DESCRIPTION
A solenoid operated, three-port, pressure-compensated, spool-type, normally open when de-energized, proportional flow control regulator. It can be used as a priority-type flow regulator with pressure-compensated, regulated and bypass flow. It can also be used as a restrictive-type two-way, pressure-compensated flow regulator when the bypass line (port 2) is blocked.

OPERATION
The PV70-31 provides regulated flow out of port 3 with pressure compensated regulated and bypass flow. The regulated flow is inversely proportional to electric current applied to the solenoid.

FEATURES
- Choice of two regulated flow ranges.
- Hardened spool and cage for long life.
- Optional coil voltages and terminations.
- Efficient wet armature construction.
- Excellent linearity and hysteresis.
- Utilized, molded coil design.
- Coil waterproofing standard.
- Manual override options.

RATINGS
Operating Pressure: Inlet (Port 1): 240 bar (3500 psi); Regulated (Port 3): 207 bar (3000 psi); Bypass (Port 2): 207 bar (3000 psi)
Proof Pressure: 345 bar (5000 psi)
Burst Pressure: 896 bar (13,000 psi)
Flow Rating:

<table>
<thead>
<tr>
<th>Flow Rating lpm (gpm)</th>
<th>Range A 2-Ported</th>
<th>Range A 3-Ported</th>
<th>Range B 2-Ported</th>
<th>Range B 3-Ported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulated</td>
<td>26.5 (7.0)</td>
<td>30.3 (8.0)</td>
<td>17.0 (4.5)</td>
<td>17.0 (4.5)</td>
</tr>
<tr>
<td>Nominal Input</td>
<td>--</td>
<td>37.9 (10.0)</td>
<td>--</td>
<td>18.9 (5.0)</td>
</tr>
<tr>
<td>Maximum Input</td>
<td>--</td>
<td>49.2 (13.0)</td>
<td>--</td>
<td>26.5 (7.0)</td>
</tr>
</tbody>
</table>

Operating Fluid Temperature: -40 to 100°C (-40 to 212°F) with Buna N seals; -26 to 204°C (-15 to 400°F) with fluorocarbon seals
Internal Leakage: 197 cc/min. (12 cu. in./min.) fully closed at 207 bar (3000 psi)

Electrical Parameters: (Nominal values with size 70 E-series and D-series coils)

<table>
<thead>
<tr>
<th>Coil Voltage Rating (VDC)</th>
<th>Valve Inductance (mH)</th>
<th>Threshold Current (mA)</th>
<th>Maximum Control Current (mA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-Coil</td>
<td>D-Coil</td>
<td>Flow Range A</td>
<td>Flow Range B</td>
</tr>
<tr>
<td>12</td>
<td>240</td>
<td>200</td>
<td>150 ±70</td>
</tr>
<tr>
<td>24</td>
<td>700</td>
<td>600</td>
<td>75 ±35</td>
</tr>
</tbody>
</table>

Hysteresis: ±0.9 lpm (0.25 gpm) maximum

Dither/PWM Frequency Range: 100 to 250 Hz

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: Install D-series coils with two O-rings above and below the coil. Install E-series coils with only one O-ring above the coil. Manual override options M and G require Coil Nut Kits. See part numbers below. See Cartridge Installation, page 9.020.1 for cartridge, coil and coil retainer installation. To assure proper function, coil retainer must be installed.

Cavity: VC10-3; See page 9.110.1

Cavity Tool: CT10-3X-XX; See page 8.600.1

Seal Kit: SK10-3X-MM; See page 8.650.1 for seal kit options and appropriate seals based on application temperature range.

Coil Nut Kits (for Manual Override Option G): 4001214; (for Option M): 420218
**PERFORMANCE (Continued)**

Regulated Flow vs. Pressure Drop
2-Ported; Flow Range A
240 bar/3500 psi Inlet
12V Coil; 200 Hz PWM
32 cSt/150 sus oil at 40°C (104°F)

<table>
<thead>
<tr>
<th>FLOW lpm/gpm</th>
<th>PRESSURE DROP bar/psi</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0 AMP</td>
<td>37.9/10</td>
</tr>
<tr>
<td>0.5 AMP</td>
<td>30.3/8</td>
</tr>
<tr>
<td>0.8 AMP</td>
<td>22.7/6</td>
</tr>
<tr>
<td>1.1 AMP</td>
<td>15.1/4</td>
</tr>
<tr>
<td>1.4 AMP</td>
<td>11.4/3</td>
</tr>
<tr>
<td>1.7 AMP</td>
<td>7.6/2</td>
</tr>
<tr>
<td>2.0 AMP</td>
<td>3.8/1</td>
</tr>
</tbody>
</table>

Regulated Flow vs. Pressure Drop
2-Ported; Flow Range B
240 bar/3500 psi Inlet
12V Coil; 200 Hz PWM
32 cSt/150 sus oil at 40°C (104°F)

<table>
<thead>
<tr>
<th>FLOW lpm/gpm</th>
<th>PRESSURE DROP bar/psi</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0 AMP</td>
<td>22.7/6</td>
</tr>
<tr>
<td>0.5 AMP</td>
<td>18.9/5</td>
</tr>
<tr>
<td>0.7 AMP</td>
<td>15.1/4</td>
</tr>
<tr>
<td>0.9 AMP</td>
<td>11.4/3</td>
</tr>
<tr>
<td>1.1 AMP</td>
<td>7.6/2</td>
</tr>
<tr>
<td>1.3 AMP</td>
<td>3.8/1</td>
</tr>
</tbody>
</table>

**DIMENSIONS**

**ALUMINUM BODY SHOWN**

**TO ORDER**

**PV70-31**

**Flow Range**
- 0 to 30.3 lpm (0 to 8 gpm)
- 0 to 17 lpm (0 to 4.5 gpm)

**Porting**
- 0 Cartridge Only
- 6T SAE 6
- 8T SAE 8
- 2B 1/4 in. BSP*
- 3B 3/8 in. BSP*

**Option(s)**
- None (Blank)
- Manual Override M*
- Manual Override with Guard G**

**Seals**
- Buna N (Std.)
- Fluorocarbon V

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**Recommended Electronic Controllers:**
See page 2.001.1 or our Electronics catalog.

**MATERIALS**

**Cartridge:** Weight: 0.32 kg. (0.70 lbs.); with manual override M: 0.37 kg (0.81 lb.); with manual override G: 0.45 kg (1.0 lb.) Steel with hardened work surfaces. Zinc-plated exposed surfaces. Buna N O-rings and polyester elastomer back-ups standard.

**Standard Ported Body:** Weight: 0.36 kg. (0.80 lbs.) Anodized high-strength aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

**70-Size “D” Coil:** Weight: 0.32 kg. (0.7 lbs.) Unitized thermoplastic encapsulated, Class H high temperature magnet wire. See page 3.200.7

**70-Size “E” Coil:** Weight: 0.41 kg. (0.9 lbs.) Fully encapsulated with rugged external metal shell. IP69K rated. See page 3.400.13

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**Terminations D-Coil**
- DS Dual Spades
- DG DIN 43650
- DL Leadwires (2)
- DL/W Leads w/Weatherpak® Connectors

**Terminations E-Coil**
- IP69K Rated
- ER Deutsch DT04-2P
- EY Metri-Pack® 150

**Voltage**
- 0 Less Coil
- 12 12 VDC
- 24 24 VDC