

Introduction

This installation guide provides instructions for installation, startup, and adjustment. To receive a copy of the instruction manual, contact your local Sales Office or view a copy at www.fisherregulators.com. For further information, refer to Type 99 Instruction Manual, Form 589, D100260X012.

P.E.D. Category

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

PRODUCT SIZE	PED LIMITATION	CATEGORY
DN 50 / NPS 2	19,0 bar / 275 psig	I

Specifications

Available Configurations

Type 99L - Type 99 with Type 61L pilot which has 2-inches w.c. to 20 psig / 5 mbar to 1,4 bar pressure range.

Type 99LD - Type 99 with Type 61LD pilot which has a narrower proportional band than the standard Type 61L pilot.

Type 99LE - Type 99 with Type 61LE pilot which has a broader proportional band than the standard Type 61L pilot.

Type 99H - Type 99 with Type 61H pilot which has 10 to 65 psig / 0,69 to 4,5 bar pressure range.

Type 99HP - Type 99 with Type 61HP pilot has 35 to 100 psig / 2,4 to 6,9 bar pressure range.

Body Size and End Connection Styles

DN 50 / NPS 2 body with NPT, CL125 FF, CL150 RF, CL250 RF, CL300 RF

Maximum Allowable Inlet Pressure⁽¹⁾

11,0 bar / 160 psig with Type 61LD pilot;
27,6 bar / 400 psig with Types 61L / 61H pilots;
69,0 bar / 1000 psig with Type 61HP pilot, along with Type 1301F pilot supply regulator and Type H110 relief valve and 13 mm / 1/2-inch main valve orifice

All constructions limited to 19,0 bar / 275 psig for PED Category I

Outlet (Control) Pressure Ranges⁽¹⁾

See Table 1

Maximum Allowable Pressure Drop⁽¹⁾

See Table 2

Maximum Actuator Pressures⁽¹⁾

Operating: 6,9 bar / 100 psig

Emergency: 7,6 bar / 110 psig

Maximum Pilot Spring Case Loading Pressure⁽¹⁾

Types 61L, 61LD and 61LE: 3,5 bar / 50 psig with special steel closing cap

Types 61H and 61HP: 6,9 bar / 100 psig

Minimum Differential Pressure⁽¹⁾

See Table 2

Maximum Rated Travel

6,4 mm / 1/4-inch

Temperature Capabilities⁽¹⁾

Nitrile (NBR)/Neoprene (CR):

-29° to 82°C / -20° to 180°F

Fluorocarbon (FKM): -18° to 149°C / 0° to 300°F

Installation



WARNING

Only qualified personnel should install or service a regulator.

Regulators should be installed, operated, and maintained in accordance with international and applicable codes and regulations, and Emerson Process Management Regulator Technologies, Inc. instructions.

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

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

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

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

Type 99

Table 1. Outlet Pressure Ranges

PILOT TYPE	MAXIMUM PILOT SUPPLY PRESSURE, PSIG / bar	OUTLET (CONTROL) PRESSURE RANGES	PILOT CONTROL SPRING			
			Part Number	Color Code	Wire Diameter, Inches / mm	Free Length, Inches / mm
61L	400 / 27,6	2 to 4-inches w.c. / 5 to 10 mbar ⁽¹⁾ 3 to 12-inches w.c. / 7 to 30 mbar ⁽¹⁾ 0.25 to 2 psig / 0,02 to 0,14 bar 1 to 5 psig / 0,07 to 0,35 bar 2 to 10 psig / 0,14 to 0,69 bar 5 to 15 psig / 0,35 to 1,0 bar 10 to 20 psig / 0,69 to 1,4 bar	1B558527052	Orange	0.072 / 1,83	3.78 / 96,0
61LD	160 / 11,0		1C680627222	Unpainted	0.080 / 2,03	3.00 / 76,2
			1B886327022	Red	0.109 / 2,77	2.75 / 69,9
61LE	400 / 27,6		1J857827022	Yellow	0.142 / 3,61	2.75 / 69,9
			1B886427022	Blue	0.172 / 4,37	2.88 / 73,2
			1J857927142	Brown	0.187 / 4,75	3.03 / 77,0
61H	400 / 27,6	10 to 65 psig / 0,69 to 4,5 bar	0Y066427022	Green stripe	0.363 / 9,22	6.00 / 152
61HP	600 / 41,4	35 to 100 psig / 2,4 to 6,9 bar	1D387227022	Blue	0.200 / 5,08	1.69 / 42,9

