

Model BV60 Back Pressure/Pressure Relief Valves

Description

The Model BV60 Brodie Control Valves are back pressure regulators designed to maintain a specific minimum upstream pressure regardless of fluctuations in flow rate or downstream pressure. When correctly installed and adjusted, the Model BV60 valve will maintain up stream pressure at a value within +/-2 PSI (13.8 kPa) of the valve pilot's setting. A minimum pressure differential across the valve of 15 PSI (103 kPa) is required for it to fully open.

Principle of Operation

The Model BV60 valve is controlled by a back pressure pilot which senses line pressure at a selected point upstream of the valve and throttles the valve to maintain a desired minimum pressure at that point. If line pressure at the sense point exceeds the setting of the pilot, the pilot throttles the valve open until the correct pressure level is reached. Conversely, if line pressure at the sense point falls below the setting of the pilot, the pilot throttles the valve closed until the correct pressure level is reached. In the static condition, both the pilot and valve are closed. When the pump is activated, the initial pressure developed at the valve intake is applied to the top of the valve piston, keeping it tightly seated and preventing all flow. As pump discharge pressure rises, it soon exceeds the set point of the pilot, which then opens the valve to provide flow.

Once the valve has opened and continuous flow is established, the pilot monitors upstream pressure and compares it with the set point. If upstream pressure is greater than the set point, the pilot vents the pressure on top of the valve piston downstream, and the valve opens wider to conduct more flow. If upstream pressure is less than the set point, however, the pilot applies additional pressure to the top of the valve piston, and the valve throttles closed to restrict flow. The valve will limit flow in this manner in order to



WARNING

Do NOT operate this instrument in excess of the specifications listed. Failure to heed this warning could result in serious injury and/or damage to the equipment.

maintain the required minimum back pressure. A needle valve is included as a sensitivity adjustment used to regulate the speed at which the valve opens and closes.

Design Features

- Modular construction -all internal parts including seat ring can be removed with the cylinder assembly without disturbing line connections.
- No diaphragms or stuffing boxes
- 45° body design assures high capacity
- Positive shut-off
- Uniform speed of response
- Linear control characteristics
- Inherently checks reverse flow
- Characterized ports for better low flow response

Valve Capacity Data

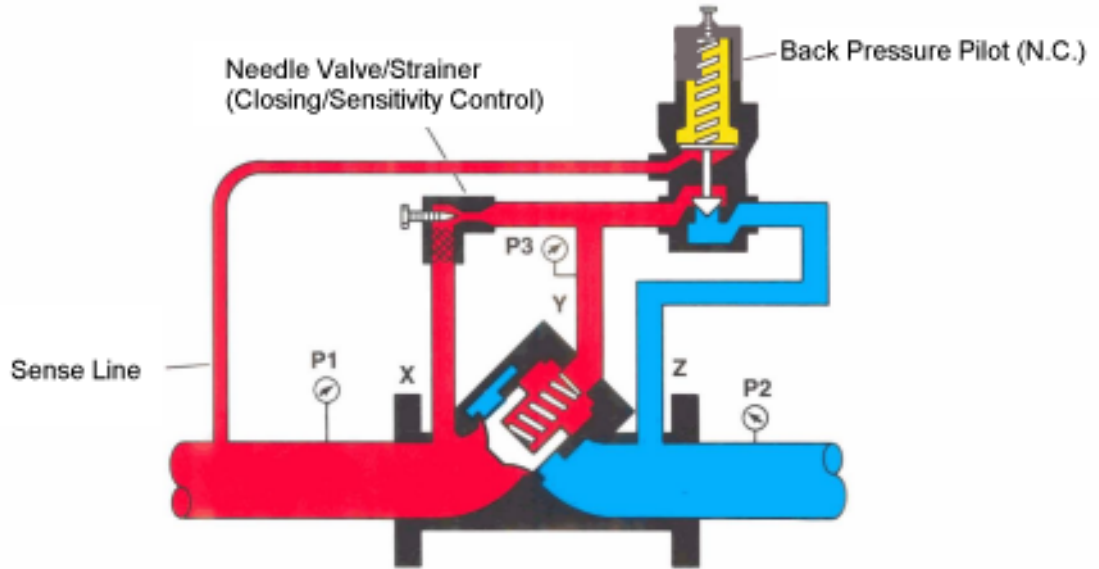
Valve Size	2"	3"	4"	6"
*Cv-gpm	90	190	315	700

*Cv based on wide open valve utilizing water at 60F (15.6C).

