plate (key 29).
2. Remove ring nuts (key 30).
3. Remove damper adjusting screw (key 27). Remove and inspect O-ring (key 28) for damage or wear and replace if necessary. Lightly lubricate O-ring before placing on the adjusting screw. Insert damper adjusting screw into the body (key 16) and tighten. Insert ring nut (key 30) and tighten. Back out damper adjusting screw until it stops.

Note

When using a Type PRX/120 pilot with a Type PRX/125 pilot as a monitor, use the following settings:

- **Restrictor - completely tighten and then back out three full turns.**
 - **Damper - back out until it stops.**
4. Remove restrictor adjusting screw (key 32). Remove and inspect O-ring (key 28) for damage or wear and replace if necessary. Lightly lubricate O-ring before placing on the adjusting screw. Insert restrictor adjusting screw into the body (key 16) and completely tighten. Insert ring nut (key 30) and completely tighten. Back out restrictor adjusting screw 1/2 turn.
 5. Install plate (key 29) and screw (key 31).

Type SA/2

Note

The ports marked H in the top view of Figure 11 are optional heating ports.

1. Remove pressure from the Type SA/2.
2. Remove bolts, washers and nuts (keys 2, 9 and 10) from body (key 7) and the separate upper and lower covers (keys 11 and 19) from the body (key 7). When separating the covers from the body, be aware of loose components: (keys 1, 3, 4, 8, 12, 18, 20 and 21).

3. Remove and inspect O-ring (key 13) for damage or wear and replace if necessary. Lightly lubricate the O-ring before placing it back in the cover (key 11).
4. Clean screens (key 8). Replace filter pad (key 12).
5. Inspect diaphragm (key 18) for damage or wear and replace if necessary. Check the seating surface of the orifice in the screw unit (key 17) for erosion, scratches, spurs or other damage and replace if necessary.
6. Unscrew and remove the seat (key 5). Inspect O-ring (key 6) for damage or wear and replace if necessary. Lightly lubricate the O-ring and place it on the seat (key 5).
7. Pull the pad holder unit (key 15) out of the body (key 7). Inspect the seat for damage and replace if necessary.
8. Set the pad holder unit (key 15) on the spring (key 14) and insert the seat (key 5). Tighten the seat (key 5) until it stops.
9. Lightly lubricate the outer and inner rims of the diaphragm (key 18). Place the diaphragm assembly on top of the seat (key 5). The screw unit (key 17) will slide into the seat (key 5). Use care to avoid damage to parts when reassembling.
10. Set the spring (key 1) on top of the nut (key 21).
11. Align the cover (key 19) over the body (key 7) with the sensing port (V) opposite the pilot supply port (R).
12. Place the filter pad (key 12) and screens (key 8), one on each side of the filter pad, on the inlet cover (key 11).
13. Pick up the body (key 7) and place it on the inlet cover (key 11) with the inlet port (M) aligned vertically with the sensing port (V).
14. Insert bolts (key 2). Place washers (key 9) and nuts (key 10) on the end of the bolts. Tighten the nuts.

Parts Ordering

Each regulator is assigned a serial number, which can be found on the nameplate. Refer to the number when contacting your local Sales Office for technical information or when ordering parts.

When ordering replacement parts, reference the key number of each needed part as found in the following parts list. Separate kit containing all recommended spare parts is available.

Parts List

Type FL Main Valve (Figure 6)

Key	Description	Part Number	Key	Description	Part Number
	Start-Up Repair Kit (includes keys 18, 20, 46 and 47. Key 46 is only used for Type SR/SRII-SRS. Not all parts are used for all sizes.)	See Table 3	5	Socket Head Screw NPS 1 / DN 25 (16 required) NPS 2 / DN 50 (16 required) NPS 3 / DN 80 (16 required) NPS 4 / DN 100 (16 required) NPS 6 / DN 150 (16 required) NPS 8 / DN 200 (24 required) NPS 10 / DN 250 (24 required)	M5011044X12 M5011062X12 M5011086X12 M5011094X12 M5011115X12 M5011115X12 ERCA04502A0
	Parts kit (includes keys 2, 3, 4, 10, 18, 20, 26, 28, 35, 37B, 46, 47 and 66. Key 46 is only used for Type SR/SRII-SRS. Not all parts are used for all sizes.)	See Table 4	6	Spring NPS 1 / DN 25 NPS 2 / DN 50 NPS 3 / DN 80 NPS 4 / DN 100 NPS 6 / DN 150 NPS 8 / DN 200 NPS 10 / DN 250	M0194590X12 M0191440X12 M0192240X12 M0194880X12 M0249030X12 M0296460X12 ERCA01214A0
	Travel Indicator Kit (includes keys 33, 34, 35, 36, 37B, 38, 39, 40 and 66)	See Table 5	7	Tube Fitting	-----
	Conversion Kit (includes keys 19, 20, 21, 25, 47, 48 and 67. Not all parts are used for all sizes.)	See Table 6	8	Inlet Plate NPS 1 / DN 25 NPS 2 / DN 50 NPS 3 / DN 80 NPS 4 / DN 100 NPS 6 / DN 150 NPS 8 / DN 200 NPS 10 / DN 250	M0194440X12 M0194620X12 M0192080X12 M0194740X12 M0302910X12 M0302950X12 ERCA01164A0
1	Inlet Flange CL300 RF NPS 1 / DN 25 NPS 2 / DN 50 NPS 3 / DN 80 NPS 4 / DN 100 NPS 6 / DN 150 NPS 8 / DN 200 NPS 10 / DN 250 CL600 RF NPS 1 / DN 25 NPS 2 / DN 50 NPS 3 / DN 80 NPS 4 / DN 100 NPS 6 / DN 150 NPS 8 / DN 200 NPS 10 / DN 250	M0268280X12 M0268410X12 M0268520X12 M0268580X12 M0298170X12 M0298330X12 ERCA01166A0 M0268260X12 M0268430X12 M0268540X12 M0268600X12 M0298160X12 M0296890X12 ERCA01168A0	9	Flange Bolt NPS 1 / DN 25 (16 required) NPS 2 / DN 50 (16 required) NPS 3 / DN 80 (16 required) NPS 4 / DN 100 (16 required) NPS 6 / DN 150 (24 required) NPS 8 / DN 200 (30 required) NPS 10 / DN 250 (36 required)	M5007026X12 M5007045X12 M5007077X12 M5007100X12 M5007141X12 M5007193X12 ERCA04503A0
2*	Anti-Friction Ring, Polytetrafluoroethylene (PTFE) NPS 1 / DN 25 (6 required) NPS 2 / DN 50 (6 required) NPS 3 / DN 80 (6 required) NPS 4 / DN 100 (6 required) NPS 6 / DN 150 (6 required) NPS 8 / DN 200 (6 required) NPS 10 / DN 250 (6 required)	M0194530X12 M0194690X12 M0192170X12 M0194830X12 M0207640X12 M0296300X12 ERCA01177A0	10*	Diaphragm, PVC Coated Nitrile (NBR) NPS 1 / DN 25 NPS 2 / DN 50 NPS 3 / DN 80 NPS 4 / DN 100 NPS 6 / DN 150 NPS 8 / DN 200 NPS 10 / DN 250	M0194450X12 M0194630X12 M0192090X12 M0194750X12 M0238490X12 M0296620X12 ERCA01228A0
3*	O-ring, Fluorocarbon (FKM) NPS 1 / DN 25 (3 required) NPS 2 / DN 50 (3 required) NPS 3 / DN 80 (3 required) NPS 4 / DN 100 (3 required) NPS 6 / DN 150 (3 required) NPS 8 / DN 200 (3 required) NPS 10 / DN 250 (3 required)	M6020019X12 M6020029X12 M6020036X12 M6020044X12 M6020050X12 M6020053X12 ERCA04451A0	11	Inlet Body Cover NPS 1 / DN 25 NPS 2 / DN 50 NPS 3 / DN 80 NPS 4 / DN 100 NPS 6 / DN 150 NPS 8 / DN 200	M0268640X12 M0268680X12 M0268720X12 M0268740X12 M0302930X12 M0302970X12
4*	Body O-ring Nitrile (NBR) NPS 1 / DN 25 (2 required) NPS 2 / DN 50 (2 required) NPS 3 / DN 80 (2 required) NPS 4 / DN 100 (2 required) NPS 6 / DN 150 NPS 8 / DN 200 Fluorocarbon (FKM) NPS 1 / DN 25 (2 required) NPS 2 / DN 50 (2 required) NPS 3 / DN 80 (2 required) NPS 4 / DN 100 (2 required) NPS 6 / DN 150 NPS 8 / DN 200	M6010108X12 M6010119X12 M6010195X12 M6010157X12 M6010084X12 M6010084X12 M6020084X12 M6020101X12 M6020128X12 M6020090X12 M6020072X12 M6020072X12	12	Outlet Plate NPS 1 / DN 25 NPS 2 / DN 50 NPS 3 / DN 80 NPS 4 / DN 100 NPS 6 / DN 150 NPS 8 / DN 200 NPS 10 / DN 250	M0194480X12 M0194660X12 M0192120X12 M0194780X12 M0302920X12 M0302960X12 ERCA01135A0
			13	Outlet Body Cover NPS 1 / DN 25 NPS 2 / DN 50 NPS 3 / DN 80 NPS 4 / DN 100 NPS 6 / DN 150 NPS 8 / DN 200 NPS 10 / DN 250	M0268650X12 M0268690X12 M0268730X12 M0268750X12 M0302940X12 M0302980X12 ERCA01124A0

North America Only

*Recommended Spare Part

- continued -

Type FL

Type FL Main Valve (Figure 6) (continued)

Key	Description	Part Number	Key	Description	Part Number
14	Washer		20*	Disk (continued)	
	NPS 1 / DN 25 (16 required)	M5001007X12		Type FL, FL-SR, FL-SR/SRS (continued)	
	NPS 2 / DN 50 (16 required)	M5001009X12		Fluorocarbon (FKM)	
	NPS 3 / DN 80 (16 required)	M5001012X12		NPS 1 / DN 25	M0276650X12
	NPS 4 / DN 100 (16 required)	M5001015X12		NPS 2 / DN 50	M0276670X12
	NPS 6 / DN 150 (24 required)	M5001015X12		NPS 3 / DN 80	M0276690X12
	NPS 8 / DN 200 (30 required)	M5001015X12		NPS 4 / DN 100	M0276700X12
	NPS 10 / DN 250 (36 required)	ERCA00477A0		NPS 6 / DN 150	M0276710X12
15	Nut			NPS 8 / DN 200	M0298670X12
	NPS 1 / DN 25 (16 required)	M5002007X12		NPS 10 / DN 250	ERCA01209A0
	NPS 2 / DN 50 (16 required)	M5002009X12		Polyurethane (PU)	
	NPS 3 / DN 80 (16 required)	M5002012X12		NPS 1 / DN 25	ERAA02034A0
	NPS 4 / DN 100 (16 required)	M5002014X12		NPS 2 / DN 50	ERAA02050A0
	NPS 6 / DN 150 (24 required)	M5002014X12		NPS 3 / DN 80	ERAA02073A0
	NPS 8 / DN 200 (30 required)	M5002014X12		NPS 4 / DN 100	ERAA02078A0
	NPS 10 / DN 250 (36 required)	ERCA04504A0		NPS 6 / DN 150	ERAA02098A0
16	Sleeve			NPS 8 / DN 200	ERAA02102A0
	NPS 1 / DN 25	M0247720X12		Disk for Types SR11 and SR11/SRS only	
	NPS 2 / DN 50	M0230761X12		Nitrile (NBR)	
	NPS 3 / DN 80	M0230621X12		NPS 1 / DN 25	ERCA00849A1
	NPS 4 / DN 100	M0230631X12		NPS 2 / DN 50	ERCA00854A1
	NPS 6 / DN 150	M0238340X12		NPS 3 / DN 80	ERCA00856A1
	NPS 8 / DN 200	M0296700X12		NPS 4 / DN 100	M0304550X12
	NPS 10 / DN 250	ERCA01107A0		NPS 6 / DN 150	M0305120X12
17	Tube Fitting	-----		NPS 8 / DN 200	M0304580X12
18*	O-ring			NPS 10 / DN 250	ERCA01204A0
	Nitrile (NBR)			Fluorocarbon (FKM)	
	NPS 1 to 4 / DN 25 to 100	See Key 4		NPS 1 / DN 25	ERCA00849A0
	NPS 6 / DN 150	M6010083X12		NPS 2 / DN 50	ERCA00854A0
	NPS 8 / DN 200	M6010087X12		NPS 3 / DN 80	ERCA00856A0
	NPS 10 / DN 250	ERCA04457A0		NPS 4 / DN 100	M0304550X12
	Fluorocarbon (FKM)			NPS 6 / DN 150	M0304570X12
	NPS 6 / DN 150	M6020122X12		NPS 8 / DN 200	M0304370X12
	NPS 8 / DN 200	M6020167X12		NPS 10 / DN 250	ERCA01209A0
	NPS 10 / DN 250	ERCA04457A1	21	Disk Retainer	
19	Disk Holder			Type FL	
	Type FL			NPS 1 / DN 25	M0194520X12
	NPS 1 / DN 25	M0250720X12		NPS 2 / DN 50	M0230750X12
	NPS 2 / DN 50	M0242810X12		NPS 3 / DN 80	M0230591X12
	NPS 3 / DN 80	M0251580X12		NPS 4 / DN 100	M0230601X12
	NPS 4 / DN 100	M0251640X12		NPS 6 / DN 150	M0238350X12
	NPS 6 / DN 150	M0250550X12		NPS 8 / DN 200	M0296670X12
	NPS 8 / DN 200	M0296660X12		NPS 10 / DN 250	ERCA01114A0
	NPS 10 / DN 250	ERCA01119A0		Type FL-SR or FL-SR/SRS	
	Type FL-SR, FL-SR11, FL-SR/SRS or FL-SR11/SRS			NPS 1 / DN 25	M0264370X12
	NPS 1 / DN 25	M0274770X12		NPS 2 / DN 50	M0264390X12
	NPS 2 / DN 50	M0274750X12		NPS 3 / DN 80	M0269090X12
	NPS 3 / DN 80	M0269210X12		NPS 4 / DN 100	M0264400X12
	NPS 4 / DN 100	M0274320X12		NPS 6 / DN 150	M0264410X12
	NPS 6 / DN 150	M0274780X12		NPS 8 / DN 200	-----
	NPS 8 / DN 200 ⁽¹⁾	M0304410X12		NPS 10 / DN 250	-----
	NPS 10 / DN 250 ⁽¹⁾	ERCA01119A0		Type FL-SR11 or FL-SR11/SRS	
20*	Disk			NPS 1 / DN 25	ERCA00754A0
	Type FL, FL-SR, FL-SR/SRS			NPS 2 / DN 50	ERCA00755A0
	Nitrile (NBR)			NPS 3 / DN 80	ERCA00756A0
	NPS 1 / DN 25	M0250770X12		NPS 4 / DN 100	M0304590X12
	NPS 2 / DN 50	M0242820X12		NPS 6 / DN 150	M0304600X12
	NPS 3 / DN 80	M0251650X12		NPS 8 / DN 200	M0304390X12
	NPS 4 / DN 100	M0251600X12		NPS 10 / DN 250	ERCA01114A0
	NPS 6 / DN 150	M0250560X12		For regulator with Polyurethane (PU) disk	
	NPS 8 / DN 200	M0296690X12		NPS 1 / DN 25	ERAA02007A0
	NPS 10 / DN 250	ERCA01204A0		NPS 2 / DN 50	ERAA02047A0
				NPS 3 / DN 80	ERAA02072A0
				NPS 4 / DN 100	ERAA02077A0
				NPS 6 / DN 150	ERAA02097A0
				NPS 8 / DN 200	ERAA02101A0