1. Type 61LD pilot only.

Table 2. Maximum Inlet Pressure, Allowable Pressure Drop, and Minimum Differential Pressures

MAXIMUM ALLOWABLE INLET PRESSURE / PRESSURE DROP, PSIG / bar	MAIN VALVE SPRING			MINIMUM DIFFERENTIAL PRESSURE FOR FULL STROKE, PSIG / bar	DISK MATERIAL	MAXIMUM ORIFICE SIZE ⁽¹⁾ , INCHES / mm
	Part Number	Wire Diameter, Inches / mm	Free Length, Inches / mm			
25 / 1,7	1C277127022	0.148 / 3,76	6 / 152	0.75 / 0,05	Nitrile (NBR), Fluorocarbon (FKM)	1-1/8 / 29
50 / 3,4	1N801927022	0.156 / 3,96	7.13 / 181	1.5 / 0,10	Neoprene (CR), Fluorocarbon (FKM)	1-1/8 / 29
100 / 6,9	1B883327022	0.187 / 4,75	6.63 / 168	3 / 0,21	Nitrile (NBR), Neoprene (CR), Fluorocarbon (FKM)	1-1/8 / 29
150 / 10,3	1B883327022	0.187 / 4,75	6.63 / 168	3 / 0,21	Nitrile (NBR), Neoprene (CR), Fluorocarbon (FKM)	1-1/8 / 29
175 / 12,1	1B883327022	0.187 / 4,75	6.63 / 168	3 / 0,21	Nitrile (NBR) ⁽²⁾ , Neoprene (CR) ⁽²⁾ , Fluorocarbon (FKM) ⁽²⁾	7/8 / 22
250 / 17,2	1B883327022	0.187 / 4,75	6.63 / 168	3 / 0,21	Neoprene (CR), Fluorocarbon (FKM)	7/8 / 22
300 / 20,7	0W019127022	0.281 / 7,22	6 / 152	10 / 0,69	Nylon (PA)	1-1/8 / 29 ⁽⁴⁾
400 / 27,6	0W019127022	0.281 / 7,22	6 / 152	10 / 0,69	Nylon (PA)	7/8 / 22
1000 / 69,0	0W019127022	0.281 / 7,22	6 / 152	10 / 0,69	Nylon (PA)	1/2 / 13 ⁽⁵⁾

1. Can use all orifice sizes up to maximum size listed.
2. CL125 FF flanged body only.
3. 1-1/8-inch / 29 mm is the only orifice available for 300 psig / 20,7 bar maximum inlet pressure regulator.
4. 1/2-inch / 13 mm is the only orifice available for 1000 psig / 69,0 bar maximum inlet pressure regulator.
5. O-ring seat construction is only available for 7/8 and 1-1/8-inch / 22 and 29 mm orifice sizes.

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

Clean out all pipelines before installation of the regulator and check to be sure the regulator has not been damaged or has collected foreign material during shipping. For NPT bodies, apply pipe compound to the external pipe threads. For flanged bodies, use suitable line gaskets and approved piping, and bolting practices. Install the regulator in any position desired, unless otherwise specified, but be sure flow through the body is in the direction indicated by the arrow on the body.

Note

It is important that the regulator be installed so that the vent hole in the

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

Overpressure Protection

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

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

Startup

The regulator is set at the factory for the setpoint specified on the order or at the midpoint of the spring range. The allowable spring range is stamped on the nameplate. If a pressure setting other than specified is desired, be sure to change the pressure setting by following the Adjustment section. With proper installation completed and relief valves properly adjusted, slowly open the upstream and downstream shutoff valves (if applicable).

