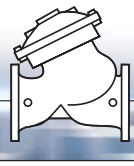


700 Series

Model 770-U

Flow Control Valve

- Prioritizing main system over sub-system
- Limiting consumers over demand
- Controlling pipeline fill rate
- Pump overload & cavitation protection

The Model 770-U Flow Control Valve is a hydraulically operated, diaphragm actuated control valve that maintains pre-set maximum flow, regardless of fluctuating demand or varying system pressure.

Features and Benefits

- **Line pressure driven** – Independent operation
- **Hydraulic flow sensor (upstream installation)**
  - No moving parts
  - No electronic components
  - No need for flow straightening
- **In-line serviceable** – Easy maintenance
- **Double chamber design**
  - Moderated valve reaction
  - Protected diaphragm
- **Flexible design** – Easy addition of features
- **Variety of accessories** – Perfect mission matching
- **"Y" or angle, wide body** – Minimized pressure loss
- **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

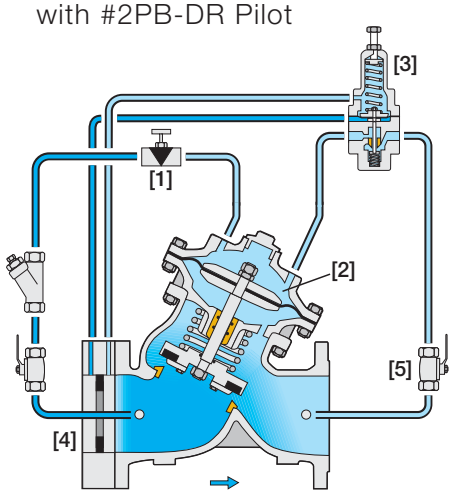
- Solenoid control – **770-55-U**
- Solenoid control & check feature – **770-25-U**
- High sensitivity pilot – **770-12-U**
- Pressure Reducing – **772-U**
- Level & flow control valve – **757-U**
- Pump & flow control valve – **747-U**
- Pump circulation & flow control valve – **749-U**
- Electronic control valve – **718-03**

See relevant BERMAD publications.

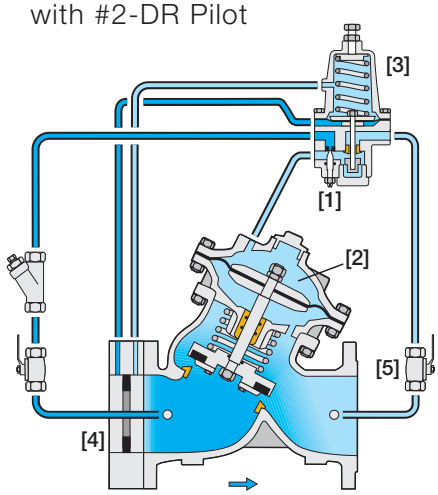
Operation

The Model 770-U is a pilot controlled valve equipped with an adjustable, 2-Way flow pilot and an orifice assembly.
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]**. Should this 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, and 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.
The needle valve controls the closing speed. The downstream cock valve **[5]** enables manual closing.

1½-4"
with #2PB-DR Pilot



6-14"
with #2-DR Pilot



Note: For 16" and larger valves, see "Flow Pilot Valve Selection" table at the last page.

Engineer Specifications

The Flow Control Valve shall maintain pre-set maximum flow, regardless of fluctuating demand or varying system pressure.

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 2-Way adjustable, direct acting flow pilot valve, an orifice plate, a needle valve, isolating cock valves, and a filter. The orifice shall be attached to main valve inlet. All fittings shall be forged brass or stainless steel. The assembled valve shall be hydraulically tested and factory adjusted to customer requirements.

