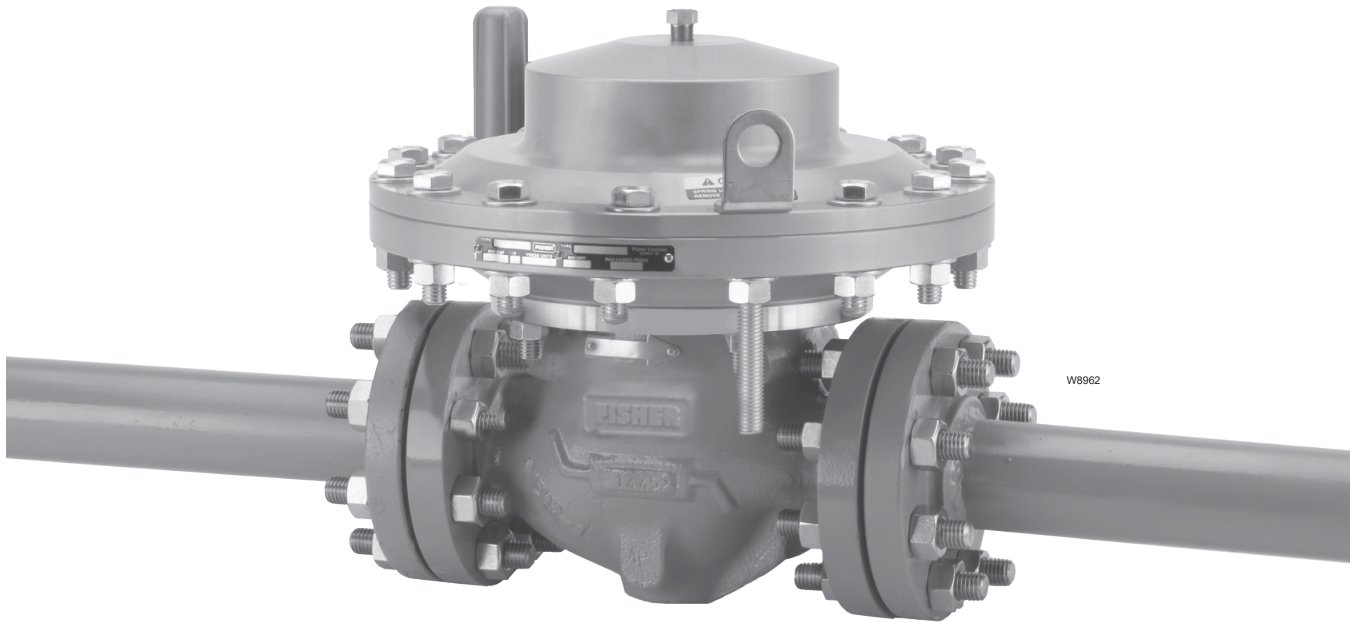


August 2019

# Type EZZ Relief Valve or Backpressure Regulator



*Figure 1. Type EZZ Relief or Backpressure Regulator*

## Introduction

### Scope of the Manual

This manual provides installation, startup, maintenance and parts ordering information for the Type EZZ relief valve or backpressure regulator. Information on other equipment used with this regulator is found in separate manuals.

### Product Description

Type EZZ relief valves or backpressure regulators are accurate pilot-operated, pressure balanced and soft seated regulators. They are designed for use in natural gas distribution applications such as district regulating stations and commercial/industrial meter sets. They provide low differential, smooth, reliable operation, tight shutoff and long life.

# Type EZL

## Specifications

The Specifications section lists the specifications for Type EZL relief valve or backpressure regulator. Factory specifications for specific relief valve or backpressure regulator constructions are stamped on the nameplate fastened to either the main actuator or the pilot spring case.

<b>Body Sizes, End Connection Styles and Pressure Ratings<sup>(1)</sup></b> See Table 1  <b>Maximum Pressures<sup>(1)</sup></b> <b>Inlet and Outlet (Design):</b> 290 psig / 20 bar <b>Emergency (Design Casing):</b> 290 psig / 20 bar <b>Operating Differential:</b> 290 psid / 20 bar d  <b>Relief Set Pressure Ranges</b> See Table 2	<b>Minimum Differential Pressure<sup>(1)</sup></b>								
	<table border="1"> <thead> <tr> <th rowspan="2">TRIM, PERCENT OF CAPACITY</th> <th colspan="2">MINIMUM DIFFERENTIAL FOR FULL STROKE</th> </tr> <tr> <th>2 In. / DN 50</th> <th>3 and 4 In. / DN 80 and 100</th> </tr> </thead> <tbody> <tr> <td>100</td> <td>2.9 psid / 0.204 bar d</td> <td>2.9 psid / 0.204 bar d</td> </tr> </tbody> </table>		TRIM, PERCENT OF CAPACITY	MINIMUM DIFFERENTIAL FOR FULL STROKE		2 In. / DN 50	3 and 4 In. / DN 80 and 100	100	2.9 psid / 0.204 bar d
TRIM, PERCENT OF CAPACITY	MINIMUM DIFFERENTIAL FOR FULL STROKE								
	2 In. / DN 50	3 and 4 In. / DN 80 and 100							
100	2.9 psid / 0.204 bar d	2.9 psid / 0.204 bar d							
	<b>Temperature Capabilities<sup>(1)</sup></b> <b>Nitrile (NBR) Version:</b> -20 to 180°F / -29 to 82°C <b>Fluorocarbon (FKM) Version:</b> 0 to 180°F / -18 to 82°C  <b>Options</b> <ul style="list-style-type: none"> <li>• Travel Indicator</li> </ul>								

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

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

MAIN VALVE BODY SIZE	MAIN VALVE BODY MATERIAL	END CONNECTION STYLE	STRUCTURAL DESIGN RATING <sup>(1)</sup>	
			psig	bar
2, 3 and 4 in. / DN 50, 80 and 100	WCC Steel	NPT <sup>(2)</sup> or SWE <sup>(2)</sup>	1500	103
		CL150 RF	290	20.0
		CL300 RF	750	51.7
	Cast iron	CL600 RF or BWE	1500	103
		NPT <sup>(2)</sup>	400	27.6
		CL125 FF	200	13.8

1. Structural design rating is the rating for the main valve body. The Type EZL complete assembly is limited to 290 psig / 20 bar.  
 2. Available only on 2 in. / DN 50 body.

**Table 2. Relief Set Pressure Ranges**

PILOT TYPE	RELIEF SET PRESSURE RANGE <sup>(1)</sup>		SPRING PART NUMBER	SPRING COLOR	SPRING WIRE DIAMETER		SPRING FREE LENGTH	
	psig	bar			In.	mm	In.	mm
6358B	3 to 18	0.21 to 1.2	1B986027212	Green	0.120	3.05	2.12	53.8
	15 to 40	1.0 to 2.8	1E392527022	Yellow	0.148	3.76	2.00	50.8
	35 to 125	2.4 to 8.6	1K748527202	Red	0.187	4.75	2.19	55.6
6358EB	85 to 140	5.9 to 9.6	17B1261X012	Green	0.225	5.72	3.70	94.0
	130 to 200	9.0 to 13.8	17B1263X012	Blue	0.262	6.65	3.85	97.8
	180 to 350	12.4 to 24.1	17B1264X012	Red	0.294	7.47	4.22	107

1. See the Main Valve Body Sizes, End Connections, Structural Design Ratings tables and the Main Valve Diaphragm and Spring Pressure Ratings table for additional pressure ratings.