Typical Installation

Closed Position

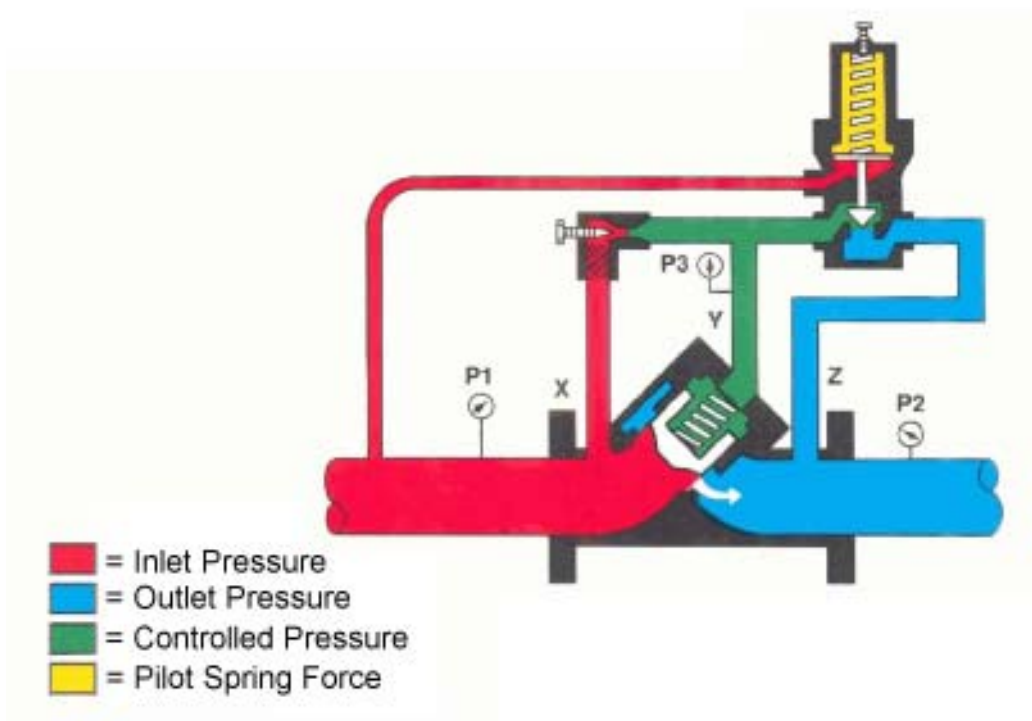
The pilot is closed. Inlet pressure (P1) is less than the pilot spring setting, indicating the main line upstream (P1) has been closed off, or pressure is not sufficient to overcome the pilot spring setting. Pilot is closed. Y=port (P3) to Z-port (P2) is closed. X-port (P1) and Y-port (P3) pressures are balanced. The main valve spring, being the differential force, closes the piston and keeps it seated.



