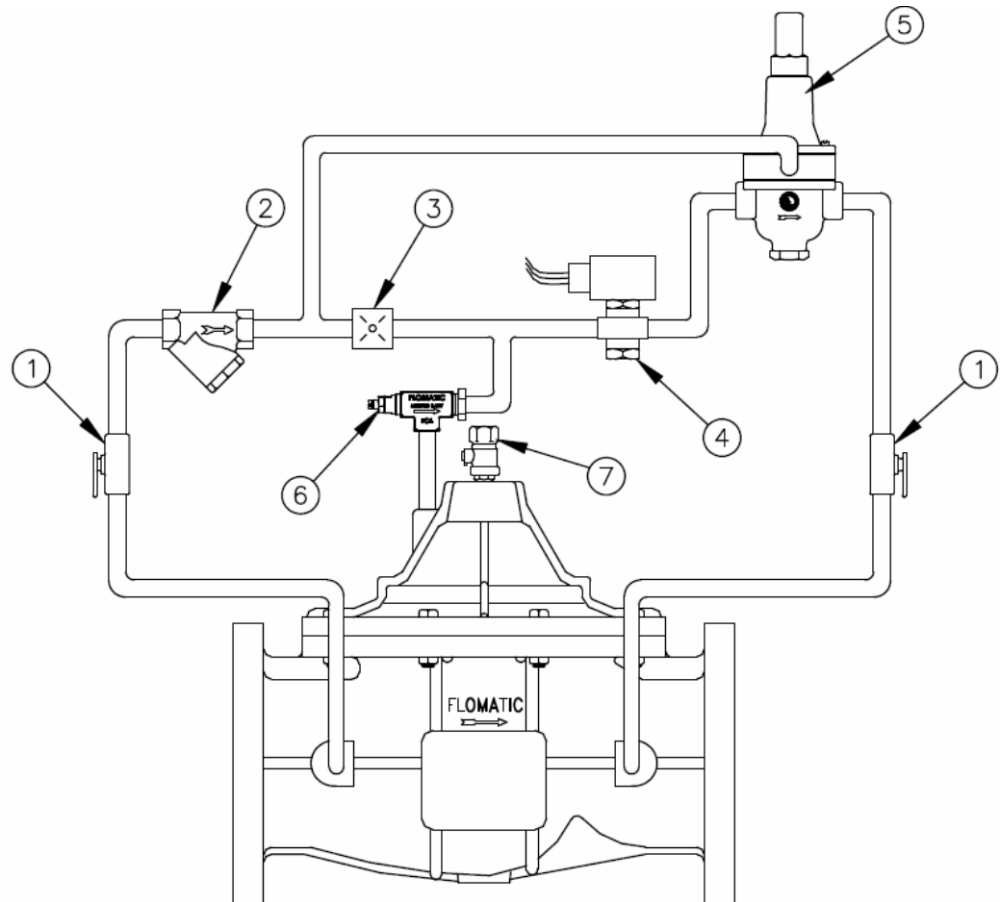


Operation & Maintenance Manual

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. Solenoid Valve
5. Pilot (Model BPP)
6. Flow Control Valve (FC4)
7. 1/4" Air Bleeder



Model C/CA/CF/CFA 303 & 304 Back Pressure Sustaining with Solenoid Override

YOUR PRODUCT INFORMATION:

Model Number: _____

Date: _____

Serial Number: _____

Valve Size: _____

Factory BPP Preset: _____ **psi**

Solenoid: _____ **volt**

Normally: _____

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BACK PRESSURE WITH SOLENOID OVERRIDE

The Model C/CA/CF/CFA 303 permits flow and operates as a back pressure sustaining valve when the two-way, normally open solenoid valve is de-energized. Energizing the solenoid closes the valve.

The Model C/CA/CF/CFA 304 permits flow and operates as a back pressure sustaining valve when the two-way, normally closed solenoid valve is energized. De-energizing the solenoid closes the valve.

SHIPMENT:

When shipped, controls are usually mounted on the main valve. If control sub-assemblies 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 the body pointing in the direction of flow.
4. Attach sub-assemblies to main valve if necessary.
5. Connect Solenoid wires to system control assembly.
6. Allow enough clearance above valve for 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 back pressure setting is too high, turn the pilot adjustment screw slowly counter clockwise, if the back pressure setting is too low, turn the pilot adjusting screw slowly clockwise until required setting is achieved. Fluid must be flowing through valve to make pilot adjustments.

CAUTION: any adjustment should be done slowly.

OPERATION:

When the solenoid allows, the Models C/CA/CF/CFA 303 and 304 - Back Pressure Sustaining Valve will throttle to maintain a minimum upstream pressure (backpressure) regardless of change in demand downstream.

The throttled position of the main valve diaphragm assembly is controlled by a pilot valve which senses the upstream pressure. The pilot valve reacts immediately to changes in pressure and in turn causes a repositioning of the main valve diaphragm assembly to sustain the desired, preset upstream pressure.