*Recommended Spare Part
1. NPS 8 and 10 / DN 200 and 250 are available only with Types SR11 and SR11/SRS silencers.

- continued -

Type FL Main Valve (Figure 6) (continued)

Key	Description	Part Number	Key	Description	Part Number
22	Outlet Flange		24	Spacer (continued)	
	Type FL, FL-SR or FL-SRII only			Type FL-SR/SRS or FL-SRII/SRS ⁽²⁾	
	CL300 RF			CL300 RF	
	NPS 1 / DN 25	M0268290X12		NPS 1 x 4 / DN 25 x 100	M0208100X12
	NPS 2 / DN 50	M0268420X12		NPS 2 x 6 / DN 50 x 150	M2007602X12
	NPS 3 / DN 80	M0268530X12		NPS 3 x 10 / DN 80 x 250	M2007606X12
	NPS 4 / DN 100	M0268590X12		NPS 4 x 10 / DN 100 x 250	M2007606X12
	NPS 6 / DN 150	M0298190X12		NPS 6 x 12 / DN 150 x 300	M0299740X12
	NPS 8 / DN 200	M0298310X12		CL600 RF	
	NPS 10 / DN 250	ERCA01138A0		NPS 1 x 4 / DN 25 x 100	M0267260X12
	CL600 RF			NPS 2 x 6 / DN 50 x 150	M2007603X12
	NPS 1 / DN 25	M0268270X12		NPS 3 x 10 / DN 80 x 250	M2007607X12
	NPS 2 / DN 50	M0268440X12		NPS 4 x 10 / DN 100 x 250	M2007607X12
	NPS 3 / DN 80	M0268550X12		NPS 6 x 12 / DN 150 x 300	M0299750X12
	NPS 4 / DN 100	M0268610X12	25	Socket Head Screw	
	NPS 6 / DN 150	M0298180X12		Type FL	
	NPS 8 / DN 200	M0296880X12		NPS 1 / DN 25	M5011015X12
	NPS 10 / DN 250	ERCA01157A0		NPS 2 / DN 50	M5011044X12
	Type FL-SR/SRS or FL-SRII/SRS			NPS 3 / DN 80	M5011061X12
	CL300 RF			NPS 4 / DN 100	M5011139X12
	NPS 1 x 4 / DN 25 x 100	M2006489X12		NPS 6 / DN 150	M5011103X12
	NPS 2 x 6 / DN 50 x 150	M2006493X12		NPS 8 / DN 200	M5011105X12
	NPS 3 x 10 / DN 80 x 250	M2006497X12		NPS 10 / DN 250	M5011150X12
	NPS 4 x 10 / DN 100 x 250	M2006499X12		Type FL-SR or FL-SR/SRS	
	NPS 6 x 12 / DN 150 x 300	M2007260X12		NPS 1 / DN 25	M5009010X12
	NPS 8 x 16 / DN 200 x 400	M2007622X12		NPS 2 / DN 50	M5009028X12
	CL600 RF			NPS 3 / DN 80	M5009037X12
	NPS 1 x 4 / DN 25 x 100	M2006490X12		NPS 4 / DN 100	M5009080X12
	NPS 2 x 6 / DN 50 x 150	M2006494X12		NPS 6 / DN 150	M5009095X12
	NPS 3 x 10 / DN 80 x 250	M2006498X12		NPS 8 / DN 200	-----
	NPS 4 x 10 / DN 100 x 250	M2006500X12		NPS 10 / DN 250	-----
	NPS 6 x 12 / DN 150 x 300	M2007261X12		Type FL-SRII or FL-SRII/SRS	
	NPS 8 x 16 / DN 200 x 400	M2007621X12		NPS 1 / DN 25	M5009009X12
23	Gasket			NPS 2 / DN 50	M5009027X12
	Type FL, FL-SR or FL-SRII only			NPS 3 / DN 80	M5009035X12
	NPS 1 / DN 25	M0136180X12		NPS 4 / DN 100	M5009047X12
	NPS 2 / DN 50	M0136210X12		NPS 6 / DN 150	M5009059X12
	NPS 3 / DN 80	M0136230X12		NPS 8 / DN 200	M5011105X12
	NPS 4 / DN 100	M0136250X12		NPS 10 / DN 250	M5011150X12
	NPS 6 / DN 150	M0136270X12	26*	O-ring	
	NPS 8 / DN 200	M0136280X12		Nitrile (NBR)	
	NPS 10 / DN 250	M0136290X12		NPS 1 / DN 25	M6010029X12
	Type FL-SR/SRS or FL-SRII/SRS			NPS 2 / DN 50	M6010105X12
	NPS 1 x 4 / DN 25 x 100	M0136250X12		NPS 3 / DN 80	M6010115X12
	NPS 2 x 6 / DN 50 x 150	M0136270X12		NPS 4 / DN 100	M6010121X12
	NPS 3 x 10 / DN 80 x 250	M0136290X12		NPS 6 / DN 150	M6010226X12
	NPS 4 x 10 / DN 100 x 250	M0136290X12		NPS 8 / DN 200	M6010140X12
	NPS 6 x 12 / DN 150 x 300	M0136300X12		NPS 10 / DN 250	ERCA04464A0
24	Spacer			Fluorocarbon (FKM)	
	Type FL, FL-SR or FL-SRII only			NPS 1 / DN 25	M6020021X12
	CL300 RF			NPS 2 / DN 50	M6020095X12
	NPS 1 / DN 25	M0267180X12		NPS 3 / DN 80	M6020073X12
	NPS 2 / DN 50	M0208080X12		NPS 4 / DN 100	M6020098X12
	NPS 3 / DN 80	M0208090X12		NPS 6 / DN 150	M6020116X12
	NPS 4 / DN 100	M0208100X12		NPS 8 / DN 200	M6020117X12
	NPS 6 / DN 150	M2007602X12		NPS 10 / DN 250	ERCA04464A1
	NPS 8 / DN 200	M2007604X12	27	Socket Head Screw	
	NPS 10 / DN 250	M2007606X12		NPS 1 / DN 25 (6 required)	M5011005X12
	CL600 RF			NPS 2 / DN 50 (6 required)	M5011014X12
	NPS 1 / DN 25	M0267210X12		NPS 3 / DN 80 (12 required)	M5011140X12
	NPS 2 / DN 50	M0267230X12		NPS 4 / DN 100 (12 required)	M5011125X12
	NPS 3 / DN 80	M0267250X12		NPS 6 / DN 150 (16 required)	M5011043X12
	NPS 4 / DN 100	M0267260X12		NPS 8 / DN 200 (16 required)	M5011125X12
	NPS 6 / DN 150	M2007603X12		NPS 10 / DN 250 (20 required)	M5011125X12
	NPS 8 / DN 200	M2007605X12			
	NPS 10 / DN 250	M2007607X12			

North America Only

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

- continued -

Type FL

Type FL Main Valve (Figure 6) (continued)

Key	Description	Part Number	Key	Description	Part Number
28*	O-ring Nitrile (NBR)		40	Indicator Cover	
	NPS 1 / DN 25	M6010104X12		NPS 2 / DN 25	M0194580X12
	NPS 2 / DN 50	M6010116X12		NPS 2 / DN 50	M0194710X12
	NPS 3 / DN 80	M6010126X12		NPS 3 / DN 80	M0192220X12
	NPS 4 / DN 100	M6010132X12		NPS 4 / DN 100	M0194870X12
	NPS 6 / DN 150	M6010140X12		NPS 6 / DN 150	M0210910X12
	NPS 8 / DN 200	M6010212X12		NPS 8 / DN 200	M0210910X12
	NPS 10 / DN 250	ERCA04500A0		NPS 10 / DN 250	ERCA01185A0
	Fluorocarbon (FKM)		43	Type SR Silencer	
	NPS 1 / DN 25	M6020120X12		Type FL-SR or FL-SR/SRS	
	NPS 2 / DN 50	M6020096X12		NPS 1 / DN 25	M0258950X12
	NPS 3 / DN 80	M6020127X12		NPS 2 / DN 50	M0258930X12
	NPS 4 / DN 100	M6020097X12		NPS 3 / DN 80	M0258390X12
	NPS 6 / DN 150	M6020117X12		NPS 4 / DN 100	M0258900X12
	NPS 8 / DN 200	M6020168X12		NPS 6 / DN 150	M0258990X12
	NPS 10 / DN 250	ERCA04500A1		NPS 8 / DN 200	-----
29	Nameplate	-----		NPS 10 / DN 250	-----
30	Nameplate Sticker	-----		Type FL-SR/II or FL-SR/II/SRS	
31	Drive Screw (4 required)			NPS 1 / DN 25	ERCA00859A0
	NPS 1 / DN 25	M4500027X12		NPS 2 / DN 50	ERCA00862A0
	NPS 2 / DN 50	M4500027X12		NPS 3 / DN 80	ERCA00865A0
	NPS 3 / DN 80	M4500027X12		NPS 4 / DN 100	ERCA00868A0
	NPS 4 / DN 100	M4500027X12		NPS 6 / DN 150	M0304830X12
	NPS 6 / DN 150	M4500027X12		NPS 8 / DN 200	M0305110X12
	NPS 8 / DN 200	M4500027X12		NPS 10 / DN 250	ERCA01140A0
	NPS 10 / DN 250	M4500027X12	46*	O-ring	
32	Flow Arrow	-----		Type FL-SR, FL-SR/II, FL-SR/SRS	
33	Spring Collet			or FL-SR/II/SRS, Nitrile (NBR)	
	NPS 1 / DN 25	M0192180X12		NPS 1 / DN 25	M6010014X12
	NPS 2 / DN 50	M0192180X12		NPS 2 / DN 50	M6010026X12
	NPS 3 / DN 80	M0192180X12		NPS 3 / DN 80	M6010193X12
	NPS 4 / DN 100	M0192180X12		NPS 4 / DN 100	M6010108X12
	NPS 6 / DN 150	M0192180X12		NPS 6 / DN 150	M6010052X12
	NPS 8 / DN 200	M0296750X12		Type FL-SR, FL-SR/II, FL-SR/SRS	
	NPS 10 / DN 250	ERCA01229A0		or FL-SR/II/SRS, Fluorocarbon (FKM)	
34	Indicator Stem			NPS 1 / DN 25	M6020007X12
	NPS 1 / DN 25	ERSA01798A0		NPS 2 / DN 50	M6020019X12
	NPS 2 / DN 50	ERSA01788A0		NPS 3 / DN 80	M6020131X12
	NPS 3 / DN 80	ERSA01804A0		NPS 4 / DN 100	M6020084X12
	NPS 4 / DN 100	ERSA01796A0		NPS 6 / DN 150	M6020041X12
	NPS 6 / DN 150	ERSA01805A0	47*	O-ring	
	NPS 8 / DN 200	ERSA01797A0		Nitrile (NBR)	
	NPS 10 / DN 250	ERSA04468A0		NPS 1 / DN 25	-----
35*	O-ring			NPS 2 / DN 50	-----
	Nitrile (NBR)			NPS 3 / DN 80	M6010102X12
	NPS 1 to 4 / DN 25 to 100	M6010010X12		NPS 4 / DN 100	M6010113X12
	NPS 6 and 8 / DN 150 and 200	M6010012X12		NPS 6 / DN 150	M6010123X12
	NPS 10 / DN 250	M6010174X12		NPS 8 / DN 200	M6010136X12
	Fluorocarbon (FKM)			NPS 10 / DN 250	ERCA04501A0
	NPS 1 to 4 / DN 25 to 100	M6020004X12		Fluorocarbon (FKM)	
	NPS 6 and 8 / DN 150 and 200	M6020005X12		NPS 1 / DN 25	-----
	NPS 10 / DN 250	ERCA00488A0		NPS 2 / DN 50	-----
36	Indicator Fitting			NPS 3 / DN 80	M6020082X12
	NPS 1 / DN 25	ERSA01820A0		NPS 4 / DN 100	M6020124X12
	NPS 2 / DN 50	ERSA01820A0		NPS 6 / DN 150	M6020123X12
	NPS 3 / DN 80	ERSA01822A0		NPS 8 / DN 200	M6020166X12
	NPS 4 / DN 100	ERSA01822A0		NPS 10 / DN 250	ERCA04501A1
	NPS 6 / DN 150	ERSA02569A0	48	Washer	
	NPS 8 / DN 200	ERSA01823A0		Type FL-SR, FL-SR/II, FL-SR/SRS or FL-SR/II/SRS	
	NPS 10 / DN 250	ERSA04463A0		NPS 1 / DN 25	M5055001X12
37A*	O-ring			NPS 2 / DN 50	M5055003X12
	Fluorocarbon (FKM)	M6020066X12		NPS 3 / DN 80	M5055004X12
	Nitrile (NBR)	M6010001X12		NPS 4 / DN 100	M5055005X12
37B*	O-ring			NPS 6 / DN 150	M5055006X12
	Fluorocarbon (FKM)	1H2926X0022	59	Eyebolt	
	Nitrile (NBR)	1H2926X0032		NPS 6 / DN 150 (2 required)	M5040008X12
38	Indicator Bushing	ERSA02798A0		NPS 8 / DN 200 (2 required)	M5040007X12
39	Indicator Scale	M0201990X12		NPS 10 / DN 250 (2 required)	ERCA00481A0
			61	Pin (NPS 6 / DN 150 only) (8 required)	M0249050X12

