

# Powered Opening Solenoid Controlled Valve

### Model 710-B

- Zero pressure system control
- Network management optimizing
- Low pressure burst excess flow shut-off
- Reservoir distribution routing
- Filter drain-off prior to air scrubbing
- Gravity filter bed outlet control
- Sewerage “fill and flush” systems

The Model 710-B Powered Opening Solenoid Controlled Valve is a double chambered, hydraulically operated, diaphragm actuated control valve that either opens fully, regardless of valve differential pressure, or shuts off in response to electric signals.



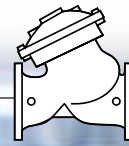
### Features and Benefits

- **Line pressure driven**
  - Independent operation
  - No motor required
  - Long term drip tight sealing
- **Solenoid controlled**
  - Low power consumption
  - Low cost wiring
  - Wide ranges of pressures and voltages
  - Normally Open, Normally Closed or Last Position
- **In-line serviceable** – Easy maintenance
- **Double chamber**
  - Full powered opening and closing
  - Non-slam closing characteristic
  - Protected diaphragm
- **Semi-straight flow** – Smooth flow characteristics
- **“Y” or angle, wide body** – Minimized pressure loss
- **Flexible design** – Easy addition of features

### Major Additional Features

- Opening & closing speed control – **710-03-B**
- Relief override – **710-3Q-B**
- Flow over-the-seat (fail-safe close) – **710-BO**
- Closing surge prevention – **710-49-B**

See relevant BERMAD publications.



## Operation

The Model 710-B is a solenoid controlled valve equipped with two 3-Way solenoid pilots.

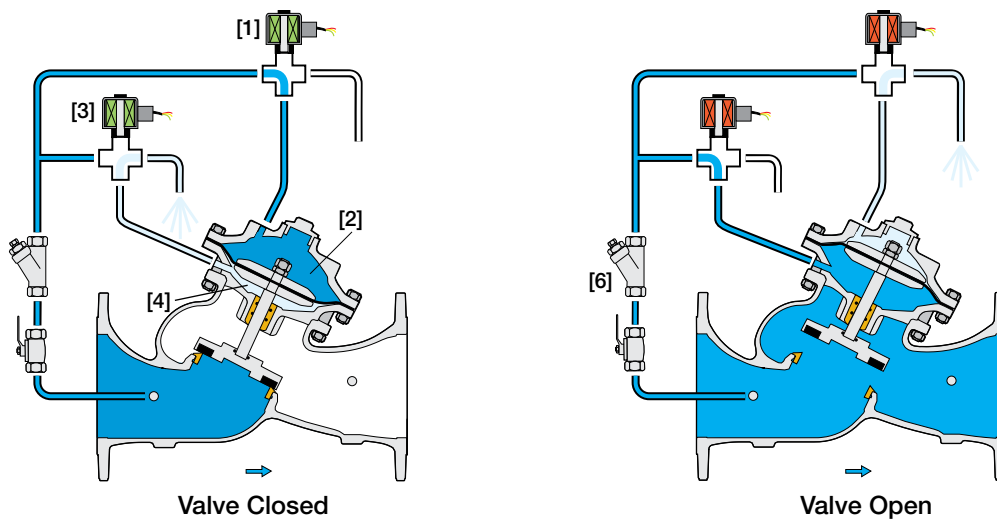
The Normally Open solenoid [1] applies pressure to the upper control chamber [2], harnessing line pressure to power the diaphragm actuator while the Normally Closed solenoid [3] vents the lower control chamber [4], closing the main valve.

Energizing the solenoids vents the upper control chamber pressure while applying line pressure to the lower control chamber, causing the main valve to powerfully open.

In cases where pipeline water is contaminated (corrosive, debris laden) or where vacuum conditions exist, external control fluid is often used.

Normally closed, normally open and last position models are available.

For 10" and larger valves, a single solenoid commands two accelerators to powerfully open and close the main valve.



## Pilot System Specifications

### Standard Materials:

#### Solenoids:

Body: Brass or Stainless Steel

Elastomers: NBR or FPM

Enclosure: Molded epoxy

#### Tubing & Fittings:

Stainless Steel 316 or Copper & Brass

#### Accessories:

Stainless Steel 316, Brass and Synthetic

Rubber Elastomers

### Solenoids Electrical Data:

#### Voltages:

(ac): 24, 110-120, 220-240, (50-60Hz)