Adjustment

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

Taking Out of Service (Shutdown)



WARNING

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

Parts List

P590 Series

Key	Description
1	Filter Body
2	Filter Element
3	Filter Head
4	Machine Screw
5	Washer
6	Spring Washer
7	Gasket

Actuator and Main Valve Assembly

Key	Description
1	Spring Case
2	Main Spring Seat
3	Main Spring
4	Diaphragm Rod
5	Diaphragm Rod Guide Assembly
6	Collar
7	Pusher Post Gasket
8	Pusher Post Assembly
9	Lever
10	Diaphragm Plate
11	Diaphragm
12	Cap Screw
13	Hex Nut
14	Union Nut
15	Body Snap Ring
16	Body Gasket
17	Valve Body
18	Disk Holder
19	Disk
19	O-Ring
20	Orifice
21	Retainer
22	Cap Screw
25	Cotter Pin
26	Valve Carrier
27	Lever Pin
28	Retaining Ring
29	Lower Casing
32	Nameplate
56	Upper Casing
57	Spring Case Gasket
58	Cap Screw
64	O-Ring
73	Pipe plug
75	P590 Series Filter
91	Pipe Tee
113	Pipe Nipple
133	Pipe Elbow
134	Pipe Nipple
152	Drive Screw

Travel Indicator Assembly

Key	Description
1	Spring Case
101	Indicator Stem Adaptor
102	Indicator Cap
103	Indicator Stem
104	Disk Nut
105	Machine Screw Nut
106	Retainer
107	Indicator Window
108	Gasket
109	Indicator Cover
110	Machine Screw
111	O-Ring
112	Indicator Scale