*Recommended Spare Part

- continued -

Type FL Main Valve (Figure 6) (continued)

Key	Description	Part Number
62	Screw NPS 8 / DN 200 only (6 required) NPS 10 / DN 250 (6 required)	M5007160X12 ERCA04505A0
63	Washer NPS 8 / DN 200 only (6 required) NPS 10 / DN 250 (6 required)	M5077001X12 ERCA00478A0
64	Socket Head Screw NPS 6 / DN 150 (16 required) NPS 8 / DN 200 (20 required)	M5011150X12 M5011117X12
65	Spring Pin NPS 8 and 10 / DN 200 and 250	M4501106X12
66*	Back-up Rings (2 required)	1N659106242
67	Disk Support NPS 1 / DN 25 NPS 2 / DN 50 NPS 3 / DN 80 NPS 4 / DN 100 NPS 6 / DN 150 NPS 8 / DN 200 NPS 10 / DN 250	ERAA02042A0 ERAA02067A0 ERAA02074A0 ERAA02080A0 ERAA02100A0 ERAA02103A0 ERAA02106A0

Type SRS Main Valve (Figure 8)

Key	Description	Part Number
200	Body CL300 RF NPS 1 / DN 25 NPS 2 / DN 50 NPS 3 / DN 80 NPS 4 / DN 100 NPS 6 / DN 150 NPS 8 / DN 200 CL600 RF NPS 1 / DN 25 NPS 2 / DN 50 NPS 3 / DN 80 NPS 4 / DN 100 NPS 6 / DN 150 NPS 8 / DN 200	M0272850X12 M0273070X12 M0273290X12 M0273420X12 M0298210X12 ERCA01012A0 M0272860X12 M0273080X12 M0273300X12 M0273430X12 M0298240X12 ERCA00802A0
201	Retainer NPS 1 / DN 25 NPS 2 / DN 50 NPS 3 / DN 80 NPS 4 / DN 100 NPS 8 / DN 200	M0272870X12 M0273090X12 M0273310X12 M0273440X12 ERCA00803A0
202	Stud NPS 1 / DN 25 NPS 2 / DN 50 NPS 3 / DN 80 NPS 4 / DN 100	M5002004X12 M5002006X12 M5002007X12 M5002007X12
202	Nut NPS 8 / DN 200	M5085005X12
203	Attenuator Plate NPS 1 / DN 25 NPS 2 / DN 50 NPS 3 / DN 80 NPS 4 / DN 100	M0272880X12 M0273100X12 M0290400X12 M0282670X12
204	Spring Pin NPS 1 / DN 25 (2 required) NPS 2 / DN 50 (2 required) NPS 3 / DN 80 (2 required) NPS 4 / DN 100	M4501106X12 M4501106X12 M4501106X12 M4501106X12
205	Ring CL300 RF NPS 1 / DN 25 NPS 2 / DN 50 NPS 3 / DN 80 NPS 4 / DN 100	M0272890X12 M0273000X12 M0273330X12 M0273330X12

Type SRS Main Valve (Figure 8) (continued)

Key	Description	Part Number
205	Ring (continued) CL600 RF NPS 1 / DN 25 NPS 2 / DN 50 NPS 3 / DN 80 NPS 4 / DN 100	M0272900X12 M0273010X12 M0273340X12 M0273340X12
206	Nut (3 required) NPS 1 / DN 25 NPS 2 / DN 50 NPS 3 / DN 80 NPS 4 / DN 100	M5006014X12 M5006002X12 M5006003X12 M5006003X12
206	Spacer NPS 8 / DN 200	ERCA00809A0
207	Attenuator Plate NPS 1 / DN 25 NPS 2 / DN 50 NPS 3 / DN 80 NPS 4 / DN 100 NPS 8 / DN 200	M0272910X12 M0273130X12 M0273350X12 M0273480X12 ERCA00805A0
208	Attenuator Plate NPS 1 / DN 25 NPS 2 / DN 50 NPS 3 / DN 80 NPS 4 / DN 100 NPS 8 / DN 200	M0272920X12 M0273140X12 M0273360X12 M0273490X12 ERCA00804A0
209	Spacer NPS 1 / DN 25 NPS 2 / DN 50 NPS 3 / DN 80 NPS 4 / DN 100	M0272930X12 M0273150X12 M0273370X12 M0273500X12
209	Stud Bolt NPS 8 / DN 200	ERCA00811A0
210	Spring Cage NPS 1 / DN 25 NPS 2 / DN 50 NPS 3 / DN 80 NPS 4 / DN 100	M0272940X12 M0273160X12 M0273380X12 M0273510X12
210	Spacer NPS 8 / DN 200	ERCA00807A0
211	Spring NPS 1 / DN 25 (50 required) NPS 2 / DN 50 (50 required) NPS 3 / DN 80 (600 required) NPS 4 / DN 100 (3250 required) NPS 6 and 8 / DN 150 and 200 (3250 required)	M0273680X12 M0273680X12 M0273680X12 M0273680X12 M0273680X12
213	Attenuator Plate CL300 RF NPS 8 / DN 200 CL600 RF NPS 8 / DN 200	ERCA01000A0 ERCA00806A0
215	O-ring NPS 8 / DN 200 Nitrile (NBR) Fluorocarbon (FKM)	M6010085X12 M6020192X12
216	Spacer NPS 8 / DN 200	ERCA00808A0
217	Spacer NPS 8 / DN 200	ERCA00810A0
218	O-ring NPS 8 / DN 200 Nitrile (NBR) Fluorocarbon (FKM)	M6010151X12 M6020193X12
219	Screw NPS 8 / DN 200	M5011045X12
220	Washer NPS 8 / DN 200	M5055005X12
221	Base Plate NPS 6 / DN 150	ERAA16946A0

*Recommended Spare Part

- continued -

Type FL

Type SRS Main Valve (Figure 8) (continued)

Key	Description	Part Number
222	Nut (18 required) NPS 6 / DN 150	ERAA18805A0
223	Rod (6 required) NPS 6 / DN 150	ERAA17099A0
224	Plate #2 NPS 6 / DN 150	ERAA16864A0
225	Plate #3 (2 required) NPS 6 / DN 150	ERAA16465A0
226	Plate #4 NPS 6 / DN 150	ERAA16866A0
227	Plate #5 NPS 6 / DN 150	ERAA16896A0
228	Spacer #1 NPS 6 / DN 150	ERAA18797A0
229	Spacer #2 NPS 6 / DN 150	ERAA18798A0
230	Spacer #3 NPS 6 / DN 150	ERAA18799A0
231	Spacer #4 NPS 6 / DN 150	ERAA18800A0

PRX Series Pilot (Figure 10)

Key	Description	Part Number
	Parts Kits	
	Elastomer Parts Kits	
	Without Disk (include keys 4, 5, 14, 17, 18, 25 and 28)	RPRX00X0N12
	Nitrile (NBR)	RPRX00X0F12
	Fluorocarbon (FKM)	
	With Disk (includes keys 4, 5, 14, 17, 18, 22, 25 and 28)	RPRX00X0N22
	Nitrile (NBR)	RPRX00X0F22
	Fluorocarbon (FKM)	
1	Adjusting Screw	M0253340X12
2	Locknut	M5036008X12
3	Cap	M0253350X12
4*	Upper Cover O-ring	
	Nitrile (NBR)	M6010178X12
	Fluorocarbon (FKM)	M6020112X12
5*	O-ring	
	Nitrile (NBR)	M6010005X12
	Fluorocarbon (FKM)	M6020001X12
6	Upper Spring Seat	M0253360X12
7	Spring	See Table 1
8	Upper Cover	M0298540X12
9	Lower Spring Seat	M0253380X12
10	Machine Screw	M5011018X12
11	Washer	M5055001X12
12	Filter	M4500367X12
13	Upper Diaphragm Plate	M0253390X12
14*	Diaphragm	
	Nitrile (NBR)	GG05785X012
	Fluorocarbon (FKM)	GG05785X022
15	Lower Diaphragm Plate	M0253410X12
16	Body	M0253310X12
17*	Orifice O-ring	
	Nitrile (NBR)	M6010003X12
	Fluorocarbon (FKM)	M6020126X12
18*	Lower Cover O-ring	
	Nitrile (NBR)	M6010098X12
	Fluorocarbon (FKM)	M6020132X12
19	Orifice	M0253440X12
20	Nut	M5002004X12
21	Lower Cover	M0298600X12
22*	Pad Holder	
	Polyurethane (PU)	ERAA11220A0
	Fluorocarbon (FKM)	M0279950X12
23	Stem	M0253430X12

*Recommended Spare Part

PRX Series Pilot (Figure 10) (continued)

Key	Description	Part Number
24	Nameplate	M0268080X12
25*	Stem O-ring	
	Nitrile (NBR)	M6010223X12
	Fluorocarbon (FKM)	M6020133X12
26	Upper Diaphragm Nut	M5028005X12
27	Damper Adjusting Screw with Hole	M0253480X12
28*	Restrictor/Damper O-ring	M6020054X12
29	Damper/Restrictor Plate	
	Types PRX/120 and PRX/120-AP	M0254400X12
	Types PRX/125 and PRX/125-AP	M0257930X12
30	Ring Nut	M0253490X12
31	Nameplate Screw	M5061001X12
32	Restrictor Adjusting Screw with Hole	M0253480X12
33	Plug (Types PRX/125 and PRX/125-AP only)	M0257920X12
34	Plug (Types PRX/125 and PRX/125-AP only)	M4500328X12
35	Spring Barrel Extension for AP	M0274100X12

Mounting Parts (Figure 9)

Standard Configurations

Key	Description	Part Number
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)	-----
77	Three-way valve	15A6017X112

Type SA/2 Pilot Supply Filter Regulator (Figure 11)

