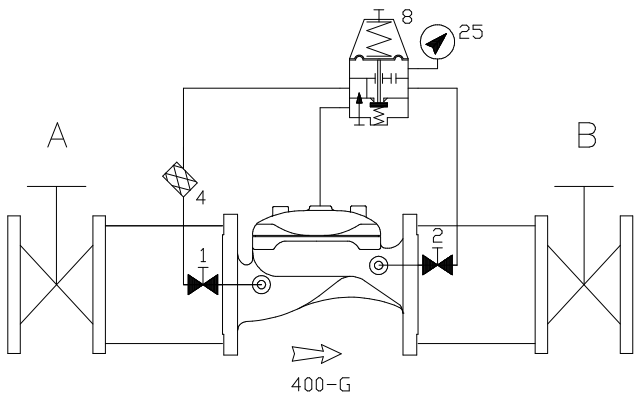
MODEL **420**

PRESSURE REDUCING CONTROL VALVE (with pilot #2)

■ MAINTENANCE ■OPERATION ■INSTALLATION



CONTROL LIST

400-G	RAM 400-Globe
8	Press. Reducing Pilot valve #2
1	Cock Valve
2	Cock Valve
25	Pressure Gauge
4	Control Filter, Y

DESCRIPTION

Model 420 Pressure Reducing Valve is an automatic control valve designed to reduce a higher inlet pressure to a lower constant outlet pressure regardless of fluctuating flow rates and/or varying inlet pressure. It is a pilot controlled, hydraulically operated diaphragm-type globe or angle 405 valve. The pressure regulating pilot senses downstream pressure and modulates open or closed, causing the main valve to throttle, thus maintaining constant delivery pressure. The pressure regulating pilot has an adjusting screw to preset the desired pressure, and a closing speed-control needle valve. When downstream pressure falls below the pilot setting, the pilot and main valve modulate open to increase pressure to maintain pilot setting. When downstream pressure rises above the pilot setting, the pilot and main valve throttle close to decrease pressure to maintain pilot setting. Pressure-reducing pilots are stamped with the number 2 on the side of the pilot body.

INSTALLATION

1. Allow enough room around the valve assembly for any adjustments and future maintenance/ disassembly work.
2. Thoroughly flush the pipeline to remove any dirt, scale, and debris. Failure to perform this operation may render the valve inoperable.
3. Isolation valves A and B should be installed upstream and downstream of the Bermad control valve to allow for future maintenance operations.
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 raising and lowering the valve. Install the valve horizontally with the cover up. Ensure that the valve is positioned so that the diaphragm assembly can be easily removed for future maintenance.
5. After installation carefully inspect /correct any damaged accessories, piping, tubing, or fittings.

ON LINE STATIC TEST PROCEDURES

OPEN VALVE: STATIC TEST

1. Close cock valve #1and #2, to isolate the pilot control system. This prevents dirt exposure in the control loop.
2. Remove the cover plug on the main valve cover.

Caution: This will allow the valve to open fully. Make sure that this condition does not cause system damage!

3. Check for leaks at the flange connection fittings etc.
4. Replace the cover plug.

CLOSED VALVE: STATIC TEST

1. Close cock valve #1 and open cock valve #2.
2. Vent any trapped air in the main valve cover by loosening the tube fitting at the highest point on the cover. This will trap the main valve in a closed position while the pipeline is pressurized.
3. Check the valve cover and diaphragm for leaks, tighten bolts if necessary.

START-UP OPERATION

Note: There must be constant flow through the valve and system to check and adjust the 420 PRV. Ensure that a downstream demand is created by opening a hydrant, relief valve, bypass, etc.

1. Close the main valve by closing cock valve #1. Close isolating valves A and B.
2. The needle valve #21 is factory set on at one-and-a-half turns. Turn the needle valve clockwise - to reduce the closing rate speed of the main valve - or vice versa.
3. Turn the adjusting screw counter clockwise (CCW) on the pressure reducing pilot (8) until all spring tension is released. Open cock valves #2; the main valve will remain closed.
4. Fully open upstream isolating valve A, and slightly open downstream isolating valve B; the main valve will remain closed.
5. Slowly turn the adjusting screw clockwise (CW) on the pressure reducing pilot valve #8 until the main valve begins to open. Continue turning the screw slowly, pausing after each half-turn to allow the valve to react. Set the desired pressure indicated on the pressure gauge (25). Tighten the locknut in the adjusting screw.
6. Check valve operation by slowly opening and closing downstream isolating valve B; downstream pressure should remain constant.
7. If necessary, adjust the closing speed by opening/closing the needle valve (21). Tighten the locknut on the needle valve.
8. Fully open downstream isolating valve B.

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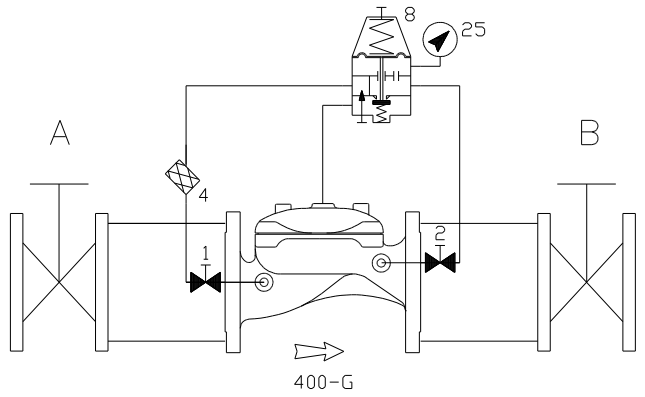
■ MAINTENANCE ■ OPERATION ■ INSTALLATION

TROUBLSHOOTING

SYMPTOM	CAUSE	REMEDY
Valve fails to open.	1. Insufficient inlet pressure.	1. Check/create inlet pressure.
	2. No downstream demand.	2. Create demand/flow.
	3. Needle valve (21) opening too wide.	3. Reduce needle valve opening.
	4. Insufficient pilot spring compression.	4. Turn adjusting screw CW on pilot (8).
	5. Cock valve (1) closed.	5. Open cock valve (1).
Valve fails to close.	1. Filter #4 blocked.	1. Remove filter cap and screen to clean.
	2. Needle valve (21) blocked or closed.	2. Open or adjust needle valve (21).
	3. Cock valve #1 closed.	3. Open cock valve #1.
	4. Debris trapped in main valve.	4. Remove and inspect diaphragm assembly. Check seat area.
	5. Diaphragm in main valve leaking.	5. Test for leakage. Close cock valves (1 and 2) and remove the plug in the main valve cover. If a continuous flow exists, the diaphragm is damaged or loose. **CAUTION:** the valve will be fully open. Close downstream gate valve B or omit this test if this may cause system damage.
Valve fails to regulate.	1. Air trapped in main valve cover.	1. Loosen cover tube fitting at its highest point and allow the air to escape. Re-tighten.
	2. Pulsate or hunts.	2. Slowly adjust needle valve (21) until pulsating stop.
	3. Air trapped in the main valve cover.	3. Loosen cover tube fitting at the highest point, allow the air to escape and re-tighten.



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