Differential Pressure Sustaining Valve

- 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

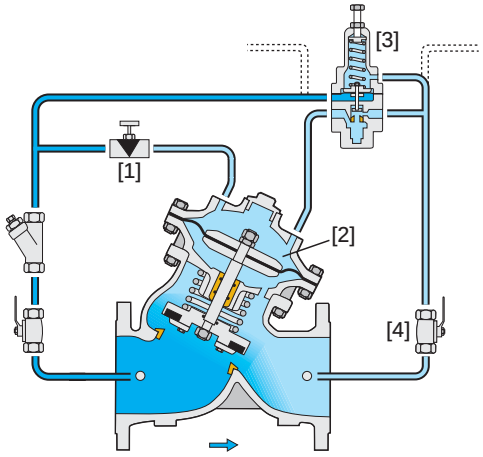
- Solenoid control – **736-55**
- Check feature – **736-20**
- High sensitivity pilot – **736-12**
- Solenoid control & check feature – **736-25**
- Electric override – **736-59**
- Electronic Differential Pressure Sustaining valve – **738-03-06**

See relevant BERMAD publications.

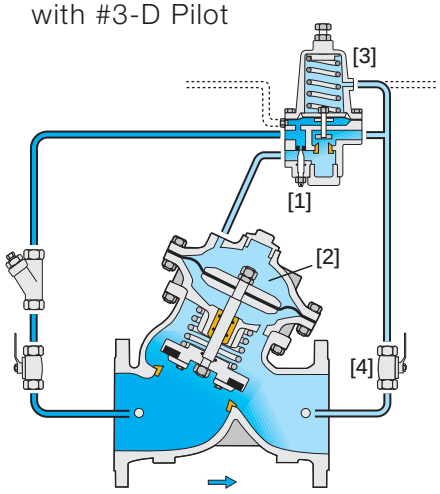
Operation

The Model 736 is a pilot controlled valve equipped with an adjustable, 2-Way differential pressure sustaining pilot.
The needle valve 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 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 needle valve controls the closing speed. The downstream cock valve [4] enables manual closing.
Pressure sensing is either internal (standard) or external (on request)

1½- 4”
with #3PB-D Pilot



6-14”
with #3-D Pilot



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

Engineer Specifications

The Differential Pressure Sustaining Valve shall sustain minimum pre-set, differential pressure between two points regardless of fluctuating flow or varying upstream 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.

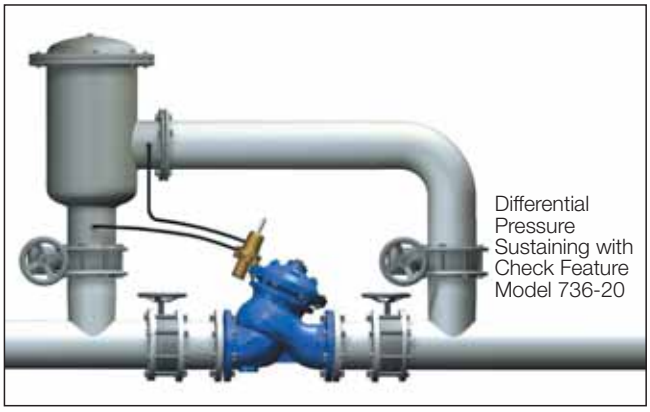
Actuator: The actuator assembly shall be double chambered with an inherent separating partition between the lower surface of the diaphragm and the main valve. The entire actuator assembly (seal disk to top cover) shall be removable from the valve as an integral unit. The stainless steel valve shaft shall 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, differential pressure sustaining pilot valve, a needle valve, isolating cock valves, and a filter. 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

Filtration Systems

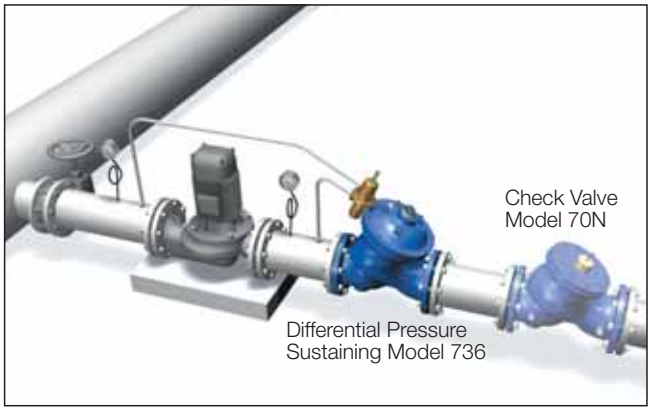


In filtration systems there are two cases when by-passing the filter is essential:

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

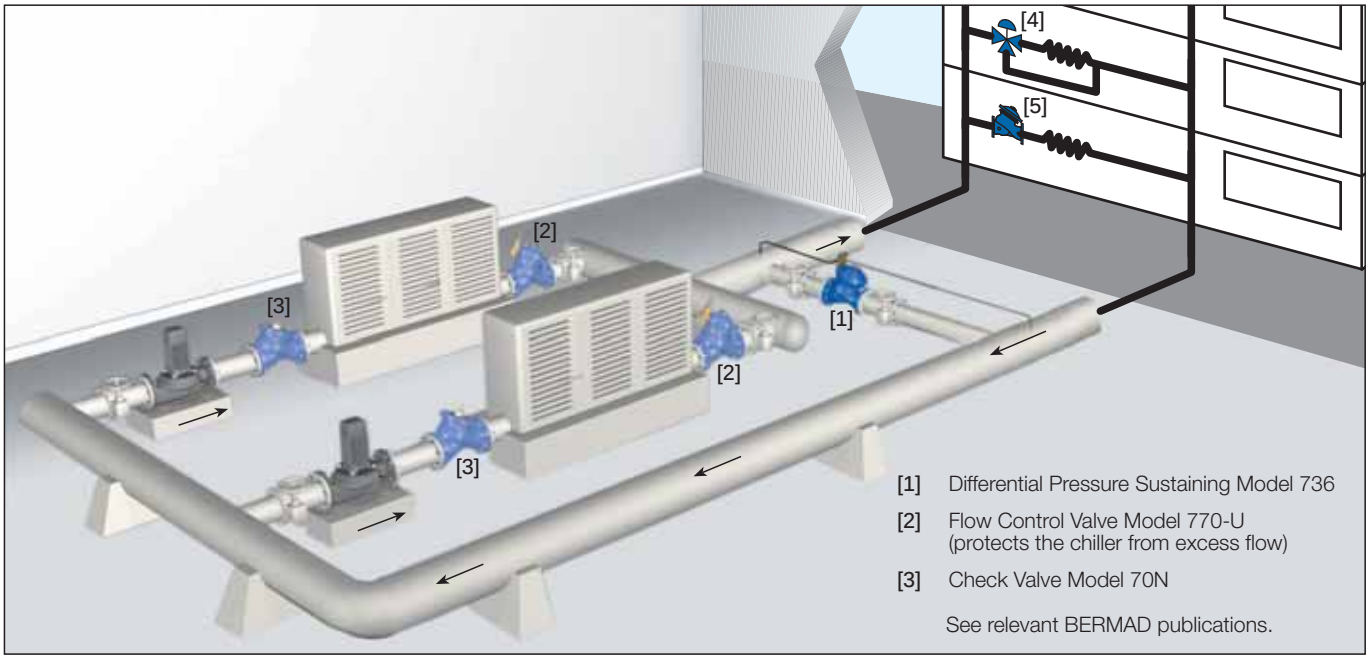
The Model 736, installed as a by-pass, progressively compensates for excessive demand.
Adding feature "S" incorporates alarm signaling attribute.

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



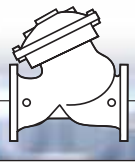
Air conditioning chillers are sensitive to changes in flow.
In typical large scale air conditioning systems, two types of valves react to varying consumer demand:

- **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

BERMAD Waterworks



700 Series

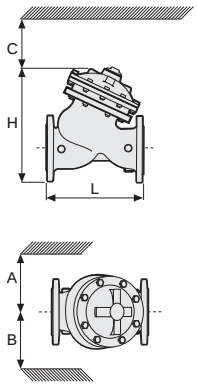
Model 736

Technical Data

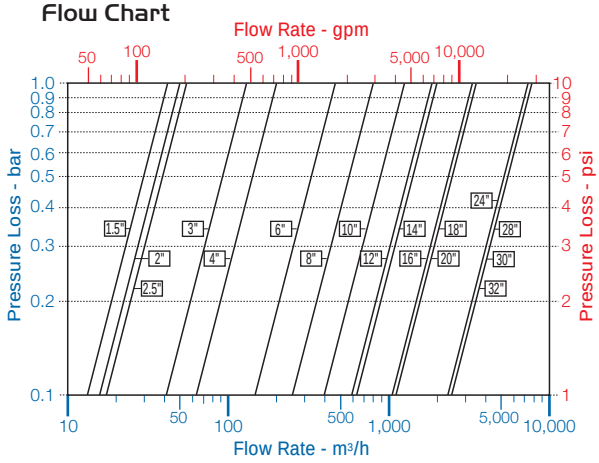
Dimensions and Weights

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

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: Stainless Steel
Internals: Stainless Steel

Pilot Valve Selection

Valve Size	Pilot Setting (bar)	Pilot Type		
		#3PB-D	#3-D	#3HC-D
1½-4"	<15	■		
40-100 mm	>15		●	
6-14"	<15		■	
150-350 mm	>15		●	
16-32"	<15			■
400-800 mm	>15			●

■ Standard model ● with high pressure setting kit

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"	736	00	Y	C	16	EB	–	CB	VI

Sector
- Waterworks — WW
  - For Air-Condition applications order Sector "WC" - valve prepared for thermal insulation

Size
- 1½ - 32" — 6"

Primary Feature
- Differential Pressure Sustaining — 736

Additional Feature (Multiple choices permitted)

No Additional Feature	00
High sensitivity pilot	12
Check Valve	20
Solenoid Controlled & Check Valve	25
Multi-Setting Levels - Electrically Selected	45
Closing Surge Prevention	49
Hydraulic Control	50
Solenoid Controlled	55
Electric Override	59

Pattern

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

Body Material

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

End Connections

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

Coating

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

Voltage & Position (Use when additional electric control feature is selected)

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

Tubing & Fittings

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

Additonal Attributes (Multiple choices permitted)

Valve Position Indicator	I
Large Control Filter	F
V-Port Throttling Plug	V
Electric Limit Switch	S
3-Way Control Loop	X
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
Pressure Gauge	6

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