The Model 120-16 has a wide range of applications: anywhere the flow rate must be controlled or limited. Typical examples include: Pump systems  Fuel metering systems

**SERIES FEATURES**
- Modulates as required to prevent flow rate from exceeding a predetermined maximum.
- Opens and closes via discrete electrical signals.
- Closes to prevent backflow in the event of pressure reversal.
- Built-in orifice plate for sensing flow rate.
- Extra-sensitive differential pilot.
- Flow rate is adjustable with single screw.
- Adjustable response speed.
- Can be maintained without removal from the line.
- Factory tested and can be pre-set to your requirements.

**OPERATION**

The rate of flow control pilot moves open or closed based on differential pressure created across the orifice plate. As the differential, hence the rate, increases, the pilot moves further closed, closing the main valve. As the differential decreases, the pilot moves further open, opening the main valve. The net result is a constant modulation of the pilot and main valve to hold the flow rate constant.

**ELECTRICAL ON-OFF ACTION:** When the coil of the solenoid pilot (4) is energized, the pilot is open, and the main valve opens under control of the rate of flow pilot, as described above. When the coil is deenergized, the pilot is closed, which forces the main valve to hold the flow rate constant.

**CHECK VALVE ACTION:** If downstream pressure should become higher than upstream pressure, check valve (7B) opens to admit the higher downstream pressure to the main valve diaphragm chamber, forcing the valve fully and tightly closed. At the same time, check valve (7A) closes to prevent any reverse flow through the pilot system.

**COMPONENTS**
The Model 120-16 consists of the following components, arranged as shown on the schematic diagram:

1. Model 65 Basic Valve Assembly
2. Orifice Plate
3. Model 2450 Rate of Flow Control Pilot
5. Model 126 Ejector
6. Model 141-2 Flow Control Valve (opening Speed Control)
7. Model 141-1 Check Valve
8. Model 123 Inline Strainer
9. Model 155L Visual Indicator (optional)

**SIZING**
The following chart states the minimum and maximum flow rate with standard bore orifice plate, based on a fluid specific gravity of 0.8. This means the valve can be adjusted to control within the ranges shown. Lower flow ranges are possible through the use of smaller orifice plate bore and all ranges are adjustable within a 4:1 ratio (high to low flow). Consult the factory for assistance.

<table>
<thead>
<tr>
<th>SIZE</th>
<th>1 1/4&quot;, 1 1/2&quot;</th>
<th>2&quot;</th>
<th>2 1/2&quot;</th>
<th>3&quot;</th>
<th>4&quot;</th>
<th>6&quot;</th>
<th>8&quot;</th>
<th>10&quot;</th>
<th>12&quot;</th>
<th>14&quot;</th>
<th>16&quot;</th>
<th>18&quot;</th>
<th>24&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIN. FLOW, GPM</td>
<td>40 62 97 145 251 559 942 1,321 1,871 2,245 2,994 8,762</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>MAX. FLOW, GPM</td>
<td>158 247 387 581 1,004 2,237 3,769 5,283 7,485 8,982 11,796 35,047</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**MAX. PRESSURE**
(The pressures listed here are maximum working pressures at 100°F)

<table>
<thead>
<tr>
<th>END CONNECTIONS</th>
<th>DUCTILE IRON</th>
<th>STEEL WCB</th>
<th>STEEL LCB</th>
<th>STN. STL.</th>
<th>ALUMINUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>150# Flanged</td>
<td>247</td>
<td>286</td>
<td>267</td>
<td>276</td>
<td>286</td>
</tr>
<tr>
<td>300# Flanged</td>
<td>740</td>
<td>740</td>
<td>696</td>
<td>719</td>
<td>----</td>
</tr>
</tbody>
</table>

NOTE: Maximum pressures may be limited by the solenoid.
SIZES GLOBE/ANGLE
Flanged Ends - 1 1/4" - 24" (globe)
1 1/4" - 16" (angle)

FLUID OPERATING TEMPERATURE RANGE
(Valve Elastomers)
Buna -20°F to 180°F
Viton 20°F to 230°F
Fluorosilicone -40°F to 150°F

MATERIALS
Consult factory for others.

Body/Bonnet: Ductile Iron (epoxy coated), Carbon Steel (epoxy coated), Stainless Steel, Aluminum

Seat Ring: Stainless Steel, Monel

Stem: Stainless Steel, Monel

Spring: Stainless Steel

Diaphragm: Buna-N, Viton, (Nylon reinforced)

Seat Disc: Buna-N, Viton

Pilot: Stainless Steel, Bronze

Other pilot system components: Stainless Steel, Bronze/Brass

Tubing & Fittings: Stainless Steel, Copper/Brass

SPECIFICATIONS (Typical Aviation Fueling Application)

The rate of flow/solenoid shut-off/check control valve shall function to (1) control or limit the flow rate, regardless of fluctuations in upstream or downstream pressure, (2) open and close via an electrical signal, and (3) close to prevent reverse flow.

