
MODEL 18-FR Pressure Relief Pilot Valve Drawing A1064A INSTALLATION, OPERATION AND MAINTENANCE

OVERVIEW:

Model 18-FR is a direct acting, spring and diaphragm-operated relief valve. It is designed to open and close within a preset pressure range. It is designed to operate with clear water or mixed foam-water.

DESCRIPTION OF OPERATION:

Model 18-FR is a normally-closed valve due to the downward force of Spring (7) on Diaphragm (9).

When the inlet pressure is higher than the spring setpoint, Inner Valve (22) is lifted off its seat, allowing flow. At pressures below the setpoint, the spring returns the inner valve to its initial closed position.

PRESSURE SETTING ADJUSTMENT:

The setpoint of the Model 18-FR can be adjusted to any point within the pressure range indicated on Tag (10).

Adjustment is done by turning Adjusting Screw (20) clockwise or counterclockwise. This varies the force applied to the top of diaphragm by the spring.

Turning the Adjusting Screw (20) clockwise compresses the internal Spring (7), increasing the pressure needed under the diaphragm to open the valve. Turning counterclockwise decreases the pressure needed to open the valve.

When the required setpoint is achieved, Jam Nut (13) is tightened to prevent resetting.

INSTALLATION:

1. Ensure that the valve is as shown in enclosed Drawing A1064A.
2. Note the direction of flow of the system and align with the arrow indicating flow direction on Tag (10).
3. Connect the valve to the inlet and outlet lines ensuring that Adjusting Screw (20) is upward pointing.
For angle orientation, remove Plug (19) from the bottom port, and place it in the horizontal inlet port. Use the now free bottom port as the inlet port.
4. If required, install gauges in the place of the two Pipe Plugs (12).

Note: If the valve is intended for use in sprinkler systems, the following criteria must be met:

- a) A relief valve not smaller than ½ inch is to be installed downstream of the pilot operated pressure control valve
- b) Pressure gauges must be installed on the inlet and outlet sides of the pressure control valve

DISASSEMBLY AND REASSEMBLY:

1. Loosen Jam Nut (13) and turn Adjusting Screw (20) counterclockwise, completely relieving spring compression.
2. Remove Casing Screws (14), Spring Casing (8) and Spring (7).
3. Remove Plug (19). Hold Inner Valve Assembly (22) with a pair of soft-jawed pliers or vise grips, and remove Nut (21).
4. Remove Upper Clamp Plate (5), O-Ring (16), Diaphragm (9) and Lower Clamp Plate (3).
5. Remove Stem Guide Bushing (2) and Inner Valve Assembly (22).

Reassembly is done by performing the disassembly procedure in reverse. However, a thorough inspection is strongly suggested beforehand, including the following checks:

1. All parts for damage and abrasion
2. Diaphragm for tears
3. Stem for any type of scratching
4. O-rings lubrication and wear

INSPECTION AND TESTING:

Refer to Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems, NFPA 25, for inspection, testing, and maintenance requirements for Model 18-FR.

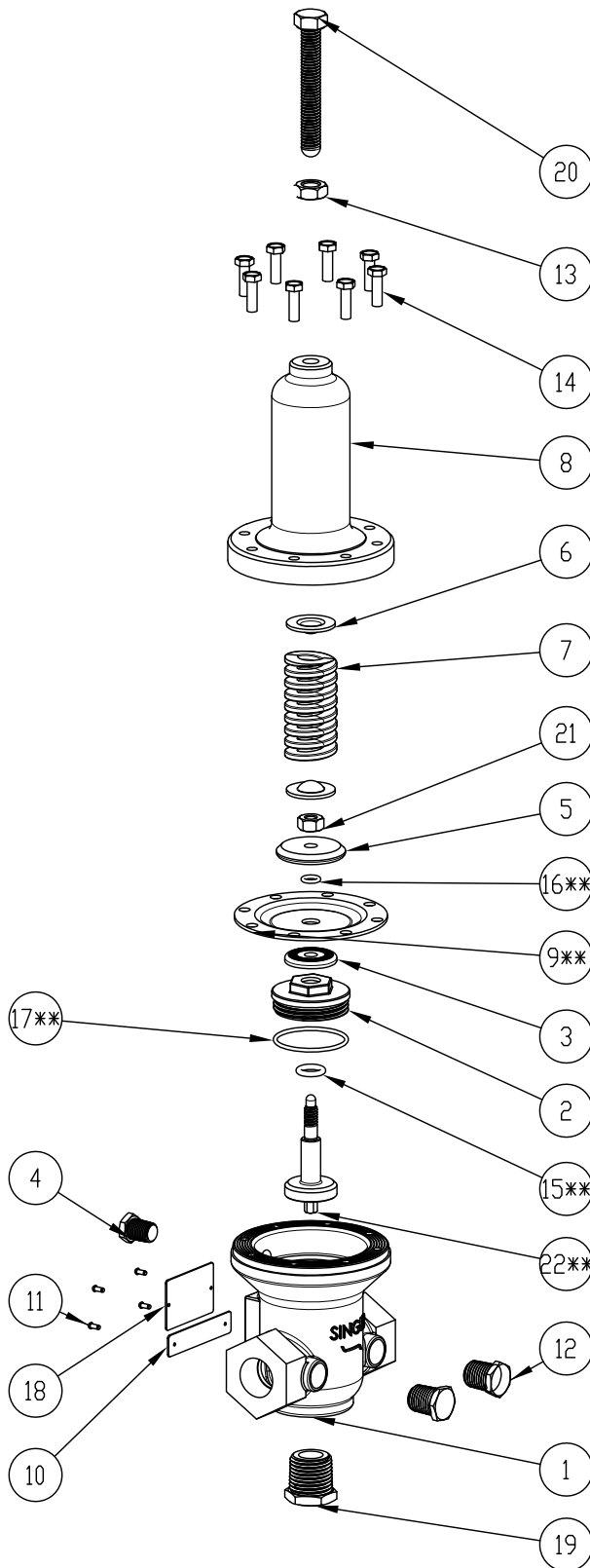
In addition to NFPA 25, Model 18-FR outlet pressures and flows must be tested after installation in accordance with NFPA 13 or NFPA 14 or both NFPA 13 and 14, whichever is applicable.