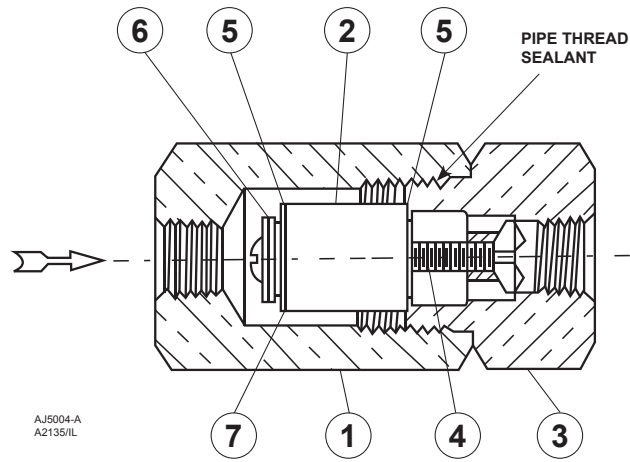


Figure 1. Standard P590 Series Filter Assembly

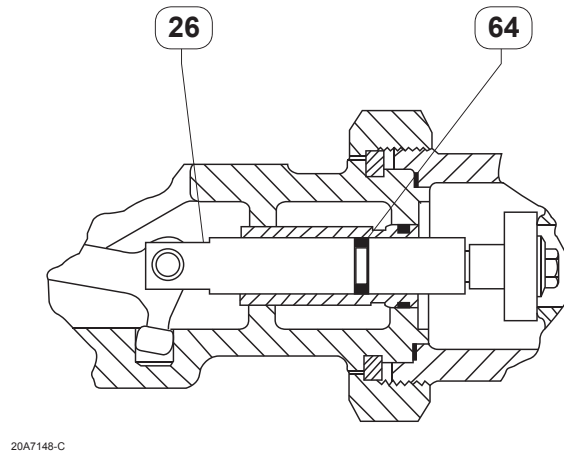


