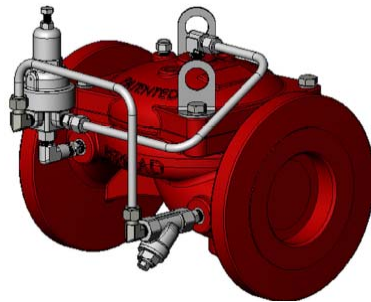
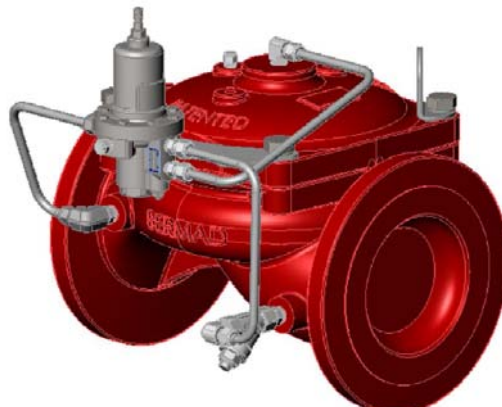


Bermad Pressure Relief Valve

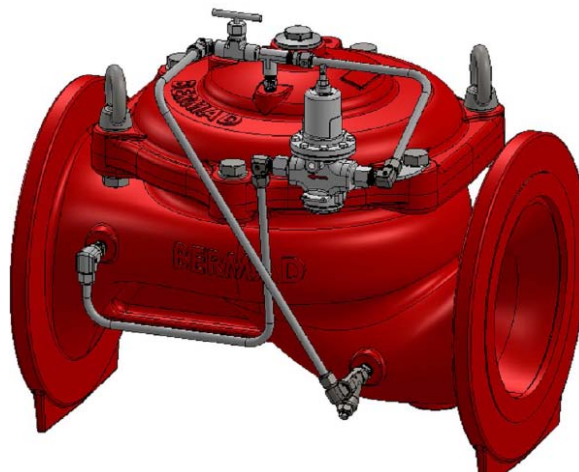
INSTALLATION OPERATION MAINTENANCE



1-1/2" – 4"



6" – 10"



12" – 14"

1. Safety First

BERMAD believes that the safety of personnel working with and around our equipment is the most important consideration. Please read all safety information below and from any other relevant source before attempting to perform any maintenance function.

Comply with all approved and established precautions for working with your type of equipment and/or environment.

Authorized personnel should perform all maintenance tasks.

Prior to performing a procedure, read it through to the end and understand it. If anything is not clear, ask the appropriate authority.

When performing a procedure, follow the steps in succession without omission.

2. Description

BERMAD's Models 430-UF and 430-00 Pressure-Relief Valve are pilot-operated, diaphragm valve globe type, high performance valve. It accurately maintains a constant preset system pressure regardless of changing demands.

The 430-UF / 430-00 Pressure-Relief Valve reliably relieves excess system pressure to sump or atmosphere, meeting all NFPA-20 requirements for fire pump service.

The actuator design enables quick and smooth valve action. According to the inlet pressure, the pilot valve regulates the main valve throttling. This valve requires only existing line pressure to operate.

2.1 Models and Sizes

BERMAD Pressure-Relief Valve Models and Sizes covered by this document include the followings:

2.1.1 Model 430-UF body type, sizes 2", 2.5", 3", 4", and 6" are UL-listed, FM Lloyd's Register and ABS approved.

2.1.2 Model 430-00 body type, sizes 1-1/2", 8", 10", 12" and 14" are Lloyd's Register and ABS approved.

2.1.3 Sizing shall be not less than according to NFPA 20 Table 2-20..

2.2 Operating Pressure Rating

All sizes are rated to maximum set pressure of 175 psi (12 bar).

2.3 Optional Features

Valve Position-Flow Indicator

This option provides the means for detecting motion of water through the valve according to requirements of NFPA 20. This item is field retro-fit able.

Large Control Filter

This option provides extra capacity means for filtering of the water supplied to the control loop to achieve the essential level of debris free water. This feature is recommended for those cases where there is any doubt as to the level of particulate matter in the water.

