

# Flow Control and Pressure Reducing Valve

### Model 772-U

- Controlling over demand & pressure
- Balancing flow via parallel pressure reducing valves
- Controlling pipeline fill rate
- Pump cavitation & system over pressure protection
- Compensating during groundwater drawdown

The Model 772-U Flow Control and Pressure Reducing Valve is a hydraulically operated, diaphragm actuated control valve with two independent functions. It maintains both pre-set maximum flow and reduces higher upstream pressure to lower constant downstream pressure, regardless of varying demand or upstream pressure.



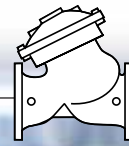
### Features and Benefits

- **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 – **772-55-U**
- Check feature – **772-20-U**
- Solenoid control & check feature – **772-25-U**
- Downstream over pressure guard – **772-48-U**

See relevant BERMAD publications.



## Operation

The Model 772-U is a pilot controlled valve equipped with an orifice assembly and two adjustable, 2-Way pilots for Flow Control (FC) and Pressure Reducing (PR), operating independently in series.

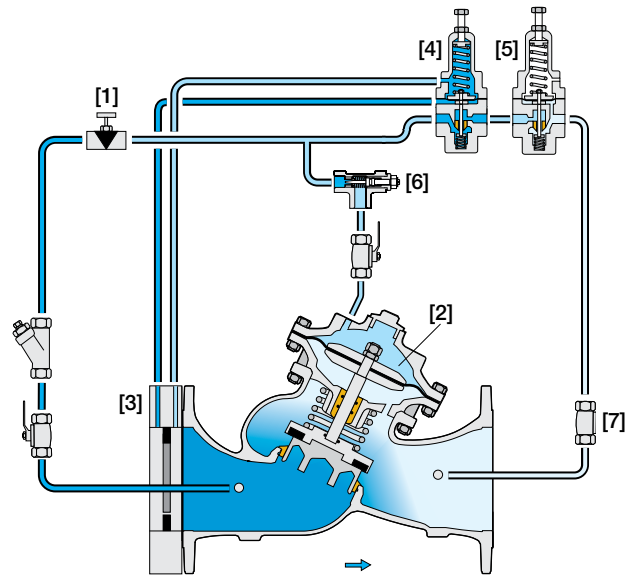
The needle valve [1] continuously allows flow from valve inlet into the upper control chamber [2].

Should orifice plate [3] differential pressure rise above FC pilot [4] setting, the pilot throttles causing pressure to accumulate in the upper control chamber. The main valve throttles closed maintaining maximum flow at pilot setting. Should this differential pressure fall below FC pilot setting, the pilot releases accumulated pressure to the main valve outlet through the held open PR pilot [5] causing the main valve to modulate open. Should opening the main valve cause downstream pressure to rise above PR pilot setting, the pilot closes, causing the main valve to throttle closed, reducing downstream pressure.

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:

#### Pilots:

Body: Stainless Steel 316 or Bronze

Elastomers: Synthetic Rubber

Springs: Galvanized Steel or Stainless Steel

#### 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

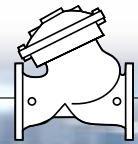
Orifice Plate: Stainless Steel

#### Pressure Reducing Pilot Adjustment Range:

- 0.5 to 3.0 bar ; 7 to 40 psi
- 0.8 to 6.5 bar ; 11 to 95 psi
- 1 to 16 bar ; 15 to 230 psi
- 5 to 25 bar ; 70 to 360 psi

#### Notes:

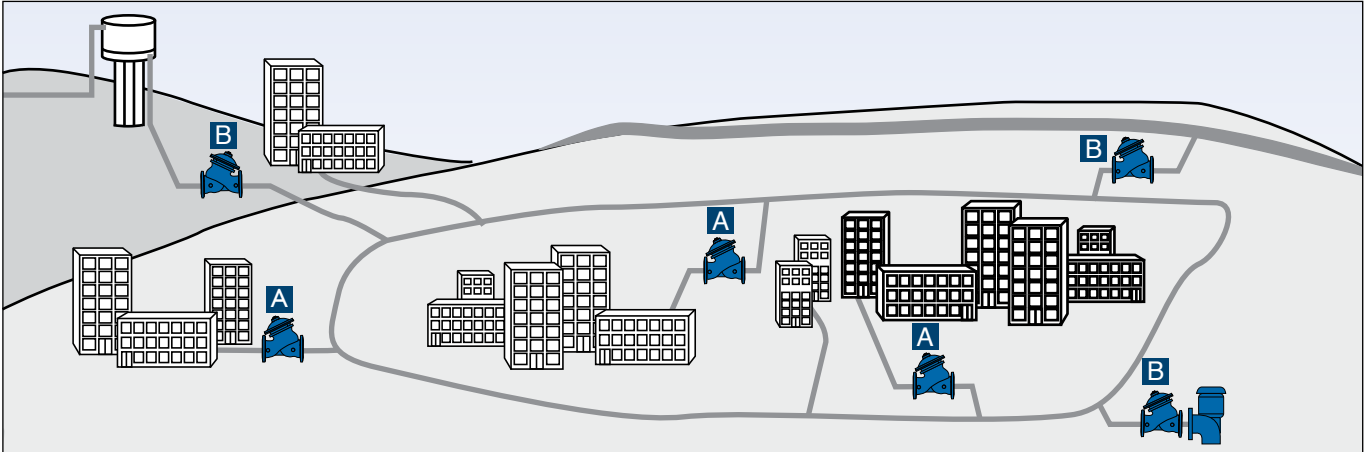
- Orifice diameter is calculated for each valve.
- Flow Setting Range:
  - (-)15% & (+)25% from predetermined flow
- The orifice additional head loss is 0.2 bar ; 2.8 psi
- Orifice assembly adds 25mm ; 1" to valve length
- Recommended continuous flow velocity:
  - 0.3-6.0 m/sec ; 1-20 ft/sec
- Minimum operating pressure: 0.7 bar ; 10 psi.  
For lower pressure requirements consult factory
- Inlet pressure, outlet pressure and flow rate are required for optimal sizing and cavitation analysis
- 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

