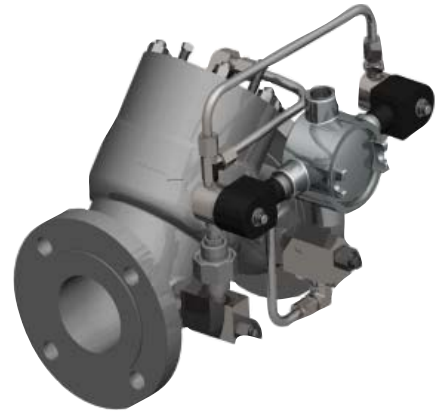


# Technical Data

## Digital Control Valve

### Model BV88



#### General

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.

#### 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

#### Applications

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

#### 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

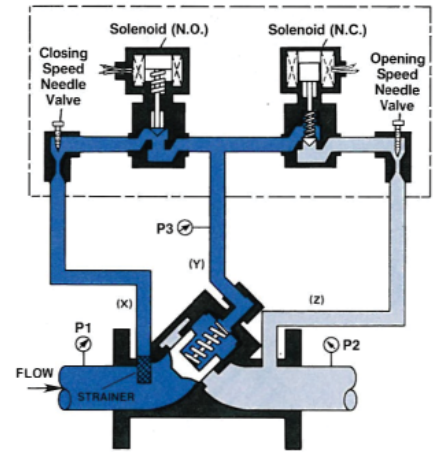
Approval	Voltage	MOPD	Seat
ATEX	120/60	145 MOPD	Viton-A
	240/60		
	230/50		
	24 VDC	740 MOPD	
	230/50		
	120/60		
UL/CSA	24 VDC	100 MOPD	Simrez
	120/60		
	240/60	145 MOPD	Simrez or Viton-A
	220/50		
	120/60-110/50		
240/60-220/50			



## Typical Installation

### Closed or Closing Position

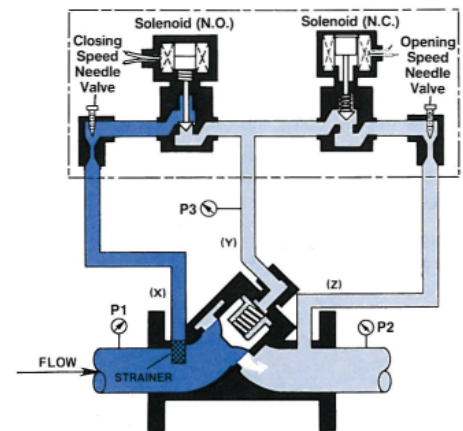
The normally closed solenoid is closed. The normally open solenoid is open. Y-Port (P3) to Z-Port (P2) is closed. X-Port (P1) and Y-Port (P3) pressures are balanced. The main valve spring being the differential force, closes the piston and keeps it seated.



■ = Inlet Pressure  
■ = Outlet Pressure

### Open Position

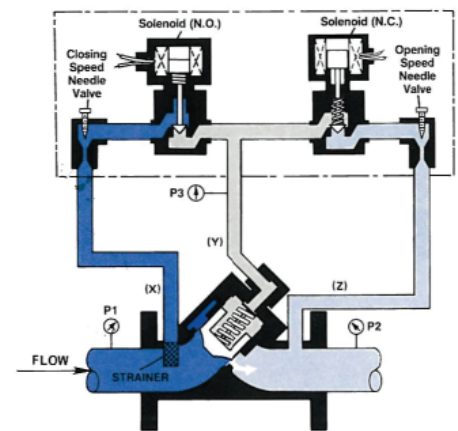
The normally closed solenoid is open. The normally open solenoid is closed. Y-Port (P3) is open to Z-Port (P2). X-Port (P1) is closed off by the normally open solenoid. The pressure on the bottom of the piston (P1) is greater than the pressure at (P3) plus the spring force; (P1 minus P2) is equal to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



■ = Inlet Pressure  
■ = Outlet Pressure

### 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.



■ = Inlet Pressure  
■ = Outlet Pressure  
■ = Pilot 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

### Standard Equipment

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

### Optional Equipment

- Manual Override
- Thermal Relief

### Recommended Spare Parts

O-Rings

### Flange Connections

Value Size	Connections	Max Working Pressures @100F	DIN Connections	Max working pressure
2"-6"	150 lb. ANSI	285 psi	DN 80 - DN 150 PN 25	25 Bar
2"-6"	300 lb. ANSI	740 psi	DN 80 - DN 150 PN 64	51 Bar

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

### Shipping Weight And Volume (Approximate)

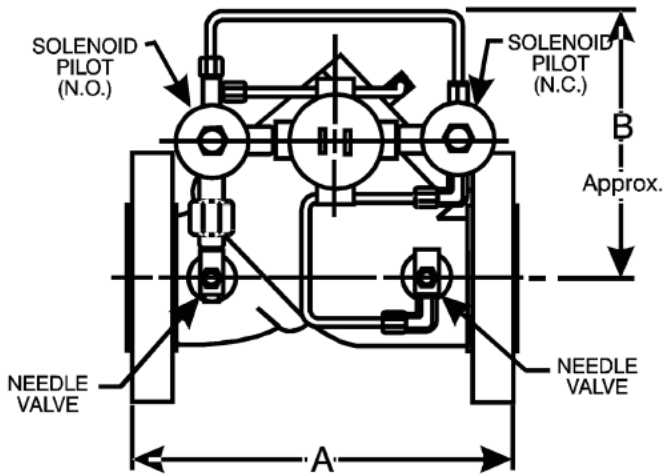
Value Size	Shipping Weight and volume
2"	69 lbs. @ 3 Cu. Feet
	31.3 kgs. @ 0.085 Cu. Meters
3"	105 lbs. @2.36 Cu. Feet
	47.63 kgs. @ 0.067 Cu. Meters
4"	140 lbs. @ 2.51 Cu. Feet
	63.5 kgs. @ 0.071 Cu. Meters
6"	250 lbs. @ 4.84 Cu. Feet
	113.4 kgs. @ 0.137 Cu. Meters

### 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.

Seal Material	Min Operating Temperatures		Max Operating Temperatures	
	Deg F	Deg C	Deg F	Deg C
Vitron-A	-15	-26	150	66
Low Swell Nitrile	-20	-29	150	66
Vitron-F	-15	-26	150	66
Fluorosilicon	-40	-40	150	66
Simrez	23	-5	150	66
EPR	-70	-56	150	66
Burna	-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	-39	150	66
ASTM SA-352 GR LCB (optional)	-40	-40	150	66

### Dimensions (For Certified Dimensional Prints -Consult Factory)



Value Size	mm	A		B	
	inches	150 lb.	300 lb.	150 lb.	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"	

**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.

**NOTE:**

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.

**Brodie International**

P.O. Box 450 (30459-0450)  
 19267 Highway 301 North  
 Statesboro, GA 30461  
 USA

Phone: +1 (912) 489-0200  
 Fax: +1 (912) 489-0294