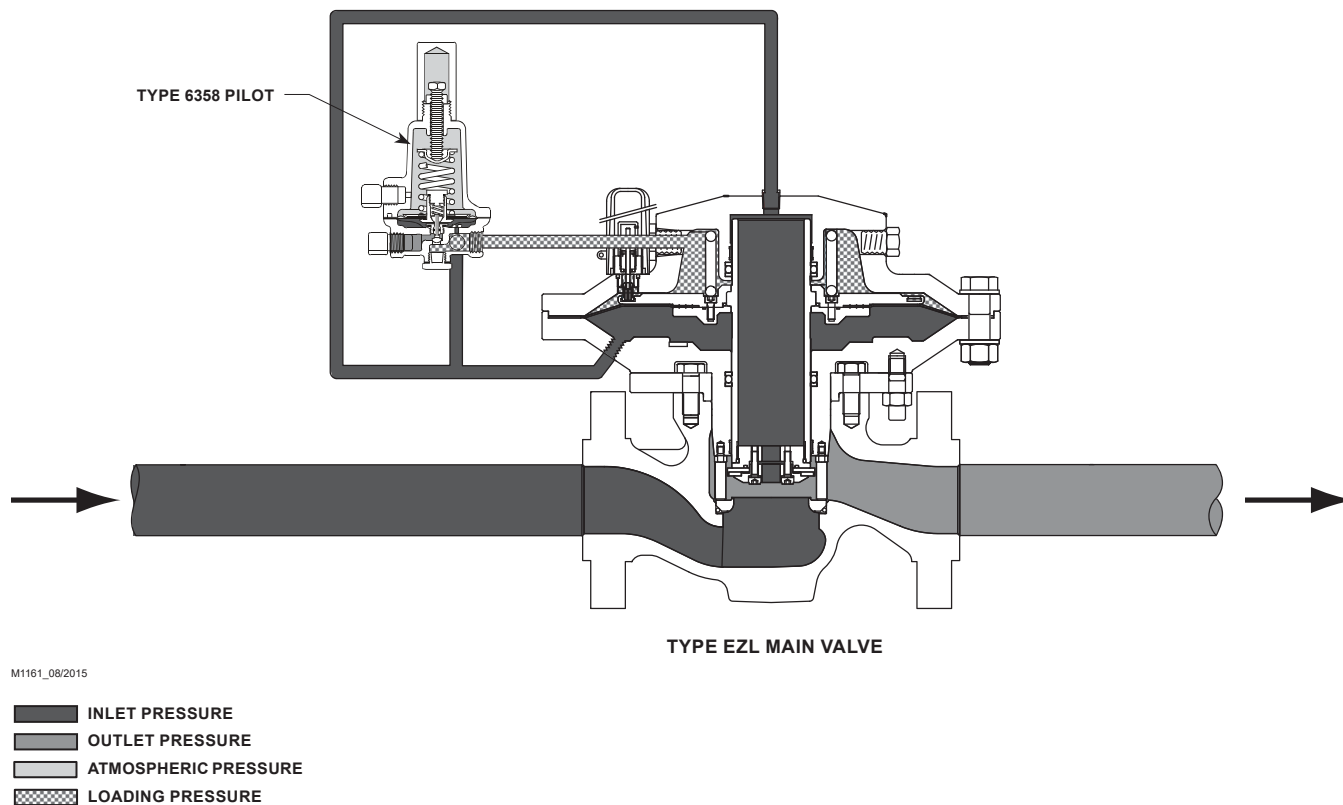


Figure 2. Type EZL Relief Valve or Backpressure Regulator

## Principle of Operation

A pressure relief valve is a throttling pressure control device that opens and closes to ensure the inlet pressure does not rise above a predetermined pressure. Fisher™ relief valves cannot be used as ASME safety relief valves.

A backpressure regulator is a device that controls and responds to changes in the upstream pressure. It functions the same as a relief valve in that it opens on increasing upstream pressure.

### Relief Valve

As long as the inlet pressure is below the set pressure, the pilot control spring keeps the pilot valve plug closed. Inlet pressure passes through the pilot restriction and registers as loading pressure on top of the main valve diaphragm and plug assembly. Force from the main spring, in addition to pilot loading pressure, provide downward loading pressure to keep the main valve diaphragm and plug assembly tightly shutoff.

When the inlet pressure rises above the set pressure, the pressure on the pilot diaphragm overcomes the pilot control spring and opens the pilot valve plug. The pilot then exhausts the loading pressure from the top of the main valve diaphragm and plug assembly. The pilot continuously

exhausts gas when the inlet pressure is above the set pressure. The inlet pressure unbalance overcomes the main spring force and opens the diaphragm and plug assembly.

As the inlet pressure drops below the set pressure, the pilot control spring closes the pilot valve plug and the exhaust to atmosphere stops. Force from the main spring, along with pilot loading pressure, pushes the diaphragm and plug assembly onto the knife edged seat, producing tight shutoff.

### Backpressure Regulator

As long as inlet pressure remains below setpoint, the pilot control spring keeps the pilot valve plug closed. Inlet pressure passes through the upper port around the upper portion of the valve plug and then through the hollow passage in that valve plug. Force from the main spring, in addition to pilot loading pressure, provide downward loading pressure to keep the main valve diaphragm and plug assembly tightly shut off.

When inlet pressure rises above the set pressure, pressure on the pilot diaphragm overcomes the control spring to close the upper port and stroke the valve plug to open the lower port. The pilot exhausts loading pressure from the top of the main valve diaphragm. Inlet pressure unbalance overcomes the main spring force to open the diaphragm and plug assembly.

# Type EZL

While the main valve is throttling, the upper port of the pilot stays closed. The pilot exhausts only when it repositions the main valve. As inlet pressure drops below setpoint, the pilot control spring overcomes the diaphragm force to stroke the valve plug down to close the lower port and open the upper port. Force from the main spring, along with pilot loading pressure, pushes the diaphragm and plug assembly onto the knife edged seat, producing tight shutoff.

## Installation



### WARNING

**Personal injury or equipment damage, due to bursting of pressure-containing parts may result if this relief valve or backpressure 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. Also, be sure the installation is in compliance with all applicable codes and regulations.**

**Additionally, physical damage to the relief valve or backpressure 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 relief valve or backpressure regulator in a safe location.**

1. Only personnel qualified through training and experience should install, operate and maintain a relief valve or backpressure regulator. Before installation, make sure that there is no damage to or debris in the main valve body or pilot. Also, make sure that all tubing and piping are clean and unobstructed.
2. Install the relief valve or backpressure regulator so that the flow arrow on the main valve matches the flow direction of process fluid through the regulator. Type EZL 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 end connections. Use gaskets between pipeline and regulator flanges when installing a relief valve or backpressure 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 relief valve or backpressure regulator.



### WARNING

**When used in relief valve service, the Type EZL main valve and pilot both exhaust gas. In hazardous or flammable gas service, personal injury, death or property damage may occur due to fire or explosion of vented gas that has accumulated. To prevent such injury or damage, provide piping or tubing to vent the gas to a safe location. The exhaust piping must be designed and installed to guard against excessive flow restriction. This piping must be protected against condensation or debris that could clog it.**

**For safety during shutdown, vent valves are required immediately upstream and downstream of the main valve on a backpressure or bypass installation.**

4. A relief valve always must be installed so that the pilot will exhaust properly and into a safe place. The pilot spring case vent must be kept open to atmospheric pressure. Protect this vent from icing, moisture or other blockage as required. If the pressed-in vent assembly remains in the pilot exhaust port, it must be pointed down if possible or otherwise protected.
5. If the exhaust is to be piped to the main valve outlet or remotely vented, remove the vent assembly and install obstruction-free tubing or piping with a minimum number of bends into the 1/4 in. NPT pilot exhaust connection. Provide protection on a remote vent by installing a screened vent cap into the remote end of the vent pipe.
6. If using pipe, apply a good grade of pipe compound to the male pipe threads before making the connection. Install tubing or piping into the appropriate pilot connection.
7. Set pressure is defined as the pressure at which the pilot starts-to-discharge. The set pressure of a unit is adjusted by changing the control spring compression on the pilot.
8. The pilot is factory-set for the set pressure specified on the order. If no setting is specified, set pressure is factory-set at midrange of the spring range.

## Startup and Shutdown



### CAUTION

**If pressure is introduced first to the main valve before the pilot, the main valve may go wide-open and subject the downstream system to full inlet pressure.**

**Note**

**The maximum inlet pressure for specific constructions are given in Specifications section. Use a pressure gauge to monitor inlet pressure during startup.**

**Relief Installation***Startup*

1. Close vent valve (not shown).
2. Slowly open block valve and hand valve, if installed.
3. Adjust the pilot as needed.

*Shutdown*

1. Close block valve and hand valve, if installed.
2. Slowly open vent valve (not shown).

**Backpressure Installation***Startup*

1. Close upstream and downstream vent valves (not shown).
2. Slowly open upstream block valve first and then slowly open downstream block valve.
3. Adjust the pilot as needed. If the pilot is not piped downstream, make sure the pilot exhaust is pointed in the correct direction.

*Shutdown*

1. Close upstream block valve first and then close the downstream block valve.
2. Open downstream and upstream vent valves (not shown).