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

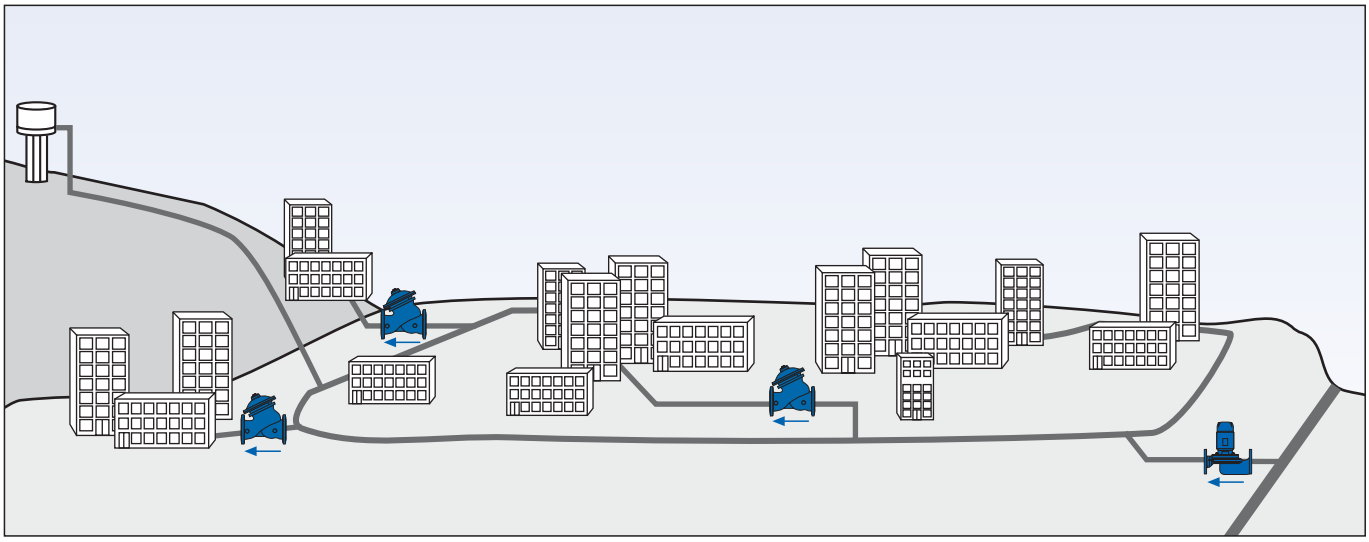
Distribution Networks

System design starts from expected flow range that determines major system components:

- Pump stations: Characteristics, location, quantity
- Supply lines: Layout, class, size
- Reservoirs: Location, volume, head

Significant deviation from designed flow range might disrupt water supply or even damage system components. Appropriate design, placement, and use of the Model 770-U protects the system from excessive flow.

When pressure reducing is also required, choosing the Model 772-U, instead of the Model 770-U, completes the solution.