Key	Description	Part Number
	Parts Kits	
	Elastomer Parts Kits	
	(includes keys 6, 12, 13, 15 and 18)	
	Nitrile (NBR)	M2200250X12
	Fluorocarbon (FKM)	M2200739X12
1	Spring	M0192560X12
2	Socket Head Cap Screw	M5058003X12
3	Washer	M0248490X12
4	Plate	M0174470X12
5	Regulator Seat	M0200830X12
6*	O-ring	
	Nitrile (NBR)	M6010013X12
	Fluorocarbon (FKM)	M6020006X12
7	Body	M0297920X12
8	Filter Net	M0102200X12
9	Washer	M5057002X12
10	Nut	M5060005X12
11	Filter Cover	M0174411X12
12*	Felt	M0102210X12
13*	O-ring	
	Nitrile (NBR)	M6010095X12
	Fluorocarbon (FKM)	M6020069X12
14	Spring	M0105970X12
15*	Pad Holder Unit	
	Polyurethane (PU)	M0233370X12
	Fluorocarbon (FKM)	M0279850X12
16	Nameplate	M0300470X12
17	Screw Unit	M0200790X12
18*	Diaphragm	M0174460X12
19	Regulator Cover	M0239890X12
20	Spring Washer	M5001003X12
21	Nut	M5006012X12

Table 3. Type FL Start-Up Repair Kit Part Numbers

DESCRIPTION	DISK MATERIAL	NPS 1 / DN 25	NPS 2 / DN 50	NPS 3 / DN 80	NPS 4 / DN 100	NPS 6 / DN 150	NPS 8 / DN 200	NPS 10 / DN 250
Type FL or FL-SR or FL-SR/SRS	Nitrile (NBR)	M2600750X12	M2600754X12	M2600758X12	M2600762X12	M2600766X12	M2600948X12	ERCA00598A0
	Fluorocarbon (FKM)	M2600751X12	M2600755X12	M2600759X12	M2600763X12	M2600767X12	M2600988X12	ERCA00571A0
Type FL-SRII or FL-SRII/SRS	Nitrile (NBR)	M2601115X12	M2601118X12	M2601121X12	M2601124X12	M2601127X12	M2601130X12	ERCA00598A0
	Fluorocarbon (FKM)	M2601114X12	M2601117X12	M2601120X12	M2601097X12	M2601098X12	M2601099X12	ERCA00571A0
Type FL or FL-SR or FL-SR/SRS or FL-SRII or FL-SRII/SRS	Polyurethane (PU)	RFL1XNFPU12	RFL2XNFPU12	RFL3XNFPU12	RFL4XNFPU12	RFL6XNFPU12	RFL8XNFPU12	-----

Table 4. Type FL Parts Kit Part Numbers

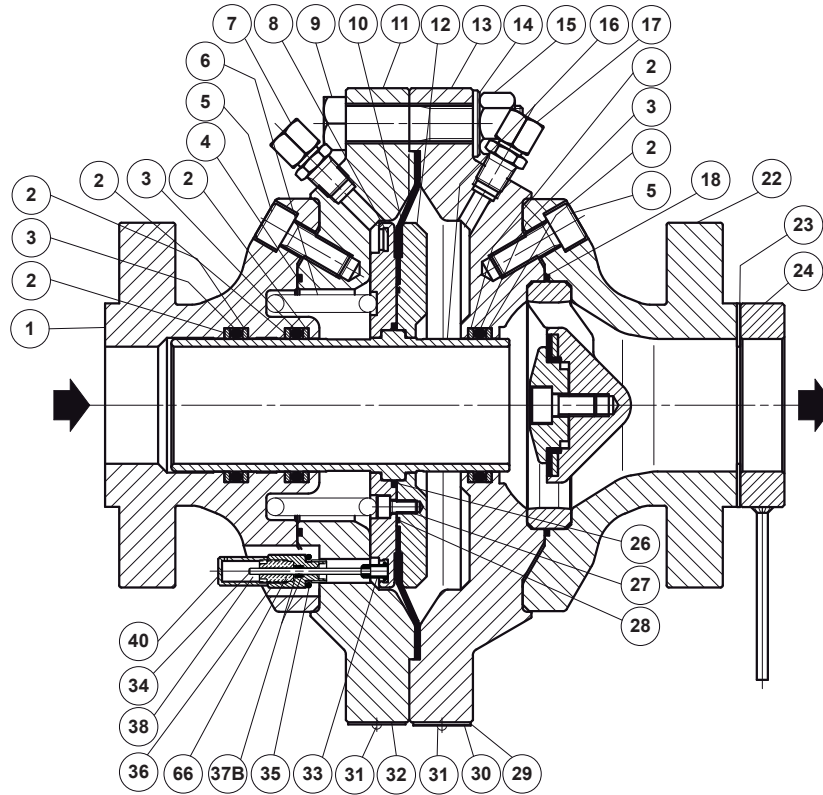
DESCRIPTION	DISK MATERIAL	NPS 1 / DN 25	NPS 2 / DN 50	NPS 3 / DN 80	NPS 4 / DN 100	NPS 6 / DN 150	NPS 8 / DN 200	NPS 10 / DN 250
Type FL or FL-SR or FL-SR/SRS	Nitrile (NBR)	M2200750X12	M2200754X12	M2200758X12	M2200762X12	M2200766X12	M2200948X12	ERCA00558A0
	Fluorocarbon (FKM)	M2200751X12	M2200755X12	M2200759X12	M2200763X12	M2200767X12	M2200988X12	ERCA00525A0
Type FL-SRII or FL-SRII/SRS	Nitrile (NBR)	M2201115X12	M2201118X12	M2201121X12	M2201124X12	M2201127X12	M2201130X12	ERCA00558A0
	Fluorocarbon (FKM)	M2201114X12	M2201117X12	M2201120X12	M2201097X12	M2201098X12	M2201099X12	ERCA00525A0
Type FL or FL-SRII	Polyurethane (PU)	RFL1XNFPU22	RFL2XNFPU22	RFL3XNFPU22	RFL4XNFPU22	RFL6XNFPU22	RFL8XNFPU22	-----
Type FL-SRII/SRS							RFL8XNFPU32	

Table 5. Type FL Travel Indicator Assemblies Part Numbers

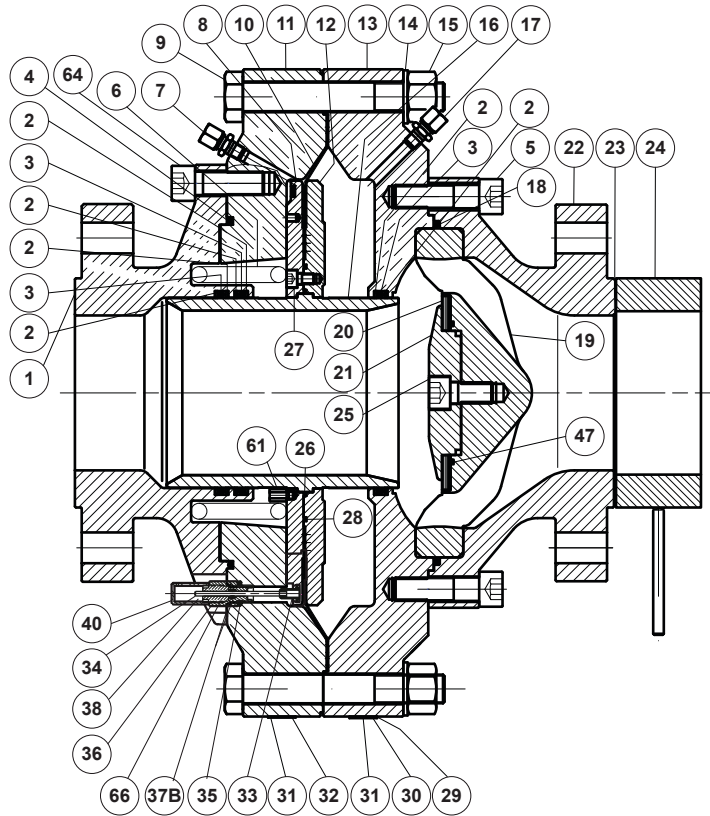
DESCRIPTION	MATERIAL	NPS 1 / DN 25	NPS 2 / DN 50	NPS 3 / DN 80	NPS 4 / DN 100	NPS 6 / DN 150	NPS 8 / DN 200	NPS 10 / DN 250
Travel Indicator	Fluorocarbon (FKM)	ERSA01557A0	ERSA01558A0	ERSA01559A0	ERSA01561A0	ERSA01569A0	ERSA01572A0	ERAA06426A1
Plug Only	----	Plug: M0305570X12 O-ring: M6020004X12				M2007253X12	Plug: ERCA04404A0 O-ring: ERCA00488A0	

Table 6. Polyurethane (PU) Seat Conversion Kit Part Numbers

DESCRIPTION	NPS 1 / DN 25	NPS 2 / DN 50	NPS 3 / DN 80	NPS 4 / DN 100	NPS 6 / DN 150	NPS 8 / DN 200
No Silencer	RFL1PUX0012	RFL2PUX0012	RFL3PUX0012	RFL4PUX0012	RFL6PUX0012	RFL8PUX0012
With Silencer	RFL1PUX0022	RFL2PUX0022	RFL3PUX0022	RFL4PUX0022	RFL6PUX0022	RFL8PUX0022

