

Model BV88 Digital Control Valve

Description

The Model BV88 Digital Control Valve is designed to provide precise flow rate control and batch delivery of fluid products when used with an electronic batch control device. The valve is controlled by the electronic preset for low flow start up, high flow rate control, low flow shutdown, and final shut-off. This also provides for maximum flowmeter accuracy by maintaining a constant flow rate with varying line pressures. The Model BV88 features an external pilot control loop that consists of a normally-open solenoid pilot, a normally-closed solenoid pilot, strainer, and opening/closing speed controls.

Principle of Operation

The valve is pilot operated on a balanced piston principle. It is 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 position.

Applications

Batch control with flow limiting capabilities when used with electronic presets capable of digital control.

Design Features

- Precision flow rate and batch control
- Modular construction -all internal parts 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
- Linear control characteristics with uniform response speed
- Automatic check valve - no reverse flow
- Fail-safe closes on loss of electrical power
- Characterized ports for better low flow response



Maximum Operating Pressure Differential (M.O.P.D.) Across Pilots

150# Standard - 100 PSID (690 kPa)

Optional - 150 PSID (1,035 kPa)

Optional - 285 PSID (1,967 kPa)

300# Standard - 740 PSID (5,106 kPa) (2"-6" Only)

Solenoid Electrical Data

UL/CSA Approvals

- Class 1, Division 1, Groups A, B, C, and D
- Class 2, Division 1, Groups E and F

ATEX Approvals

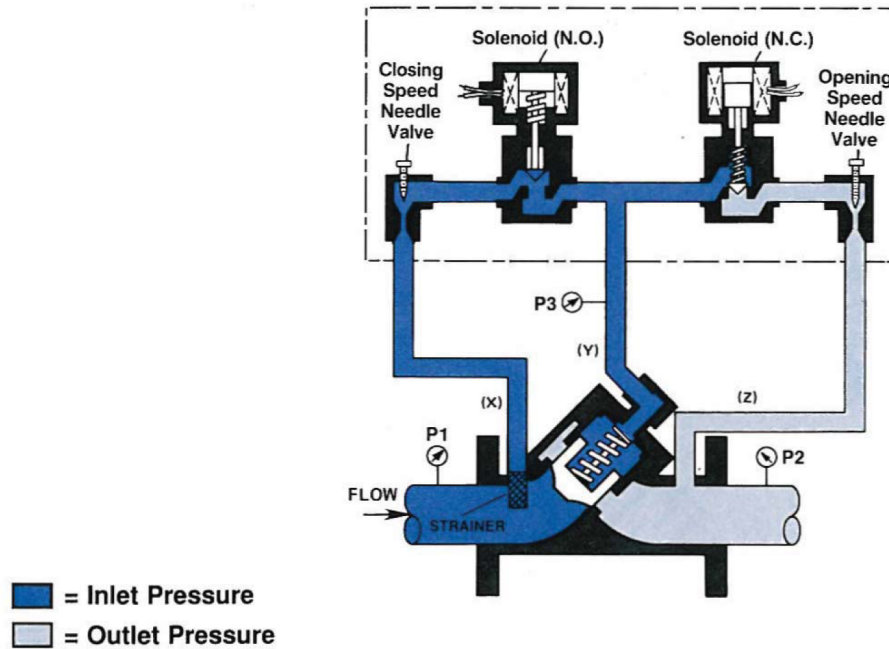
- Ex II 2 G Ex II C IP 67
- Ex II 2G Ex D II C IP67

Approval	Voltage	MOPD	Seat
ATEX	120/60	145 MOPD	Viton-A
	240/60		
	230/50		
	24 VDC		
	230/50	740 MOPD	
	120/60		
	24 VDC		
UL/CSA	120/60	100 MOPD	Simrez
	240/60		
	220/50	145 MOPD	Simrez or Viton-A
	120/60-110/50	150 or 740 MOPD	Buna, Viton-A, or Kalrez
	240/60-220/50		

Typical Installation

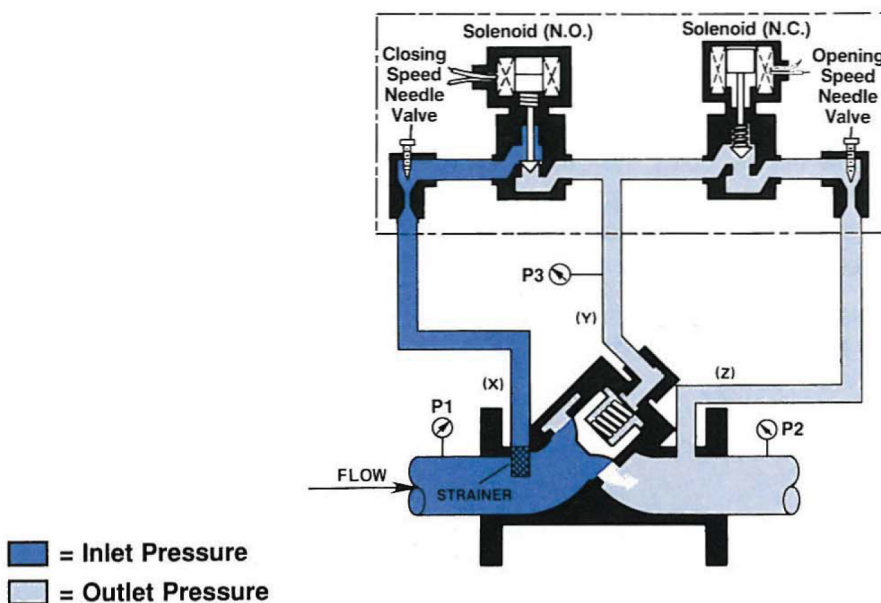
Closed or Closing Position

The normally closed solenoid is closed. The normally open solenoid is open. 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.



