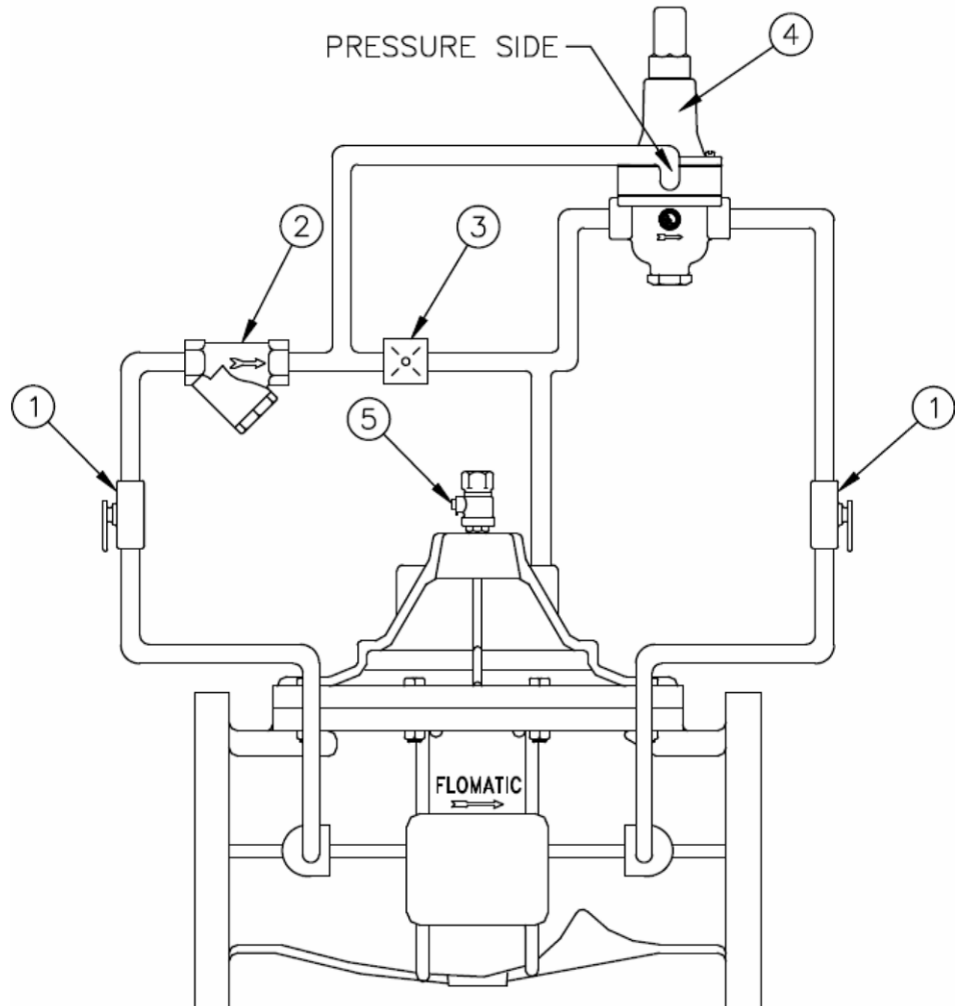


# Operation & Maintenance Manual

Place this manual with valve or person responsible for maintenance of the valve

## Part List

1. Isolation Valve
2. Y-Strainer
3. Orifice (restriction fitting)
4. Pilot (Model BPP)
5. ¼" Air bleeder



## **Model C/CA/CF/CFA 401 Pressure Relief Valve**

### **YOUR VALVE INFORMATION:**

**Model Number:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Serial Number:** \_\_\_\_\_

**Valve Size:** \_\_\_\_\_

**Factory Pilot Preset:** \_\_\_\_\_ **psi**

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## Pressure Relief Valve

The Model C/CA/CF/CFA 401 Pressure Relief Valve protects against system over-pressure in pump stations, distribution systems and transmission mains by opening when the inlet pressure exceeds the pilot setting resulting in a discharge of high pressure water to waste pump suction or a zone of lower pressure.

The hydraulic pilot valve senses inlet pressure and reacts quickly to an over pressurization causing the relief valve to open to a throttled position permitting discharge of a sufficient volume of high pressure water to protect against system damage.

### SHIPMENT:

When shipped, controls are usually mounted on the main valve. If control subassemblies are shipped separately, all connections are tagged to insure correct assembly.

### INSTALLATION:

1. Flush the pipeline before inserting the valve.
2. **Exercise caution to prevent dirt/debris from entering valve and control piping.**
3. Install the valve with the "arrow" on body pointing in the direction of flow.
4. Attach sub-assemblies to main valve if necessary.
5. Allow enough clearance above valve for future service and removal of diaphragm assembly.

### START-UP:

1. Install pressure gauges to observe inlet and outlet pressures (optional).
2. Open both isolation valves on the control assembly.
3. Open 1/4" air bleeder at the top of the valve.
4. Open main line shut-off valve (usually a gate or butterfly valve) on the outlet side of the main valve about 1/4 open.
5. Slowly open main line shut-off valve on the inlet side.
6. Close 1/4" air bleeder when **all air has been removed** from valve cover.
7. Slowly open the main line shut-off valve on the outlet side the remainder of the way.
8. If the pressure relief setting is too high, turn the pilot adjustment screw slowly counter clockwise, if the pressure relief setting is too low, turn the pilot adjusting screw slowly clockwise until required setting is achieved. Fluid must be flowing through valve to make accurate pilot adjustments. The valve is shipped from the factory at the requested pressure relief setting indicated at the time of order.