DESIGN
The rate of flow/solenoid shut-off/check control valve shall be a single-seated, line pressure operated, diaphragm actuated, pilot controlled globe valve. The valve shall seal by means of a corrosion-resistant seat and a resilient, rectangular seat disc. These, and other parts, shall be replaceable without removing the valve from the line. The stem of the main valve shall be guided top and bottom by integral bushings. Alignment of the body, bonnet and diaphragm assembly shall be by precision dowel pins. The diaphragm shall not be used as a seating surface, nor shall the pistons be used as an operating means. The orifice plate shall be integrally-installed in the valve inlet flange. The pilot system shall be furnished complete, installed on the main valve and include a needle valve speed control and an inline strainer. The rate of flow control valve shall be operationally and hydrostatically tested prior to shipment.

MATERIALS OF CONSTRUCTION
The main valve body and bonnet shall be ductile iron. All ferrous surfaces shall be coated with 4 mils of epoxy. The main valve seat ring shall be stainless steel. Elastomers (diaphragms, resilient seats and O-rings) shall be Buna-N. The control pilot shall be stainless steel, while the opening speed control and control line tubing shall be stainless steel. The orifice plate shall also be stainless steel.

OPERATING CONDITIONS
The rate of flow/solenoid shut-off/check control valve shall be suitable for controlling the flow rate over a range of <X to X (limited to 4:1)> GPM at pressures ranging from <X to X> psi.

ACCEPTABLE PRODUCTS
The rate of flow/solenoid shut-off/check control valve shall be a <size> Model 120-16, <globe pattern, angle pattern>, with <15 0# flanged, 300 # flanged> end connections, as manufactured by OCV Control Valves, Tulsa, Oklahoma, USA.

U.S. DIMENSIONS - INCHES

<table>
<thead>
<tr>
<th>DIM</th>
<th>END CONN.</th>
<th>1 1/4-1 1/2</th>
<th>2</th>
<th>2 1/2</th>
<th>3</th>
<th>4</th>
<th>6</th>
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<th>14</th>
<th>16</th>
<th>24</th>
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</thead>
<tbody>
<tr>
<td>C</td>
<td>150# FLGD</td>
<td>4 1/4</td>
<td>4 3/4</td>
<td>6 7 1/2</td>
<td>10</td>
<td>12 1/16</td>
<td>14 7/8</td>
<td>17</td>
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<td>20 13/16</td>
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<tr>
<td>D</td>
<td>150# FLGD</td>
<td>4 3/8</td>
<td>5 3/8</td>
<td>6 3/8</td>
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<td>15 9/16</td>
<td>17 3/4</td>
<td>--</td>
<td>21 5/8</td>
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<td></td>
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<tr>
<td>E</td>
<td>ALL</td>
<td>6 7</td>
<td>11 7/8</td>
<td>14 1/2</td>
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<td>15 11/16</td>
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<td>3 1/8</td>
<td>4 1/8</td>
<td>3 1/8</td>
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<td>5 13/16</td>
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<tr>
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<td>17</td>
<td>18</td>
<td>20</td>
<td>20 1/2</td>
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</tr>
</tbody>
</table>

*GROOVED END NOT AVAILABLE IN 1 1/4"****

Note: for military fueling valves, 6" (DN150) 150# flanges have 20" (20 mm) face to face dimensions and 6" (DN150) 300# flanges have 20-7/8" (208 mm) face to face dimensions.

For maximum efficiency, the OCV control valve should be mounted in a piping system so that the valve bonnet (cover) is in the top position. Other positions are acceptable but may not allow the valve to function to its fullest and safest potential. In particular, please consult the factory before installing 8" and larger valves, or any valves with a limit switch, in positions other than described. Space should be taken into consideration when mounting valves and their pilot systems.

A routine inspection & maintenance program should be established and conducted yearly by a qualified technician. Consult our factory @ 1-918-627-1942 for parts and service.

How to order your Model 120-16 valve
When ordering please provide:
Fluid to be controlled - Model Number - Size - Globe or Angle - End Connection - Body Material - Trim Material - Pilot Options - Flow Rate Setting or Range - Special Requirements / Installation Requirements

phone: (918)627.1942  •  fax: (918)622.8916  •  7400 East 42nd Place, Tulsa, Oklahoma 74145
email: sales@controlvalves.com  •  website: www.controlvalves.com