Figure 2. O-Ring Stem Seal Assembly

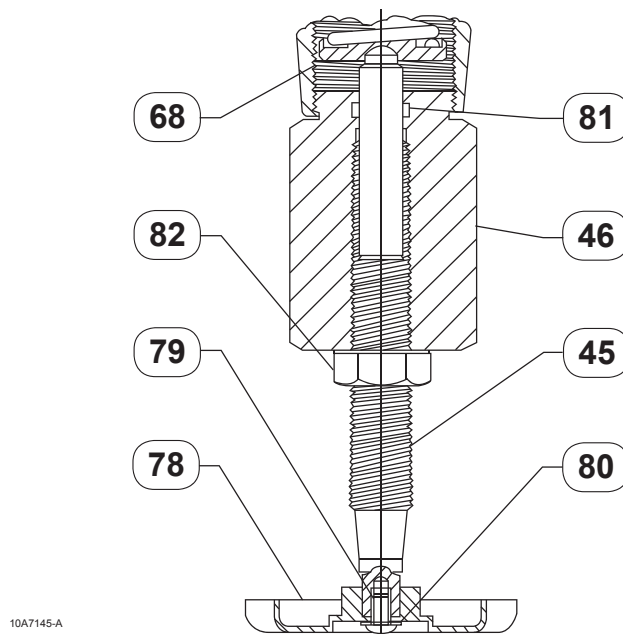
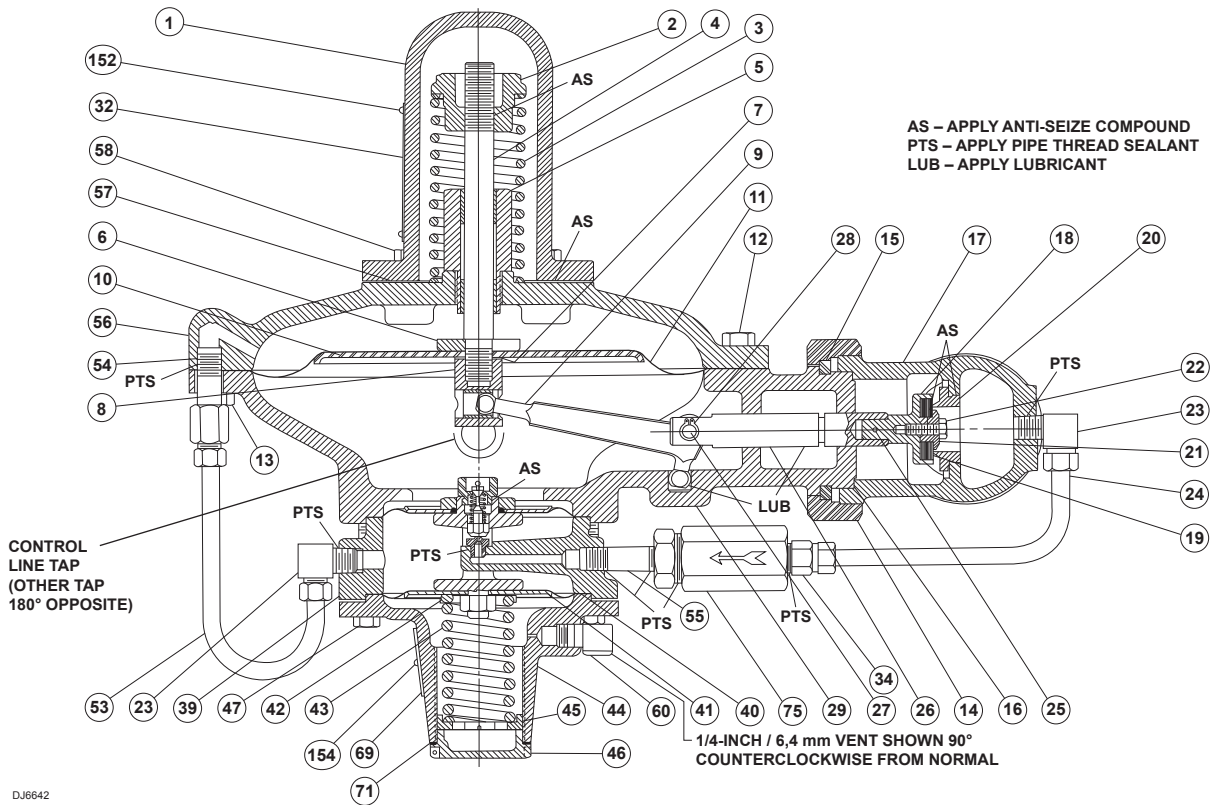
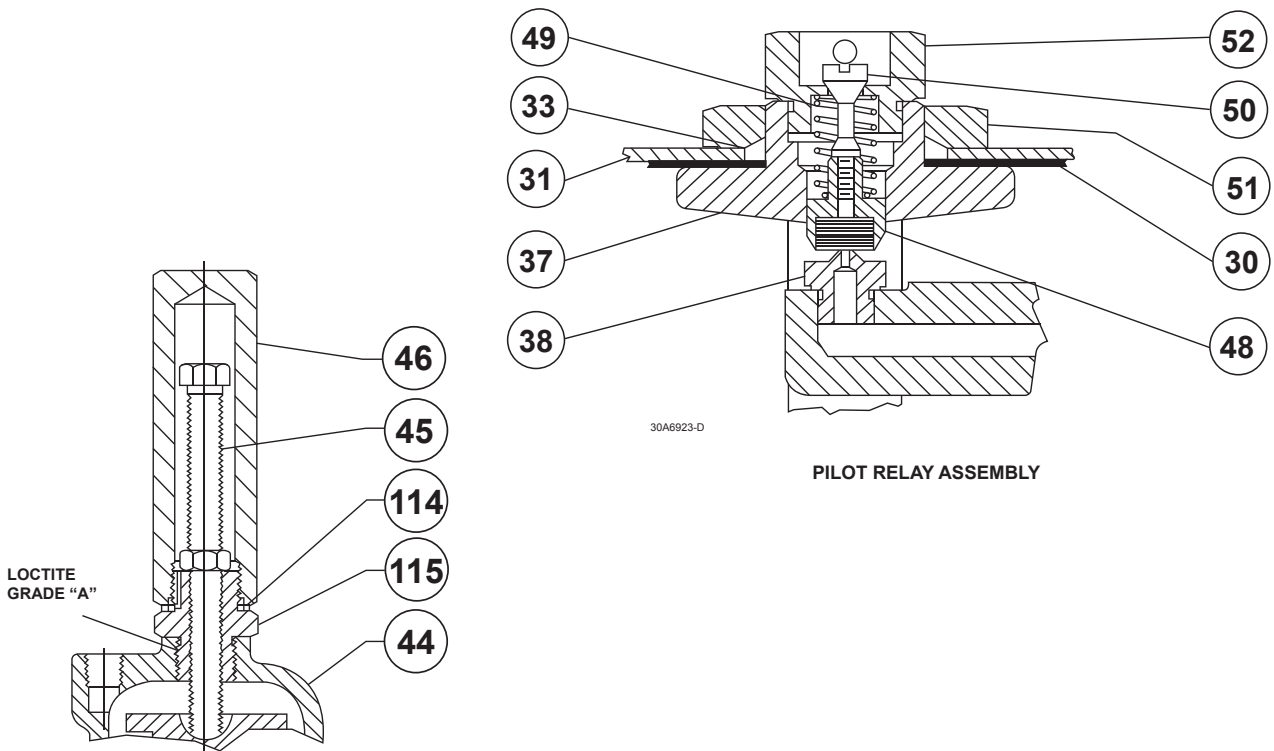


