



## Differential Pressure Sustaining Valve

### Model 736

- Pump overload & cavitation protection
- Balancing between circuits in HVAC systems
- Safeguarding pump minimum flow
- Emergency filter by-pass

The Model 736 Differential Pressure Sustaining Valve is a hydraulically operated, diaphragm actuated control valve that sustains minimum pre-set, differential pressure between two points regardless of fluctuating flow or varying upstream pressure.



### Features and Benefits

- **Line pressure driven** – Independent operation
- **Balanced seal disk** – High relief flow capacity
- **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

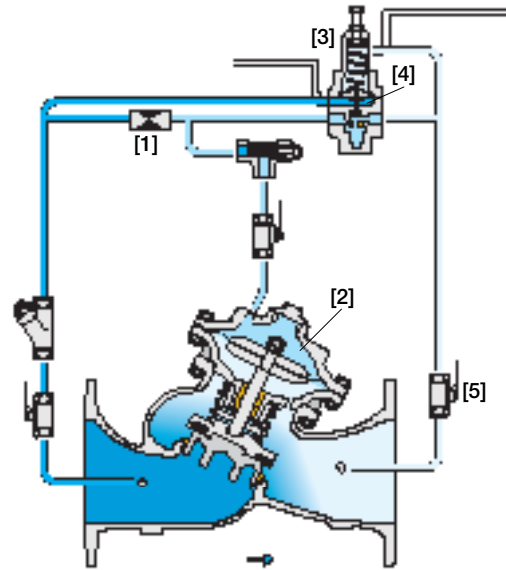
- Solenoid control – **736-55**
- Check feature – **736-20**
- High sensitivity pilot – **736-12**
- Solenoid control & check feature – **736-25**
- Electric override – **736-59**
- Electronic Differential Pressure Sustaining valve – **738-03-06**

See relevant BERMAD publications.



## Operation

The Model 736 is a pilot controlled valve equipped with an adjustable, 2-Way differential pressure sustaining pilot. The restriction [1] continuously allows flow from valve inlet into the upper control chamber [2]. The pilot [3], locally or remotely, senses both high pressure below its diaphragm [4] and low pressure above it. Should differential pressure fall below pilot setting, the pilot throttles, enabling pressure to accumulate in the upper control chamber, causing the main valve to throttle, thereby sustaining differential pressure at the pilot setting. Should differential pressure rise above pilot setting, the pilot releases accumulated pressure causing the main valve to modulate open. The downstream cock valve [5] enables manual closing. Pressure sensing is either internal (standard) or external (on request).



## Pilot System Specifications

### Standard Materials:

#### Pilot:

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

#### Tubing & Fittings:

Stainless Steel 316 or Copper & Brass

#### Accessories:

Stainless Steel 316, Brass and Synthetic Rubber Elastomers

### 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

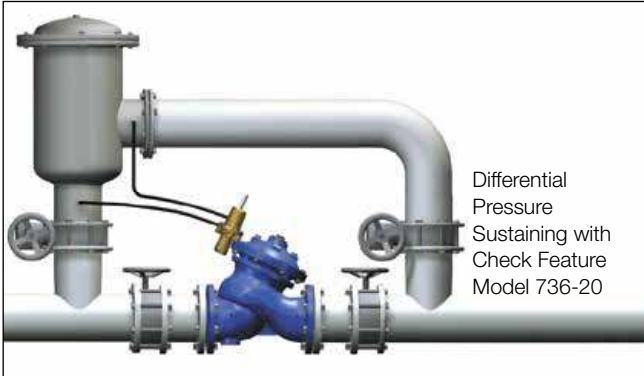
### Notes:

- Inlet pressure, outlet pressure and flow rate are required for optimal sizing and cavitation analysis
- 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

### Filtration Systems



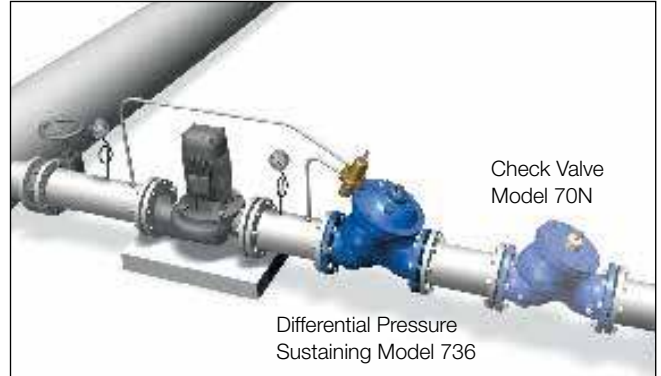
In filtration systems there are two cases when by-passing the filter is essential:

- Blocked filter (potentially causing element collapse)
- Demand for emergency fire water

The Model 736, installed as a by-pass, progressively compensates for excessive demand.

Adding feature "S" incorporates alarm signaling attribute.

