

Flow Control Valve with Solenoid Control

Model 770-55-U

- Limiting consumers over demand
- Controlling pipeline fill rate
- Pump overload & cavitation protection
- Switching between “on-duty” valves
- Selecting system flow regime

The Model 770-55-U Flow Control Valve with Solenoid Control is a hydraulically operated, diaphragm actuated control valve that maintains preset maximum flow, regardless of fluctuating demand or varying system pressure. The valve opens and shuts off in response to an electric signal.



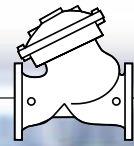
Features and Benefits

- **Line pressure driven** – Independent operation
- **Hydraulic flow sensor (upstream installation)**
 - No moving parts
 - No electronic components
 - No need for flow straightening
- **Solenoid controlled**
 - Low power consumption
 - Wide range of pressure and voltage
 - Normally Open, Normally Closed or Last Position
- **In-line serviceable** – Easy maintenance
- **Double chamber design**
 - Moderated valve reaction
 - Protected diaphragm
- **Semi-straight flow** – Non-turbulent flow
- **Stainless Steel raised seat** – Cavitation damage resistant
- **Obstacle free, full bore** – Uncompromising reliability
- **V-Port Throttling Plug** – Low flow stability

Major Additional Features

- Flow control (constant downstream pressure) – **727-U**
- Solenoid control & check feature – **770-25-U**
- High sensitivity pilot – **770-55-12-U**
- Pressure Reducing – **772-U**
- Electric override – **770-59-U**
- Level & flow control valve – **757-U**
- Pump & flow control valve – **747-U**
- Electronic control valve – **718-03**

See relevant BERMAD publications.



Operation

The Model 770-55-U is a pilot controlled valve equipped with an adjustable, 2-Way flow pilot, an orifice assembly, and a solenoid pilot.

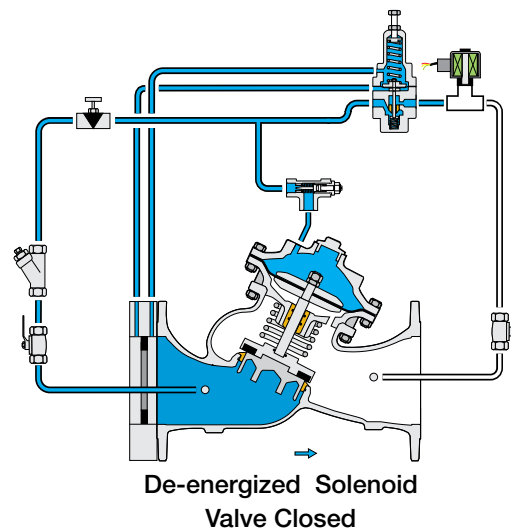
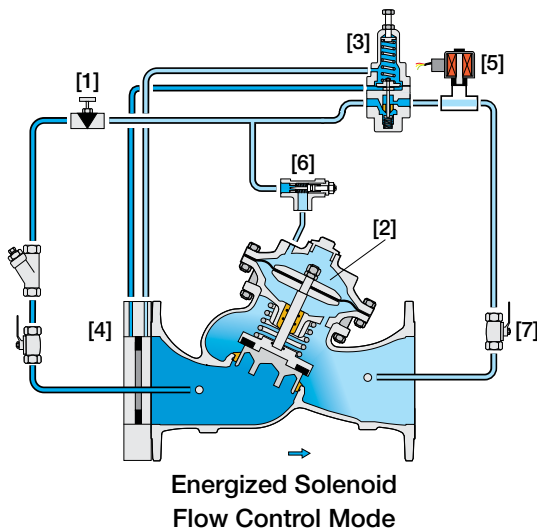
The needle valve [1] continuously allows flow from valve inlet into the upper control chamber [2]. The pilot [3] senses the differential pressure across the orifice plate [4], and together with the solenoid [5], controls outflow from the upper control chamber. Should orifice differential pressure rise above pilot setting, the pilot throttles, enabling pressure to accumulate in the upper control chamber, causing the main valve to throttle closed, thereby limiting flow to the pilot setting. Should orifice differential pressure fall below pilot setting, the pilot releases accumulated pressure causing the main valve to modulate open. Should the solenoid close, pressure in the upper control chamber accumulates causing the main valve to shut off.

