



## 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

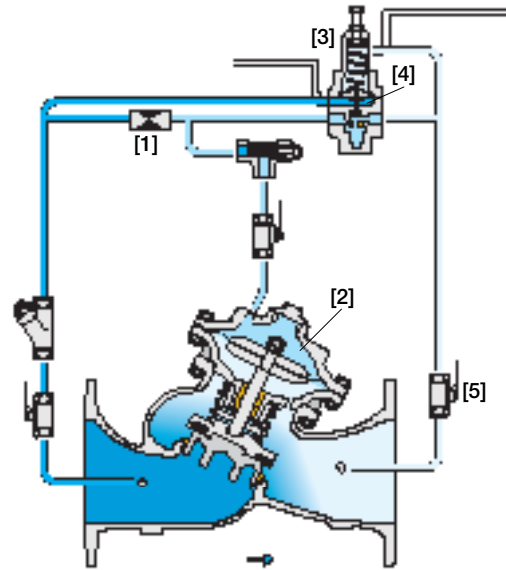
- Solenoid control – **736-55**
- Check feature – **736-20**
- High sensitivity pilot – **736-12**
- Solenoid control & check feature – **736-25**
- Electric override – **736-59**
- Electronic Differential Pressure Sustaining valve – **738-03-06**

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

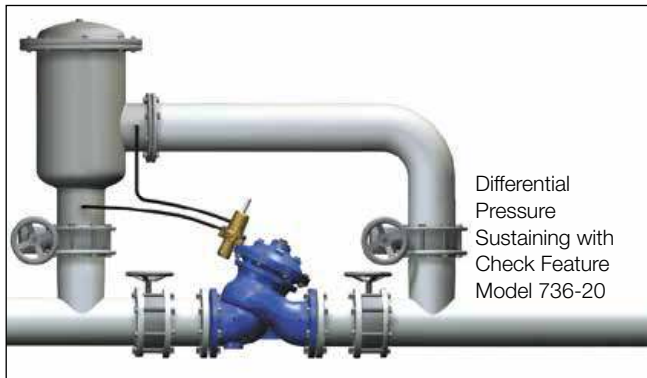
#### Notes:

- 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



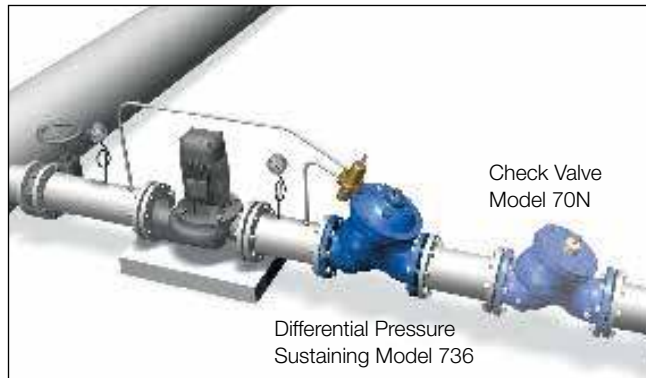
In filtration systems there are two cases when by-passing the filter is essential:

- 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.