**Pilot Adjustment (Figures 5 and 6)**

If set pressure adjustment is necessary, monitor relief (inlet) pressure with a gauge during the adjustment procedure. Remove the pilot closing cap (key 12) and loosen the locknut (key 11). Turn the adjusting screw (key 10) into the spring case to increase the set pressure. Turn the adjusting screw out of the spring case to decrease the set pressure. When adjustment is completed, tighten the locknut to lock the adjusting screw in position and replace the pilot closing cap.

**Maintenance**

Relief valve or backpressure regulator parts are subject to normal wear and must be inspected periodically and replaced as necessary. Due to the care Fisher™ takes

in meeting all manufacturing requirements (heat treating, dimensional tolerances, etc.), use only replacement parts manufactured or furnished by Emerson. Also when lubrication is required, use a good quality lubricant and sparingly coat the recommended parts.

The frequency of inspection and replacement depends upon the severity of service conditions and upon applicable codes, government regulations and company standards.

**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.**

**CAUTION**

**When disassembling the upper and lower actuator, always remove the long cap screws (key 39) last to allow spring tension force to be released in a slow and controlled manner.**

**Use proper lifting techniques, when lifting the upper and lower actuator casings (keys 11 and 5) off the Type EZL body (key 1). The 2 in. / DN 50 actuator assembly weighs more than 40 lbs / 18 kg.**

**Type EZL (Figure 4)***Seat Maintenance*

1. Make a mark on the lower actuator casing (key 5), intermediate flange (key 25) and body (key 1) to indicate proper alignment.
2. Remove stud nuts (key 26).

**CAUTION**

**Use proper care in moving actuator to ensure no damage occurs to the pins or actuator casings.**

3. Carefully lift the actuator assembly (keys 11 and 5) off the body (key 1).
4. Remove O-ring (key 34) from lower actuator casing (key 5). Inspect the O-ring for damage or wear and replace if necessary. Lightly lubricate O-ring before placing on lower actuator casing (key 5).
5. Remove the hex socket cap screws (key 33) and spring lock washers (key 32). Lift off the disk holder assembly (key 30) and disk retainer (key 31).

# Type EZL

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6. Remove the O-ring (key 29). Inspect for damage or wear and replace if necessary. Lightly lubricate O-ring before placing in the sleeve adaptor (key 27).
7. Remove the O-ring (key 29). Inspect for damage or wear and replace if necessary. Lightly lubricate O-ring before placing in the sleeve adaptor (key 27).
- 7a. On the 2 and 3 in. / DN 50 and 80 sizes remove the seat ring (key 2), spring washer (key 72) and O-ring (key 34) (see Figure 4, Detail A.2). Inspect the O-ring for damage or wear, replace if necessary.
- 7b. On the 4 in. / DN 100 size remove the intermediate flange (key 25), seat ring (key 2) and O-ring (key 75) (see Figure 4, Detail A.2). The seat ring (key 2) can be moved out of the way and the O-ring (key 75) can be removed without removing the intermediate flange (key 25). Inspect the O-ring for damage or wear, replace if necessary.
- 8a. For the 2 and 3 in. / DN 50 and 80 sizes reinstall the spring washer (key 72) with the inside edge pointing up. Lightly lubricate O-ring (key 34) before placing on top of the spring washer (key 72) in the body (key 1).
- 8b. For the 4 in. / DN 100 size lightly lubricate the O-ring (key 75) and place it in the body (key 1).
9. Set the seat ring (key 2) back in the body (key 1) with the curved side down and the seat edge up.
10. Place the disk holder assembly (key 30) and disk retainer (key 31) on the sleeve adaptor (key 27).
11. Insert the spring lock washers (key 32) and hex socket cap screws (key 33) and tighten. See Torque Specification table for proper torque.
12. Lubricate surface between lower casing and intermediate flange. Carefully lift the upper actuator casing and lower actuator casing assembly (keys 11 and 5) and place on the body (key 1). Secure with stud nuts (key 26). See Torque Specification table for proper torque.
6. Remove O-ring (key 7). Inspect the O-ring for damage or wear and replace if necessary. Lightly lubricate O-ring before placing in the body (key 1).
7. Replace the intermediate flange (key 25), make sure to position the stud bolt (key 24) holes on the outsides of the body (key 1). Secure with cap screws (key 6). See Torque Specification table for proper torque.
8. Lubricate the surface between the lower casing and the intermediate flange. Reinstall actuator assembly to body.

## *Actuator Assembly Maintenance*

1. Make a mark on the upper actuator casing (key 11), lower actuator casing (key 5), intermediate flange (key 25) and body (key 1) to indicate proper alignment.
2. Remove travel indicator assembly, if present, by loosening the travel indicator fitting (key 56) and lifting out the indicator assembly. Refer to Travel Indicator Maintenance section for maintenance procedure.
3. Remove cap screws (key 21), washers (key 22) and hex nuts (key 23). Remove all the short cap screws first, then evenly remove the two long cap screws (key 39) and brackets (key 35). Take care to balance the upper actuator casing while removing the spring tension. Carefully lift the upper actuator casing (key 11) off the lower actuator casing (key 5). Remove spring (key 13).
4. Remove the hex socket cap screws (key 16). Lift off the diaphragm (key 20) and the inlet plate (key 18). Remove O-rings (keys 15 and 17). Inspect the diaphragm and O-rings for damage or wear and replace if necessary.
5. Inspect the upper actuator casing (key 11), O-ring (key 9), anti-friction split rings (key 8) and anti-friction ring (key 4) for damage or wear. If damaged, remove the O-ring and split rings and replace with new parts. Lightly lubricate the O-ring and split rings. Place the split rings in the body first, then slide the O-ring between the split rings.
6. Remove hex nuts (key 26) from the stud bolts (key 24). Lift off the lower actuator casing (key 5). Remove the hex socket cap screws (key 33) and spring lock washers (key 32). Lift off the disk holder assembly (key 30) and disk retainer (key 31).
7. Slide the sleeve (key 14) out of the lower actuator casing (key 5) and slide the outlet plate (key 19) off of the sleeve. Check the sleeve for scratches, burrs or other damage and replace if necessary.
8. Inspect the lower actuator casing (key 5), O-ring (key 9), anti-friction split rings (key 8) and anti-friction ring (key 4) for damage or wear. If damaged, remove the O-ring and split rings and replace with new parts. Lightly lubricate the O-ring and split rings. Place the split rings in the body first, then slide the O-ring between the split rings.

## *Intermediate Flange O-ring Maintenance*

1. Make a mark on the lower actuator casing (key 5), intermediate flange (key 25) and body (key 1) to indicate proper alignment.
2. Remove stud nuts (key 26).
3. Carefully lift the upper actuator casing and lower actuator casing assembly (keys 11 and 5) off the body (key 1).
4. Remove cap screws (key 6).
5. Lift off intermediate flange (key 25).

**Table 3. Torque Specifications**

BODY SIZE	INDICATOR FITTING (KEY 56) OR PLUG (KEY 38), FT-LBS / N•m	STUD NUTS (KEY 26), FT-LBS / N•m	SOCKET HEAD CAP SCREWS (KEY 16) <sup>(1)(2)</sup> , FT-LBS / N•m	CAP SCREWS (KEYS 21 AND 39), FT-LBS / N•m	CAP SCREWS (KEY 6), FT-LBS / N•m	SOCKET HEAD CAP SCREWS (KEY 33) <sup>(1)</sup> , FT-LBS / N•m
2 in. / DN 50	10 to 15 / 15 to 20	45 to 50 / 60 to 70	55 to 60 / 75 to 80	35 to 45 / 50 to 60	50 to 60 / 70 to 80	55 to 60 / 75 to 80
3 and 4 in. / DN 80 and 100	10 to 15 / 15 to 20	80 to 95 / 110 to 130	90 to 100 / 120 to 135	31 to 34 / 42 to 46	70 to 95 / 95 to 130	80 to 90 / 110 to 120

1. Socket head cap screw (keys 16 and 33) torque specifications are given in in-lbs.  
2. Apply torque to each screw in star pattern, 5 complete rounds.