Testing must be done periodically thereafter in accordance with NFPA 25.

TROUBLESHOOTING COMMON PROBLEMS:

Problem	Probable Cause	Solution
Valve does not open.	Inlet pressure does not reach setpoint pressure.	Turn adjusting screw counterclockwise to lower setpoint.
Valve does not open (with no spring compression).	Obstruction in body or stem damage.	Disassemble valve. Remove obstruction and/or clean stem surface. Replace parts if necessary.
Valve does not close.	Inlet pressure too high for spring setting.	Turn adjusting screw clockwise. To raise setpoint.
Valve does not close (with spring compression).	Obstruction in body.	Disassemble valve and remove obstruction.

NOTE: If the valve still does not open or close under flowing conditions, pressure ranges must be reassessed for the application, and valve suitability reevaluated.

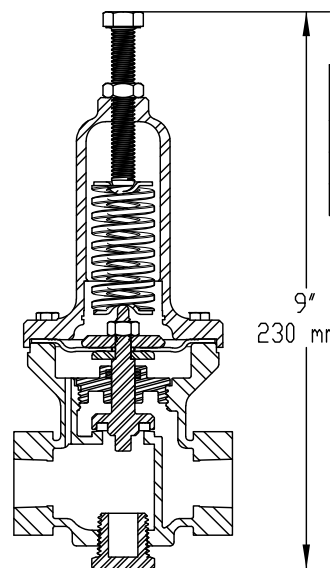


ITEM NO.	DESCRIPTION	Standard Material	Optional Material	Quantity
1	Body	Stainless Steel	Stainless Steel	1
2	Guide Bushing 18-FR	Stainless Steel	Stainless Steel	1
3	Clamp Plate Lower	Stainless Steel	Stainless Steel	1
4	Plug	Stainless Steel	Stainless Steel	1
5	Clamp Plate Upper	Stainless Steel	Stainless Steel	1
6	Spring Step	Stainless Steel	Stainless Steel	2
7	Spring	Die Spring Steel	Die Spring Steel	1
8	Spring Casing	Stainless Steel	Stainless Steel	1
9**	Diaphragm	EPDM	EPDM	1
10	Tag	Brass	Brass	1
11	Rivet U Drive	Stainless Steel	Stainless Steel	4
12	Plug	Stainless Steel	Stainless Steel	2
13	Jam Nut	Stainless Steel	Stainless Steel	1
14	Screw	Stainless Steel	Stainless Steel	8
15**	O-Ring	BUNA	BUNA	1
16**	O-Ring	BUNA	BUNA	1
17**	O-Ring	BUNA	BUNA	1
18	Tag	Brass	Brass	1
19	Plug	Stainless Steel	Stainless Steel	1
20	BOLT	Stainless Steel	Stainless Steel	1
21	Nut	Stainless Steel	Stainless Steel	1
22**	Inner Valve	Stainless Steel & EPDM	Stainless Steel & BUNA	1

** Parts in pilot rebuild kit (part number Kit 18FR-100)

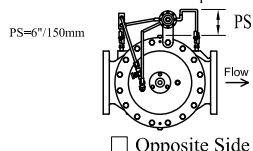
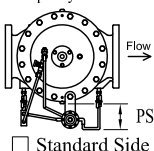
Inner Valve also available in Stainless Steel & BUNA

Size	Spring	Part Number
Stainless Steel & EPDM		
1/2"	10 - 75 PSI	18-FR50 10-75 E-TT01
1/2"	20 - 200 PSI	18-FR50 20-200 E-TT01
1/2"	100 - 300 PSI	18-FR50 100-300 E-TT01
3/4"	10 - 75 PSI	18-FR75 10-75 E-TT01
3/4"	20 - 200 PSI	18-FR75 20-200 E-TT01
3/4"	100 - 300 PSI	18-FR75 100-300 E-TT01
Stainless Steel & BUNA		
1/2"	10 - 75 PSI	18-FR50 10-75 B-RS50080
1/2"	20 - 200 PSI	18-FR50 20-200 B-RS50080
1/2"	100 - 300 PSI	18-FR50 100-300 B-RS50080
3/4"	10 - 75 PSI	18-FR75 10-75 B-RS50080
3/4"	20 - 200 PSI	18-FR75 20-200 B-RS50080
3/4"	100 - 300 PSI	18-FR75 100-300 B-RS50080



Spring Range	Approx. adjustment Per Turn
10 - 75 PSI (69 - 517 Kpa)	9 PSI (62 Kpa)
20 - 200 PSI (138 - 1379 Kpa)	22 PSI (152 Kpa)
100 - 300 PSI (690 - 2068 Kpa)	49 PSI (338 Kpa)

Must specify on order. Standard side will be selected if not specified.



Series/Model No.

18-FR

Description

Pressure Relief Valve

Dwg by ML

Apvd by SG

Dwg date 10/27/2016

Dwg No. A1064A

Rev C

SINGER®
a MUELLER brand