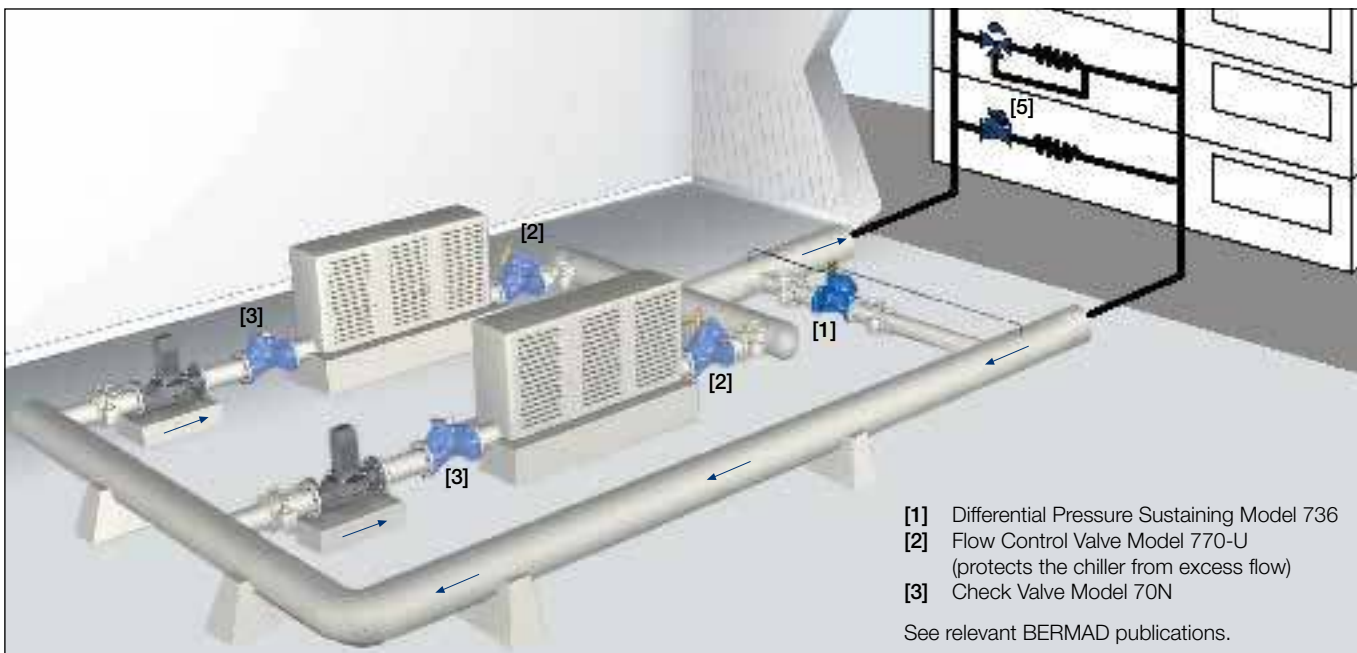
### Pump Overload & Cavitation Protection



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



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

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

$\Delta P$  = Differential Pressure for fully open valve (bar; psi)

$Q$  = Flow rate (m³/h; gpm)

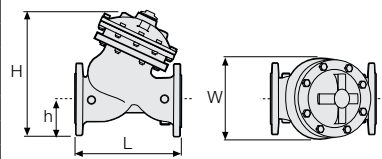
$Kv$  = Metric system - valve flow coefficient  
(flow in m³/h at 1 bar  $\Delta P$  with 15°C water)