CAUTION: any adjustment should be done slowly.

### OPERATION:

The Model C/CA/CF/CFA 401 Pressure Relief Valve is usually installed off of a tee in the piping system to protect against system over pressurization. Discharge from the valve is usually piped to a waste pump suction or a zone of lower pressure. The valve opens to relieve pressure when the system pressure exceeds the setting of the pilot control.

The throttled position of the main valve diaphragm assembly is controlled by a pilot valve which senses the upstream pressure. When the upstream pressure exceeds the pilot valve setting it will react immediately by opening and allowing the water from the top of the main valve diaphragm to be released resulting in the main valve opening and releasing excessive system pressure. When the system pressure drops below the setting of the pilot control, the pilot will close causing the upstream pressure to be redirected to the top of the main valve diaphragm resulting in drip tight closure of the main valve.

The main valve will only open once the system pressure exceeds the pilot setting. The BPP senses the upstream (inlet) pressure and reacts immediately to add or remove water from the top of the main valve diaphragm assembly causing a repositioning of the main valve as the inlet pressure tends to increase or decrease with varying flow demand. The BPP diaphragm will automatically sense the changes in the flow of the system as it continuously controls the main valve to throttle or to close. The throttling action of the main valve provides the required system over-pressurization protection. This valve will close when the upstream pressure drops below the pilot control setting.

## TROUBLE SHOOTING GUIDE

PROBLEM: Valve opens and will not close.	
<p style="text-align: center;"><b>CAUSE</b></p> <ol style="list-style-type: none"> <li>1. Main valve is air bound.</li> <li>2. Isolation valve at the inlet side of controls is closed.</li> <li>3. Indicator stuffing box or sight glass is leaking (if equipped).</li> <li>4. Ruptured diaphragm in BPP, evidenced by leak from vent hole in spring chamber.</li> <li>5. Fouled orifice (or needle valve).</li> <li>6. Fouled Y-strainer.</li> <li>7. Damaged BPP valve seat.</li> <li>8. Ruptured diaphragm in main valve.</li> <li>9. Sticks or stones lodged under seat of main valve.</li> <li>10. Worn seat packing and/or seat ring in main valve.</li> <li>11. Incorrect adjustment of BPP (set too low).</li> <li>12. Leakage from one or more fittings in the controls.</li> <li>13. Damaged o-ring stem seal.</li> </ol>	<p style="text-align: center;"><b>CORRECTION</b></p> <ol style="list-style-type: none"> <li>1. Open ¼" air bleeder located on top cover of valve to release air.</li> <li>2. Open isolation valve.</li> <li>3. Tighten packing nut or replace packing seals.</li> <li>4. Replace BPP diaphragm.</li> <li>5. Remove and clean orifice, or open needle valve wide (counter clockwise) to flush seat. Return to original setting after 4 or 5 seconds.</li> <li>6. Disassemble, clean or replace screen.</li> <li>7. Disassemble, clean and replace damaged parts.</li> <li>8. Disassemble and replace diaphragm.</li> <li>9. Disassemble and remove. Replace damaged parts.</li> <li>10. Disassemble and replace damaged parts.</li> <li>11. Turn BPP adjusting screw clockwise slowly until valve resumes control and the desired pressure setting is obtained.</li> <li>12. Tighten or replace fitting.</li> <li>13. Disassemble and replace o-ring.</li> </ol>
PROBLEM: Valve is closed and will not open.	
<p style="text-align: center;"><b>CAUSE</b></p> <ol style="list-style-type: none"> <li>1. Incorrect adjustment of BPP (set too high).</li> <li>2. Isolation valve at the outlet side of the controls is closed.</li> <li>3. Fouled BPP valve.</li> <li>4. Worn or eroded orifice (or needle valve seat).</li> </ol>	<p style="text-align: center;"><b>CORRECTION</b></p> <ol style="list-style-type: none"> <li>1. Turn BPP adjusting screw counter clockwise slowly until the valve opens and the desired pressure setting is obtained.</li> <li>2. Open isolation valve.</li> <li>3. Disassemble and clean, replace seat ring/packing if necessary.</li> <li>4. Replace orifice (or needle valve).</li> </ol>
<b>Test To Isolate Source Of Problem</b> (After visual inspection of external leaks)	
<p>1. With the main line gate valves open and the pressure relief valve under pressure, close the isolation valve at the outlet side of the pilot controls. <b>THE MAIN VALVE SHOULD CLOSE.</b></p> <p><b>If the valve remains fully open the source of the problem could be:</b>                      (A) fouled orifice; (B) fouled Y-strainer; (C) control isolation valve at inlet is closed; (D) ruptured main valve diaphragm.</p> <p><b>If the valve is partially closed the source of the problem could be:</b>                      (A) damaged main valve seat packing or seat ring; (B) debris under seat; (C) main valve is air-bound; (D) damaged stem o-ring.</p> <p><b>If the valve closes fully, the source of the problem could be:</b>                      (A) pilot valve out of adjustment; (B) damaged pilot valve stem or set ring; (C) partially fouled y-strainer or needle valve.</p> <p>2. With the main line gate valves open and the pressure relief valve under pressure, close both isolation valves and open the air bleeder valve to release water from the chamber above the diaphragm of the main valve. Water will flow from the air bleeder as the valve moves to the full open position.</p> <p><b>If water continues to flow from the air bleeder, the source of the problem could be:</b>                      (A) damaged main valve diaphragm or stem seal o-ring; (B) loose locknut.</p>	