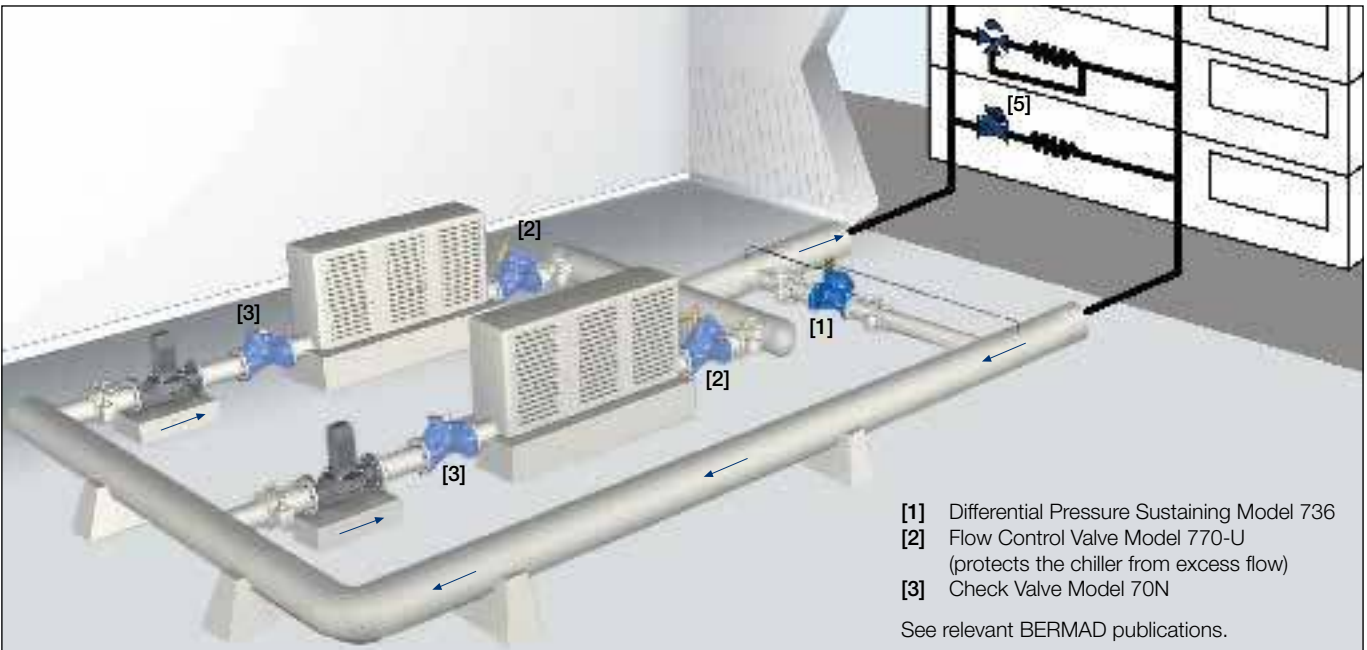
### Pump Overload & Cavitation Protection



Where suction pressure regimes vary, the Model 736 is needed to limit pump flow by sustaining pump differential pressure, preventing pump overload and cavitation damage caused by excessive demand.

Adding check feature "20", saves the cost of a line sized check valve.

### Air Conditioning Systems



- [1] Differential Pressure Sustaining Model 736
- [2] Flow Control Valve Model 770-U (protects the chiller from excess flow)
- [3] Check Valve Model 70N

See relevant BERMAD publications.

Air conditioning chillers are sensitive to changes in flow.

In typical large scale air conditioning systems, two types of valves react to varying consumer demand:

- **Three-way valves [4]** route flow that is in excess of demand through a by-pass.
- **Two-way valves [5]** enable reduced flow or shut off completely.

Chillers in systems that include two-way valves might be subjected to varying flows.

The Model 736 [1] functions as a circulation valve to sustain preset differential pressure between distribution and collection lines:

- Safeguarding system minimum flow protecting the chillers from low flow freezing
- Relieving excessive pressure





### 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

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

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

**Q** = Flow rate (m³/h; gpm)

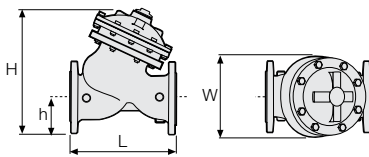
**Kv** = Metric system - valve flow coefficient (flow in m³/h at 1 bar ΔP with 15°C water)

**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 - V-Port																											
	700 & 700EN	Kv / Cv - "Y" Flat																											
700-ES	PN16; 25	Kv / Cv - "Y" V-Port																											
	PN16; 25	L (mm / inch)																											
		W (mm / inch)																											
		h (mm / inch)																											
		H (mm / inch)																											
Weight (Kg/lb)																													
700-EN	PN16; 25	L (mm / inch)																											
	PN16; 25	W (mm / inch)																											
		h (mm / inch)																											
		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