Figure 3. O-Ring Sealed Handwheel Adjustment Accessory Assembly



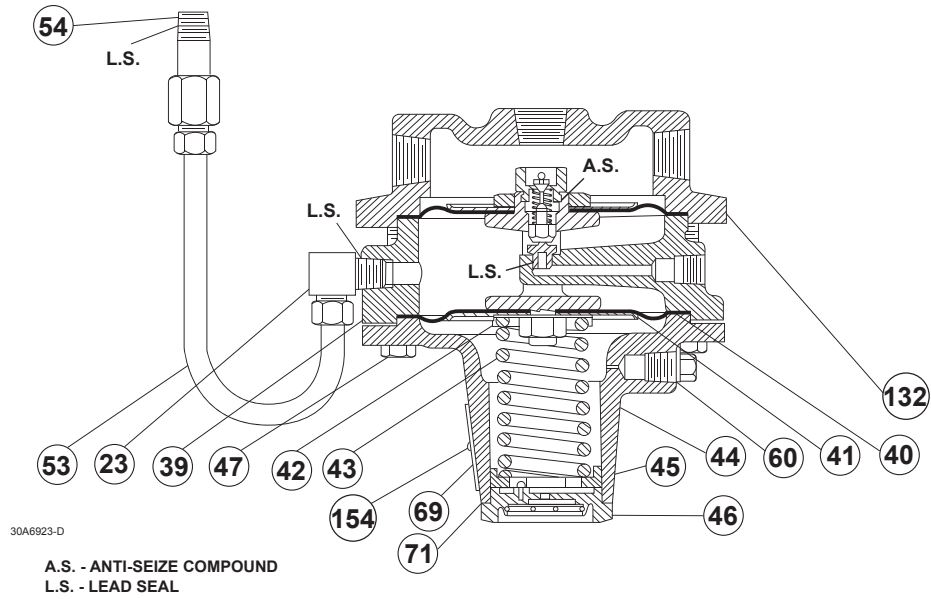
COMPLETE REGULATOR SHOWING TYPE 61L PILOT AND DISK SEAT



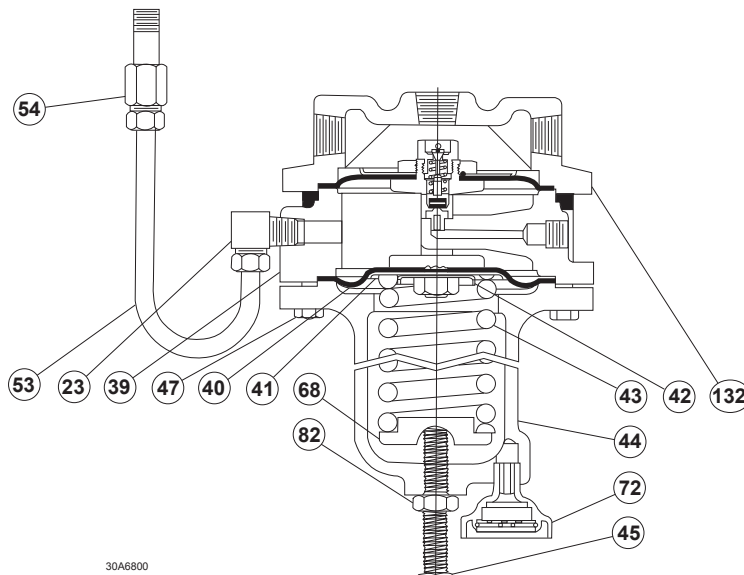
CLOSING CAP ACCESSORY FOR HIGH PRESSURE PILOT

Figure 4. Type 99 Regulator with Type 61L (Low) or 61H (High-Pressure) Pilot Assembly

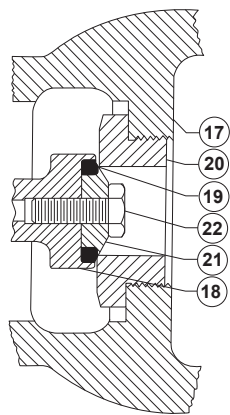
Type 99



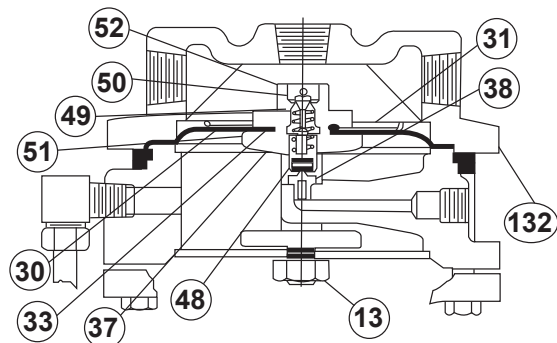
LOW-PRESSURE PILOT PARTS



HIGH-PRESSURE PILOT PARTS



O-RING SEAT DETAIL



PILOT RELAY AND COVER ASSEMBLY

Figure 4. Type 99 Regulator with Type 61L (Low) or 61H (High-Pressure) Pilot Assembly (Continued)

