

Model BV86 Two-Stage Hydraulic Control Valve

Description

The Model BV86 Brodie Two-Stage Control Valve is a two-stage hydraulically actuated control valve designed to utilize the flow stream as the source of power. It is commonly used with a positive displacement flowmeter with a mechanical preset counter to provide shock-free two-stage closure. Through the use of optional accessory pilots, mounted in series with the BV86 pilot, functions such as back pressure, pressure reducing, or rate of flow control can be obtained.

The main valve includes a strainer in the hydraulic pilot fluid supply line and a needle valve to control closing speed. Low flow rate is controlled by the adjustable position of the hydraulic pilot. High flow rate is not limited unless a flow limiting control function is specified.

Operation is simple and troublefree affording all the advantages of mechanical systems, without the need for a separate flow limiting valve. When specified, the model BV86 valve can be supplied as a unit, with the valve coupled to the outlet flange of a BiRotor meter, including all interconnecting tubing and fittings resulting in an economical package with less pressure drop than conventional mechanical systems.

Principle of Operation

The Model BV86 valve is pilot operated on a balanced piston principle, spring biased to a closed position. Pressure differential overcomes the force of the spring, causing the main valve to open and establish flow. The pilot control(s) vary the pressure on the spring side of the piston for a position.

The Hydraulic pilot is mechanically attached to and actuated by the preset counter of the flowmeter, and is hydraulically connected to the shut-off valve.



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.

When the preset counter “start” button is depressed, the pilot opens to its full-open position and the main valve opens to high flow. As the preset counter engages its first stage trip, the pilot is partially closed, causing the main valve to throttle to a low flow position. Upon final trip of the preset counter, the mechanically actuated pilot is forced to a fully-closed position. This causes the hydraulic pressure across the main valve piston to be balanced, thus closing the valve.

Applications

Typical batching applications would include low viscosity products such as gasoline, No. 2 fuel oil, Kerosene, jet fuel, diesel, solvents, etc., or other products compatible with o-ring seal material and the metallurgy of the system.

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
- O-Ring plus metal-metal seat
- Characterized ports for better low flow response

“AP” (Aggressive Products) Option

The “AP” Option valve cylinder incorporates a combination of seals and o-ring materials to provide optimum performance in aggressive product applications. Specify “AP” Option at time of order when valve is to be used on products which may affect standard seals.

Materials of Construction

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

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

Main Valve Piston: Stainless Steel

Seat Ring: Stainless Steel

O-Rings: Viton (Standard), Other Materials (Optional)

Other Internal Parts: Stainless Steel

Pilot Valve Strainer/Needle Valve Body: Steel (Standard)

Tubings and Fittings: Steel (Standard), Stainless Steel (Optional)

Optional Equipment

- Valve Position Indicator
- Position Indicator Switches
- Independent Opening Speed Control
- Stainless Steel Tubing
- Thermal Relief
- Additional Pilot Control Functions
- Excess Flow Shutoff (Pressure Sensitive)
- Pilot Line Isolation Block Valves
- Fusible Link Pilot Valve (closes at 160°F)
- Manual Override (opens valve)
- Epoxy Coating main Valve Body Unmachined Surfaces
- Orifice Flange

Recommended Spare Parts

O-Rings

Ordering Information

When ordering, the following information must be supplied:

- Size
- Flange Connections
- Product, Product Viscosity, Product Specific Gravity
- Minimum and Maximum Flow Rate
- Minimum, Normal and Maximum Operating Temperature
- Control Functions to be Performed
- O-Ring Material
- Control Pilot Materials
- Tubing Material
- Pilot Spring Range
- Pilot Spring Setting (psi or kPa)

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

* Spring selection based on control pressure set point.