(dc): 12, 24, 110, 220

#### Power Consumption:

(ac): 30 VA, inrush; 15 VA (8W), holding or

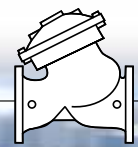
70 VA, inrush; 40 VA (17.1W), holding

(dc): 8-11.6W

Values might vary according to specific solenoid model

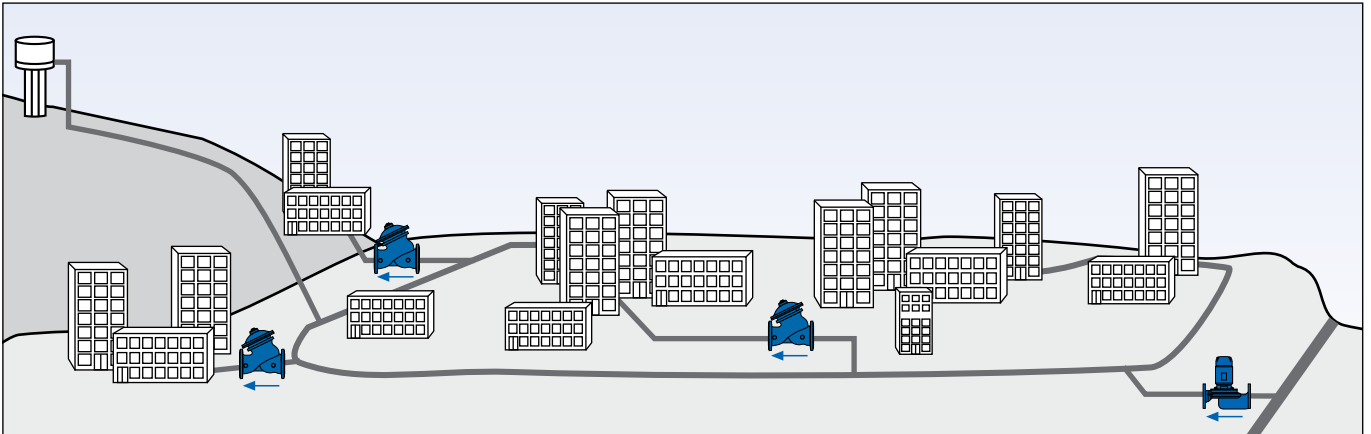
### Notes:

- Option: 4/2 solenoid with manual override is available for size range 1½-20", maximum operating pressure: 6.5 bar (100 psi), 24V AC only.
- Recommended continuous flow velocity: 0.3-6.0 m/sec ; 1-20 ft/sec
- Minimum operating pressure: 0.7 bar ; 10 psi.  
For lower pressure requirements consult factory



## Typical Applications

### Complex Distribution Networks



In complex distribution networks, management optimization of sources and consumers is essential:

- Sources are of various qualities and costs
- Source quality varies throughout the year
- Consumers demand various qualities
- Zones require isolation for maintenance
- Burst occurrence requires management
- Reservoirs call for systematic refreshing

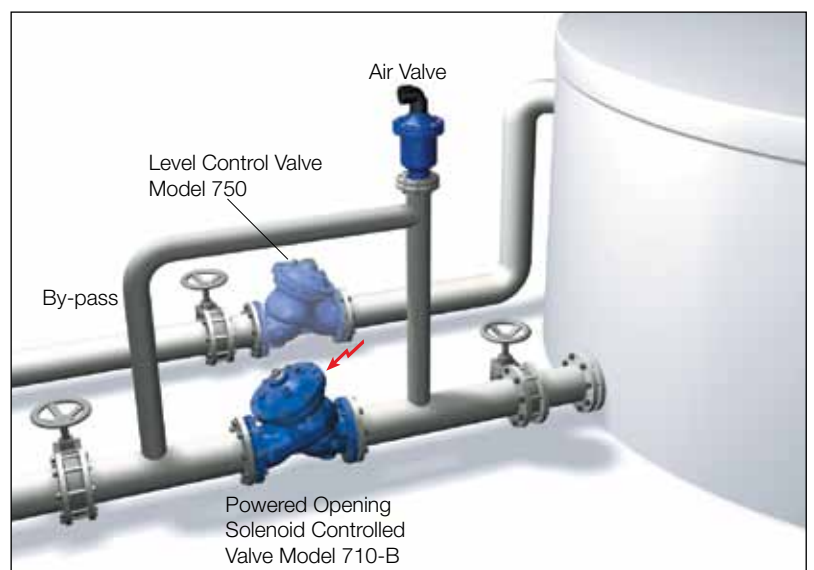
Low pipeline pressure normally exists at reservoir sites and sometimes occurs at other system points. The Model 710-B, as a powered opening valve, is well suited to meet all the above needs and more, even at very low line pressure.

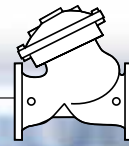
It should be included for placement in multiple locations during the design stage or with changing needs.

