

# 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.



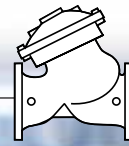
### Features and Benefits

- **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.

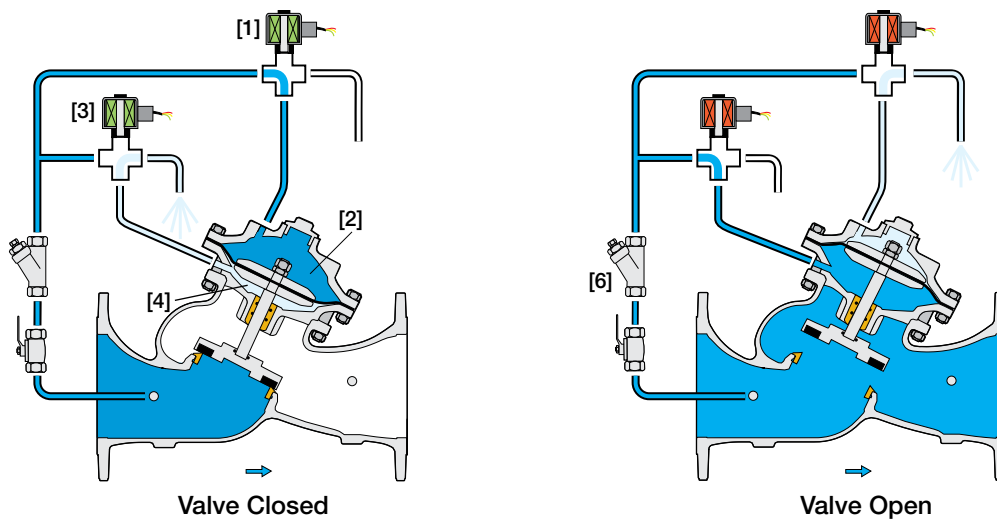
The Normally Open solenoid [1] applies pressure to the upper control chamber [2], harnessing line pressure to power the diaphragm actuator while the Normally Closed solenoid [3] vents the lower control chamber [4], closing the main valve.

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:

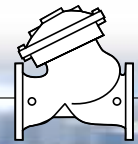
(ac): 30 VA, inrush; 15 VA (8W), holding or  
70 VA, inrush; 40 VA (17.1W), holding

(dc): 8-11.6W

Values might vary according to specific solenoid model

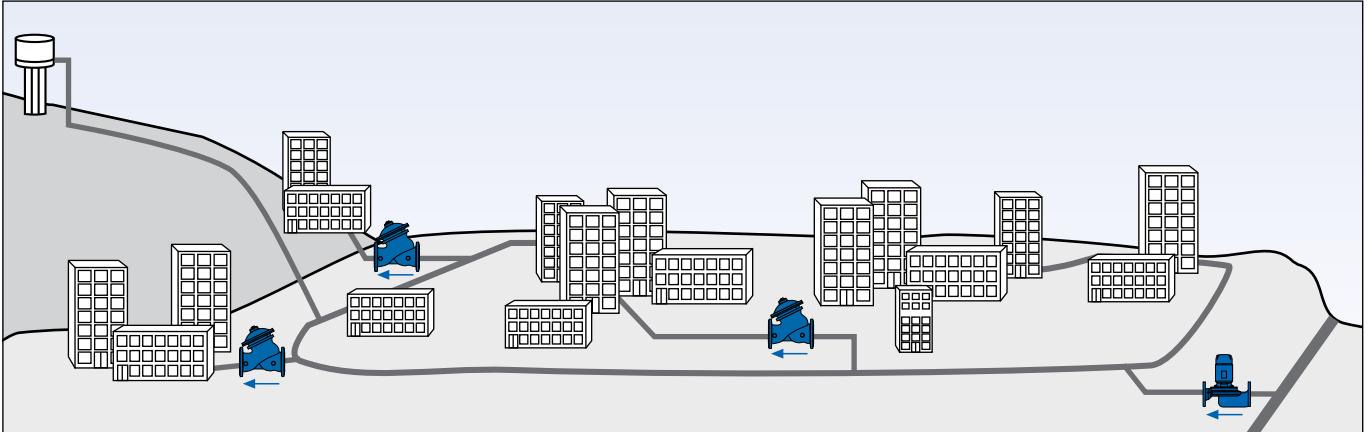
### Notes:

- 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

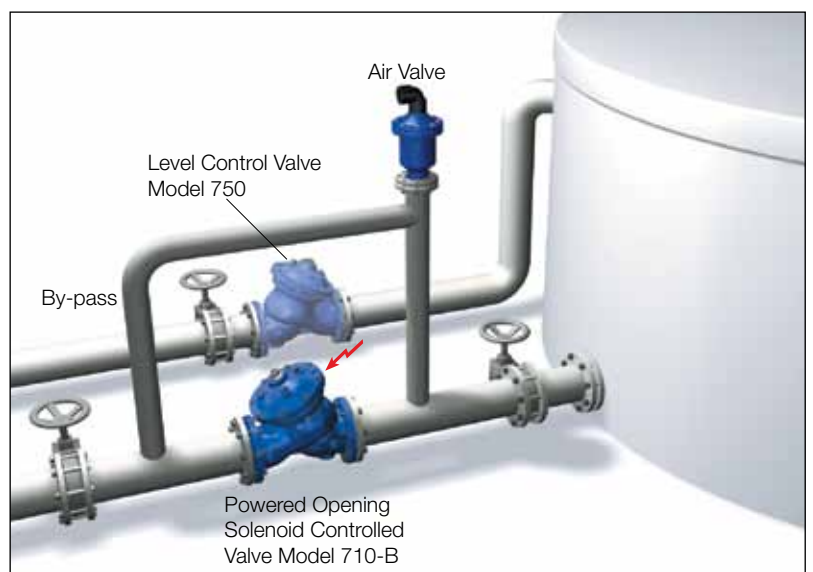
Low pipeline pressure normally exists at reservoir sites and sometimes occurs at other system points. The Model 710-B, as a powered opening valve, is well suited to meet all the above needs and more, even at very low line pressure.

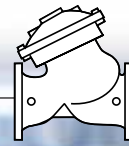
It should be included for placement in multiple locations during the design stage or with changing needs.

### 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 ; 1½-36"

**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 (m³/h; gpm)

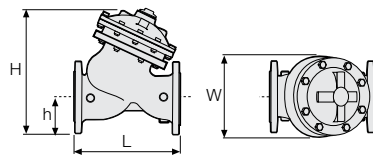
$Kv$  = Metric system - valve flow coefficient  
(flow in m³/h at 1 bar  $\Delta P$  with 15°C water)