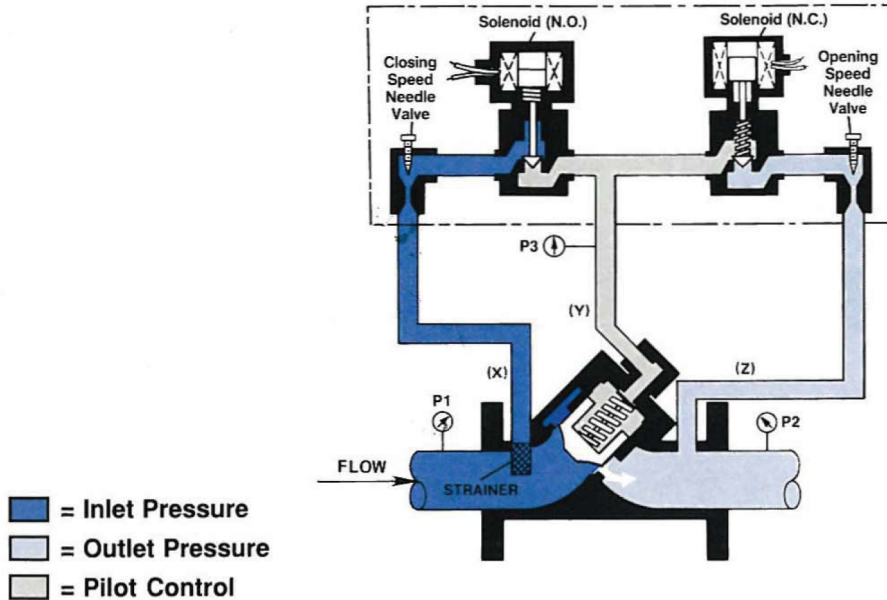
Open Position

The normally closed solenoid is open. The normally open solenoid is closed. Y-Port (P3) is open to Z-Port (P2). X-Port (P1) is closed off by the normally open solenoid. The pressure on the bottom of the piston (P1) is greater than the pressure at (P3) plus the spring force; $(P1 \text{ minus } P2)$ is equal to or greater than the spring force. Therefore, (P1) pressure pushes the spring open.



Controlling Position

The normally closed solenoid is closed. The normally open solenoid is closed. Y-Port (P3) to Z-Port (P2) is closed. X-Port (P1) to Y-Port (P3) is closed. Note: The product cannot flow to or from the top of the piston (Y-Port). The piston is hydraulically locked in position until the PC-IMS commands the valve to open or close as required to maintain the desired flow rate.



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, Fluorosilicate (Ethanol)

Other Internal Parts: Stainless Steel

Pilot Valve Strainer/Needle Valve Strainer:

Standard: Steel

Tubings and Fittings: Standard: Steel

Recommended Spare Parts

O-Rings

Standard Equipment

- Opening and closing speed controls
- Self-cleaning strainer (Pilot Inlet)
- Stainless steel solenoid pilots

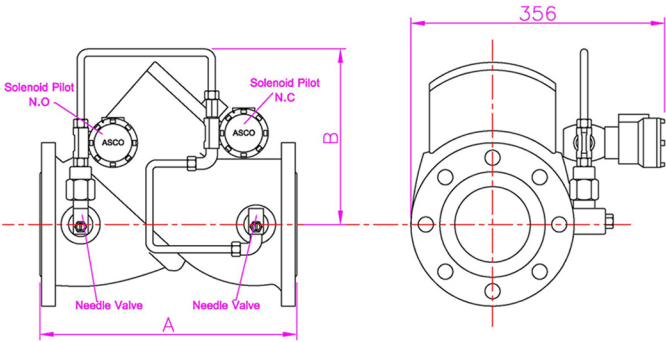
Optional Equipment

- Manual Override
- Thermal Relief

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.

Dimensions (For Certified Dimensional Prints - Consult Factory)



Valve Size	mm	A Dimension		B Dimension
	inches	150#	300#	150# & 300#
2"	mm	260	267	280
	inches	10 1/4	10 1/2	11
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 3/8

Flange Connections

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

Seal Material	Min Operating Temperatures		Max Operating Temperatures	
	Deg F	Deg C	Deg F	Deg C
Viton-A	-15	-26	150	66
Low Swell Nitrile	-20	-29	150	66
Viton-F	-15	-26	150	66
Fluorosilicon	-40	-40	150	66
Simrez	23	-5	150	66
EPR	-70	-56	150	66
Buna	-30	-34	150	66
Viton 1289	-40	-40	150	66
Valve Body	Deg F	Deg C	Deg F	Deg C
ASTM-A216-GR-WCB	-20	-29	150	66
ASTM SA-352 GR LCB (optional)	-40	-40	150	66

Shipping Weight and Volume (Approximate)

2"	69# @ 3 Cu Feet 31.3 kgs @ .085 Cu Meters
3"	105# @ 2.36 Cu Feet 47.63 kgs @ .085 Cu Meters
4"	140# @ 2.51 Cu Feet 63.5 kgs @ .071 Cu Meters
6"	250# @ 4.84 Cu Feet 113.4 kgs @ .137 Cu Meters

Note:

1. The minimum and maximum operating temperature of the valve is dependant on the construction materials of the main valve (steel) and rating of the seals in the main valve and/or pilot operators (see above table).
2. Valves with tempertures below -15F (-26C) must utilize BV10 and BV11 Pilots.
3. Only UL/cUL approvals are available on low-temperature untis.

**Consult Factory for additional seal material options.



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