9. Slide the outlet plate (key 19) onto the sleeve (key 14) and slide the sleeve into the lower actuator casing (key 5). Place the disk holder (key 30) and disk retainer (key 31) on the sleeve adaptor (key 27). Insert the spring lock washers (key 32) and hex socket cap screws (key 33) and tighten. See Torque Specification table for proper torque. If seat was removed, make sure to reinstall.
10. Lightly lubricate the O-rings (keys 15 and 17) and the inner and outer diaphragm (key 20) edges. Make sure O-rings (keys 15 and 17) are correctly positioned. Place the inlet plate (key 18) and the diaphragm (key 20) on the sleeve (key 14). Insert and tighten the hex socket cap screws (key 16). See Torque Specification table for proper torque.
11. Lubricate surface between lower casing and intermediate flange. Carefully lift the lower actuator casing assembly (key 5) and place on the body (key 1). Take care to match up the alignment marks. Secure with stud bolts and nuts (keys 24 and 26). See Torque Specification table for proper torque.
12. Lightly lubricate the spring (key 13) and place on the inlet plate (key 18).
13. Carefully place the upper actuator casing (key 11) on the lower actuator casing (key 5). Take care to match up the alignment marks. Insert the two long cap screws (key 39) and brackets (key 35) 180° apart and away from flanges. Place the washers (key 22) and hex nuts (key 23) on the long cap screws and evenly tighten. Using proper bolting techniques, install remaining small cap screws (key 21), washers and hex nuts. See Torque Specification table for proper torque.
14. Place travel indicator assembly in the upper actuator casing (key 11), if present and tighten the travel indicator fitting (key 56).

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 3 shows the difference between the designs. The spare parts kits will support either design. Take care to use the correct O-ring (key 12A or 12B) when performing maintenance, see parts list for the appropriate part number.

1. Remove plastic travel indicator cover (key 53).
2. Loosen travel indicator bushing (key 55) and remove it by sliding it over the travel indicator stem (key 54).
3. Remove indicator fitting (key 56) and inspect O-ring (key 70). Remove O-ring (key 12B) and back-up rings (key 76). Replace and lubricate O-ring if damaged. Pull up on the travel indicator stem (key 54) to force the spring collet (key 57) 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 54) and spring collet (key 57) back into the diaphragm head groove. Replace the indicator fitting (key 56) and O-ring (key 70) and tighten with a referenced torque of 20 ft-lbs / 27.1 N•m.
5. Lubricate the O-ring (key 12B) and backup rings (key 76, 2 required). Place one back-up ring on the stem (key 54) followed by the O-ring and then the other back-up ring. Push into groove of the indicator fitting (key 56).  
  
Slide the travel indicator bushing (key 55) over the travel indicator stem (key 54) and tighten firmly in place with a torque of 3.7 ft-lbs / 5.0 N•m.
6. Replace the travel indicator cover (key 53) and tighten firmly in place.

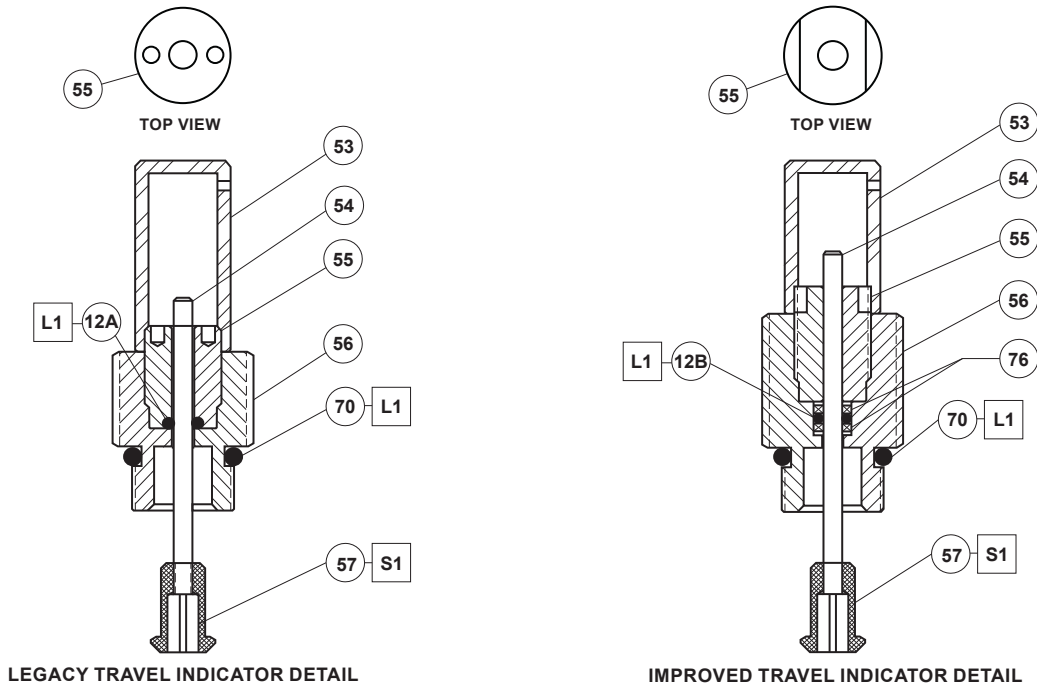
## Pilot Maintenance

### 6358 Series Pilots

Key numbers are referenced in Figures 5 and 6 unless otherwise noted. Unless replacing or removing the body assembly (key 1), the pilot may remain on the pipe nipple (key 47) during maintenance.

## Type EZL 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 seal to minimize leakage and extend service life. The components of the legacy and new versions are not



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- APPLY LUBRICANT (L) OR SEALANT (S)<sup>(1)</sup>
- 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 3. Travel Indicator Assembly Drawings



## WARNING

**Avoid personal injury or damage to property from sudden release of pressure or uncontrolled gas or other process fluid. Before starting to disassemble, carefully release all pressures according to the shutdown procedure. Use gauges to monitor inlet, loading and outlet pressures while releasing these pressures.**

### Disassembly

1. If necessary to check the outlet end of the body cavity and the seating surfaces for moisture or debris, remove the body plug (key 3) and body plug O-ring (key 13) from the body (key 1).
2. Remove the closing cap (key 12), loosen the locknut (key 11) and back out the adjusting screw (key 10) until compression is removed from the control spring (key 7).
3. Remove the machine screws (key 17) and separate the spring case (key 2) from the body assembly. Remove the control spring seat (key 8), the control spring (key 7) and, if used, the diaphragm limiter (key 40).

4. Lift out the diaphragm assembly (key 5) and valve plug (key 4). Check the stem guide (key 9) and restriction (key 20) for damage or plugging. The 6358 Series has a restriction plug, not a restriction.
5. If necessary to replace the diaphragm assembly, the valve plug (key 4), the valve spring (key 14) or the stem O-ring (key 37), remove the connector cap (key 6) and connector cap O-ring or gasket (key 36) from the top of the diaphragm assembly.

### Assembly

1. If removed, install the body plug O-ring (key 13) over the body plug (key 3) and install the body plug into the body (key 1).
2. Install the stem guide (key 9), if removed make sure to install the connector cap O-ring or gasket (key 36) between the body (key 1) and the stem guide.

### Note

**In step 3, if installing a different size restriction, be sure to remove the code letter on the bottom of the pilot and indicate the new letter.**



3. If the restriction or restriction plug (key 20) was removed, coat the threads with lubricant and install it.
4. If replacing the stem O-ring (key 37), sparingly apply lubricant and install the O-ring over the valve plug (key 4).
5. If removed, install the valve plug (key 4) and valve spring (key 14) into the diaphragm assembly (key 5). Install a replacement connector cap O-ring or gasket (key 36) on the diaphragm assembly and secure with the connector cap (key 6).
6. Install the diaphragm assembly (key 5) and push down on it to see if the valve plug (key 4) moves smoothly. The diaphragm assembly should stroke approximately 1/16 in. / 1.6 mm after the valve plug contacts the port.

### Note

**In step 7, if installing a control spring of a different set pressure range, be sure to remove the set pressure range on the spring case and indicate the new range.**

7. Stack the control spring (key 7), the control spring seat (key 8) and, if used, the diaphragm limiter (key 40) onto the diaphragm assembly (key 5). Make sure to install the diaphragm limiter bevelled side up.
8. Install the spring case (key 2) on the body (key 1) with the vent assembly (key 16) oriented to prevent clogging or entrance of moisture. Install the machine screws (key 17) and tighten in a crisscross pattern, using 5 to 7 ft-lbs / 7 to 9 N•m of torque.
9. Replace the closing cap gasket (key 19) if necessary install the closing cap (key 12). When all maintenance is complete, refer to the Startup and Shutdown section to put the relief valve or backpressure regulator into operation and adjust the pressure setting.

