Type MR108

English – October 2020

Introduction

This installation guide provides instructions for installation, startup and adjustment. To receive a copy of the instruction manual, contact your local Sales Office or view a copy at www.fisher.com. For further information refer to Type MR108 Instruction Manual, D103247X012.

PED/PE(S)R Categories

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

PRODUCT SIZE	CATEGORY
DN 25 / NPS 1	SEP
DN 50 / NPS 2	II
DN 80 / NPS 3	II
DN 100 / NPS 4	II

Specifications

Available Constructions

Type MR108 with low-pressure actuator: Direct-operated large multi-purpose backpressure regulator with 0.34 to 2.4 bar / 5 to 35 psig pressure range

Type MR108 with high-pressure actuator: Direct-operated large multi-purpose backpressure regulator with 1.7 to 20.7 bar / 25 to 300 psig pressure range

Body Sizes and End Connection Styles

DN 25 and 50 / NPS 1 and 2: NPT, CL125 FF, CL250 RF, CL150 RF, CL300 RF, CL600 RF and PN 16/25/40 RF

DN 80 and 100 / NPS 3 and 4: CL125 FF, CL250 RF, CL150 RF, CL300 RF, CL600 RF and PN 16 RF

Backpressure Control Ranges(1)

Low-Pressure Actuator: 0.34 to 0.97 bar / 5 to 14 psig; 0.55 to 1.7 bar / 8 to 24 psig; 0.83 to 2.1 bar / 12 to 30 psig; 1.0 to 2.4 bar / 15 to 35 psig

High-Pressure Actuator: 1.7 to 2.8 bar / 25 to 40 psig; 2.4 to 4.8 bar / 35 to 70 psig; 3.8 to 8.3 bar / 55 to 120 psig; 6.2 to 13.8 bar / 90 to 200 psig(2); 12.1 to 20.7 bar / 175 to 300 psig(3)

Maximum Set Pressure(1)

Low-Pressure Actuator: 2.4 bar / 35 psig

High-Pressure Actuator:

Nitrile (NBR) and Ethylene Propylene (EPDM) Diaphragm: 20.7 bar / 300 psig

Fluorocarbon (FKM) Diaphragm: 10.3 bar / 150 psig

Maximum Inlet, Outlet and Emergency Casing Pressure(1)(4)

Low-Pressure Actuator: 4.8 bar / 70 psig

High-Pressure Actuator: 27.6 bar / 400 psig(5)

Maximum Differential Pressures(1)

Low-Pressure Actuator: 4.8 bar / 70 psig

High-Pressure Actuator: 27.6 bar / 400 psig or maximum inlet pressure, whichever is lower

Maximum Pressures over Set Pressure to Avoid Internal Parts Damage(1)

Low-Pressure Actuator: 1.4 bar / 20 psig

High-Pressure Actuator: 8.3 bar / 120 psig

Temperature Capabilities(1)(6)

Nitrile (NBR): -29 to 82°C / -20 to 180°F

Fluorocarbon (FKM): -7 to 121°C / 20 to 250°F(7)

Ethylene Propylene (EPDM): -29 to 107°C / -20 to 225°F(8)

Installation

WARNING

Only qualified personnel should install or service a backpressure regulator. Backpressure 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 using a backpressure regulator on a hazardous or flammable fluid service, personal injury and property damage could occur due to fire or explosion of vented fluid that may have accumulated.

1. The pressure/temperature limits in this Installation Guide or any applicable limitation should not be exceeded.
2. Maximum set pressure is limited to 10.3 bar / 150 psig for constructions with Fluorocarbon (FKM) diaphragm.
3. Not applicable for constructions with Fluorocarbon (FKM) diaphragm.
4. Pressure ratings are based on a maximum operating temperature of 121°C / 250°F.
5. Maximum Inlet, Outlet and Emergency Casing Pressures for constructions with Fluorocarbon (FKM) diaphragm are limited to 15.8 bar / 230 psig or the body rating limit, whichever is lower.
6. Special low temperature constructions for process temperatures between -60 to 85°C / -76 to 185°F are available by request. The low temperature construction passed Emerson laboratory testing for lockup and external leakage down to -60°C / -76°F.
7. Fluorocarbon (FKM) is limited to 93°C / 200°F hot water.
8. Ethylene Propylene (EPDM) is limited to -7 to 107°C / 20 to 225°F when used with Low Pressure Actuator.