Normally Closed, Normally Open and Last Position models are available.

The needle valve controls the closing speed.

The one-way flow control needle valve [6] stabilizes the valve's reaction in hard regulation conditions, by restricting the flow out of the control chamber.

The downstream cock valve [7] enables manual closing.



Pilot System Specifications

Standard Materials:

Pilot:

Body: Stainless Steel 316 or Bronze
Elastomers: Synthetic Rubber
Spring: Stainless Steel

Solenoid:

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

Orifice Assembly:

Body: Fusion Bonded Epoxy Steel or Stainless Steel
Orifice Plate: Stainless Steel

Solenoid Electrical Data:

Voltages:

(ac): 24, 110-120, 220-240, (50-60Hz)
(dc): 12, 24, 110, 220

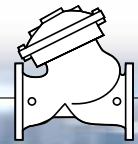
Power Consumption:

(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:

- Orifice diameter is calculated for each valve.
- Flow Setting Range:
(-)15% & (+)25% from predetermined flow
- The orifice additional head loss is 0.2 bar ; 2.8 psi
- Orifice assembly adds 25mm ; 1" to valve length
- 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
- When minimum head loss is essential and flow velocity is higher than 1.0 m/sec, consider using the Model 770-j equipped with a pitot tube flow sensor and high sensitivity flow pilot #7

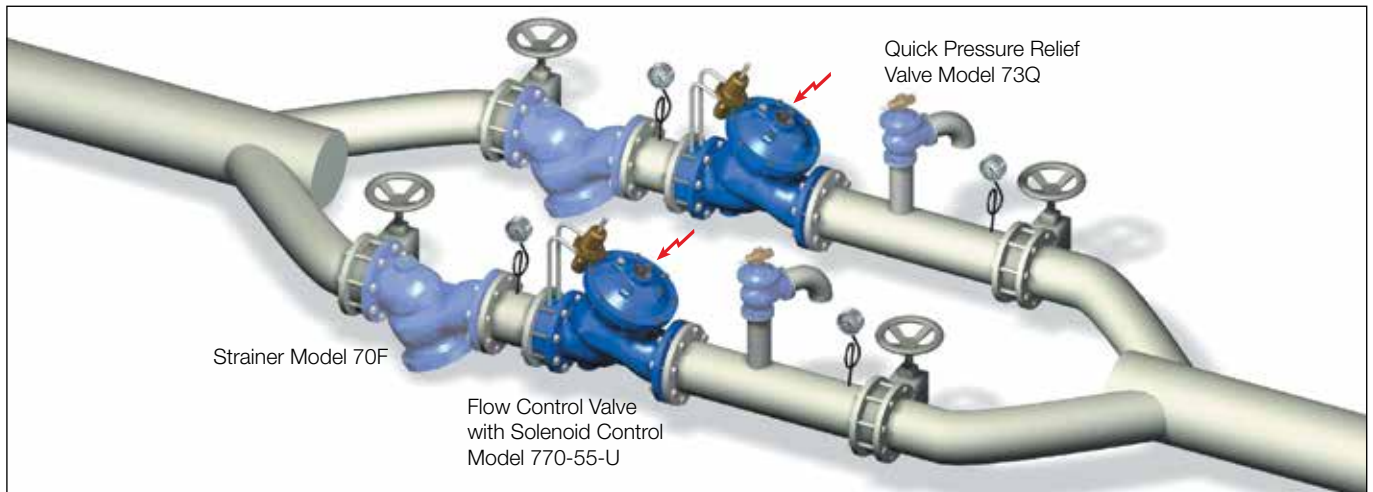


Typical Applications

Parallel Valve Installation

In a distribution network, there is often a need to respond to several flow regimes. In flow control valves, the orifice limits the valve adjustment range to about $\pm 15\%$. Parallel installation of two Model 770-55-U valves enable:

- Flow limiting for various flow regimes
- Equalizing operating hours between valves