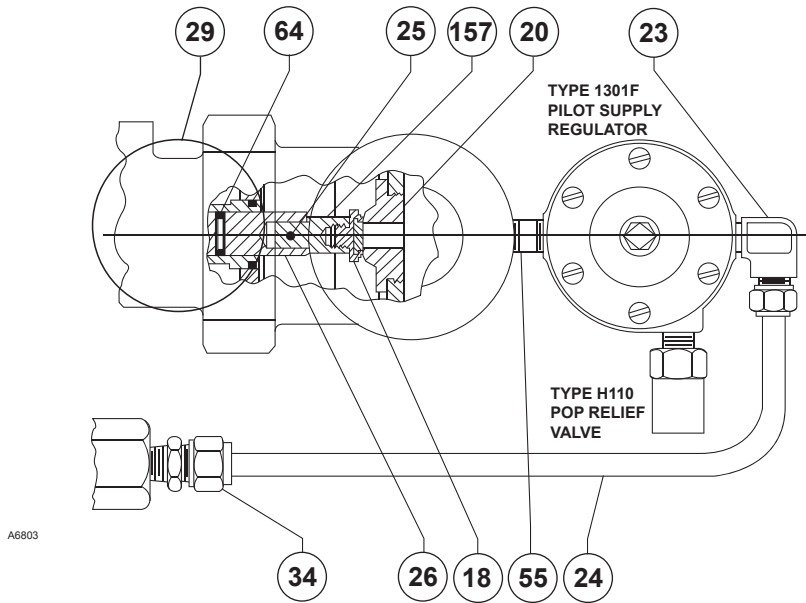
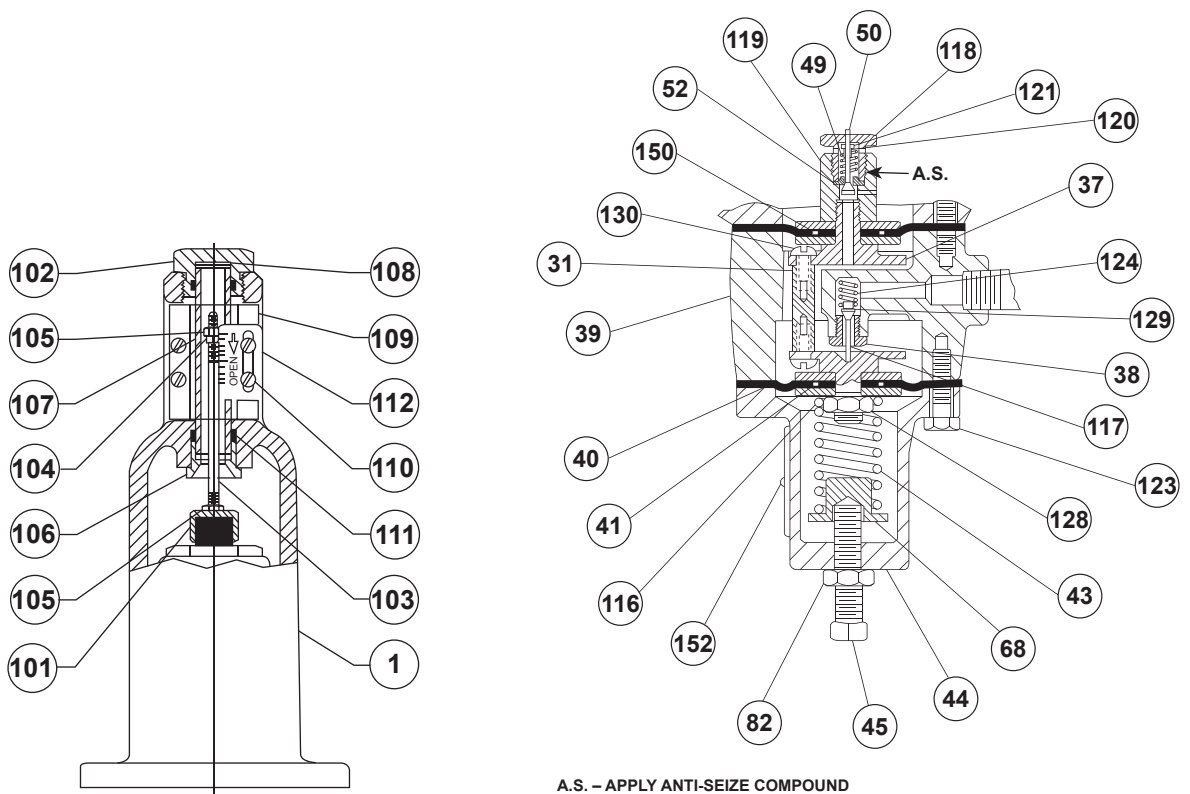