- = Inlet Pressure
- = Outlet Pressure
- = Pilot Spring Force

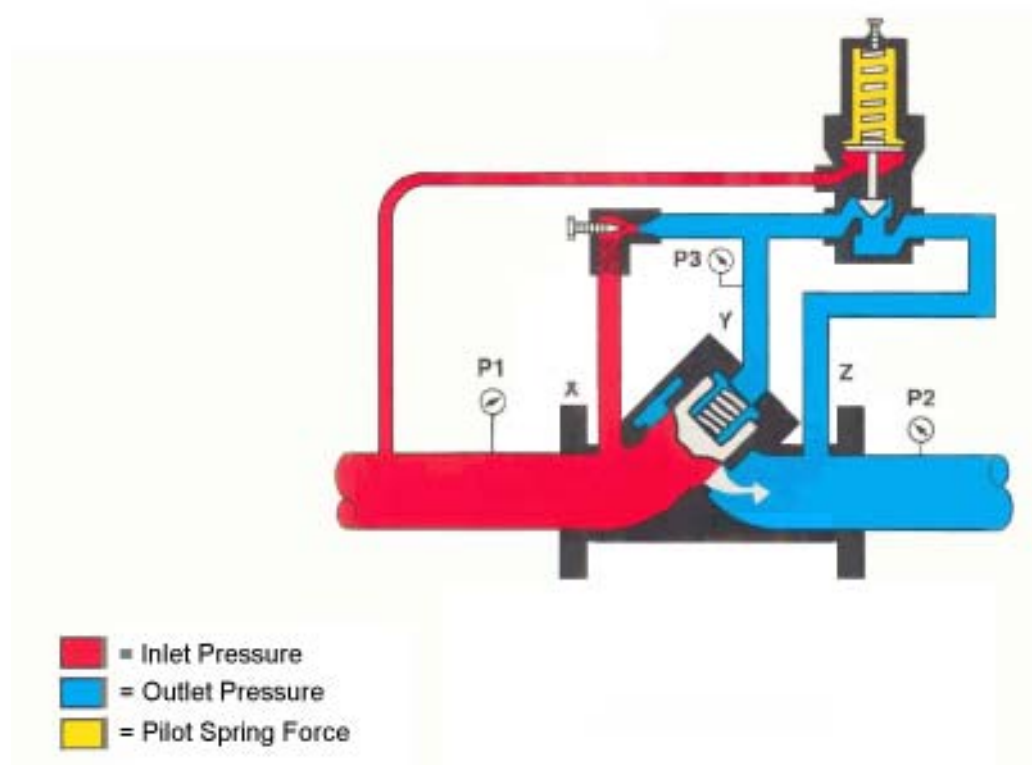
Open - Controlled Position

The pilot is partially open. Inlet pressure (P1) has slightly exceeded the pilot spring setting. Z-port (P2) is being opened by the throttling of the pilot, reducing the pressure on Y-port (P3). The decreasing pressure at Y-port (P3) plus the main valve spring force establishes a position of the valve piston such that it balances inlet (P1) pressure equal to the pilot setting (Plus or minus 2 psi.)



Full Open - No Control

The pilot is full open. Inlet pressure (P1) is greater than the pilot setting. Y-port (P3) is open to Z-port (P2). The valve is floating the stream and is not required to control.



Materials of Construction

Main Valve Body: Steel-ASTM-A216-GR-WCB

Main Valve Cylinder: 17-4 Stainless Steel, Heat Treated

Main Valve Piston: Stainless Steel

Seat Ring: Stainless Steel

O-Rings: Viton Standard
(Other elastomers available)

Other Internal Parts: Stainless Steel

Pilot Valve Strainer/Needle Valve Strainer:
Standard: Steel

Tubings and Fittings: Standard: Steel

Optional Equipment

- Independent Opening Speed Control
- Stainless Steel Tubing
- Thermal Relief
- Pilot Line Isolation Block Valves
- Manual Override (Opens Valve)

Recommended Spare Parts

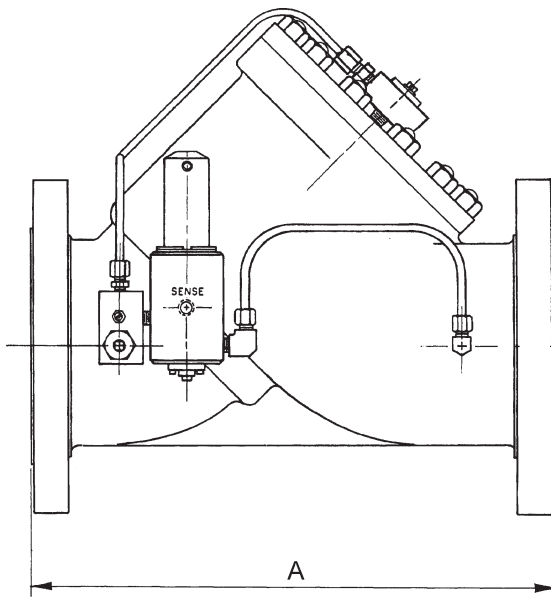
O-Rings

Flange Connections

Valve Size	Connections	Max Working Pressure @100F
2"-6"	150 lb. ANSI	285 PSI
3"-6"	300 lb. ANSI	740 PSI

Temperature Range: -20F to 150F (-29C to 66C) Optional 250F (121C)

Dimensions (For Certified Dimensional Prints - Consult Factory) Pilot Spring Ranges



150-300 lb. Valves	
(PSI)	(kPa)
0-20	0-138
*0-40	0-276
30-80	207-552
70-180	483-1241
150-350	1034-2413
350-650	2413-4482

* Spring selection based on control pressure set point.

Shipping Weight and Volume (Approximate)	
2"	69 lbs. @ 3 Cu. Feet 31.3 kgs. @ .085 Cu. Meters
3"	105 lbs. @ 2.36 Cu. Feet 47.63 kgs. @ .067 Cu. Meters
4"	140 lbs. @ 2.51 Cu. Feet 63.5 kgs. @ .071 Cu. Meters
6"	250 lbs. @ 4.84 Cu. Feet 113.4 kgs. @ .137 Cu. Meters

Valve Size	mm	Dimensions	
	Inches	150 lb.	300 lb.
2"	mm	260	N/A
	Inches	10 1/4	
3"	mm	279	333
	Inches	11	13 1/8
4"	mm	330	368
	Inches	13	14 1/2
6"	mm	432	454
	Inches	17	17 7/8

Ordering Information

In order to accurately process an order, such information as product to be controlled, product viscosity, product temperature range, ambient temperature range, rate of flow, operating pressure, and optional features needed must be specified by the customer.

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