### Distribution Networks

The Model 772-U synergizes the advantages of flow control and pressure-reducing in one valve.



### Better than Just Flow Control

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 **[A systems]**, instead of the Model 770-U, completes the solution.

### Better than Just Pressure Reducing

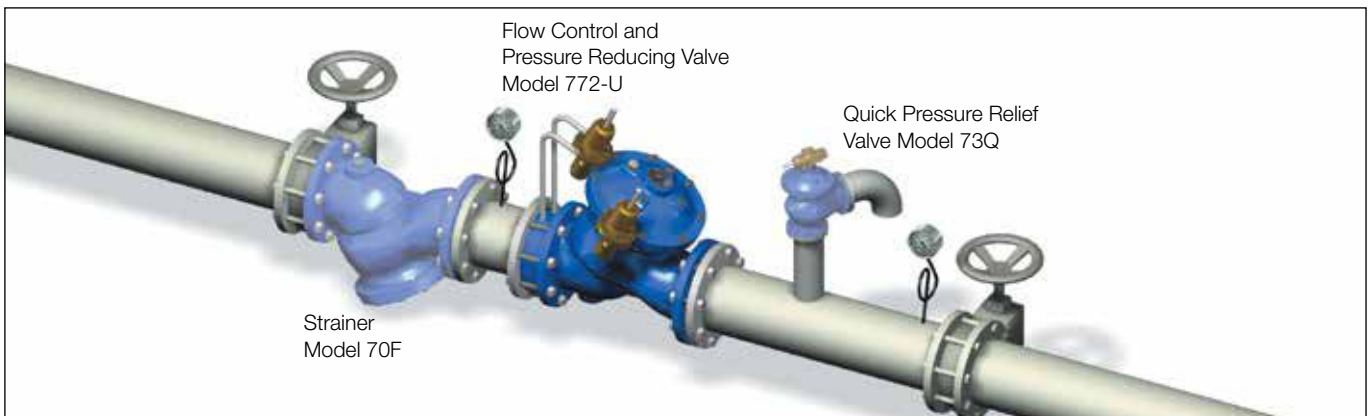
Where multiple sources with various pressures feed into a common network, multiple pressure reducing valves are installed to control network pressure. Their pressure settings are adjusted so that valves progressively “step-in” and “step-out” resulting in the minimum number of valves of the smallest size operating at any time.

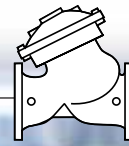
Where downstream pressure (as with the Model 720) is the only controlled characteristic, flow through any of the valves might rise above recommended values to damage the valves and cause each “step” to be fuzzy.

The Model 772-U **[B systems]** limits flow through each valve resulting in:

- Protection against excessive flow cavitation damage
- Sharp valve “step-in” and “step-out”

## Typical Installation





### 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)

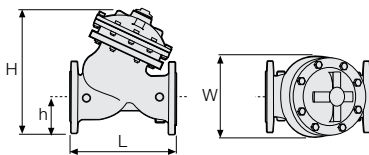
$Kv$  = Metric system - valve flow coefficient (flow in m³/h at 1 bar  $\Delta P$  with 15°C water)

$Cv$  = 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																											
	700 & 700EN	Kv / Cv - V-Port																											
	700 & 700EN	Kv / Cv - "Y" Flat																											
700-ES	PN16; 25	Kv / Cv - "Y" V-Port																											
		L (mm / inch)																											
		W (mm / inch)																											
		h (mm / inch)																											
		H (mm / inch)																											
700-EN	PN16; 25	Weight (Kg/lb)																											
		L (mm / inch)																											
		W (mm / inch)																											
		h (mm / inch)																											
		H (mm / inch)																											
700 Flanged	"Y" PN16 Class 150	Weight (Kg/lb)																											
		L (mm / inch)																											
		W (mm / inch)																											
		h (mm / inch)																											
		H (mm / inch)																											
	"Y" PN25 Class 300	Weight (Kg/lb)																											
		L (mm / inch)																											
		W (mm / inch)																											
		h (mm / inch)																											
		H (mm / inch)																											
700 Threaded	"Y" PN16; 25 Class 150; 300	Weight (Kg/lb)																											
		L (mm / inch)																											
		W (mm / inch)																											
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	"Y" PN25 Class 300	Weight (Kg/lb)																											
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### 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