Figure 5. 1000 Psig / 69,0 bar Maximum Inlet Regulator Partial Detail



A.S. – APPLY ANTI-SEIZE COMPOUND

A6804

20A7146-A

Figure 6. Travel Indicator Assembly

Figure 7. Type 61HP (Extra High Pilot) Pilot

Type 99

Pilot (Low or High-Pressure Pilots) and Tubing Parts

Key	Description	Key	Description
23	Elbow	51	Diaphragm Nut
24	Pilot Supply Tubing	52	Bleed Orifice
30	Upper Relay Diaphragm	53	Loading Tubing
31	Upper Relay Diaphragm Plate	54	Connector
33	O-Ring seal	55	Pipe Nipple
34	Connector	59	Pipe Plug (not shown)
37	Yoke	60	Type Y602-1 Vent Assembly
38	Relay Orifice	68	Spring Seat
39	Relay Valve Body	69	Pilot Nameplate
40	Lower Relay Diaphragm	71	Closing Cap Gasket
41	Lower Relay Diaphragm Plate	72	Type Y602-1 Vent Assembly
42	Spring Seat	78	Handwheel
43	Control Spring	79	Machine Screw
44	Spring Case	80	Lockwasher
45	Adjusting Screw	81	O-Ring
46	Closing Cap	82	Hex nut
47	Cap Screw	114	Gasket
48	Relay Disk Assembly	115	Adaptor
49	Bleed Valve Spring	132	Pilot Cover
50	Bleed Valve	154	Drive Screw

Type 61HP (Extra High-Pressure Pilot)

Key	Description	Key	Description
23	Elbow	68	Spring Seat
24	Pilot Supply Tubing	82	Hex nut
30	Diaphragm	92	Pipe Tee
31	Yoke Leg	113	Pipe Nipple
34	Connector	116	Yoke Cap
35	Cap Screw	117	Inlet Valve Plug
36	Elbow	118	Relief Valve Cap
37	Lower Yoke Cap	119	Relief Valve Body
38	Inlet Orifice	120	Spring Seat
39	Pilot Body	121	Spring Seat Washer
40	Diaphragm	122	Pipe Bushing
41	Diaphragm Plate	123	Cap Screw
43	Control Spring	124	Valve Spring
44	Spring Case	125	Flange Adaptor
45	Adjusting Screw	126	Gasket
47	Cap Screw	128	Diaphragm Nut
49	Relief Valve Spring	129	Valve Spring Seat
50	Relief Valve Plug	130	Machine Screw
52	Bleed Orifice	131	Pipe Plug (not shown)
53	Loading Tubing	150	Diaphragm Insert
55	Pipe Nipple	151	Pilot Nameplate
57	Adaptor	152	Drive Screw
60	Pipe plug (not shown)	153	Seal Washer

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