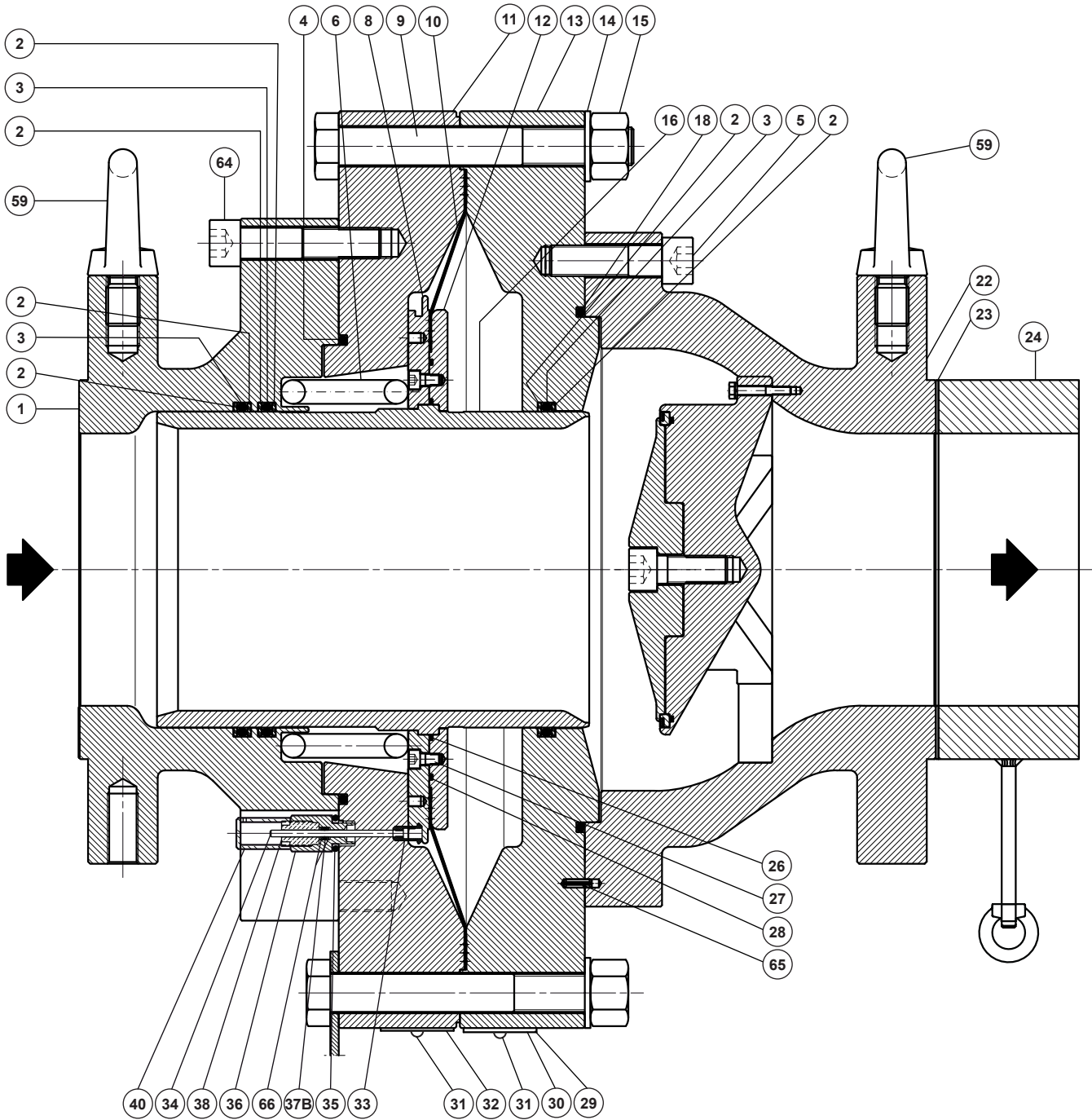


NPS 1 TO 4 / DN 25 TO 100



NPS 6 / DN 150

Figure 6. Type FL Main Valve Assembly

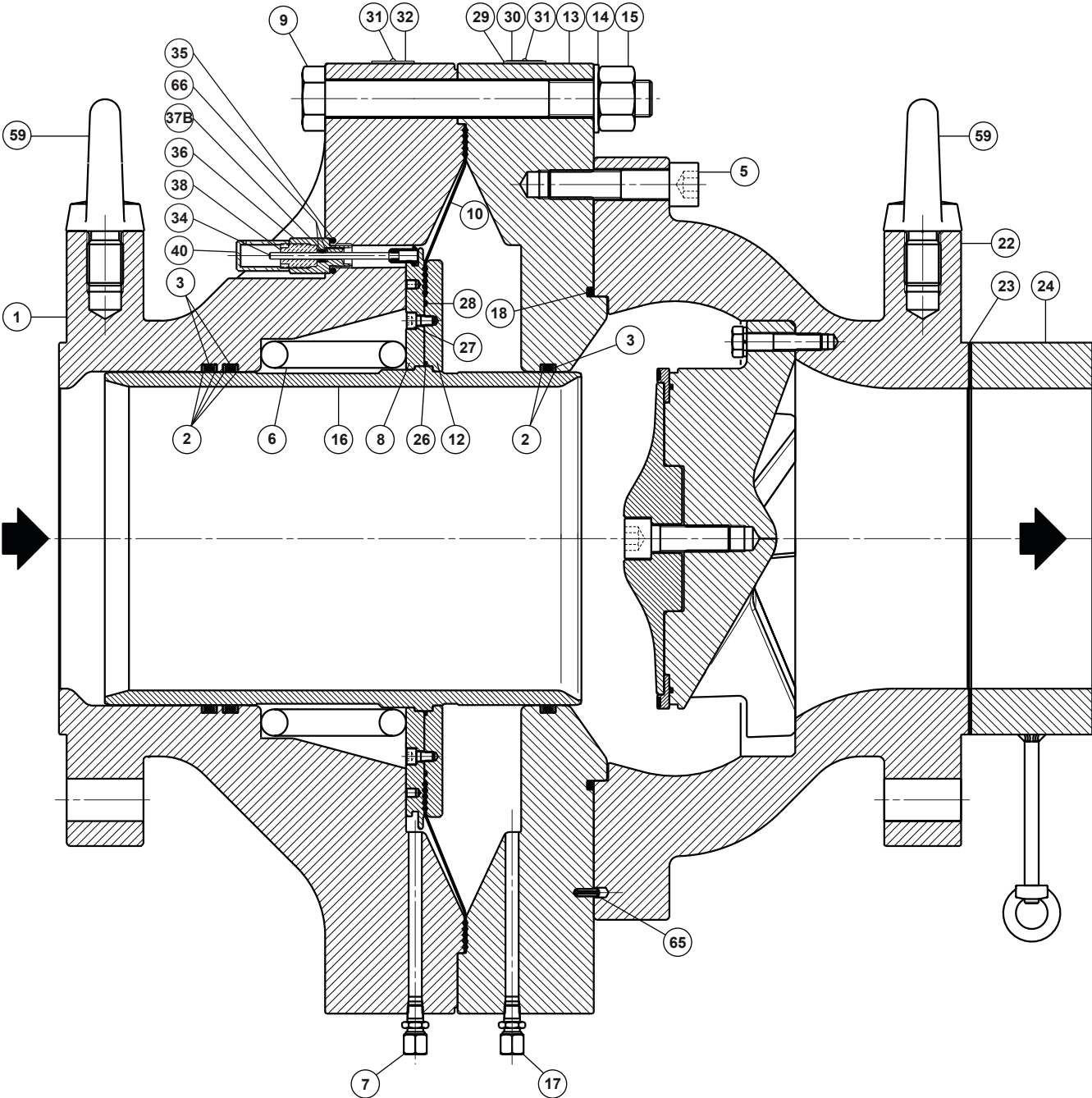


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LM/1403

NPS 8 / DN 200

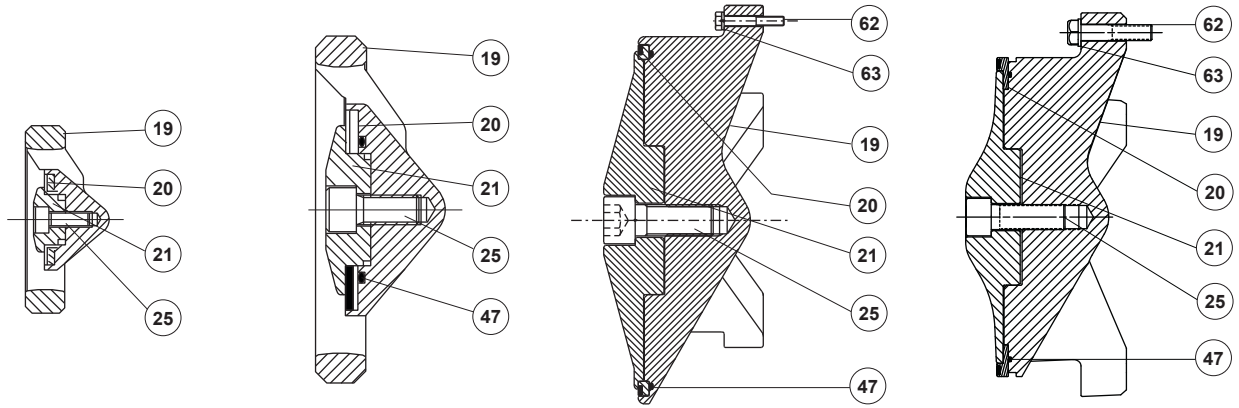
Figure 6. Type FL Main Valve Assembly (continued)



North America Only

NPS 10 / DN 250

Figure 6. Type FL Main Valve Assembly (continued)

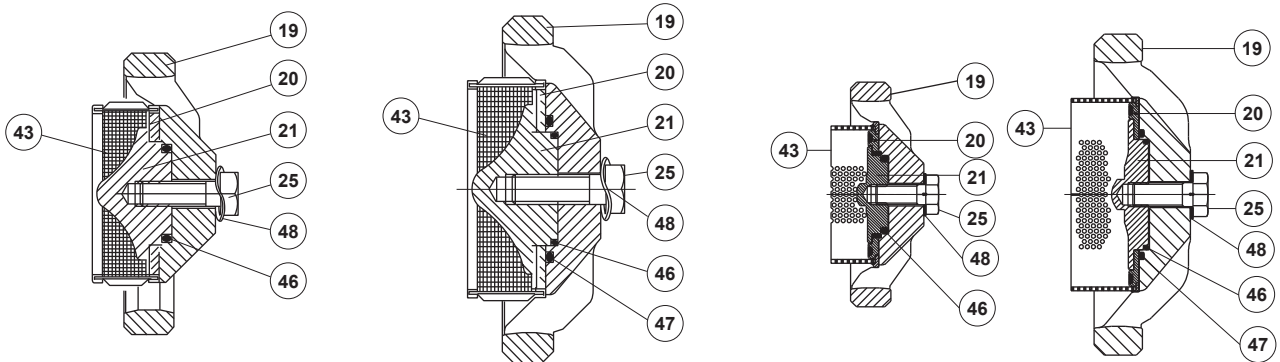


NPS 1 AND 2 / DN 25 AND 50
WITHOUT SILENCER

NPS 3, 4 AND 6 /
DN 80, 100 AND 150
WITHOUT SILENCER

NPS 8 / DN 200
WITHOUT SILENCER

NPS 10 / DN 250
WITHOUT SILENCER

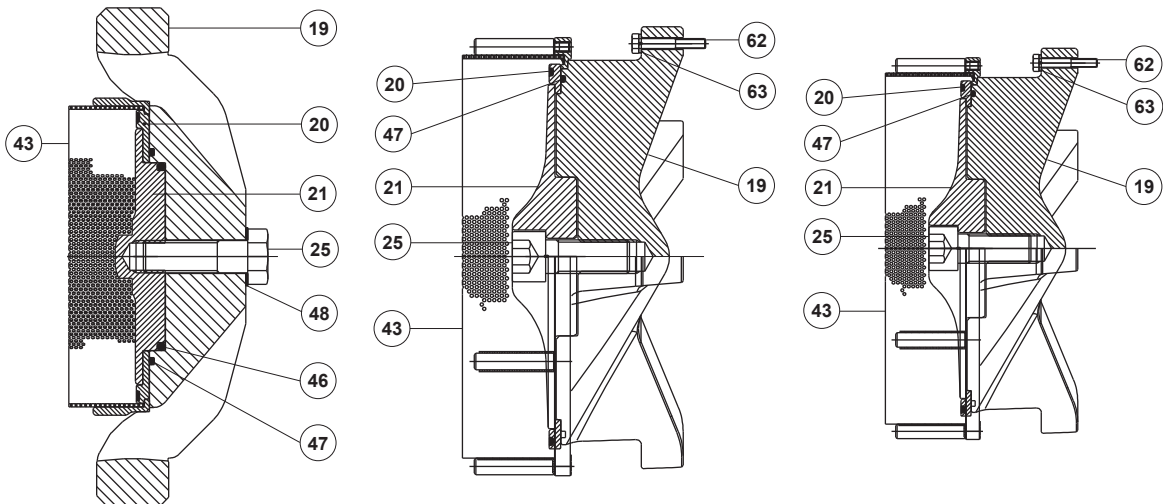


NPS 1 AND 2 / DN 25 AND 50
WITH TYPE SR

NPS 3, 4 AND 6 / DN 80, 100 AND 150
WITH TYPE SR

NPS 1 AND 2 / DN 25 AND 50
WITH TYPE SRII

NPS 3 / DN 80
WITH TYPE SRII



NPS 4 AND 6 / DN 100 AND 150
WITH TYPE SRII

NPS 8 / DN 200
WITH TYPE SRII

NPS 10 / DN 250
WITH TYPE SRII

FOR NITRILE (NBR) AND FLUOROCARBON (FKM) DISKS

Figure 6. Type FL Main Valve Assembly (continued)

Type FL

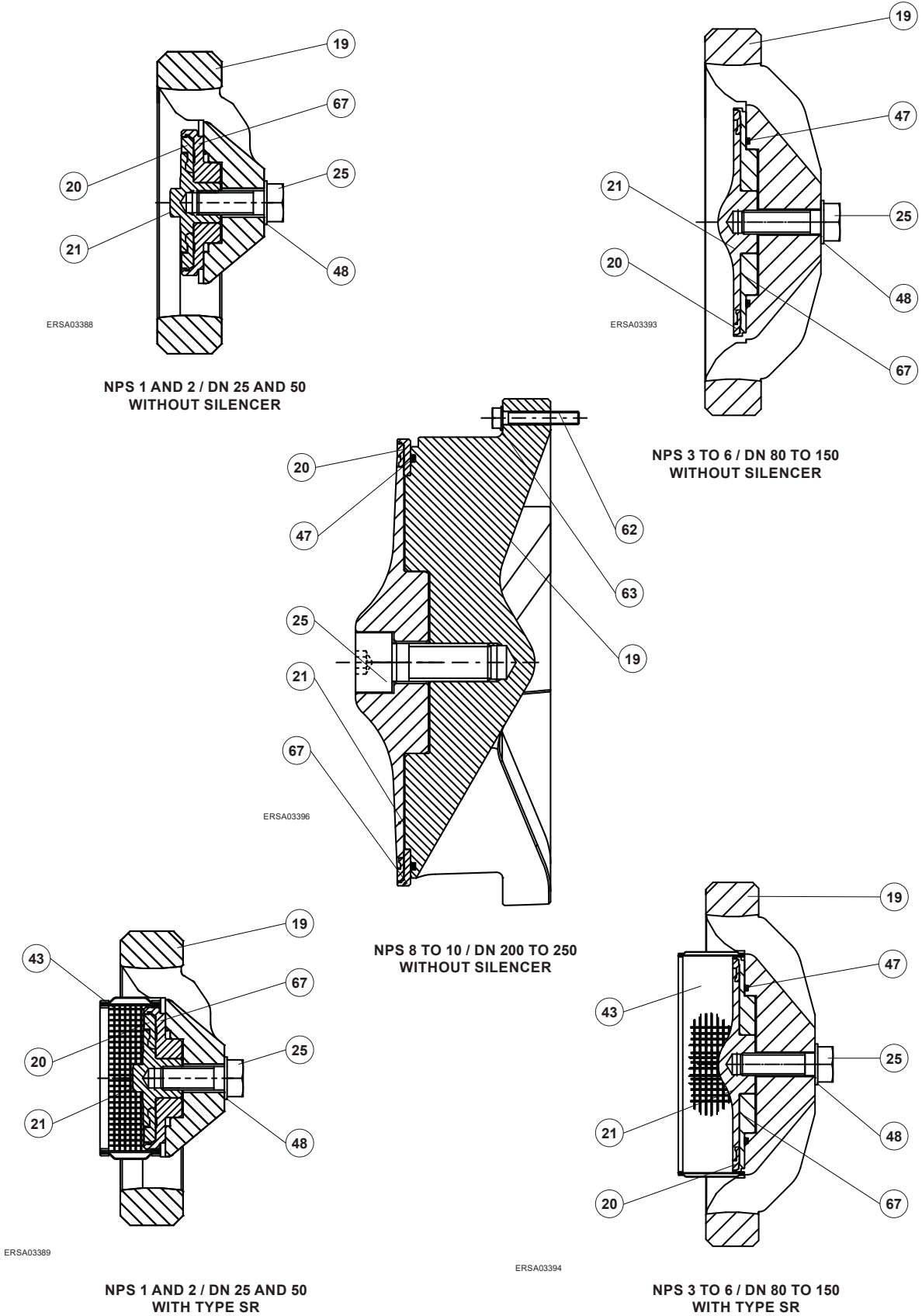
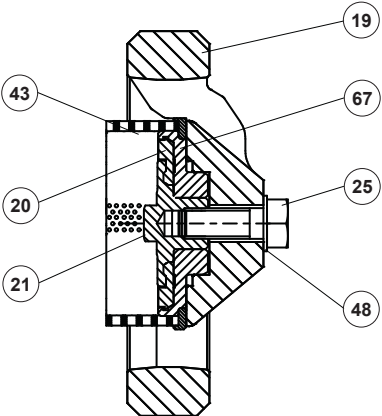