## Parts Ordering

Each Type EZZ relief valve or backpressure 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 ordering parts. Also be sure to include the complete 11-character part number from the following Parts List.

## Parts List

### Type EZZ Main Valve (Figure 4)

Key	Description	Part Number
	Disk Parts Kits	
	2 and 3 in. / DN 50 and 80 (includes key numbers: 29, 30 and 34)	
	4 in. / DN 100 (includes key numbers: 29, 30, 34 and 75)	
	2 in. / DN 50, Nitrile (NBR) and Fluorocarbon (FKM)	REZL2X00N12

Key	Description	Part Number
	Disk Parts Kits (continued)	
	2 in. / DN 50, Fluorocarbon (FKM)	REZL2X00F12
	3 in. / DN 80, Nitrile (NBR) and Fluorocarbon (FKM)	REZL3X00N12
	3 in. / DN 80, Fluorocarbon (FKM)	REZL3X00F12
	4 in. / DN 100, Nitrile (NBR) and Fluorocarbon (FKM)	REZL4X00N12
	4 in. / DN 100, Fluorocarbon (FKM)	REZL4X00F12
	Full Repair Kits	
	2 and 3 in. / DN 50 and 80 (includes key numbers: 4, 7, 8, 9, 12B, 15, 17, 20, 28, 29, 30, 34, 70 and 76)	
	4 in. / DN 100 (includes key numbers: 4, 7, 8, 9, 12B, 15, 17, 20, 28, 29, 30, 34, 70, 75 and 76)	
	2 in. / DN 50, Nitrile (NBR) and Fluorocarbon (FKM)	REZL2X00N22
	2 in. / DN 50, Fluorocarbon (FKM)	REZL2X00F22
	3 in. / DN 80, Nitrile (NBR) and Fluorocarbon (FKM)	REZL3X00N22
	3 in. / DN 80, Fluorocarbon (FKM)	REZL3X00F22
	4 in. / DN 100, Nitrile (NBR) and Fluorocarbon (FKM)	REZL4X00N22
	4 in. / DN 100, Fluorocarbon (FKM)	REZL4X00F22
	Travel Indicator Parts Kits	
	2 in. / DN 50 (includes key numbers: 12B, 53, 54, 55, 56, 57, 58, 70 and 76)	ERSA01550A0
	3 and 4 in. / DN 80 and 100 (includes key numbers: 12B, 53, 54, 55, 56, 57, 58, 70 and 76)	ERSA01555A0
1	Body	
	2 in. / DN 50	
	Cast iron	
	NPT	GE10583X012
	CL125 FF	GE10585X012
	Steel	
	NPT	GE10588X012
	CL150 RF	
	Standard	GE10676X032
	Tapped inlet and outlet	14B5834X032
	CL300 RF	
	Standard	GE10676X012
	Tapped inlet and outlet	14B5834X042
	CL600 RF	
	Standard	GE10679X012
	Tapped inlet and outlet	14B5834X052
	BWE, Schedule 40	GE10680X012
	SWE	GE10682X012
	3 in. / DN 80	
	Cast iron	
	CL125 FF	GE10689X012
	Steel	
	CL150 RF	
	Standard	GE10699X012
	Tapped inlet and outlet	14B5835X032
	CL300 RF	
	Standard	GE10700X012
	Tapped inlet and outlet	14B5835X042
	CL600 RF	
	Standard	GE10701X012
	Tapped inlet and outlet	14B5835X052
	BWE, Schedule 40	GE10702X012

- continued -

# Type EZL

## Type EZL Main Valve (Figure 4) (continued)

Key	Description	Part Number	Key	Description	Part Number
1	Body (continued)		15*	O-ring	
	4 in. / DN 100			2 in. / DN 50	M6020095X12
	Cast iron			3 and 4 in. / DN 80 and 100	M6020073X12
	CL125 FF	GE10707X012	16	Socket Head Cap Screw (6 required)	
	Steel			2 in. / DN 50	M5011119X12
	CL150 RF			3 and 4 in. / DN 80 and 100	FA402512X12
	Standard	GE10835X012	17*	O-ring	
	Tapped inlet and outlet	14B5836X032		2 in. / DN 50	M6020096X12
	CL300 RF			3 and 4 in. / DN 80 and 100	M6020127X12
	Standard	GE10839X012	18	Inlet Plate	
	Tapped inlet and outlet	14B5836X042		2 in. / DN 50	M0300260X12
	CL600 RF			3 and 4 in. / DN 80 and 100	M0196800X12
	Standard	GE10842X012	19	Outlet Plate	
	Tapped inlet and outlet	14B5836X052		2 in. / DN 50	M0279180X12
	BWE, Schedule 40	GE10843X012		3 and 4 in. / DN 80 and 100	M0276570X12
2	Seat Ring		20*	Diaphragm	
	2 in. / DN 50	GE10271X012		2 in. / DN 50	GE07400X012
	3 in. / DN 80	GE11213X012		3 and 4 in. / DN 80 and 100	GE09204X012
	4 in. / DN 100	GE17779X012	21	Cap Screw	
3*	Pin			2 in. / DN 50 (14 required)	18B3065X012
	2 in. / DN 50 (6 required)	M0295820X12		3 and 4 in. / DN 80 and 100 (22 required)	1A514724052
	3 and 4 in. / DN 80 and 100 (8 required)	M0297310X12	22	Plain Washer	
4*	Anti-Friction Ring (2 required)			2 in. / DN 50 (32 required)	1A5196X0012
	2 in. / DN 50	M0272760X12		3 and 4 in. / DN 80 and 100 (48 required)	1A518925072
	3 and 4 in. / DN 80 and 100	M0272810X12	23	Hex Nut	
5	Actuator Lower Casing			2 in. / DN 50 (16 required)	1E944624112
	2 in. / DN 50	GE05003X012		3 and 4 in. / DN 80 and 100 (24 required)	1A3412A0022
	3 and 4 in. / DN 80 and 100	GE07988X012	24	Continuous Thread Stud Bolt (4 required)	
6	Cap Screws (8 required)			2 in. / DN 50	GE00808X012
	2 in. / DN 50	1A340924052		3 and 4 in. / DN 80 and 100	M4693003X12
	3 and 4 in. / DN 80 and 100	M4696002X12	25	Intermediate Flange	
	4 in. / DN 100	1N462324052		2 in. / DN 50	GE10308X012
7*	O-ring			3 in. / DN 80	GE11210X012
	2 in. / DN 50			4 in. / DN 100	GE17777X012
	Nitrile (NBR)	12A1297X022	26	Hex Nut (4 required)	
	Fluorocarbon (FKM)	12A1297X012		2 in. / DN 50	1A341224122
	3 in. / DN 80			3 and 4 in. / DN 80 and 100	1A368124122
	Nitrile (NBR)	18B8514X012	27	Sleeve Adaptor	
	Fluorocarbon (FKM)	18B8514X022		2 in. / DN 50	M0272570X12
	4 in. / DN 100			3 and 4 in. / DN 80 and 100	GD27634X012
	Nitrile (NBR)	18B2140X012	28*	O-ring	
	Fluorocarbon (FKM)	18B2140X022		2 in. / DN 50	M6020079X12
8*	Anti-Friction Rings (4 required)			3 and 4 in. / DN 80 and 100	M6020151X12
	2 in. / DN 50	M0194690X12	29*	O-ring	
	3 and 4 in. / DN 80 and 100	M0192170X12		2 in. / DN 50	M6020112X12
9*	O-ring (2 required)			3 and 4 in. / DN 80 and 100	M6020005X12
	2 in. / DN 50		30*	Disk Holder Assembly	
	Nitrile (NBR), -20 to 180°F / -29 to 82°C	1C3342X0042		2 in. / DN 50	
	Fluorocarbon (FKM)	M6020036X12		Nitrile (NBR)	M0279110X12
	3 and 4 in. / DN 80 and 100			Fluorocarbon (FKM)	M0281870X12
	Nitrile (NBR), -20 to 180°F / -29 to 82°C	1D2658X0012		3 and 4 in. / DN 80 and 100	
	Fluorocarbon (FKM)	1D2658X0022		Nitrile (NBR)	M0276830X12
10	Pipe Plug (up to 3 required), All sizes	1A767524662		Fluorocarbon (FKM)	M0282120X12
11	Actuator Upper Casing		31	Disk Retainer	
	2 in. / DN 50	GE04968X012		2 in. / DN 50	
	3 and 4 in. / DN 80 and 100	GE07514X012		100% Capacity	M0272750X12
12A*	O-ring			80% Capacity	M0297340X12
	Nitrile (NBR)	M6010001X12		50% Capacity	M0297430X12
	Fluorocarbon (FKM)	M6020066X12		30% Capacity	M0297440X12
12B*	O-ring		31	Disk Retainer (continued)	
	Nitrile (NBR)	1H2926X0032		3 and 4 in. / DN 80 and 100	
	Fluorocarbon (FKM)	1H2926X0022		100% Capacity	M0276250X12
13	Spring			80% Capacity	M0297630X12
	2 in. / DN 50	M0195000X12		50% Capacity	M0297640X12
	3 and 4 in. / DN 80 and 100	M0196880X12		30% Capacity	M0297650X12
14	Sleeve		32	Lock Washer (2 required)	
	2 in. / DN 50	M0272600X12		2 in. / DN 50	M5077004X12
	3 and 4 in. / DN 80 and 100	M0276310X12		3 and 4 in. / DN 80 and 100	M5077001X12

