Solenoid Controlled Valve

with Check Feature

- Network management optimizing
- Pressure zone isolating
- Zonal pressure backup
- Zonal return flow prevention
- Automatic refreshing of reservoirs
- Burst excess flow shut-off
- Switching between "on-duty" valves

The Model 710-20 Solenoid Controlled Valve with Check Feature is a hydraulically operated, diaphragm actuated control valve that either opens fully or shuts off in response to electric signals. The check feature prevents reverse flow through the valve.

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
- **Check feature**
  - Cost effective pumping
  - Zonal return flow prevention
  - Replacing line sized check valve
- **In-line serviceable** – Easy maintenance
- **Double chamber**
  - Non-slam closing characteristic
  - Protected diaphragm
- **Flexible design** – Easy addition of features

Major Additional Features

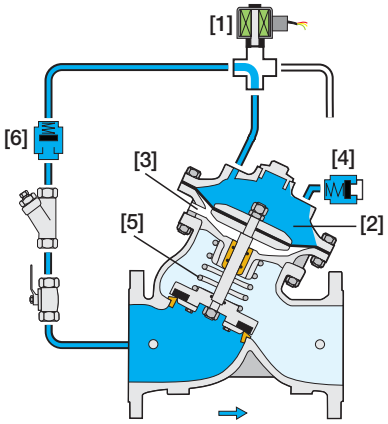
- Opening & closing speed control – **710-20-03**
- Relief override – **710-20-3Q**
- Closing surge prevention – **710-20-49**

See relevant BERMAD publications.

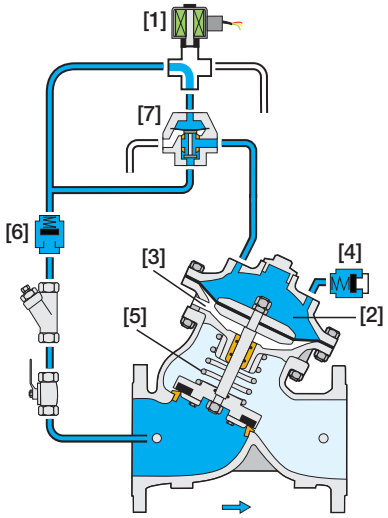
Operation

The Model 710-20 is a solenoid controlled valve equipped with a 3-Way solenoid pilot and two check valves.
The Normally Open solenoid **[1]** applies pressure to the upper control chamber **[2]**, harnessing valve differential pressure to power the diaphragm-actuator, closing the main valve. Energizing the solenoid vents control chamber pressure causing the main valve to open fully. The lower control chamber **[3]** is open to atmosphere.
Should downstream pressure exceed upstream pressure while the valve is open, check valve **[4]** quickly admits air into the upper control chamber enabling the valve to rapidly close by the spring **[5]** force. Check valve **[6]** provides a "Check Lock" feature. In cases where pipeline water is contaminated (corrosive, debris laden) external control fluid is often used.
For 10" and larger valves, an accelerator **[7]** quickens valve response.

Size Range 1½-8"



Size Range 10-20"



Engineer Specifications

The Solenoid Controlled Valve shall either open fully or shut off in response to electric signals, and shall prevent reverse flow.

Main Valve: The main valve shall be a center guided, diaphragm actuated globe valve of either oblique (Y) or angle pattern design. The body shall have a replaceable, raised, stainless steel seat ring. The valve shall have an unobstructed flow path, with no stem guides, bearings, or supporting ribs. The body and cover shall be ductile iron. All external bolts, nuts, and studs shall be Duplex® coated. All valve components shall be accessible and serviceable without removing the valve from the pipeline.

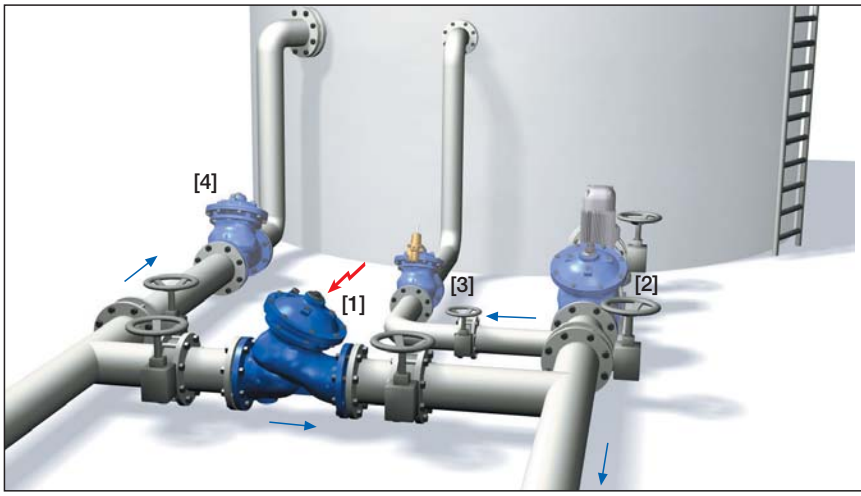
Actuator: The actuator assembly shall be double chambered with an inherent separating partition between the lower surface of the diaphragm and the main valve. The entire actuator assembly (seal disk to top cover) shall be removable from the valve as an integral unit. The stainless steel valve shaft shall be center guided by a bearing in the separating partition. The replaceable radial seal disk shall include a resilient seal and shall be capable of accepting a V-Port Throttling Plug by bolting.