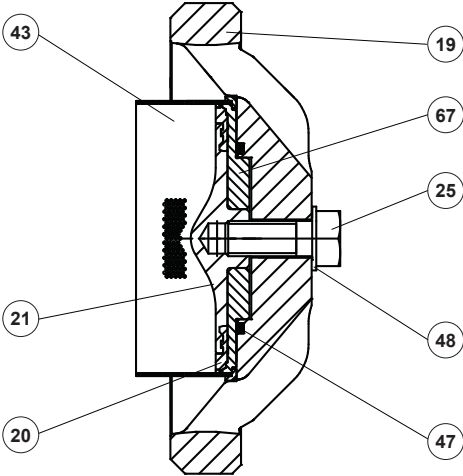
Figure 7. Polyurethane (PU) Main Valve Assembly

North America Only



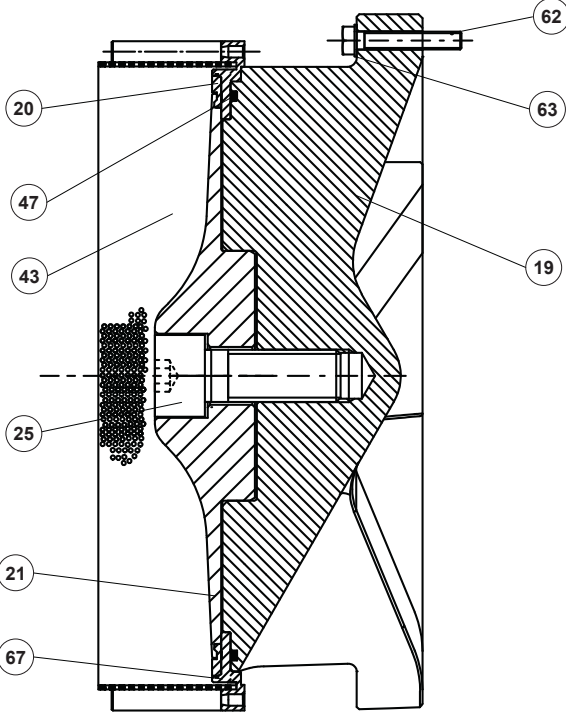
ERSA03390

NPS 1 AND 2 / DN 25 AND 50
WITH TYPE SR II



ERSA03392

NPS 3 TO 6 / DN 80 TO 150
WITH TYPE SR II



ERSA03450

NPS 8 TO 10 / DN 200 TO 250
WITH TYPE SR II

Figure 7. Polyurethane (PU) Main Valve Assembly (continued)

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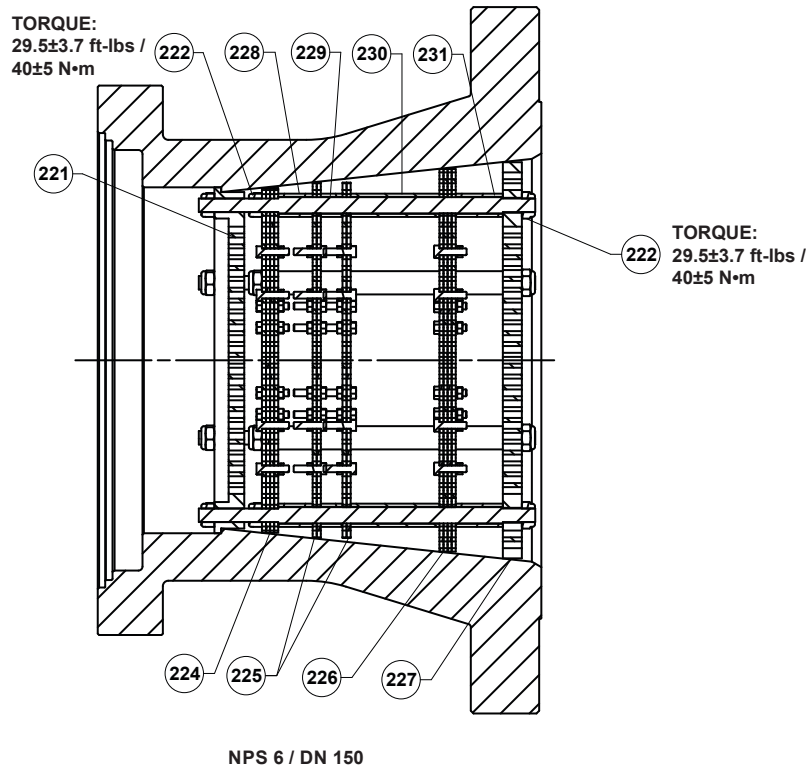
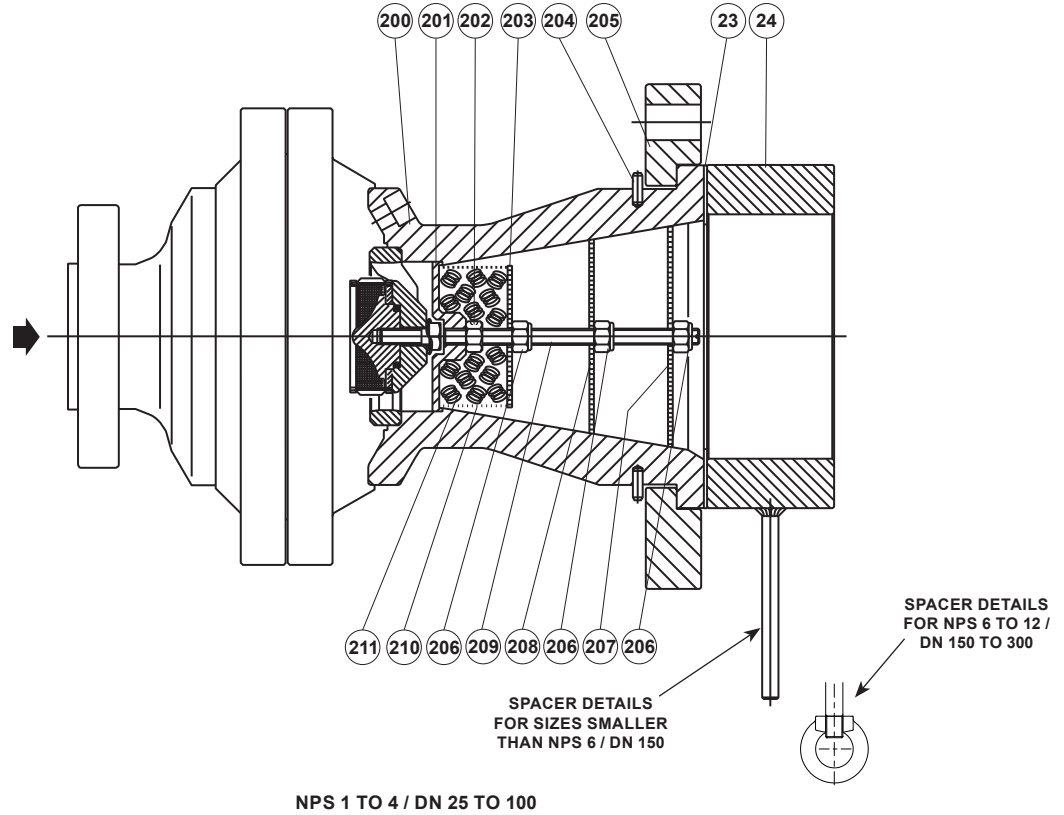
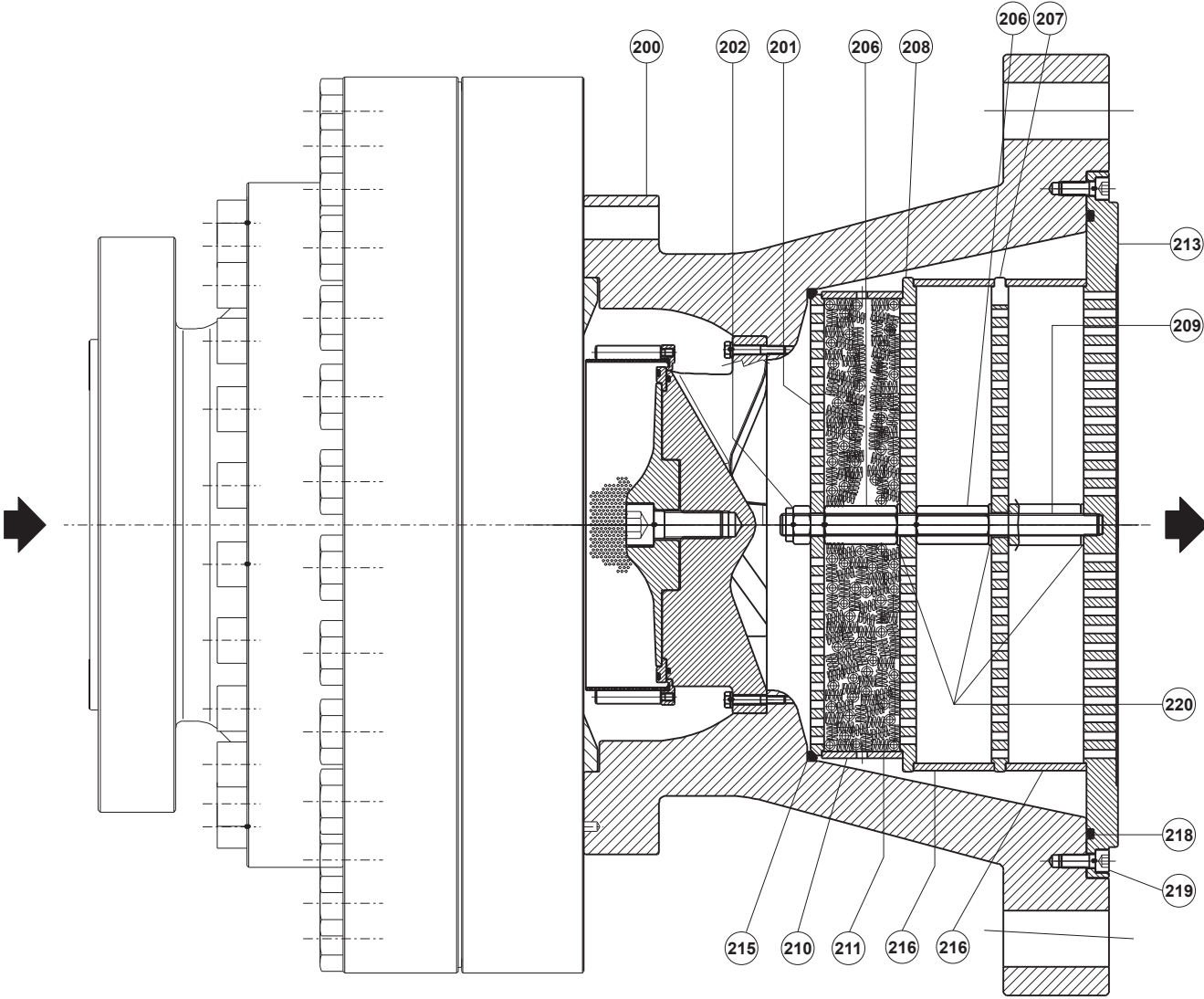


