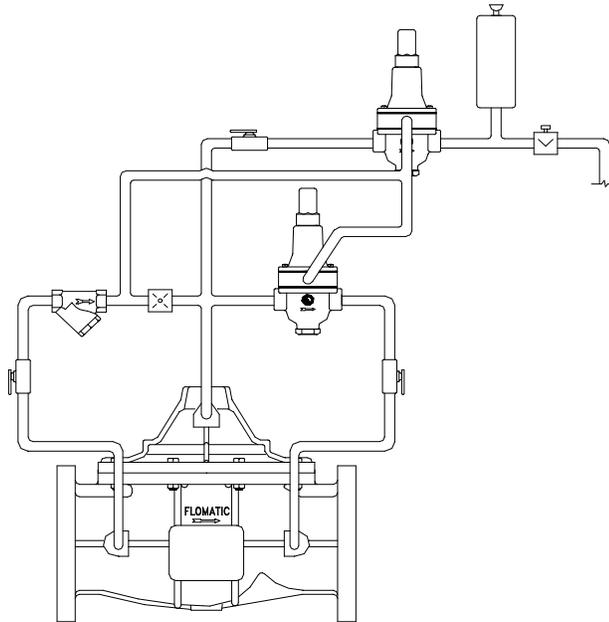


Operation & Maintenance Manual

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



Model C/CA/CF/CFA 501-Surge Arrester Valve (Hydraulic Controls)

YOUR VALVE INFORMATION:

Model Number: _____

Date: _____

Serial Number: _____

Valve Size: _____

Factory Pilot 1 Preset: _____ psi

Factory Pilot 2 Preset: _____ psi

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SURGE ARRESTOR VALVE (HYDRAULIC CONTROLS)

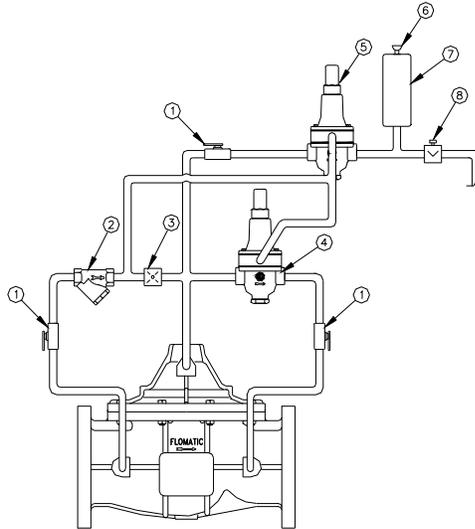
The Model C501 Surge Arrestor Valve opens quickly for over pressure which occurs during pump start and opens quickly for under pressure which occurs during normal pump shut down, electric power failure and pump failure.

When the under pressure pilot valve senses a subnormal pressure created by the low pressure portion of the surge wave (immediately after pump shut down or power failure), it causes the main valve to open rapidly by exhausting control water from above the diaphragm of the main valve to an accumulator. This insures that the main valve is open in anticipation of the returning high pressure portion of the surge wave to eliminate potential shock or hammer.

After the accumulator has filled, the main valve closes slowly at a rate controlled by an adjustable needle valve and when the line pressure returns to normal, the accumulator will drain in preparation for the next cycle.

Part List

1. Shut-Off Valve
2. Strainer
3. Orifice
4. Pilot Valve (Over Pressure)
5. Pilot Valve (Under Pressure)
6. Air/Vacuum Valve
7. Accumulator
8. Needle or Flow Control
9. Finger Strainer



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. Install the valve with the "arrow" on body pointing in the direction of flow (usually towards the tank or reservoir).
3. Attach subassemblies to main valve if necessary.
4. Install 1/4" pet cocks at the backside of valve.
5. Allow enough clearance above valve for removal of piston assembly.

START-UP:

1. Install pressure gauges to inlet and outlet.
2. Open both shut-off valves on the control assembly.
3. Open 1/8" air bleeder at the top of the valve. (Re-close after step 4 or step 5.)
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 and observe pressure gauges. When the outlet pressure gauge shows that the downstream pressure is being controlled, this shut-off valve may be opened more rapidly.
6. If the outlet pressure requires adjustment, turn the adjusting screw of the pilot valve counter clockwise to decrease, clockwise to increase. CAUTION: any adjustment should be done slowly.

TROUBLE SHOOTING GUIDE

A. PROBLEM : Valve opens and will not close.	
CAUSE 1. Main valve is air bound. 2. Shut-off (isolation) valve at the outlet side of control is closed. 3. Indicator stuffing box or sight glass is leaking (if equip). 4. Ruptured diaphragm in pilot valve. (Evidenced by leak from vent hole in cover.) 5. Fouled orifice or flow control valve. 6. Fouled strainer. 7. Damaged pilot valve seat. 8. Ruptured diaphragm in main valve. 9. Debris lodged under seat of main valve. 10. Worn seat packing and/or seat ring in main valve. 11. Incorrect adjustment of pilot valve (set too high). 12. Leakage from one or more fittings in the controls. 13. Damaged O-ring stem seal.	CORRECTION 1. Open 1/4" air bleeder at the top of valve to release air. 2. Open shut-off valve. 3. Tighten packing nut or replace packing seals (if equip). 4. Replace diaphragm. 5. Open flow control valve wide (counter clockwise) to flush seat, & after 4 or 5 seconds return to original setting, or remove and clean orifice. 6. Disassemble, clean or replace screen. 7. Disassemble, clean and replace damaged parts. 8. Disassemble and replace diaphragm. 9. Disassemble and remove debris. Replace any damaged parts. 10. Disassemble and replace damaged parts. 11. For pressure reducing valve turn adjusting screw counter clockwise slowly until valve resumes control and the desired outlet pressure is obtained. 12. Tighten or replace fitting. 13. Disassemble and replace O-ring.
B. PROBLEM: Valve is closed and will not open.	
1. Incorrect adjustment of pilot valve. (Set too high) 2. Flow control valve (if installed) open too far. 3. Shut off (isolation) valve at the outlet side of the controls is closed. 4. Fouled pilot valve 5. Worn or eroded orifice (or needle valve seat).	1. Turn pilot valve adjusting screw counter clockwise slowly until the valve opens and the desired reservoir level is reached. 2. Turn adjusting screw clockwise slowly until valve opens. 3. Open shut-off (isolation) valve. 4. Disassemble and clean, replace seat ring and seat seal if necessary. 5. Replace orifice (or needle valve).
C. PROBLEM: Valve hunts or chatters.	
1. Valve is oversized. 2. Flow control valve (or needle-valve at the outlet side of controls) is out of adjustment or may be clogged with debris. 3. Pilot valve seat packing is damaged.	1. Install a smaller pressure reducing valve in a bypass around the oversized valve to handle low flows and provide better control 2. Slowly turn adjusting screw and/or remove to inspect for debris. 3. Replace seat packing.
Test To Isolate Source Of Problem (After visual inspection of external leaks)	
1. With the main line gate valves open and the reducing valve pressurized, close the control shut-off (isolation) valve at the outlet side of the pressure reducing 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 strainer; (C) control shut off 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 strainer or needle valve.</i>	
2. With the main line gate valves open and the reducing valve pressurized, close both shut-off (isolation) valves and open the air bleeder pet cock to release water out of the power chamber above the diaphragm of the reducing valve. Water will flow from the pet cock as the valve moves to the full open position. If water continues to flow, the source of the problem could be: <i>(A) damaged: main valve diaphragm or stem seal O-ring; (B) loose locknut.</i>	