3. Approvals

BERMAD 430 UF Valve is UL-Listed and FM approved when installed with specific components & accessories. Refer to the current UL Directory.

Consult the manufacturer for any component approval recently to appear in the UL or FM fire protection equipment directory.

Model: FP / FS 430-UF / 430-00 Sizes: 2"-14"

4. Installation

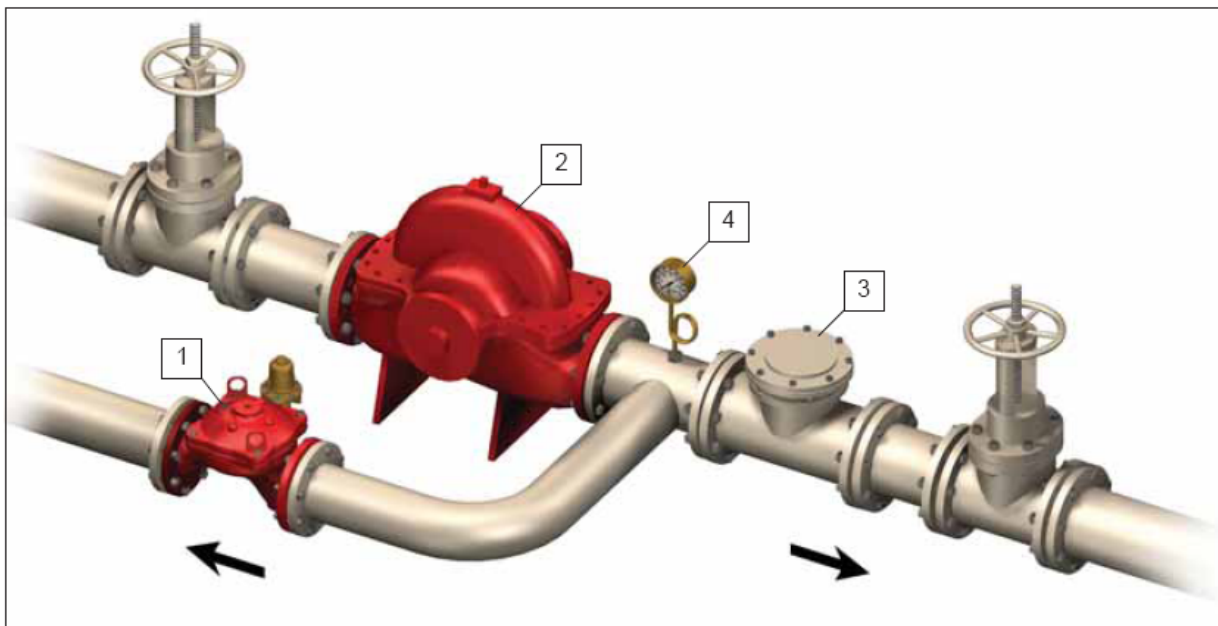
- 4.1 Before the valve is installed, flush the pipeline to remove any dirt, scale, debris, etc. Not flushing the line might result in the valve being inoperable.
- 4.2 In cases where the valve is used for individual pump pressure-relief, locate the relief valve between the pump and the pump discharge check valve. It shall be attached in a way that it can be readily removed for repairs without disturbing the piping.
- 4.3 Allow enough room around the valve assembly for any adjustments and future maintenance/disassembly work.
- 4.4 Install the valve in the pipeline with the valve flow arrow on the body casting in the proper direction. Use the lifting eye provided on the main valve cover for lifting and lowering the valve.
- 4.5 For best performance, install the valve horizontally with the cover up. However, other positions are acceptable. Ensure that the valve is positioned so that the actuator can be easily removed for future maintenance.
- 4.6 After installation, carefully inspect/correct any damaged accessories, piping, tubing, or fittings. Ensure that there are no leaks.

