

700 Series

Differential Pressure Sustaining Valve

Mod€l 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.



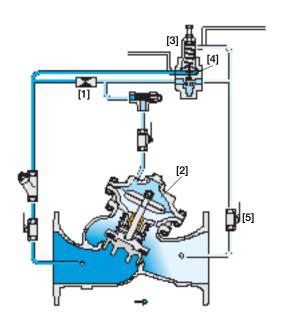


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Operation

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

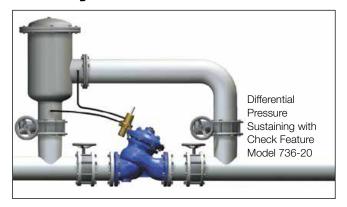




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Typical Applications

Filtration Systems



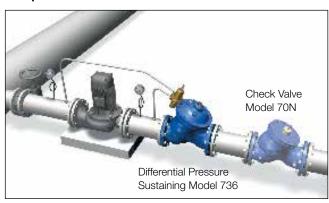
In filtration systems there are two cases when by-passing the filter is essential:

- 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.

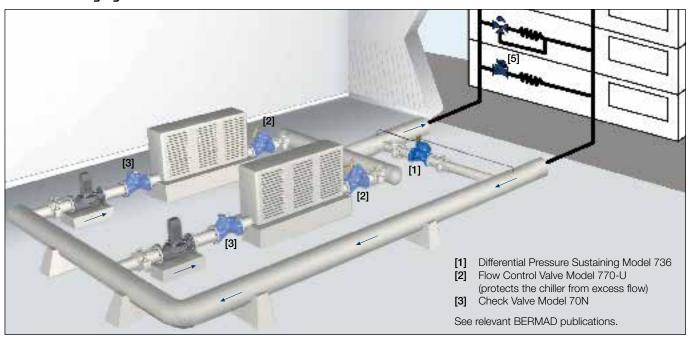
Pump Overload & Cavitation Protection



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





700 Series

Technical Data

Size Range: DN40-900; 11/2-36" 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)

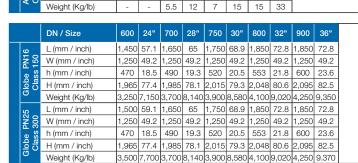
Q = Flow rate (m³/h; gpm)

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 | ES | 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 |
| | 700ES | 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 |
| | 00 Z | 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 |
| 700-ES | | 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 | - | 1,250 | 49.2 |
| | 25 | 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 |
| | PN16; | 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 | 1 | - | 385 | 15.2 |
| | Æ | 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 | - | 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 | N16 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 |
| | <u>Б</u> 8 | 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 |
| | ₽ S | 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 |
| | PN25 ss 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 |
| | R SS | 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 |
| | Clas | 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 | 1984 | 967 | 2,132 | 986 | 2,174 |
| | 20 | L (mm / inch) | 155 | 6.1 | 155 | 6.1 | 212 | 8.3 | 250 | 9.8 | | | | | | | | | | | | | | | | | | |



122 4.8 122 4.8 163 6.4

18 | 17 | 37

1.9

225 | 8.9 | 242 | 9.5 | 294 | 11.6

6.3

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209 8.2 264 10.4

4.8 122 4.8

12 8

4.8 140 5.5 159

121

122

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83 3.3 102 4

122 4.8

7.9 202 8

40 1.6 40 1.6 48 1.9 56 2.2

201

55 12 55

W (mm / inch) h (mm / inch)

H (mm / inch)

Weight (Kg/lb)

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