The main valve will only open when triggered by the solenoid valve and the required backpressure is obtained on the upstream portion of the system. 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 and maintain the desired, preset minimum inlet pressure. The throttling action of the main valve provides the required system backpressure.

This valve will close when the upstream pressure drops below the pilot control setting. If the minimum backpressure is maintained the main valve will open proportional to the system flow and pressure resulting in an increase in both the upstream and downstream pressures if the downstream demand is less than the available supply.

TROUBLE SHOOTING GUIDE

PROBLEM: Valve opens and will not close resulting in decreased back pressure.	
CAUSE	CORRECTION
<ol style="list-style-type: none"> 1. Main valve is air bound. 2. Isolation valve at the inlet side of controls is closed. 3. Indicator stuffing box or sight glass is leaking (if equipped). 4. Ruptured diaphragm in BPP (evidenced by leak from vent hole in spring chamber). 5. Fouled orifice (or needle valve). 6. Fouled Y-strainer. 7. Damaged BPP valve seat. 8. Ruptured diaphragm in main valve. 9. Sticks or stones lodged under seat of main valve. 10. Worn seat packing and/or seat ring in main valve. 11. Incorrect adjustment of BPP (set too low). 12. Leakage from one or more fittings in the controls. 13. Damaged o-ring stem seal. 	<ol style="list-style-type: none"> 1. Open ¼" air bleeder located on top cover of valve to release air. 2. Open isolation valve. 3. Tighten packing nut or replace packing seals. 4. Replace BPP diaphragm. 5. Remove and clean orifice, or open needle valve wide (counter clockwise) to flush seat. Return to original setting after 4 or 5 seconds 6. Disassemble, clean or replace screen. 7. Disassemble, clean and replace damaged parts. 8. Disassemble and replace diaphragm. 9. Disassemble and remove. Replace damaged parts. 10. Disassemble and replace damaged parts. 11. Turn BPP adjusting screw clockwise slowly until valve resumes control and the desired backpressure is obtained. 12. Tighten or replace fitting. 13. Disassemble and replace o-ring.
PROBLEM: Valve is closed and will not open.	
CAUSE	CORRECTION
<ol style="list-style-type: none"> 1. Incorrect adjustment of BPP (set too high). 2. Needle valve (if installed) open too far. 3. Isolation valve at the outlet side of the controls is closed. 4. Fouled BPP valve. 5. Worn or eroded orifice (or needle valve seat). 6. Malfunctioning solenoid valve or control system. 	<ol style="list-style-type: none"> 1. Turn BPP adjusting screw counter clockwise slowly until the valve opens and the desired backpressure is obtained. 2. Turn adjusting cap clockwise slowly until valve opens and a reduced outlet pressure is observed. Lock in this position. 3. Open isolation valve. 4. Disassemble and clean, replace seat ring/packing if necessary. 5. Replace orifice (or needle valve). 6. Investigate control system for proper operation and/or replace solenoid as necessary.
C. PROBLEM: Valve hunts or chatters	
<ol style="list-style-type: none"> 1. Valve is oversized. 2. Flow control valve (or needle valve at the outlet side) is out of adjustment or may be clogged with debris. 3. BPP seat packing is damaged. 	<ol style="list-style-type: none"> 1. Install a smaller back pressure sustaining valve in a bypass around the oversized valve to handle low flows and provide better control. 2. Slowly turn adjusting cap counter clockwise until the outlet pressure becomes steady and/or remove to inspect for debris. 3. Replace seat packing
Test To Isolate Source Of Problem (After visual inspection of external leaks)	
<ol style="list-style-type: none"> 1. With the main line gate valves open and the back pressure sustaining valve under pressure, close isolation valve at the outlet side of the pilot control. THE MAIN VALVE SHOULD CLOSE. If the valve remains fully open the source of the problem could be: <i>(A) fouled orifice or needle; (B) fouled y-strainer; (C) control isolation valve at inlet is closed; (D) ruptured main valve diaphragm.</i> If the valve is partially closed the source of the problem could be: <i>(A) damaged main valve seat packing or seat ring; (B) debris under seat; (C) main valve is air-bound; (D) damaged stem o-ring.</i> If the valve closes fully, the source of the problem could be: <i>(A) pilot valve out of adjustment; (B) damaged pilot valve stem or set ring; (C) partially fouled y-strainer or needle valve.</i> 2. With the main line gate valves open and the back pressure valve under pressure, close both isolation valves and open the air bleeder valve to release water from the power chamber above the diaphragm of the main valve. Water will flow from the air bleeder as the main valve moves to the full open position. If water continues to flow from the pet cock, the source of the problem could be: <i>(A) damaged main valve diaphragm or stem seal o-ring; (B) loose locknut.</i> 	