To prevent such injury or damage, provide piping or tubing to vent the fluid to a safe, well-ventilated area or containment vessel. Also, when venting a hazardous fluid, the piping or tubing should be located far enough away from any buildings or windows so to not create a further hazard and the vent opening should be protected against anything that could clog it.

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

To avoid such injury or damage, provide pressure-relieving or pressure-limiting devices (as required by the appropriate code, regulation or standard) to prevent service conditions from exceeding limits. Additionally, physical damage to the backpressure regulator could result in personal injury and property damage due to escaping fluid. To avoid such injury and damage, install the backpressure regulator in a safe location.

Clean out all pipelines before installation of the backpressure regulator and check to be sure the backpressure 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.

Vertical installation with the actuator oriented up or down is recommended. The unit will operate in horizontal installation with actuator on the side, however, this could result in premature wear of parts. Make sure that flow will be in the same direction as that indicated by the body arrow. Orientation of the two vents should always be down. Vents may be rotated after regulator installation so that the vent screens are down.

A control line must be installed to allow inlet pressure to register on the actuator's diaphragm. It should be installed four to eight pipe diameters upstream of the regulator and in an area of pipe that is free of turbulence.

Note

It is important that the backpressure regulator be installed so that the vent hole in the spring case is unobstructed at all times. For outdoor installations, the backpressure 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 backpressure regulator beneath eaves or downspouts and be sure it is above the probable snow level.

Overpressure Protection

Maximum inlet pressures depend upon body end connections, materials and temperatures. Refer to the nameplate for the maximum inlet pressure of the valve. The valve should be inspected for damage after any overpressure condition. **Fisher™ backpressure regulators are NOT ASME safety relief valves.**

Startup

The backpressure regulator is factory set at approximately the midpoint of the spring range or the pressure requested. 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, slowly open the upstream and downstream shutoff valves (if applicable).

Adjustment

To change the control pressure, loosen the locknut and turn the adjusting screw clockwise to increase pressure or counterclockwise to decrease pressure. Monitor the control pressure with a test gauge during the adjustment. Tighten the locknut to maintain the desired setting.

Taking Out of Service (Shutdown)

WARNING

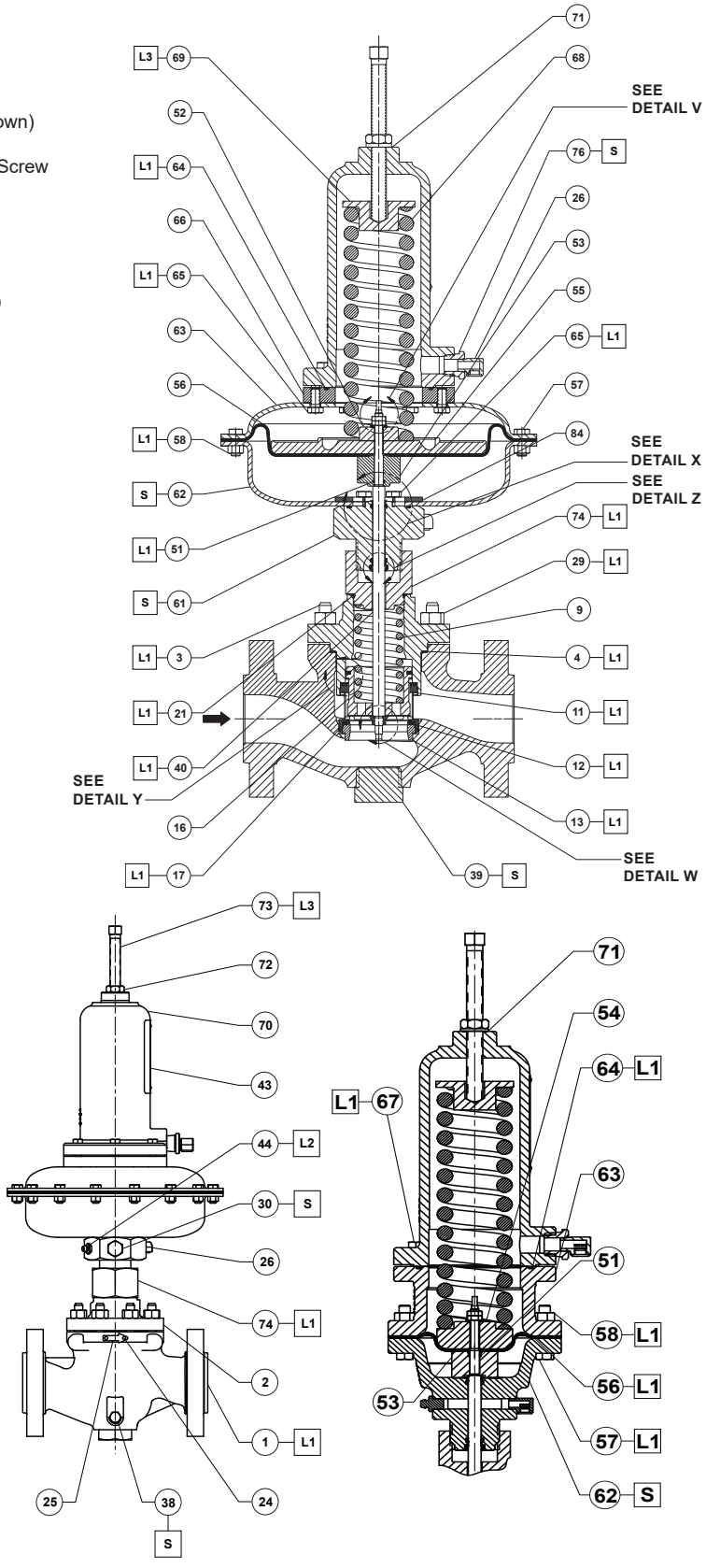
To avoid personal injury resulting from sudden release of pressure, isolate the backpressure regulator from all pressure before attempting disassembly.