Control System: The control system shall consist of a 3-Way solenoid pilot valve (for 10" and larger valves, an accelerator shall be added to the solenoid), two check valves, an isolating cock valve, and a filter. The assembled valve shall be hydraulically tested.

Quality Assurance: The valve manufacturer shall be certified according to the ISO 9001 Quality Assurance Standard. The main valve shall be certified as a complete drinking water valve according to NSF, WRAS, and other recognized standards..

Typical Applications

Automatic Refreshing of Reservoirs



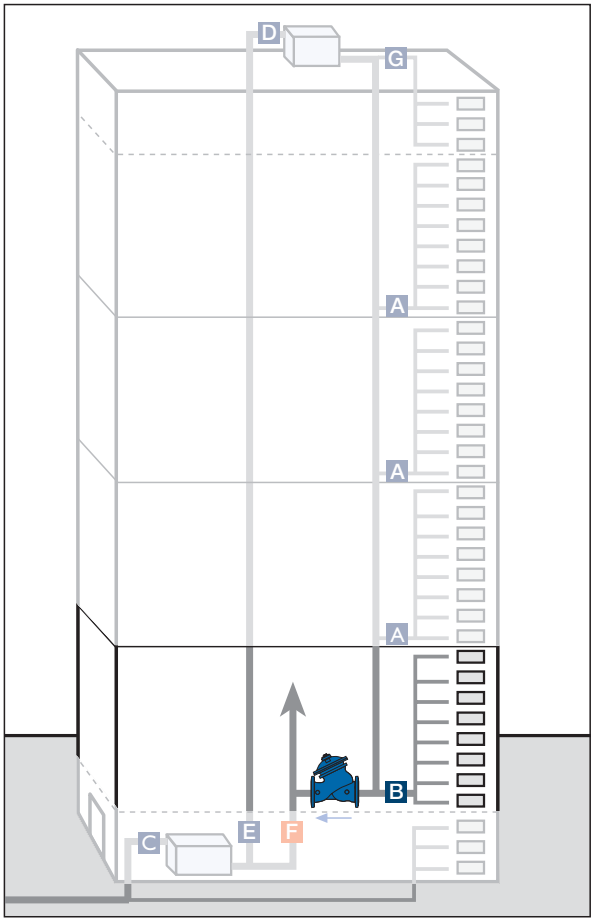
[1] Solenoid Controlled Valve with Check Feature Model 710-20
[2] Pump Control Valve Model 740
[3] Pressure Relief (Circulation) Valve Model 730
[4] Level Control Valve Model 750

This valve is installed as a short cut between the reservoir supply line and the pump discharge line to the distribution system. The Model 710-20 presents three major advantages:

- Saving energy and expensive pumping hours when supply pressure is sufficient
- Enabling automatic refreshing of water in the reservoir
- Ensuring uninterrupted supply during reservoir maintenance

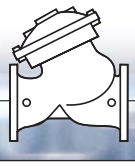
High-Rise Building Zonal Pressure Backup

In high-rise buildings, availability of all water resources for fire extinguishing is a critical design requirement.
In cases where pumping is stopped due to mechanical, electrical or supply failures, the Model 710-20 enables backup of pumped water by routing roof reservoir water to the fire extinguishing system.
The Check Feature prevents back flow of fire water during normal operation.



- A Higher zone pressure reducing system installation
- B Lower zone pressure reducing system (two-stage) installation
- C Bottom reservoir level control system
- D Roof reservoir level control system
- E Potable water pumping system
- F Fire protection pumping system
- G Upper floors pumping system

