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## Purchase Specifications

### Model No. 98-06 / 698-06

### Hydraulic Pressure Management Control Valve With Hydraulically Dampened Switching Between Dual Set Points

#### Function

The 98-06 / 698-06 Pressure Management Control Valve shall be capable of controlling downstream pressure to a low pressure set point or high pressure set point with varying flow rate. As flow increases from a low flow condition to a high flow condition, the regulated outlet pressure shall increase from the low set point pressure to the high set point pressure. The low set point pressure, high set point pressure, and flow (based on valve position) at which pressure increases to the high set point pressure shall be adjustable. The rate of change between the two set points shall be hydraulically damped to gradually increase or decrease pressure to prevent downstream piping system surges.

The 98-06 / 698-06 Valve shall not have an orifice plate or other restriction in the main line as part of the valve control. It shall operate only under hydraulic control without electrical or electronic (powered or battery operated) controls. It shall control downstream pressure to either the low pressure set point or high pressure set point depending on whether the flow is below or above the adjustable switch point.

The pilot system adjustments shall only require simple tools to make changes and allow for changes to be made to the flow switch point without resizing an orifice plate, readjusting a restriction in the line, or reprogramming electronic control. Existing Pressure Reducing Valves from the same manufacturer shall be easily retrofitted to the 98-06 / 698-06 Pressure Management Control Valve without removal of the valve from the line.

Valve sizes available shall be from 2 inch through 10 inch in the full port style valves and 3 through 12 inch in the reduced port style valves.

#### Main Valve

The valve shall be hydraulically operated, single diaphragm-actuated, globe or angle pattern. The valve shall consist of three major components: the body, with seat installed; the cover, with bearings installed; and the diaphragm assembly. The diaphragm assembly shall be the only moving part and shall form a sealed chamber in the upper portion of the valve, separating operating pressure from line pressure. Packing glands and/or stuffing boxes are not permitted and there shall be no pistons operating the main valve or pilot controls.

#### Main Valve Body

No separate chambers shall be allowed between the main valve cover and body. Valve body and cover shall be of cast ductile iron with interior/exterior heat fusion epoxy coating and stainless steel trim type 316. No fabrication or welding shall be used in the manufacturing process. The valve shall contain a resilient, synthetic rubber disc with a rectangular cross-section contained on three and one-half sides by a disc retainer and forming a tight seal against a single removable seat insert. No O-ring type discs (circular, square, or quad type) shall be permitted as the seating surface. The disc guide shall be of the contoured type to permit smooth transition of flow and shall hold the disc firmly in place. The cylindrical disc retainer shall be of a sturdy one-piece design capable of withstanding opening and closing shocks. It must have straight edge sides and a radius at the top edge to prevent excessive diaphragm wear as the diaphragm flexes across this surface. No hourglass shaped disc retainers shall be permitted and no V-type or slotted type disc guides shall be used.

The diaphragm assembly containing a non-magnetic 303 stainless steel stem; of sufficient diameter to withstand high hydraulic pressures shall be fully guided at both ends by a bearing in the valve cover and an integral bearing in the valve seat. The seat shall be a solid, one-piece design and shall have a minimum of a five-degree taper on the seating surface for a positive, drip-tight shut off. No center guides shall be permitted. The stem shall be drilled and tapped in the cover end to receive and affix accessories that aide in the valves performance. The flexible, non-wicking, FDA approved diaphragm shall consist of nylon fabric bonded with synthetic rubber compatible with the operating fluid. The vulcanized process or a rubber grommet sealing the center stem hole from the operating pressure must seal the center hole for the main valve stem. The diaphragm must withstand a Mullins Burst Test of a minimum of 600 x per layer of nylon fabric and shall be cycle tested 100,000 times to insure longevity. The diaphragm shall not be used as the seating surface.



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#### **Main Valve Body (continued)**

The diaphragm shall be fully supported in the valve body and cover by machined surfaces which support no less than one-half of the total surface area of the diaphragm in either the fully opened or fully closed position.

The main valve seat and the stem bearing in the valve cover shall be removable. The cover bearing and seat in 6" and smaller size valves shall be threaded into the cover and body. The valve seat in 8" and larger size valves shall be retained by flat head machine screws for ease of maintenance. The lower bearing of the valve stem shall be contained concentrically within the seat and shall be exposed to the flow on all sides to avoid deposits. To insure proper alignment of the valve stem, the valve body and cover shall be machined with a full circumference locating lip. No "pinned" covers to the valve body shall be permitted. Cover bearing, disc retainer, and seat shall be made of the same material. All necessary repairs and/or modifications other than replacement of the main valve body shall be possible without removing the valve from the pipeline. Packing glands and/or stuffing boxes shall not be permitted.

The valve manufacturer shall be able to supply a complete line of equipment from 1 1/4" through 48" sizes and a complete selection of complementary equipment. The valve manufacturer shall also provide a computerized cavitation chart which shows flow rate, differential pressure, percentage of valve opening, Cv factor, system velocity, and if there will be potential for cavitation damage.

#### **Material Specification**

- Valve Sizes: 2" to 10" Full Port and 3" to 12" Reduced Port
- Main Valve Body and Cover: Ductile Iron ASTM A-536
- Main Valve Trim: Stainless Steel Type 316
- End Detail: 150 # Flanged ANSI B16.42
- Pressure Rating: 250-PSI Maximum Working Pressure
- Temperature Range: To 180 Degrees Fahrenheit
- Rubber Material: Buna-N
- Coating: Internal/External Heat Fusion Epoxy Coating 6 mils thick

#### **Pilot Control System**

The dual outlet pressure reducing pilot control shall be a direct-acting adjustable, spring loaded, normally open, diaphragm valve designed to permit flow at predetermined pressure set points when controlled pressure is less than the spring setting. The pilot control system shall include separate adjustments for setting the high pressure, low pressure, and flow rate (based on valve position) at which pressure increases or decreases between set points. It shall have an integral bias chamber which allows switching between the low and high pressure set points. External bias chambers, either above or below the pilot shall not be allowed.

The pilot control system shall incorporate a stem valve that either blocks or allows upstream pressure into the pressure reducing pilot control bias chamber for switching between high and low set point pressures. The switching between low and high set point pressures shall be hydraulically dampened to prevent downstream pressure surges. Two separate pilot controls with no dampening shall not be allowed. The pressure reducing control shall have an adjustable low pressure setting up to 30 psi below the high pressure set point.

#### **Warranty**

The valve manufacturer shall warrant the valve to be free of defects in material and workmanship for a period of three years from date of shipment, provided the valve is installed and used in accordance with all applicable instructions. Electrical components shall have a one-year warranty.

#### **Start-up**

A direct factory representative shall be made available for start-up service, inspection and necessary adjustments.