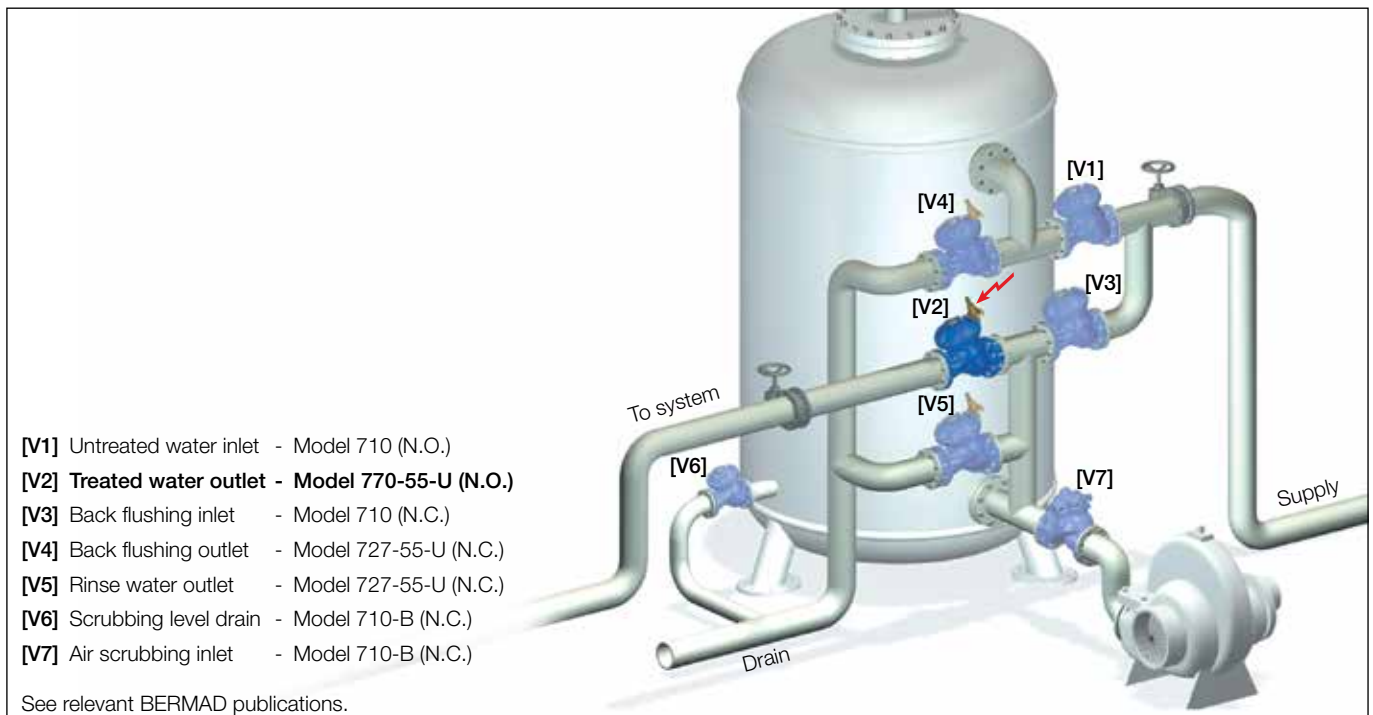


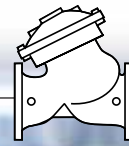
Filtration Systems

In a filter battery, installed as part of a water treatment system, excessive flow through any of the filters might cause:

- Unequal filter loading and blocking
- Reduced filter efficiency
- Structural damage to the filter element

The Model 770-55-U [V2] maintains the pre-set maximum flow through each of the filters. The solenoid control enables disconnecting each filter (in turn) from the filtration process allowing periodic back flushing.





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

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

ΔP = Differential Pressure for fully open valve (bar; psi)

Q = Flow rate (m³/h; gpm)

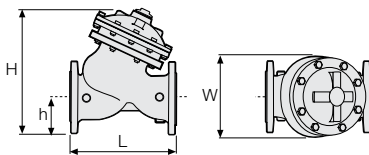
Kv = Metric system - valve flow coefficient
(flow in m³/h at 1 bar ΔP with 15°C water)

Cv = US system - Valve flow coefficient
(flow in gpm at 1 psi ΔP 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)																											
		W (mm / inch)																											
		h (mm / inch)																											
		H (mm / inch)																											
		Weight (Kg/lb)																											
700-EN	PN16; 25	L (mm / inch)																											
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		H (mm / inch)																											
		Weight (Kg/lb)																											
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