Shipping Weight and Volume

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

Flange Connections/Ratings (ANSI)

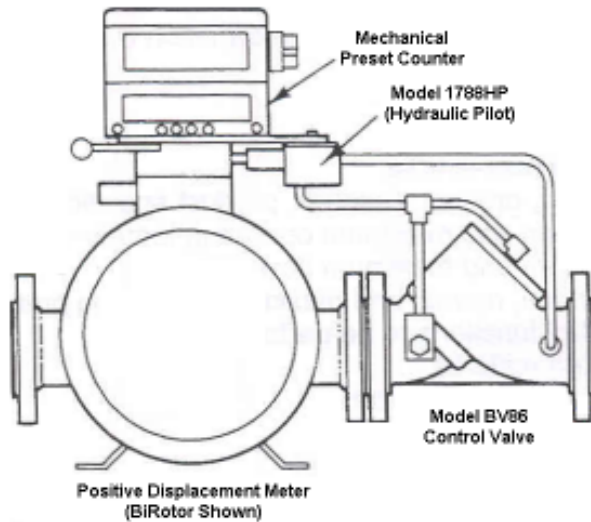
Valve Size	Connections	Max Working Pressure @100F
2" - 6"	150 lb. ANSI	285 PSI
	300 lb. ANSI	740 PSI

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

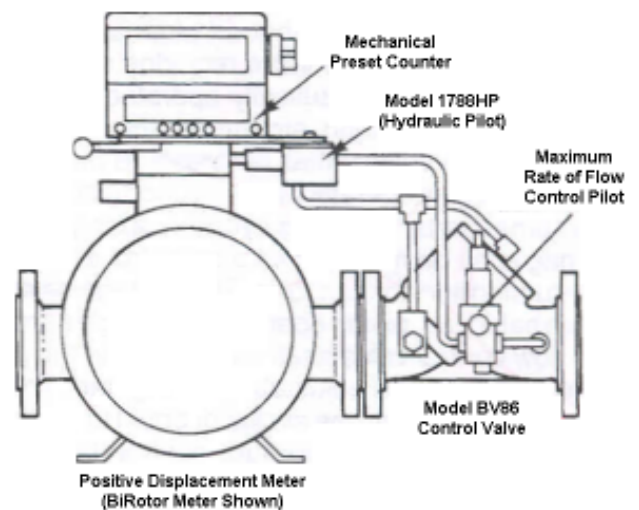
Valve Capacity Data

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

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

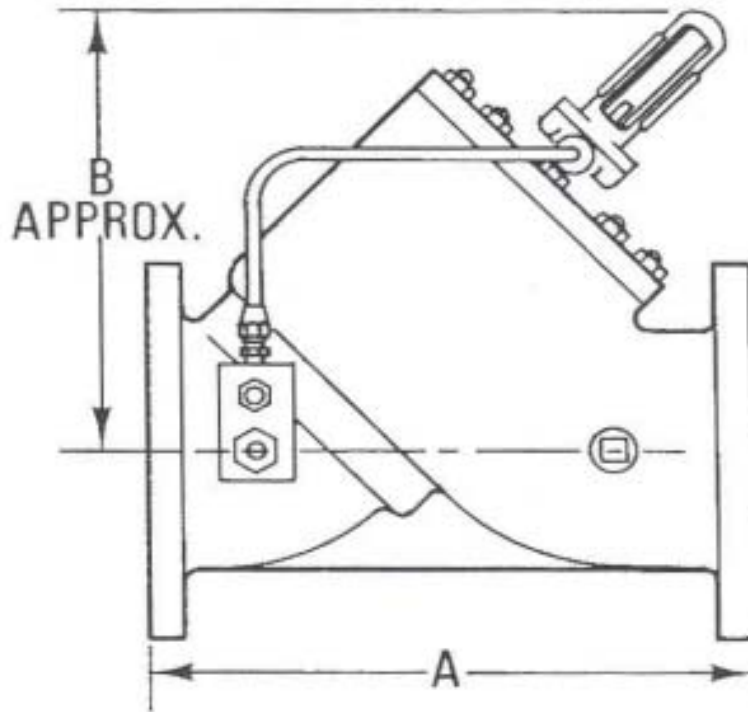


**Typical Installation for On-Off Control
Model 1788 Hydraulic Pilot (HP)**



**Typical Installation for Rate of Flow Control
Model 1788 Hydraulic Pilot (HP) with Optional Rate
of Flow Control Mounted in Series**

Dimensions (For Certified Dimensional Prints - Consult Factory)



Valve Size		A Dimensions		B Dimensions
		150 lb.	300 lb.	150 & 300 lb.
2"	mm	260	267	276
	Inches	10 1/4	10 1/2	10 7/8
3"	mm	279	333	286
	Inches	11	13 1/8	11 1/4
4"	mm	330	368	292
	Inches	13	14 1/2	11 1/2
6"	mm	432	454	346
	Inches	17	17 7/8	13 5/8

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