Figure 1: Installation Drawing

Typical Installation:

System Components

1. BERMAD Model FP-430-UF
2. Fire Pump
3. Check Valve
4. Pressure Gauge



5. Operation

Principal of Operation

The Pressure-Relief Pilot Valve (3) senses inlet pressure and modulates the upper control chamber causing the main valve to throttle, thus sustaining constant inlet pressure. When the inlet pressure rises above the pilot setting, the pilot opens, pressure in the upper control-chamber decreases, and the main valve modulates open to relieve inlet pressure and sustain pilot setting.

The pressure-relief pilot is equipped with an adjusting screw (5) to preset the desired inlet pressure and an internal adjustable Needle Valve (2) to control the main valve closing speed.

Starting –up

- 5.1 Provide pump shut-off pressure to the Model FP 430UF Control Valve (1) inlet, allow no system demand.
- 5.2 Create sufficient pressure (higher than the valve set pressure) to allow flow through the relief valve.
- 5.3 While relief valve is operating, wait for the valve inlet pressure to stabilize.
The pressure on the inlet side of the relief valve should be according to the factory pre-set adjusted pressure.
- 5.4 Slowly allow system flow so that system pressure falls below the relief-valve adjusted pressure.
The relief-valve should slowly shut to drip-tight.

6. Readjusting

Tools required:

- Flat head screwdriver
- Adjustable wrench (6-10 inch only)

The pilot valve is factory pre-set. The pre-set is clearly indicated on the pilot valve data-plate.

If readjustment to either the pressure or valve response is required, follow the following steps.

- 6.1 Ensure that there is nominal flow through the relief-valve.
- 6.2 Release the tension between the adjusting screw on the pressure-relief pilot valve and the fastening nut by turning the fastening nut counterclockwise.
- 6.3 By alternately turning the adjusting screw (5) on the pilot valve (3) a half turn and then reading the outlet pressure, gradually adjust the pressure:

Counterclockwise to decrease (—) the inlet pressure,
or

Clockwise to increase (+) the inlet pressure.

Note: Valve response adjustment affects pre-set pressure. Any adjustment to valve response requires rechecking pre-set pressure. See section 5.1, steps 1-4.

- 6.4 Repeat the Starting-up procedure, section 0 steps 1-4.
- 6.5 By turning the needle valve screw (2) on the pilot valve bottom, adjust the valve response, turn:

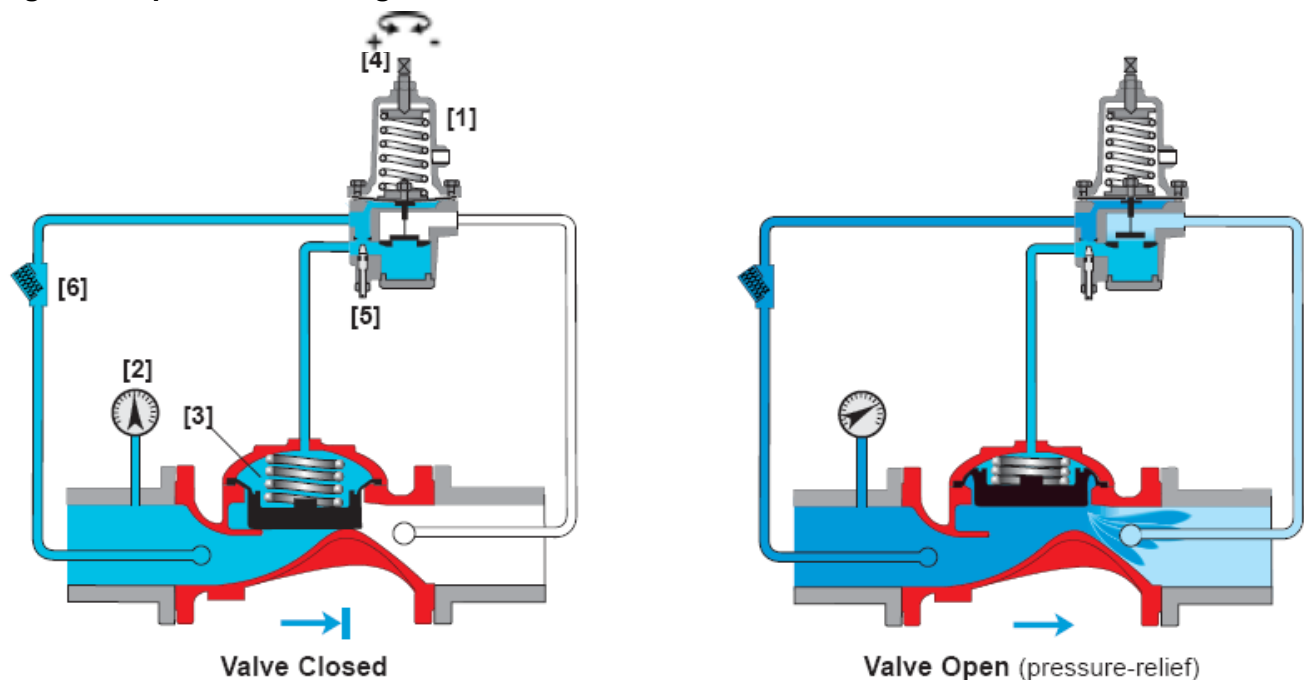
Clockwise (while facing the screw) to decrease (-) the closing speed of the main valve
or

