**TS98-30  Proportional Pressure Reducing/Relieving**

**DESCRIPTION**
A pilot-operated, spool-type proportional pressure reducing/relieving screw-in, cartridge style valve, which can be infinitely adjusted across a prescribed range using a variable electric input. Pressure output is proportional to the input electrical current. This valve is intended for use as a pressure control device in demanding applications.

**OPERATION**
Without applied current, the **TS98-30** allows flow from 3 to 4 while blocking 2. When the coil is energized, 3 is connected to 2, and pressure at 3 is controlled proportional to the amount of current applied to the coil. If pressure at 3 exceeds the setting induced by the coil, pressure is relieved to 4. Back pressure on port 4 becomes additive to the pressure setting at a 1:1 ratio.

**FEATURES**
- Protective 430 micron screen is standard.
- Bi-directional operation.
- 12 and 24 volt coils are standard.
- Optional waterproofed E-Coils rated up to IP69K.

**RATINGS**
- **Maximum Operating Pressure** (at Ports 1 and 2): 138 bar (2000 psi)
- **Regulated Pressure Range from Zero to Maximum Control Current**
  - Maximum Pilot Flow: 0.85 lpm (0.23 gpm) with 0 current at 54 °C (130 °F)
- **Flow Path**: Free Flow: 3 to 4 coil de-energized; Reduced: 2 to 3 coil energized; Relieving: 3 to 4 coil energized

**Electrical Parameters**:

<table>
<thead>
<tr>
<th>Coil</th>
<th>Typical Max Current @ 0 gpm (A)</th>
<th>Typical Resistance ±5% @ 20 °C (ohms)</th>
<th>Typical Apparent Inductance (mH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>D-Series</td>
<td>0.68</td>
<td>9.89</td>
<td>89</td>
</tr>
<tr>
<td>24 VDC</td>
<td>12 VDC</td>
<td>8.53</td>
<td>178</td>
</tr>
<tr>
<td>E-Series</td>
<td>0.68</td>
<td>8.93</td>
<td>105</td>
</tr>
<tr>
<td>24 VDC</td>
<td>12 VDC</td>
<td>33.7</td>
<td>437</td>
</tr>
</tbody>
</table>

**Temperature**: -29 to 204°C (-20 to 400°F), with fluorocarbon seals

**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

**Cavity**: VC98-3; See page 9.110.1

**Cavity Tool**: CT98-3XX; See page 8.600.1

**Seal Kit**: SK90-3V-00; See page 8.650.1

**Coil Nut**: Part No. 7004410; For E-coils manufactured prior to 1-1-04, see page 3.400.1

Performance info. continued on following page.
**Valve w/Internally Piloted Spool**

**TS98-30**

### PERFORMANCE (continued)

**Typical Frequency Response Curves**

**GAIN (dB)**

<table>
<thead>
<tr>
<th>FREQUENCY (Hz)</th>
<th>0</th>
<th>2</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
<th>90</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signal 50% 50%</td>
<td>-12</td>
<td>-9</td>
<td>-6</td>
<td>-3</td>
<td>0</td>
<td>3</td>
<td>6</td>
<td>9</td>
<td>12</td>
<td>15</td>
<td>18</td>
<td>21</td>
<td>24</td>
<td>27</td>
<td>30</td>
</tr>
<tr>
<td>Signal 95% 5%</td>
<td>-16</td>
<td>-13</td>
<td>-10</td>
<td>-7</td>
<td>-4</td>
<td>-1</td>
<td>2</td>
<td>5</td>
<td>8</td>
<td>11</td>
<td>14</td>
<td>17</td>
<td>20</td>
<td>23</td>
<td>26</td>
</tr>
<tr>
<td>Signal 70% 25%</td>
<td>-18</td>
<td>-15</td>
<td>-12</td>
<td>-9</td>
<td>-6</td>
<td>-3</td>
<td>0</td>
<td>3</td>
<td>6</td>
<td>9</td>
<td>12</td>
<td>15</td>
<td>18</td>
<td>21</td>
<td>24</td>
</tr>
</tbody>
</table>

**PHASE (degrees)**

| FREQUENCY (Hz) | 0 | 2 | 4 | 6 | 8 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
|---------------|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|
| Signal 50% 50% | 0 | 90 | 180 | 270 | 360 | 450 | 540 | 630 | 720 | 810 | 900 | 990 | 1080 | 1170 | 1260 |
| Signal 95% 5% | 5 | 140 | 230 | 320 | 410 | 500 | 590 | 680 | 770 | 860 | 950 | 1040 | 1130 | 1220 | 1310 |
| Signal 70% 25% | 10 | 120 | 210 | 300 | 390 | 480 | 570 | 660 | 750 | 840 | 930 | 1020 | 1110 | 1200 | 1290 |

**Typical Step Response Curve**

- **Inlet Pressure** vs. **Time (msec.)**
- **Current Input** vs. **Pressure (bars/psi)**
- **Response** vs. **Gain (dB)**
- **Phase (degrees)**

### DIMENSIONS

**MATERIALS**

**Cartridge:** Weight: 0.25 kg. (0.55 lbs.); Steel with hardened work surfaces. Zinc-plated exposed surfaces. O-rings standard.

**Standard Ported Body:** Weight: 0.34 kg. (0.75 lbs.) Anodized high-strength aluminum alloy, rated to 207 bar (3000 psi). See page 8.010.1.

**Standard Coil:** Weight: 0.11 kg. (0.25 lbs.) Unitized thermoplastic encapsulated, Class H high temperature magnet-wire. See page 3.200.1.

**E-Coil:** Weight: 0.14 kg. (0.3 lbs.) Perfect wound, fully encapsulated with rugged external metal shell. Rated up to IP69K with integral connectors.

**Note:** See page 3.400.1 for all E-Coil retrofit applications.

### TO ORDER

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

**Termination Std. Coil**
- **DS** Dual Spades
- **DG** DIN 43650
- **DL** Leadwires (2)
- **DL/W** Leads w/Weatherpack® Connectors
- **DR** Deutsch DT04-2P

**Termination E-Coil**
- **ER** Deutsch DT04-2P (IP69K Rated)
- **EY** Metri-Pack® 150 (IP69K Rated)
- **EG** DIN 43650 (IP65 Rated)

Coils with internal diode are available. Consult factory.