$Cv$  = 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																												54	62	57	66	60	69	65	75	145	167	395	456	610	705	905	1,045	1,520	1,756	-	-	2,250	2,599	-	-	4,070	4,701				
	700 & 700EN	Kv / Cv - V-Port																												46	53	48	56	51	59	55	64	123	142	336	388	519	599	769	888	1,292	1,492	-	-	1,913	2,209	-	-	3,460	3,996				
	700 & 700EN	Kv / Cv - "Y" Flat																												42	49	50	58	55	64	115	133	200	230	460	530	815	940	1,250	1,440	1,850	2,140	1,990	2,300	3,310	3,820	3,430	3,960	3,550	4,100				
700-ES	PN16; 25	Kv / Cv - "Y" V-Port																												36	41	43	49	47	54	98	113	170	200	391	450	693	800	1,063	1,230	1,573	1,820	1,692	1,950	2,814	3,250	2,916	3,370	3,018	3,490				
		L (mm / inch)																												230	9.1	230	9.1	290	11.4	310	12.2	350	13.8	480	18.9	600	23.6	730	28.7	850	33.5	-	-	1,100	43.3	-	-	1,250	49.2				
		W (mm / inch)																												150	5.9	165	6.5	185	7.3	200	7.9	235	9.3	300	11.8	360	14.2	425	16.7	530	20.9	-	-	626	24.6	-	-	838	33				
		h (mm / inch)																												80	3.1	90	3.5	100	3.9	105	4.1	125	4.9	155	6.1	190	7.5	220	8.7	250	9.8	-	-	320	12.6	-	-	385	15.2				
		H (mm / inch)																												240	9.4	250	9.8	250	9.8	260	10.2	320	12.6	420	16.5	510	20.1	605	23.8	725	28.5	-	-	895	35.2	-	-	1,185	46.7				
Weight (Kg/lb)																												10	22	10.8	23.8	13.2	29	15	33	26	57.2	55	121	95	209	148	326	255	561	-	-	437	960	-	-	1,061	2,334						
700-EN	PN16; 25	L (mm / inch)																												-	-	-	-	-	-	310	12.2	350	13.8	480	18.9	600	23.6	730	28.7	850	33.5	-	-	-	-	-	-	-	-				
		W (mm / inch)																												-	-	-	-	-	-	200	7.9	235	9.3	320	12.6	390	15.4	480	18.9	550	21.7	-	-	-	-	-	-	-	-	-			
		h (mm / inch)																												-	-	-	-	-	-	100	3.9	118	4.6	150	5.9	180	7.1	213	8.4	243	9.6	-	-	-	-	-	-	-	-	-			
		H (mm / inch)																												-	-	-	-	-	-	305	12	369	14.5	500	19.7	592	23.3	733	28.9	841	33.1	-	-	-	-	-	-	-	-	-			
		Weight (Kg/lb)																												-	-	-	-	-	-	21	46.2	31	68.2	70	154	115	253	198	436	337	741	-	-	-	-	-	-	-	-	-			
700 Flanged	"Y" PN16 Class 150	L (mm / inch)																												205	8.1	210	8.3	222	8.7	250	9.8	320	12.6	415	16.3	500	19.7	605	23.8	725	28.5	733	28.9	990	39	1,000	39.4	1,100	43.3				
		W (mm / inch)																												155	6.1	165	6.5	178	7	200	7.9	223	8.8	320	12.6	390	15.4	480	18.9	550	21.7	550	21.7	740	29.1	740	29.1	740	29.1				
		h (mm / inch)																												78	3.1	83	3.3	95	3.7	100	3.9	115	4.5	143	5.6	172	6.8	204	8	242	9.5	268	10.6	300	11.8	319	12.6	358	14.1				
		H (mm / inch)																												239	9.4	244	9.6	257	10.1	305	12	366	14.4	492	19.4	584	23	724	28.5	840	33.1	866	34.1	1,108	43.6	1,127	44.4	1,167	45.9				
		Weight (Kg/lb)																												9.1	20	10.6	23	13	29	22	49	37	82	75	165	125	276	217	478	370	816	381	840	846	1,865	945	2,083	962	2,121				
	"Y" PN25 Class 300	L (mm / inch)																												205	8.1	210	8.3	222	8.7	264	10.4	335	13.2	433	17	524	20.6	637	25.1	762	30	767	30.2	1,024	40.3	1,030	40.6	1,136	44.7				
		W (mm / inch)																												155	6.1	165	6.5	185	7.3	207	8.1	250	9.8	320	12.6	390	15.4	480	18.9	550	21.7	570	22.4	740	29.1	740	29.1	750	29.5				
		h (mm / inch)																												78	3.1	83	3.3	95	3.7	105	4.1	127	5	159	6.3	191	7.5	223	8.8	261	10.3	295	11.6	325	12.8	357	14.1	389	15.3				
		H (mm / inch)																												239	9.4	244	9.6	257	10.1	314	12.4	378	14.9	508	20	602	23.7	742	29.2	859	33.8	893	35.2	1,133	44.6	1,165	45.9	1,197	47.1				
		Weight (Kg/lb)																												10	22	12.2	27	15	33	25	55	43	95	85	187	146	322	245	540	410	904	434	957	900	1,984	967	2,132	986	2,174				
700 Threaded	"Y" PN16; 25 Class 150; 300	L (mm / inch)																												155	6.1	155	6.1	212	8.3	250	9.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
		W (mm / inch)																												122	4.8	122	4.8	122	4.8	163	6.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
		h (mm / inch)																												40	1.6	40	1.6	48	1.9	56	2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
		H (mm / inch)																												201	7.9	202	8	209	8.2	264	10.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
		Weight (Kg/lb)																												5.5	12	5.5	12	8	18	17	37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
		L (mm / inch)																												-	-	121	4.8	140	5.5	159	6.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
		W (mm / inch)																												-	-	122	4.8	122	4.8	163	6.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Globe PN16 Class 150	Globe PN25 Class 300	R (mm / inch)																												-	-	40	1.6	48	1.9	55	2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
		h (mm / inch)																												-	-	83	3.3	102	4	115	4.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
		H (mm / inch)																												-	-	225	8.9	242	9.5	294	11.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
		Weight (Kg/lb)																												-	-	5.5	12	7	15	15	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
		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	1,250	49.2	1,250	49.2	1,250	49.2	1,250	49.2	1,250	49.2	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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
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	1,250	49.2	1,250	49.2	1,250	49.2	1,250	49.2	1,250	49.2	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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		



### 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