BERMAD Waterworks



700 Series

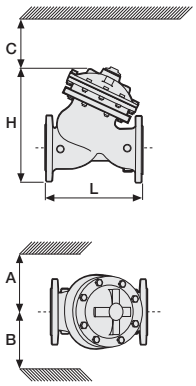
Model 710-20

Technical Data

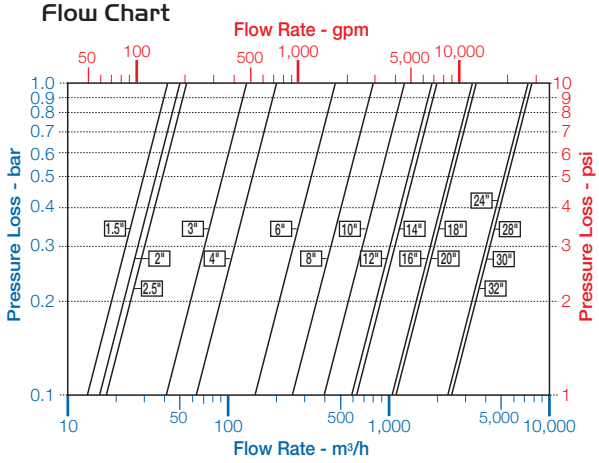
Dimensions and Weights

Size		A, B		C		L		H		Weight	
mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	kg	lbs
40	1½"	350	14	180	7	205	8.1	239	9.4	9.1	20
50	2	350	14	180	7	210	8.3	244	9.6	10.6	23
65	2½"	350	14	180	7	222	8.7	257	10.1	13	29
80	3"	370	15	230	9	250	9.8	305	12.0	22	49
100	4"	395	16	275	11	320	12.6	366	14.4	37	82
150	6"	430	17	385	15	415	16.3	492	19.4	75	165
200	8"	475	19	460	18	500	19.7	584	23.0	125	276
250	10"	520	21	580	23	605	23.8	724	28.5	217	478
300	12"	545	22	685	27	725	28.5	840	33.1	370	816
350	14"	545	22	685	27	733	28.9	866	34.1	381	840
400	16"	645	26	965	38	990	39.0	1108	43.6	846	1865
450	18"	645	26	965	38	1000	39.4	1127	44.4	945	2083
500	20"	645	26	965	38	1100	43.3	1167	45.9	962	2121

Data is for Y-pattern, flanged, PN16 valves
Weight is for PN16 basic valves
"C" enables removing the actuator in one unit
"L", ISO standard lengths available
For more dimensions and weights tables, refer to Engineering Section



Flow Chart



Data is for Y-pattern, flat disk valves
For more flow charts, refer to Engineering Section

Main Valve

Valve Patterns: "Y" (globe) & angle
Size Range: 1½–32" (40-800 mm)
End Connections (Pressure Ratings):
Flanged: ISO PN16, PN25 (ANSI Class 150, 300)
Threaded: BSP or NPT
Others: Available on request
Working Temperature:
Water up to 80°C (180°F)
Standard Materials:
Body & Actuator: Ductile Iron
Internals:
Stainless Steel, Bronze & coated Steel
Diaphragm:
NBR Nylon fabric-reinforced
Seals: NBR
Coating:
Fusion Bonded Epoxy, RAL 5005 (Blue) NSF & WRAS approved or Electrostatic Polyester Powder, RAL 6017 (Green)

Control System

Standard Materials:
Accessories:
Bronze, Brass, Stainless Steel & NBR
Tubing: Copper or Stainless Steel
Fittings: Forged Brass or Stainless Steel
Solenoid Standard Materials:
Body: Brass or Stainless Steel
Elastomers: NBR or FPM
Enclosure: Molded epoxy
Solenoid Electrical Data:
Voltages:
(ac): 24, 110-120, 220-240, (50-60 Hz)
(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

Solenoid Selection

Valve Size	Solenoid Model		Accelerator Model	
	330 (2.0 mm)	311 (1.0 mm)	54	58
1½-8"	■			
1½-6"		■		
10-20"	■		■	
8-20"		■	■	
24 -32"	■			■
24 -32"		■		■
	PN 16		PN 25	

Accelerator Standard Materials:
Body: Brass or Stainless Steel
Internals: Stainless Steel & Brass
Elastomers: NBR or FPM

How to Order

Please specify the requested valve in the following sequence: (for more options, refer to Ordering Guide)

Sector	Size	Primary Feature	Additional Feature	Pattern	Body Material	End Connections	Coating	Voltage & Position	Tubing & Fittings	Additonal Attributes
WW	6"	710	20	Y	C	16	EB	4AC	CB	I

Sector	
Waterworks	

Size	
1½ - 32"	

Primary Feature	
Solenoid Controlled	

Additional Feature	
No Additional Feature	00
Closing and Opening Speed Control	03
Check Valve	20
Relief Override	3Q
Closing Surge Prevention	49

Multiple choices permitted

Pattern		
Oblique	(up to 20")	Y
Angle	(up to 18")	A
Globe	(24-32" only)	G

Body Material	
Ductile Iron Standard	C
Cast Steel	S
St. Steel 316	N
Nickel Alumin. Bronze	U

End Connections	
ISO-16	16
ISO-25	25
ANSI-150	A5
ANSI-300	A3
JIS-16	J6
JIS-20	J2

Coating	
Epoxy FB Blue	EB
Polyester Green	PG
Polyester Blue	PB
Uncoated	UC

Voltage & Position	
24VAC/50Hz - N.C.	4AC
24VAC/50Hz - N.O.	4AO
24VDC - N.C.	4DC
24VDC - N.O.	4DO
24VDC - L.P.	4DP
220VAC/50-60Hz N.C.	2AC
220VAC/50-60Hz N.O.	2AO

Tubing & Fittings	
Copper Tubing & Brass Fittings	CB
Plastic Tubing & Brass Fittings	PB
St. St. 316 Tubing & Fittings	NN

Additonal Attributes	
Valve Position Indicator	I
Large Control Filter	F
Electric Limit Switch	S
Flow Over the Seat	O
St. St. 316 Control Accessories	N
St. St. 316 Internal Trim (Closure & Seat)	T
St. St. 316 Actuator Internal Assembly	D
Delrin Bearing	R
Viton Elastomers for Seals & Diaphragm	E
Pressure Gauge	6

Multiple choices permitted

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