Parts List

Key	Description
1	Valve Body
2	Body Flange
3	Stud Bolt DN 25 / NPS 1 (4 required) DN 50, 80 and 100 / NPS 2, 3 and 4 (8 required)
4*	Gasket
9	Valve Spring
11	Cage
12*	Port Seal
13*	Seat Ring
14*	Piston Ring
15*	Upper Seal
16	Valve Plug
17*	Cage O-ring
20*	Valve Plug O-ring
21*	Adaptor O-ring
24	Drive Screw (6 required)
25	Flow Arrow
26	Vent Assembly (2 required/ 1 required for Pressure-Loaded Actuator)
29	Hex Nut DN 25 / NPS 1 (4 required) DN 50, 80 and 100 / NPS 2, 3 and 4 (8 required)
30	Pipe Plug
33	NACE Tag (not shown)
34	Wire Seal (not shown)
38	Pipe Plug
39	Pipe Plug
40	Stem Actuator
41	Flange Nut
43	Nameplate
44	Lube Fitting
45	Wiper Ring
46*	Bearing (2 required)
47*	Valve Stem O-ring (2 required)
48*	Jam Nut (2 required)
49*	Belleville Spring Washer
51*	Lower Diaphragm Head O-ring
52	Lower Spring Guide
53	Lower Diaphragm Head
54	Lower Spring Seat
55	Diaphragm Plate
56*	Diaphragm
57	Cap Screw Low-Pressure Actuator (16 required) High-Pressure Actuator (8 required)
58	Hex Nut Low-Pressure Actuator Steel (16 required) Stainless steel (16 required) High-Pressure Actuator Steel (8 required) Stainless steel (16 required)
60*	Bonnet O-ring
61	Bonnet
62	Lower Diaphragm Casing
63	Upper Diaphragm Casing
64*	Upper Casing O-ring
65	Cap Screw (10 required)
66	Spring Case Spacer
67	Cap Screw (6 required)
68	Control Spring
69	Upper Spring Seat

Key	Description
70	Spring Case
71*	Sealing Washer (not shown)
72	Jam Nut
73	Square Head Adjusting Screw
74	Adaptor
76	Pipe Bushing
81	Pipe Nipple (not shown)
82	Drain Valve (not shown)
84	Internal Stiffener Plate
85	Bleed Valve (not shown)
87	Upper Casing Welding Assembly (not shown)