$Cv$  = 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																												54	62	57	66	60	69	65	75	145	167	395	456	610	705	905	1,045	1,520	1,756	-	-	2,250	2,599	-	-	4,070	4,701	
	700 & 700EN	Kv / Cv - V-Port																												46	53	48	56	51	59	55	64	123	142	336	388	519	599	769	888	1,292	1,492	-	-	1,913	2,209	-	-	3,460	3,996	
	700 & 700EN	Kv / Cv - "Y" Flat																												42	49	50	58	55	64	115	133	200	230	460	530	815	940	1,250	1,440	1,850	2,140	1,990	2,300	3,310	3,820	3,430	3,960	3,550	4,100	
700-ES	PN16; 25	Kv / Cv - "Y" V-Port																												36	41	43	49	47	54	98	113	170	200	391	450	693	800	1,063	1,230	1,573	1,820	1,692	1,950	2,814	3,250	2,916	3,370	3,018	3,490	
		L (mm / inch)																												230	9.1	230	9.1	290	11.4	310	12.2	350	13.8	480	18.9	600	23.6	730	28.7	850	33.5	-	-	1,100	43.3	-	-	1,250	49.2	
		W (mm / inch)																												150	5.9	165	6.5	185	7.3	200	7.9	235	9.3	300	11.8	360	14.2	425	16.7	530	20.9	-	-	626	24.6	-	-	838	33	
		h (mm / inch)																												80	3.1	90	3.5	100	3.9	105	4.1	125	4.9	155	6.1	190	7.5	220	8.7	250	9.8	-	-	320	12.6	-	-	385	15.2	
		H (mm / inch)																												240	9.4	250	9.8	250	9.8	260	10.2	320	12.6	420	16.5	510	20.1	605	23.8	725	28.5	-	-	895	35.2	-	-	1,185	46.7	
Weight (Kg/lb)																												10	22	10.8	23.8	13.2	29	15	33	26	57.2	55	121	95	209	148	326	255	561	-	-	437	960	-	-	1,061	2,334			
700-EN	PN16; 25	L (mm / inch)																												-	-	-	-	-	-	310	12.2	350	13.8	480	18.9	600	23.6	730	28.7	850	33.5	-	-	-	-	-	-	-	-	
		W (mm / inch)																												-	-	-	-	-	-	200	7.9	235	9.3	320	12.6	390	15.4	480	18.9	550	21.7	-	-	-	-	-	-	-	-	-
		h (mm / inch)																												-	-	-	-	-	-	100	3.9	118	4.6	150	5.9	180	7.1	213	8.4	243	9.6	-	-	-	-	-	-	-	-	-
		H (mm / inch)																												-	-	-	-	-	-	305	12	369	14.5	500	19.7	592	23.3	733	28.9	841	33.1	-	-	-	-	-	-	-	-	-
		Weight (Kg/lb)																												-	-	-	-	-	-	21	46.2	31	68.2	70	154	115	253	198	436	337	741	-	-	-	-	-	-	-	-	-
700 Flanged	"Y" PN16 Class 150	L (mm / inch)																												205	8.1	210	8.3	222	8.7	250	9.8	320	12.6	415	16.3	500	19.7	605	23.8	725	28.5	733	28.9	990	39	1,000	39.4	1,100	43.3	
		W (mm / inch)																												155	6.1	165	6.5	178	7	200	7.9	223	8.8	320	12.6	390	15.4	480	18.9	550	21.7	550	21.7	740	29.1	740	29.1	740	29.1	
		h (mm / inch)																												78	3.1	83	3.3	95	3.7	100	3.9	115	4.5	143	5.6	172	6.8	204	8	242	9.5	268	10.6	300	11.8	319	12.6	358	14.1	
		H (mm / inch)																												239	9.4	244	9.6	257	10.1	305	12	366	14.4	492	19.4	584	23	724	28.5	840	33.1	866	34.1	1,108	43.6	1,127	44.4	1,167	45.9	
		Weight (Kg/lb)																												9.1	20	10.6	23	13	29	22	49	37	82	75	165	125	276	217	478	370	816	381	840	846	1,865	945	2,083	962	2,121	
	"Y" PN25 Class 300	L (mm / inch)																												205	8.1	210	8.3	222	8.7	264	10.4	335	13.2	433	17	524	20.6	637	25.1	762	30	767	30.2	1,024	40.3	1,030	40.6	1,136	44.7	
		W (mm / inch)																												155	6.1	165	6.5	185	7.3	207	8.1	250	9.8	320	12.6	390	15.4	480	18.9	550	21.7	570	22.4	740	29.1	740	29.1	750	29.5	
		h (mm / inch)																												78	3.1	83	3.3	95	3.7	105	4.1	127	5	159	6.3	191	7.5	223	8.8	261	10.3	295	11.6	325	12.8	357	14.1	375	14.8	
		H (mm / inch)																												239	9.4	244	9.6	257	10.1	314	12.4	378	14.9	508	20	602	23.7	742	29.2	859	33.8	893	35.2	1,133	44.6	1,165	45.9	1,197	47.1	
		Weight (Kg/lb)																												10	22	12.2	27	15	33	25	55	43	95	85	187	146	322	245	540	410	904	434	957	900	1,984	967	2,132	986	2,174	
700 Threaded	Angle PN16; 25 Class 150; 300	L (mm / inch)																												155	6.1	155	6.1	212	8.3	250	9.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
		W (mm / inch)																												122	4.8	122	4.8	122	4.8	163	6.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		h (mm / inch)																												40	1.6	40	1.6	48	1.9	56	2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		H (mm / inch)																												201	7.9	202	8	209	8.2	264	10.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		Weight (Kg/lb)																												5.5	12	5.5	12	8	18	17	37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		L (mm / inch)																												-	-	121	4.8	140	5.5	159	6.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		W (mm / inch)																												-	-	122	4.8	122	4.8	163	6.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
R (mm / inch)																												-	-	40	1.6	48	1.9	55	2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
h (mm / inch)																												-	-	83	3.3	102	4	115	4.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
H (mm / inch)																												-	-	225	8.9	242	9.5	294	11.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Weight (Kg/lb)																												-	-	5.5	12	7	15	15	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			



### 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