### Reservoir Outlet Routing

In this reservoir system, the level is normally allowed to drop only as far as the level limiting by-pass. The Model 710-B fully opens, at near zero head, to allow flow of lower level “reserve” water for high priority or emergency services. In other reservoir contexts, the Model 710-B fulfills several other functions:

- Routing to multiple consumers, such as pumping station, lower lying consumers, other reservoirs and more
- Reservoir outlet shut-off upon distribution system burst
- Connection between two reservoirs when head differential is sometimes near zero





### Technical Data

**Size Range:** DN40-900 ; 1/2-36"

**End Connections (Pressure Ratings):**

**Flanged:** ISO PN16, PN25 (ANSI Class 150, 300)

**Threaded:** BSP or NPT

**Others:** Available on request

**Valve Patterns:** "Y" (globe) & angle, globe (DN600-900 ; 24"-36")

**Working Temperature:** Water up to 80°C ; 180°F

**Standard Materials:**

**Body & Actuator:** Ductile Iron

**Internals:** Stainless Steel, Bronze & coated Steel

**Diaphragm:** Synthetic Rubber Nylon fabric-reinforced

**Seals:** Synthetic Rubber

**Coating:** Fusion Bonded Epoxy, RAL 5005 (Blue) approved for drinking water or Electrostatic Polyester Powder

### Differential Pressure Calculation

$$\Delta P = \left( \frac{Q}{Kv; Cv} \right)^2$$

$\Delta P$  = Differential Pressure for fully open valve (bar; psi)

$Q$  = Flow rate (m<sup>3</sup>/h; gpm)

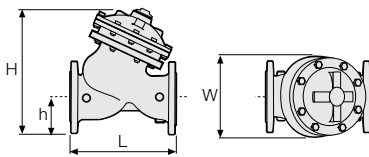
$Kv$  = Metric system - valve flow coefficient (flow in m<sup>3</sup>/h at 1 bar  $\Delta P$  with 15°C water)

$Cv$  = US system - Valve flow coefficient (flow in gpm at 1 psi  $\Delta P$  with 60°F water)

$$Cv = 1.155 Kv$$

### Flow Data & Dimensions Table

DN / Size		40	1.5"	50	2"	65	2.5"	80	3"	100	4"	150	6"	200	8"	250	10"	300	12"	350	14"	400	16"	450	18"	500	20"		
Flow Data	700 & 700ES	Kv / Cv - Flat																											
	700 & 700EN	Kv / Cv - "Y" Flat																											
	700 & 700EN	Kv / Cv - "Y" V-Port																											
700-ES	PN16; 25	L (mm / inch)																											
	PN16; 25	W (mm / inch)																											
	PN16; 25	h (mm / inch)																											
	PN16; 25	H (mm / inch)																											
	PN16; 25	Weight (Kg/lb)																											
700-EN	PN16; 25	L (mm / inch)																											
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700 Flanged	"Y" PN16 Class 150	L (mm / inch)																											
		W (mm / inch)																											
		h (mm / inch)																											
		H (mm / inch)																											
		Weight (Kg/lb)																											
	"Y" PN25 Class 300	L (mm / inch)																											
		W (mm / inch)																											
		h (mm / inch)																											
		H (mm / inch)																											
		Weight (Kg/lb)																											
700 Threaded	"Y" PN16; 25 Class 150; 300	L (mm / inch)																											
		W (mm / inch)																											
		h (mm / inch)																											
		H (mm / inch)																											
		Weight (Kg/lb)																											
	Angle PN16; 25 Class 150; 300	L (mm / inch)																											
		W (mm / inch)																											
		R (mm / inch)																											
		h (mm / inch)																											
		H (mm / inch)																											



### Specify when ordering:

- Size
- Main model
- Additional features
- Pattern
- Body material
- End connection
- Coating
- Voltage & main valve position
- Tubing & Fittings materials
- Operational data (according to model)
- Pressure data
- Flow data
- Reservoir level data
- Settings

\* Use BERMAD's Waterworks Ordering Guide

DN / Size		600	24"	700	28"	750	30"	800	32"	900	36"
Globe PN16 Class 150	L (mm / inch)	1,450	57.1	1,650	65	1,750	68.9	1,850	72.8	1,850	72.8
	W (mm / inch)	1,250	49.2	1,250	49.2	1,250	49.2	1,250	49.2	1,250	49.2
	h (mm / inch)	470	18.5	490	19.3	520	20.5	553	21.8	600	23.6
	H (mm / inch)	1,965	77.4	1,985	78.1	2,015	79.3	2,048	80.6	2,095	82.5
	Weight (Kg/lb)	3,250	7,150	3,700	8,140	3,900	8,580	4,100	9,020	4,250	9,350
Globe PN25 Class 300	L (mm / inch)	1,500	59.1	1,650	65	1,750	68.9	1,850	72.8	1,850	72.8
	W (mm / inch)	1,250	49.2	1,250	49.2	1,250	49.2	1,250	49.2	1,250	49.2
	h (mm / inch)	470	18.5	490	19.3	520	20.5	553	21.8	600	23.6
	H (mm / inch)	1,965	77.4	1,985	78.1	2,015	79.3	2,048	80.6	2,095	82.5
	Weight (Kg/lb)	3,500	7,700	3,700	8,140	3,900	8,580	4,100	9,020	4,250	9,370