Figure 8. Type SRS Assembly

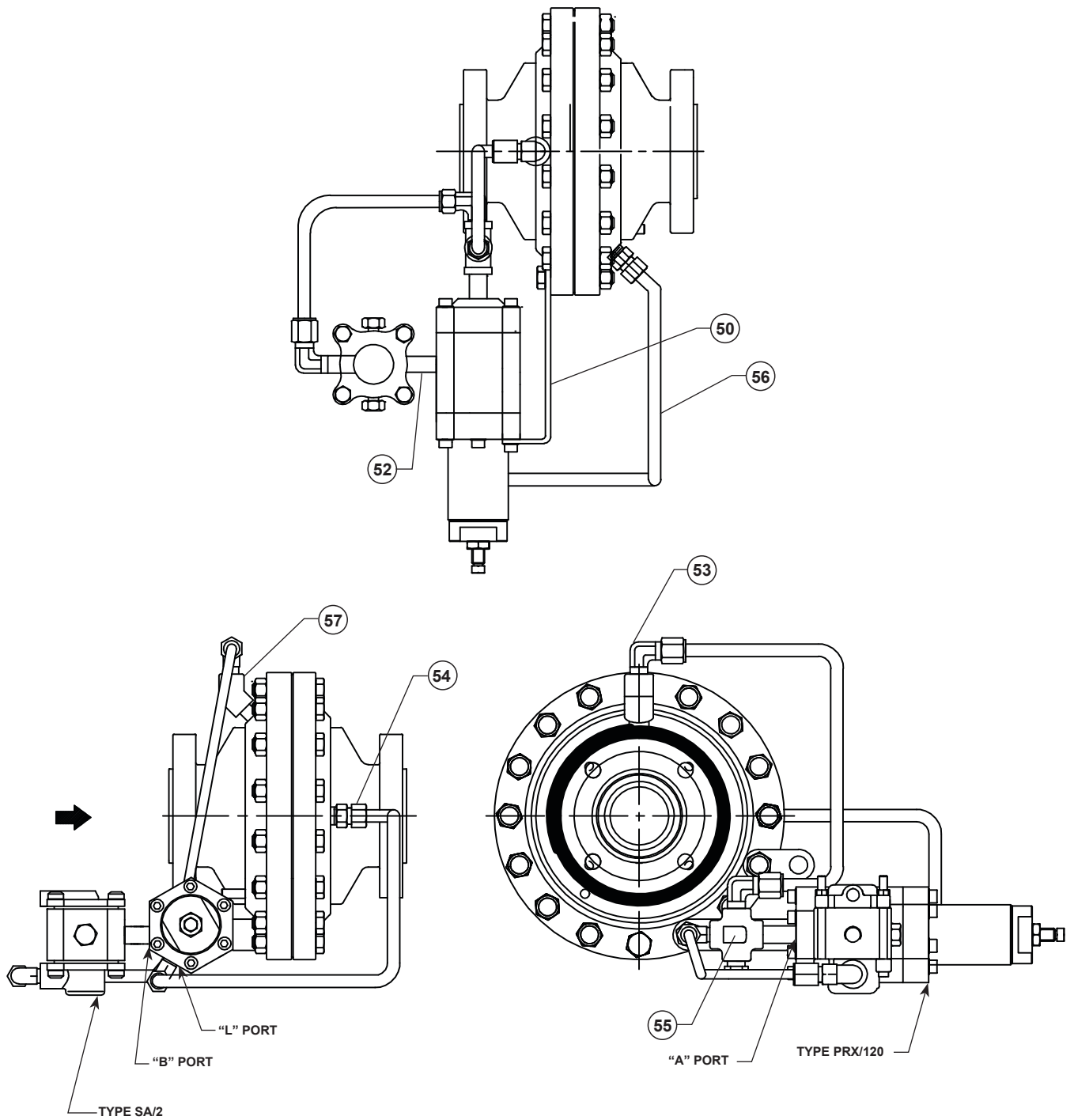


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NPS 8 / DN 200

Figure 8. Type SRS Assembly (continued)

Type FL

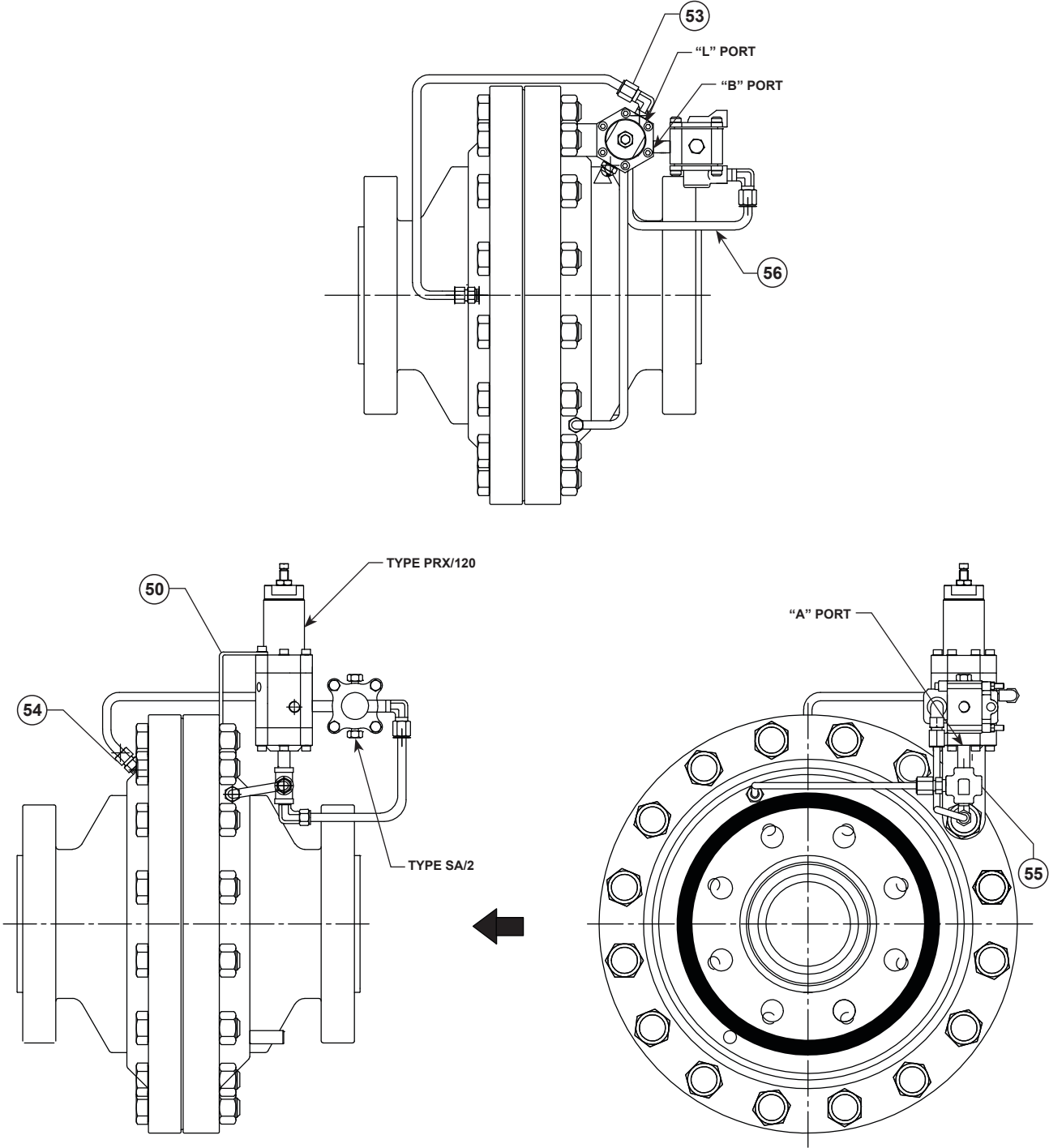


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GE46220_A

NPS 1 AND 2 / DN 25 AND 50

Figure 9. Type FL Single Pilot Mounting Assembly

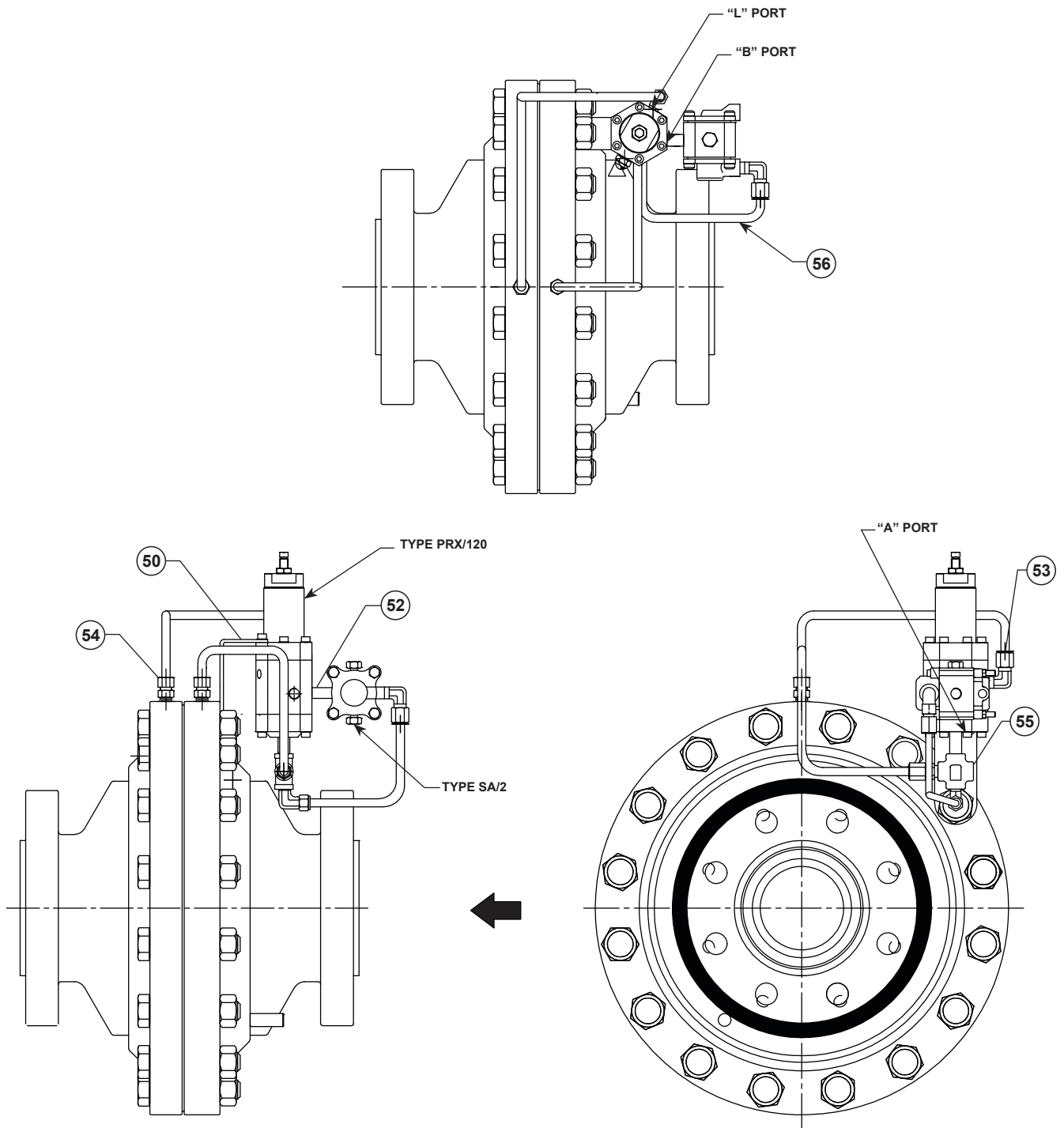


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GE45181_B

NPS 3 AND 4 / DN 80 AND 100

Figure 9. Type FL Single Pilot Mounting Assembly (continued)