\*Recommended spare part

- continued -

## Type EZL Main Valve (Figure 4) (continued)

Key	Description	Part Number
33	Socket Head Cap Screw (2 required) 2 in. / DN 50 3 and 4 in. / DN 80 and 100	M5011006X12 M5011017X12
34*	O-ring (2 required) 2 in. / DN 50 Nitrile (NBR) Fluorocarbon (FKM) 3 and 4 in. / DN 80 and 100 Nitrile (NBR) Fluorocarbon (FKM)	10B4428X012 10B4428X022 10B4366X012 10B4366X022
35	Bracket (2 required) 2 in. / DN 50 3 and 4 in. / DN 80 and 100	M0278570X12 M0220960X12
36	Nameplate	-----
37	Drive Screw (5 required), All sizes	1A368228982
38	Travel Indicator Plug, All sizes	M0297680X12
39	Bolt (2 required) 2 in. / DN 50 3 and 4 in. / DN 80 and 100	GE07223X012 GE07221X012
43	Caution Label (2 required)	GE00835X012
44	Adjusting Screw Cap, All sizes	24B1301X012
53	Indicator Cover 2 in. / DN 50 3 and 4 in. / DN 80 and 100	M0196770X12 M0192220X12
54	Travel Indicator Stem 2 in. / DN 50 3 and 4 in. / DN 80 and 100	ERSA01799A0 ERSA01806A0
55	Indicator Bushing, All sizes	ERSA02798A0
56	Travel Indicator Fitting, All sizes	ERSA02569A0
57	Spring Collet, All sizes	M0192180X12
58	Travel Indicator Scale, All sizes	M0201990X12
59	Flow Arrow, All sizes	-----
60	Protective Cap 2 in. / DN 50 3 in. / DN 80	T13659T0112 T13659T0092
70*	O-ring	M6020005X12
72	Belleville Washer 2 in. / DN 50 3 and 4 in. / DN 80 and 100	GE10273X012 GE11214X012
75*	O-ring 4 in. / DN 100 Nitrile (NBR) Fluorocarbon (FKM)	10B4373X012 10B4373X022
76*	Back Up Ring (2 required)	1N659106242

## Mounting Parts

### Type 6358

Key	Description	Part Number
47	Pipe Nipple	1F730226012
48	Tube Elbow	-----
49	External Tube Connector	-----
52	Tubing	-----
61	Coupling	1H724028992
62	Bushing	1C379026232
63	1/4 in. / 6.35 mm, Pipe Nipple	1C488226232
64	1/4 in. / 6.35 mm, Coupling	1C911728992

## 6358 Series Pilot (Figures 5 and 6)

Key	Description	Part Number
	Parts Kit (included are keys 4, 5, 13, 14, 19, 36, 37 and P590 Series Filter, keys 2 and 7) Type 6358 Parts Kit	R6358X00012
1	Body Aluminum (NACE) (only available for Types 6358 and 6358B) Stainless steel (NACE)	39A0138x012 39A5972x012
2	Spring Case Types 6358 and 6358B Aluminum Stainless steel	25A6220x012 28A9277x012
	Types 6358EB and 6358EBH Stainless steel	27B9722x012
3	Body Plug Aluminum (NACE) Stainless steel Stainless steel (NACE)	1B797509032 1B7975x0052 1B797535072
4*	Valve Plug Assembly, Stainless steel plug with Types 6358 and 6358B Nitrile (NBR) plug Fluorocarbon (FKM) plug Types 6358EB and 6358EBH Nitrile (NBR) plug Fluorocarbon (FKM) plug	14B6372x012 16A2924x012 18B3427x012 18B3427x022
5*	Diaphragm Assembly Types 6358 and 6358B Nitrile (NBR) Nitrile (NBR) (NACE) Fluorocarbon (FKM) Type 6358EB Nitrile (NBR) 75 to 200 psig / 5.17 to 13.8 bar 180 to 350 psig / 12.4 to 24.1 bar Fluorocarbon (FKM) 75 to 200 psig / 5.17 to 13.8 bar 180 to 350 psig / 12.4 to 24.1 bar	15A6216X072 15A6216X212 15A6216X172 18B3428X012 18B3428X022 18B3428X042 18B3428X052
	Type 6358EBH Nitrile (NBR) Fluorocarbon (FKM)	18B3429X012 18B3429X022
6	Connector Cap, Stainless steel Types 6358 and 6358B Standard NACE Type 6358EB or 6358EBH Standard NACE	16A2921X012 16A2921X022 14B9813X012 14B9813X022
7	Control Spring Type 6358 10 to 40 psig / 0.69 to 2.76 bar, Yellow 35 to 125 psig / 2.41 to 8.62 bar, Red Type 6358B 10 to 30 psig / 0.69 to 2.07 bar, Silver 30 to 60 psig / 2.07 to 4.14 bar, Blue 60 to 125 psig / 4.14 to 8.62 bar, Red Type 6358EB 85 to 140 psig / 5.86 to 9.65 bar, Green 130 to 200 psig / 8.96 to 13.8 bar, Blue 180 to 350 psig / 12.4 to 24.1 bar, Red Type 6358EBH 250 to 400 psig / 17.2 to 27.6 bar, Blue	1E392527022 1K748527202 1B788327022 1B788427022 1K748527202 17B1261X012 17B1263X012 17B1264X012 17B1263X012

\*Recommended spare part

- continued -

# Type EZL

## 6358 Series Pilot (Figures 5 and 6) (continued)

Key	Description	Part Number
8	Spring Seat, Zinc-plated steel Types 6358 and 6358B Type 6358EB or 6358EBH	1B798525062 17B0515X012
9	Stem Guide Stainless steel Stainless steel (NACE)	16A2923X012 16A2923X022
10	Adjusting Screw Types 6358 and 6358B Type 6358EB 75 to 140 psig / 5.17 to 9.65 bar 130 to 200 psig / 8.96 to 13.8 bar 180 to 350 psig / 12.4 to 24.1 bar Type 6358EBH	10B7192X012 17B1227X012 10B3081X012 10B3080X012 10B3080X012
11	Locknut Types 6358 and 6358B Type 6358EB or 6358EBH	1A946324122 1D667728982
12	Closing Cap Types 6358 and 6358B Aluminum Aluminum (NACE) Stainless steel (NACE) Types 6358EB and 6358EBH Stainless steel (NACE)	23B9152X012 1H2369X0012 1H2369X0032 24B1301X012
13*	Body Plug O-ring, Nitrile (NBR) (for use with Stainless steel bodies) Nitrile (NBR) Fluorocarbon (FKM)	1F113906992 1N463906382
13*	Body Plug Gasket (for use with aluminum bodies on Types 6358 and 6358B only)	1C495704022
14	Valve Plug Spring Types 6358, 6358EB and 6358EBH Standard Stainless steel (NACE) Type 6358B Stainless steel Stainless steel (NACE)	1E701337022 19A8179X012 17A2328X012 19A8179X012
15	O-ring (for Type 6358EB only)	10A7777X012
16	Vent Assembly, Type Y602X1-A12 (2 required)	27A5515X012
17	Machine Screw (6 required) Type 6358EB Aluminum Stainless Steel Type 6358EBH	1V4360X0022 1V4360X0112 T12980T0012
18	Connector Cap O-ring (for Types 6358EB and 6358EBH) Nitrile (NBR) Fluorocarbon (FKM)	10A0904X012 10A0904X032
19*	Closing Cap Gasket (for use with stainless steel Types 6358 and 6358B)	15A6218X012
20	Restriction Plug (for Type 6358 only) Standard NACE	1A346128982 1V7435X0012
20	Restriction Type 6358B High Gain Medium Gain Low Gain Types 6358EB and 6358EBH High Gain Standard Low Gain Standard	17A7279X012 17A2029X012 17A7277X012 17A7279X012 17A2030X012
36*	Connector Cap O-ring or Gasket (2 required) Fluorocarbon (FKM)	1U1716X0012