Counterclockwise to increase (+) the closing speed of the main valve.

- 6.6 Repeat the Starting-up procedure, steps 1-4.

Model: FP / FS 430-UF / 430-00 Sizes: 2"-14"

Figure 2: Operation Drawing



Note: illustration shows 6" size

7. Maintenance and Inspection Test

Warning: Do not turn off the water supply, to make repairs, without notifying local security guards.

- 7.1 In any of the following inspections or testing procedures, if an abnormal condition exists, see Troubleshooting for possible cause and corrective action.
- 7.2 The Model FP 430UF valve is to be inspected, tested and maintained in accordance with the Maintenance Instructions of the plant, this Maintenance Manual, as well as the Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems, NFPA 25.

8. Weekly Inspection

- 8.1 The system should be inspected under flow conditions.
- 8.2 Check that the main valve, pilot system, accessories, tubing & fittings, are all in good condition, damage free and not leaking.
- 8.3 The fastening nut, of the pilot valve (4 figure 2) adjusting screw, should be fastened tightly.
- 8.4 For circulation type installations, verify that sufficient water flows through the valve when fire pump is operating at shut-off pressure (churn) to prevent the pump from overheating.
- 8.5 Verify that the pressure upstream of the relief valve fittings in the fire pump discharge piping does not exceed the pressure for which the system components are rated.

9. Annual Inspection and Test

- 9.1 Complete Weekly Inspection.

Model: FP / FS 430-UF / 430-00 Sizes: 2"-14"

- 9.2 During the annual fire pump flow test, it shall be verified that the pressure relief valve is correctly adjusted and set to relieve at the appropriate pressure and closes below the pressure setting

10. Abnormal Conditions - Troubleshooting

SYMPTOM	PROBABLE CAUSE	REMEDY
Valve fails to regulate	Filter screen (4) blocked.	Remove filter cap and screen to clean. Filter might be insufficient. See Note below.
	Pulsates or hunts.	Slowly adjust needle valve (21) until pulsation stops.
	Needle valve (21) not properly adjusted.	Factory set at $\frac{1}{2}$ or $1\frac{1}{2}$ open. Adjust.
	Air trapped in main valve cover.	Loosen cover tube fitting at the highest point, allow the air to escape and re-tighten.
Valve fails to open	Insufficient inlet pressure.	Check/create inlet pressure.
	Pilot is adjusted to high.	Turn adjusting screw CCW on pilot (5).
Valve fails to seal inlet pressure	Filter screen (4) blocked.	Remove filter cap and screen to clean. Filter might be insufficient. See Note below.
	Debris trapped in main valve.	Remove and inspect actuator assembly. Check seat. Check for foreign bodies. Rinse at high flow-rate.
	Diaphragm in main valve is leaking.	Open the valve cover, inspect diaphragm. If damaged, replace.
	Diaphragm in pilot valve is leaking.	

