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).

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

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.

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
Dimensions and Weights

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<th>Size</th>
<th>A, B</th>
<th>C</th>
<th>L</th>
<th>H</th>
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<td>mm</td>
<td>mm</td>
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</table>

Data is for Y-pattern, flanged, PN16 valves; weight for PN16 basic valve. For more details, refer to Ordering Guide.

Main Valve
Valve Patterns: "Y" (globe) & angle
Size Range: 1\冲1/2\ch1/2 (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: Brass, Bronze, Stainless Steel & NBR
  - Tubing: Copper or Stainless Steel
  - Fittings: Forged Brass or Stainless Steel

Pilot Valve Selection
- Standard model
- with high pressure setting kit

Flow Chart

How to Order
Please specify the requested valve in the following sequence: (for more options, refer to Ordering Guide).

<table>
<thead>
<tr>
<th>Sector</th>
<th>Size</th>
<th>Primary Feature</th>
<th>Additional Feature</th>
<th>Pattern</th>
<th>Body Material</th>
<th>End Connections</th>
<th>Coating</th>
<th>Voltage &amp;</th>
<th>Tubing &amp; Fittings</th>
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<td>736</td>
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<td>C</td>
<td>16</td>
<td>EB</td>
<td>–</td>
<td>CB</td>
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</table>

Flow Rate - gpm
Flow Rate - m³/h
Pressure Loss, bar
Pressure Loss, psi
Pressure Gauge

For more flow charts, refer to Engineering Section.