## 6358 Series Pilot (Figures 5 and 6) (continued)

Key	Description	Part Number
37	Stem O-ring Nitrile (NBR) Fluorocarbon (FKM)	16A2920X012 16A2920X022
38	Lower Spring Seat, thermoplastic Types 6358EB and 6358EBH	18B1248X012
40	Diaphragm Limiter for Type 6358EB at 180 to 350 psig / 12.4 to 24.1 bar	10B4407X012
42	NACE Tag	-----
43	Tag Wire	-----

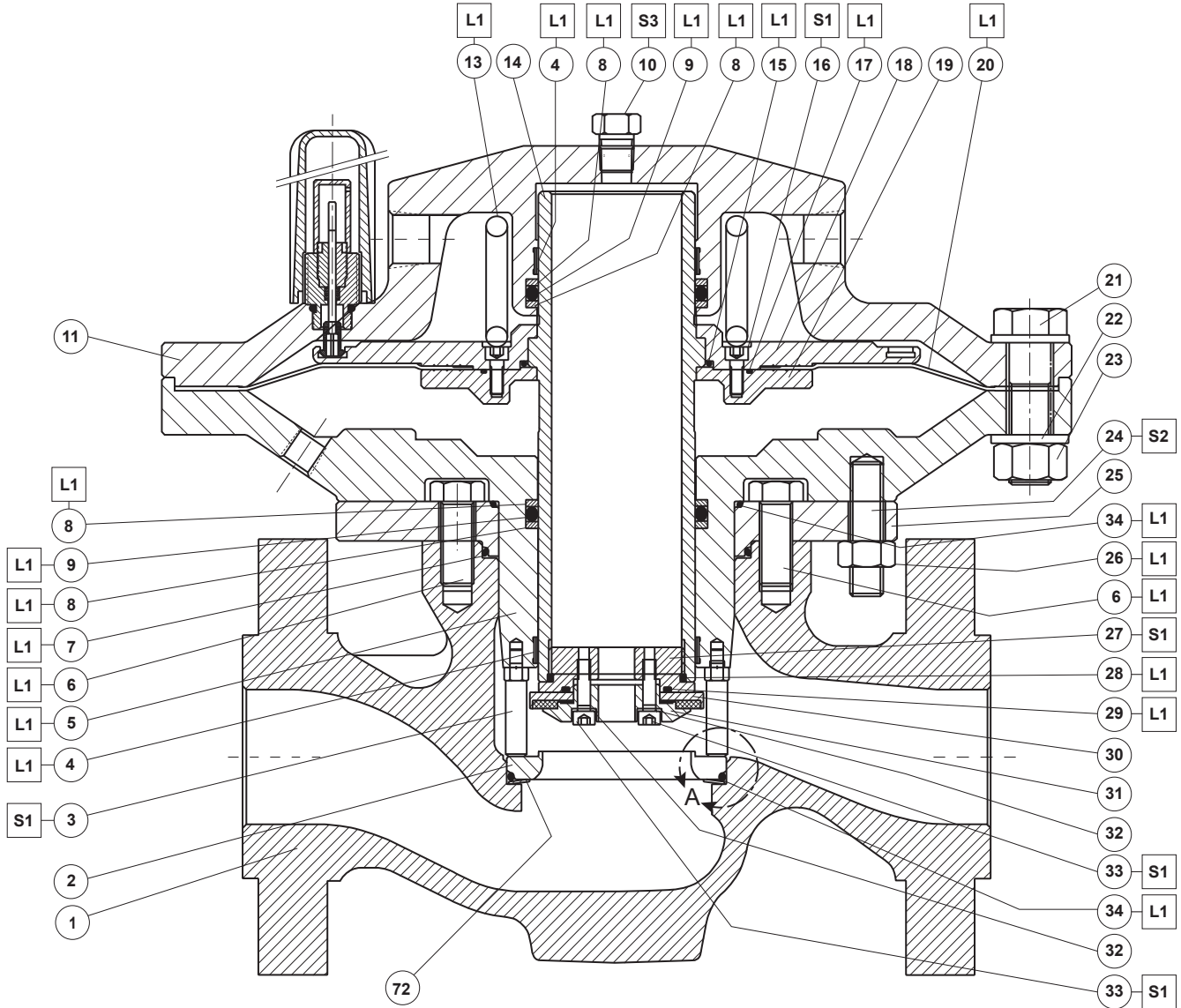
## P590 Series Filter (Figure 7)

Key	Description	Part Number
1	Filter Body Type P594-1, Brass Type P593-1, Aluminum	1E312414012 1E312409012
2*	Filter Element, Cellulose	1E312606992
3	Filter Head Type P594-1, Brass Type P593-1, Aluminum	1E312514012 1E312509012
4	Machine Screw Type P594-1, Brass Type P593-1, Aluminum	1J500218992 1J500209012
5	Washer (2 required) Type P594-1, Brass Type P593-1, Aluminum	1J500018992 1J500010062
6	Spring Washer, Plated carbon steel	1H885128982
7*	Gasket, Composition	1F826804022

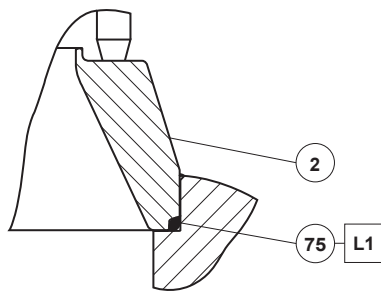
## Type 252 Pilot Supply Filter (Figure 8)

Key	Description	Part Number
1	Filter Head Assembly Aluminum (A92011 T3) 316 Stainless steel	17B7978X012 17B7978X022
2	Filter Body Aluminum (A92011 T3) Standard Extended 316 Stainless steel Standard Extended	27B6811X022 27B7488X022 27B6811X012 27B7488X012
3	Lower Seat, Delrin®	17B6816X012
4	Filter Cartridge, Polyethylene	17B6813X012
5	O-ring, Nitrile (NBR)	1F269206992
6	Pipe Plug, 316 Stainless steel	1A767535072
7	Drain Valve (Optional), 316 Stainless steel	16A8280X362
8	Upper Seat, Delrin®	17B6814X012

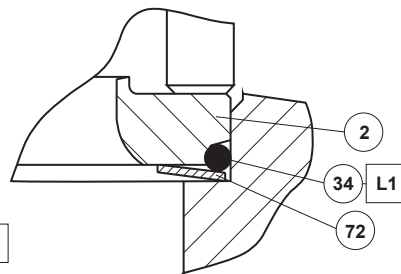
\*Recommended spare part  
Delrin® is a mark owned by E.I. du Pont de Nemours and Co.