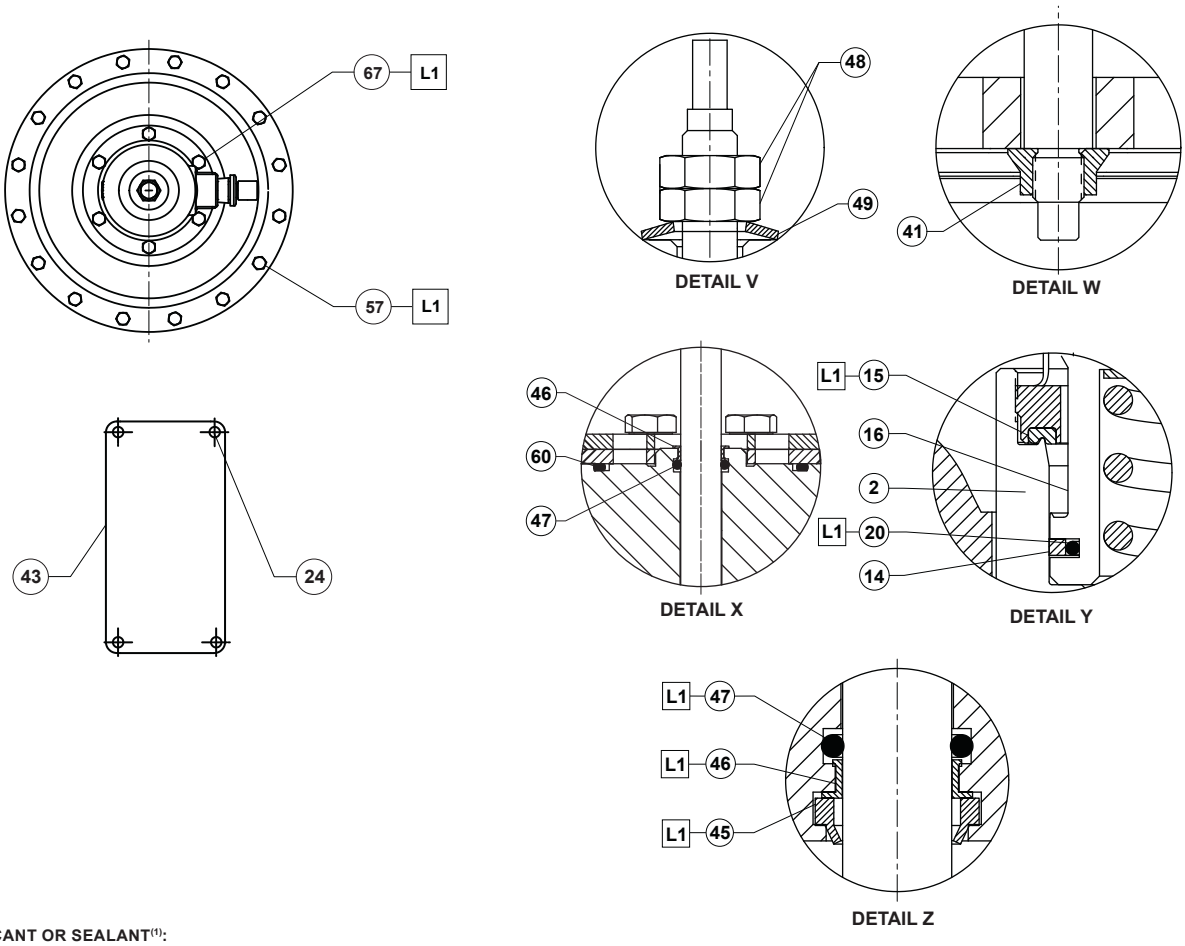
*Recommended spare part.



☐ **APPLY LUBRICANT OR SEALANT(1):**
L1 = MULTI-PURPOSE POLYTETRAFLUOROETHYLENE (PTFE) LUBRICANT
L2 = MULTI-PURPOSE DYNAMIC GREASE
L3 = ANTI-SEIZE COMPOUND
S = MULTI-PURPOSE PTFE THREAD SEALANT

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

Figure 1. *Type MR108 Assembly Drawings*



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☐ **APPLY LUBRICANT OR SEALANT(1):**
L1 = MULTI-PURPOSE PTFE LUBRICANT

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

Figure 1. *Type MR108 Assembly Drawings (continued)*

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For further information on the current PED/PE(S)R revision see Bulletin: *D103053X012*
or scan the QR code.

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