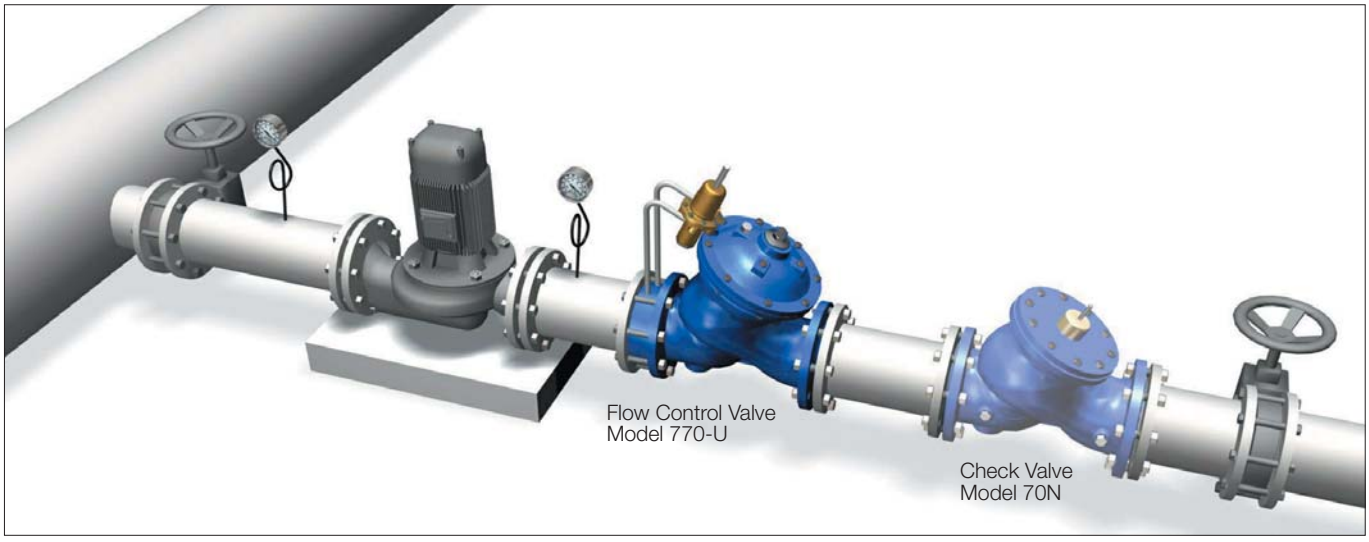


Pump Overload and Cavitation Protection

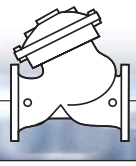
Protection against excessive demand that causes pump overload and cavitation damage, is achieved by sustaining pump flow within design specifications.

Since pump specifications vary, so do the required solutions:

- When the pump curve (flow vs. ΔP) is relatively steep, pressure sustaining valves Models 730, 730R, and 736 are the most suitable.
- When the pump curve is relatively flat, pump protection with respect to pressure is not sufficient. Protection according to flow is recommended. The Model 770-U is the most suitable.



BERMAD Waterworks



700 Series

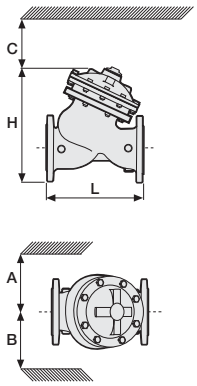
Model 770-U

Technical Data

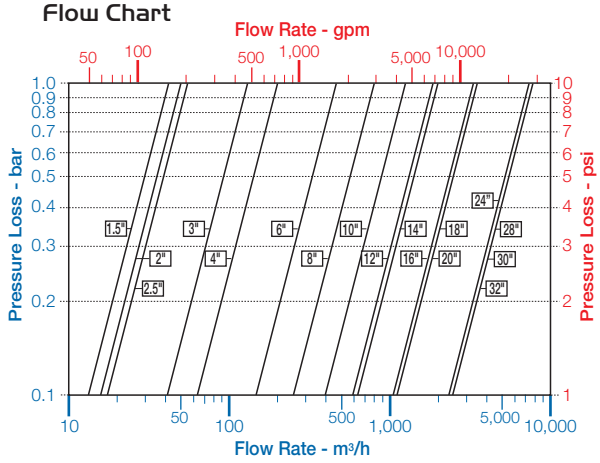
Dimensions and Weights

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

The orifice assembly adds 20 mm to valve length.
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
Pilot Standard Materials:
Body: Brass, Bronze or Stainless Steel
Elastomers: NBR
Springs: Galvanized Steel or Stainless Steel
Internals: Stainless Steel
Orifice Assembly Standard Materials:
Body: Fusion bonded epoxy Steel or Stainless Steel
Orifice Plate: Stainless Steel
Sensing Ports: ⅛" NPT

- Standard (calculated) differential pressure: 0.4 bar (5.5 psi)

Flow Pilot Valve Selection

Valve Size	Pilot Type		
	#2PB-DR	#2- DR	#2HC-DR
1½-4" 40-100 mm	■		
6-14" 150-350 mm		■	
16 -32" 400-800 mm			■

- Pilots are modified to differential remote sensing-model "DR".
- 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.

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"	770	00	Y	C	16	EB	–	CB	UI
Waterworks	1½ - 32"	Flow Control								

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

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

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

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

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

Valve Position Indicator	I
Large Control Filter	F
Orifice Assembly	U
V-Port Throttling Plug	V
Electric Limit Switch	S
Valve Position Transmitter	Q
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
Pitot Tube	j

Multiple choices permitted

No Additional Feature	00
Closing and Opening Speed-Control	03
High sensitivity pilot	12
Check Valve	20
Solenoid Controlled & Check Valve	25
Hydraulic Control	50
Solenoid Controlled	55
Electric Override	59

Multiple choices permitted

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

Use when additional electric control feature is selected

Pelmar Engineering Ltd. Tel. (888) 754-6329, sales@pelmareng.com, www.pelmareng.com