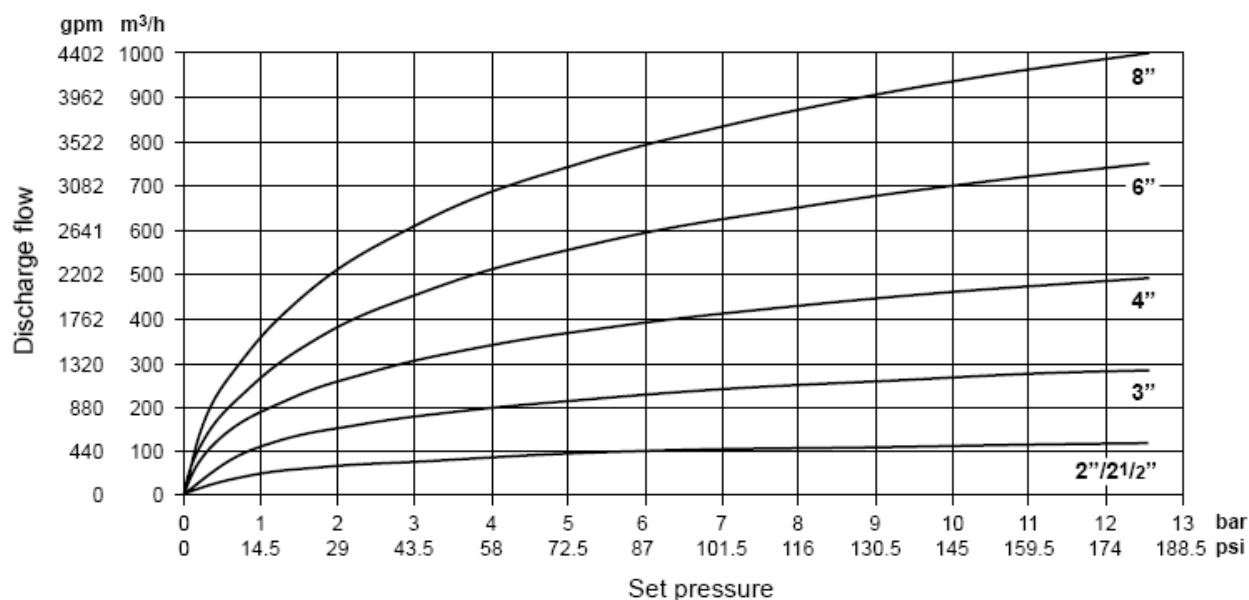
Note: Mark "F" – Large Filter

In cases where the filter screen frequently becomes blocked, install a filter with filtration capacity of at least 80 mesh, 250 μ m.

11. Difficulty in Performance

Where difficulty in performance is experienced, the manufacturer or his authorized representative should be contacted if any field adjustment is to be made.

Figure 3: Discharge Chart



12. Performance Tables

Performance Characteristics for Pressure Rating 175						
Valve size	2" (50 mm)	2½" (65 mm)	3" (80 mm)	4" (100 mm)	6" (150 mm)	8" (200 mm)
Flow capacity [gpm(lps)]	250 (15.75)		500 (31.5)	1000 (63)	2500 (157.5)	5000 (315)
Max. inlet pressure [psi(bar)]	175 (12)					
Adjustment range [psi(bar)]	30-175 (2-12)					

Flow Capacity Test						
Valve size	2" (50 mm)	2½" (65 mm)	3" (80 mm)	4" (100 mm)	6" (150 mm)	8" (200 mm)
Required flow-rate [gpm (lps)]	250 (15.75)	250 (15.75)	500 (31.5)	1000 (63)	2500 (157.5)	5000 (315)
Valve set pressure psi	Actual required inlet trip pressure					
30	29	29	29	29	31	32
50	52	53	52	52	51	52
100	104	104	105	102	102	101
150	152	152	154	153	152	151
175	177	177	176	173	177	175

Note: consult Bermad for sizes greater than 8".