GE10987



**DETAIL A.1**  
4 IN. / DN 100 BODY SIZE ONLY



**DETAIL A.2**  
2 AND 3 IN. / DN 50 AND 80  
BODY SIZES ONLY

- APPLY LUBRICANT (L) OR SEALANT (S)<sup>(1)</sup>
- L1 = LITHIUM HYDROXYSTEGRATE NLGI 2 GRADE GREASE
  - S1 = ANAEROBIC METHACRYLATE SEALANT FOR NUTS AND BOLTS
  - S2 = ANAEROBIC METHACRYLATE SEALANT FOR THREADS
  - S3 = MULTI-PURPOSE POLYTETRAFLUOROETHYLENE (PTFE) THREAD SEALANT

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

**Figure 4. Type EZL Main Valve Assembly**

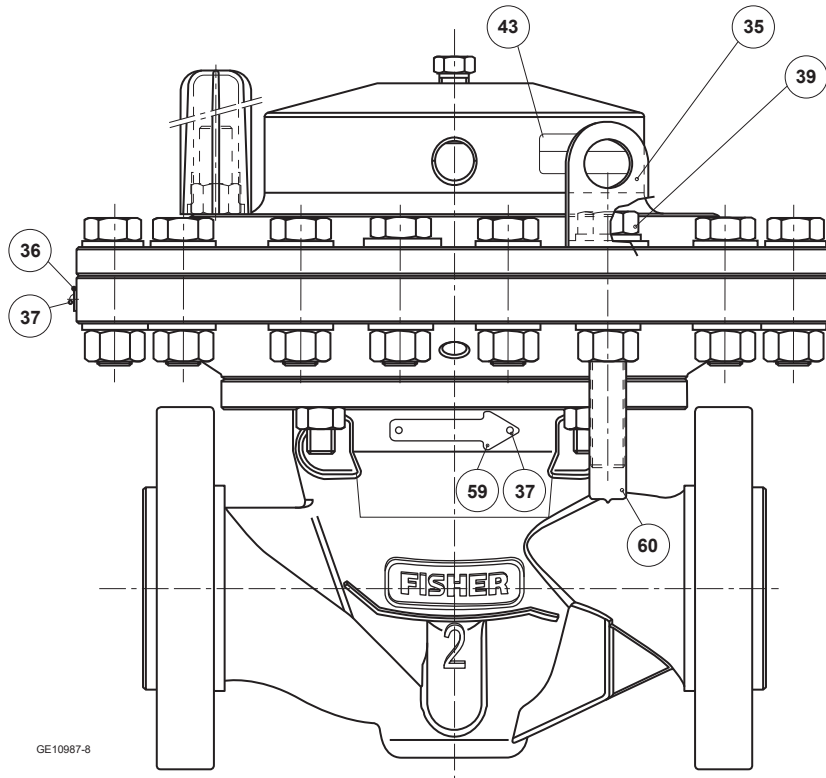
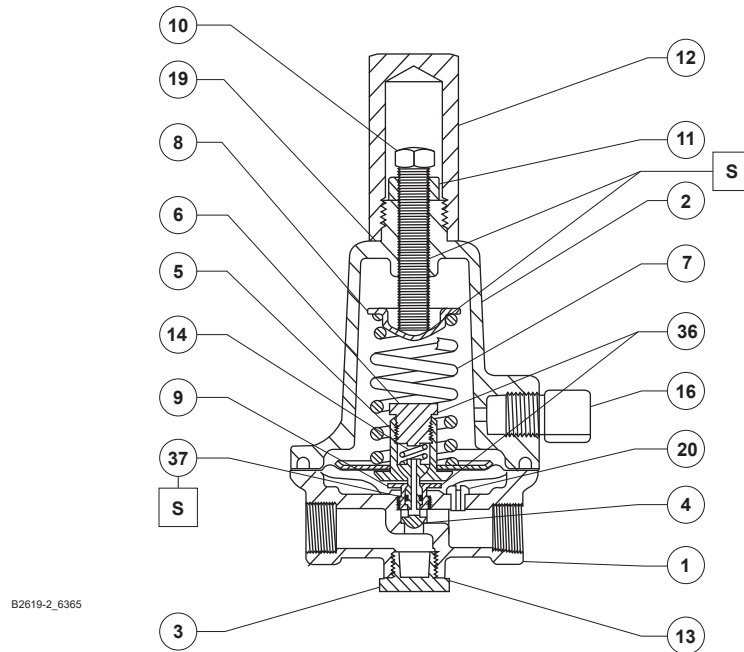


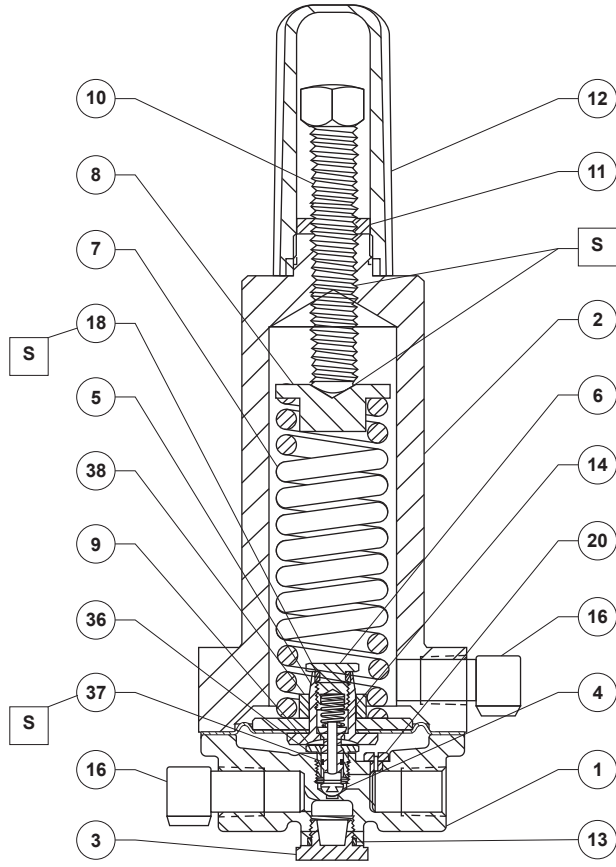
Figure 4. Type EZL Main Valve Assembly (continued)



TYPE 6358B PILOT INTERIOR VIEW

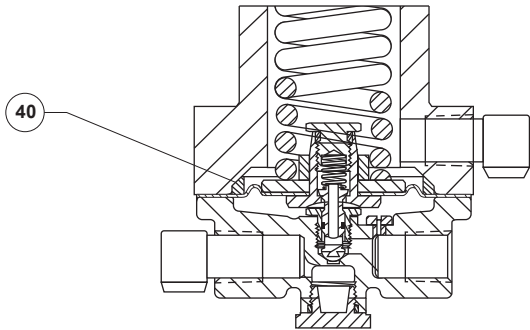
□ APPLY SEALANT (S)

Figure 5. Types 6358B Pilot Assembly



□ APPLY SEALANT (S)

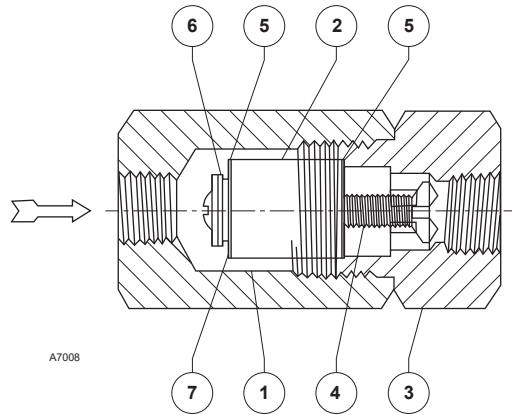
TYPE 6358EB PILOT INTERIOR VIEW



TYPE 6358EB PILOT WITH DIAPHRAGM LIMITER  
FOR 180 TO 350 psig / 12.4 TO 24.1 bar  
SET PRESSURE RANGE INTERIOR VIEW

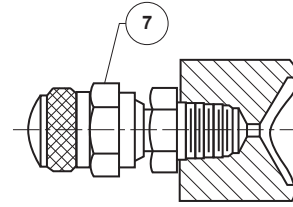
Figure 6. Types 6358EB Pilot Assembly

# Type EZZ

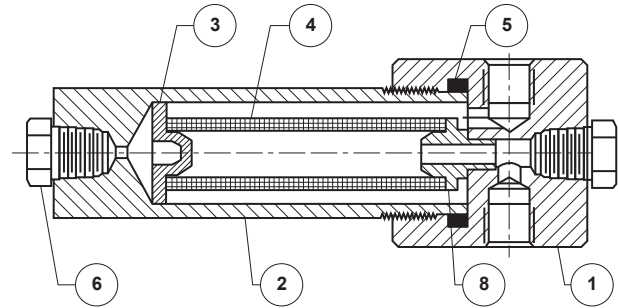


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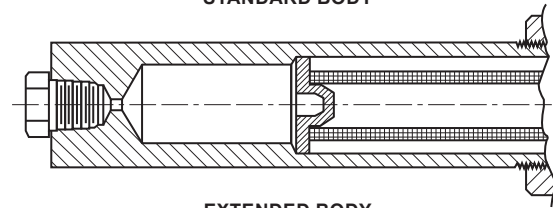
**Figure 7. P590 Series Filter**



**OPTIONAL DRAIN VALVE**



**STANDARD BODY**



**EXTENDED BODY**

A7013

**Figure 8. Type 252 Filter**

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