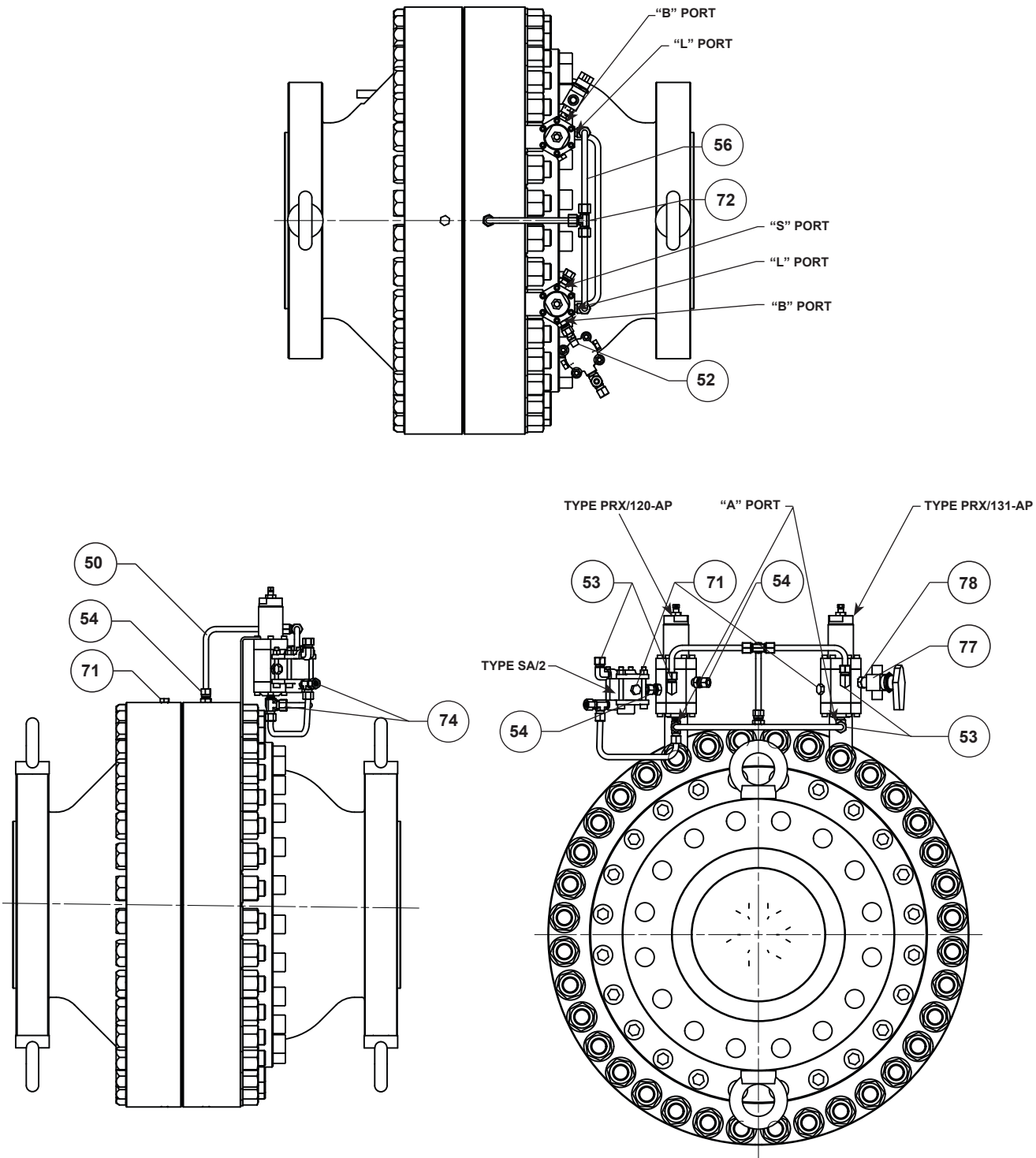


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GE45213_B

NPS 6 AND 8 / DN 150 AND 200

Figure 9. Type FL Single Pilot Mounting Assembly (continued)

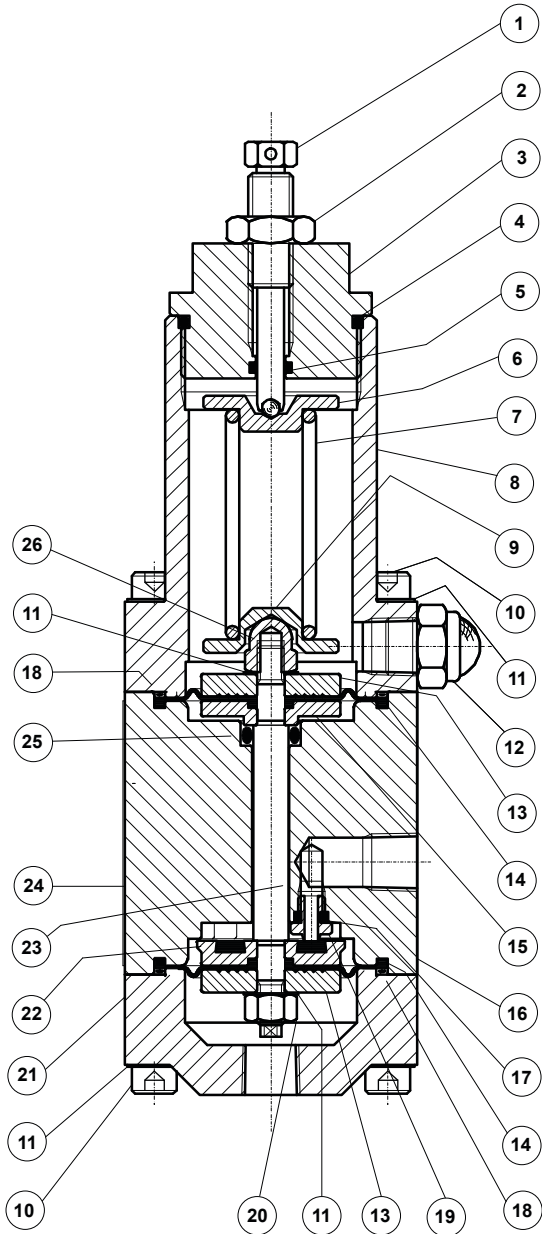


NOTE: TYPE PRX/131 BOOSTER VALVE IS INSTALLED AS STANDARD FOR NPS 10 / DN 250

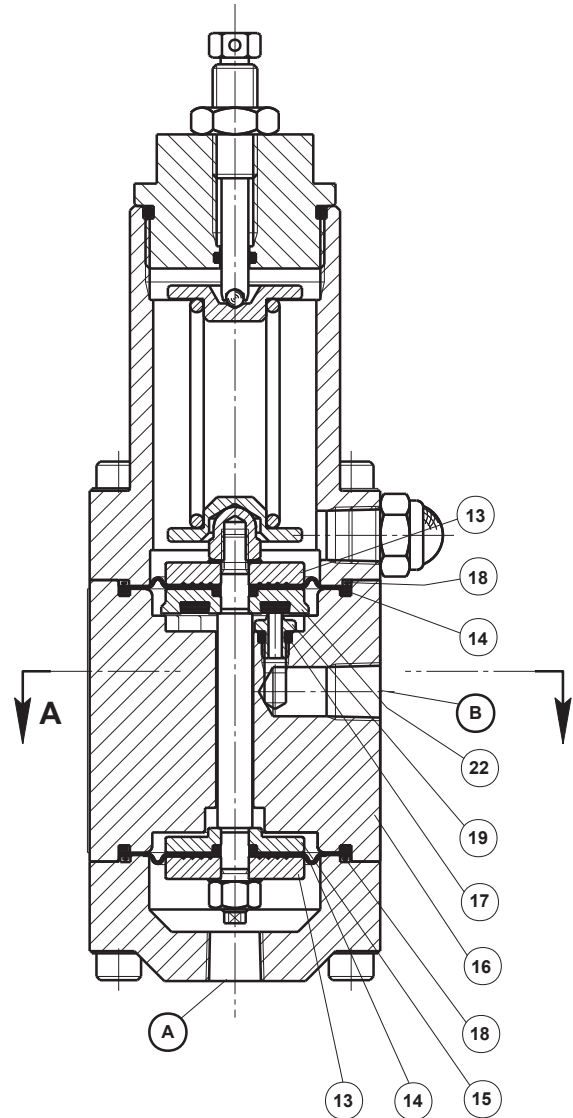
NPS 10 / DN 250

Figure 9. Type FL Single Pilot Mounting Assembly (continued)

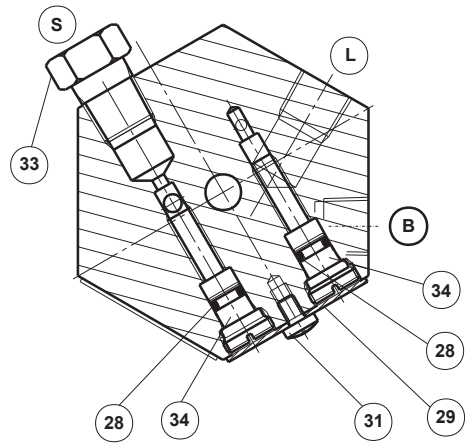
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TYPE PRX/120 OR PRX/125



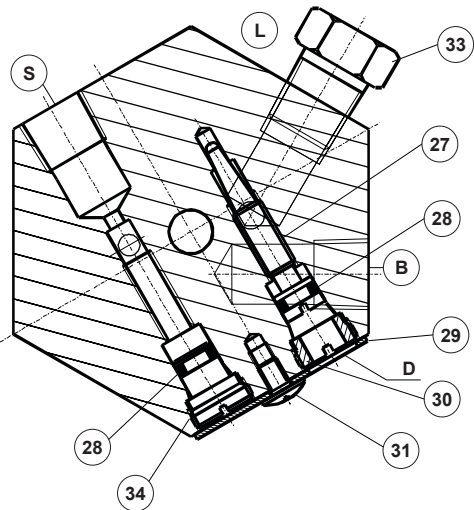
TYPE PRX/131 OR PRX/131-AP ASSEMBLY



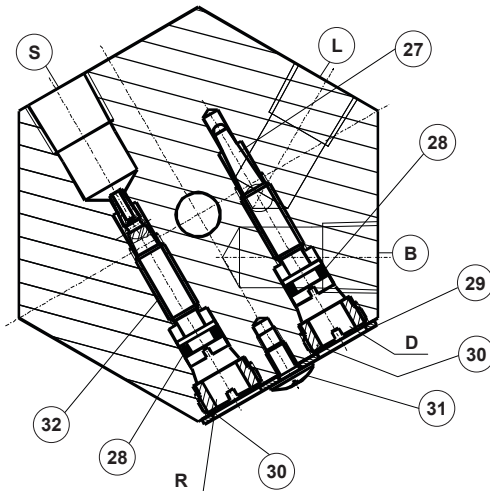
SECTION A-A

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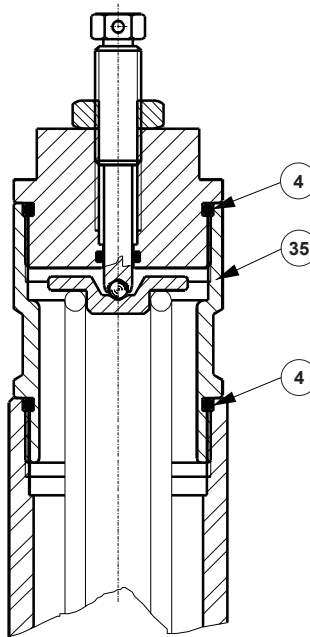
Figure 10. PRX Series Pilot Assembly



TYPE PRX/125 OR PRX/125-AP



TYPE PRX/120 OR PRX/120-AP



TYPE PRX/120-AP OR PRX/125-AP

Figure 10. PRX Series Pilot Assembly (continued)

Table 9. Type PRX/120 Connections

CODE	PORT DESCRIPTION
A	Downstream Sense Line
B	Pilot feed
S	Outlet discharge
L	To regulator loading pressure chamber

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Type FL

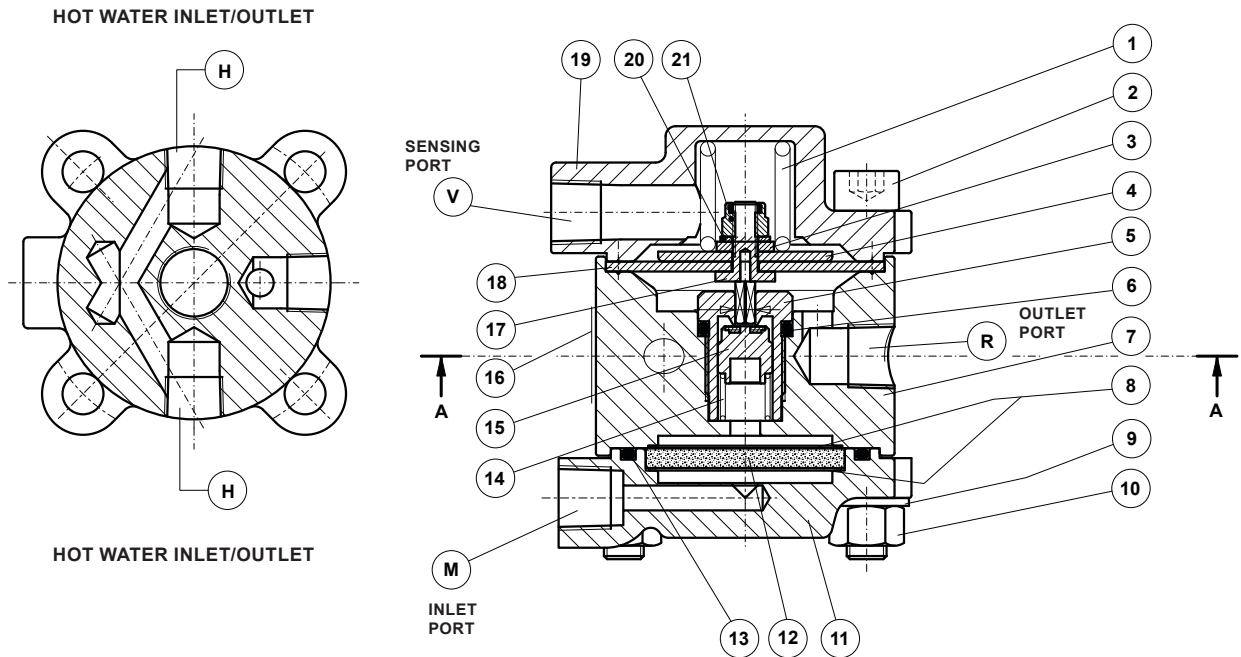


Figure 11. Type SA/2 Pilot Supply Filter Assembly

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