## Pilot Control Valves

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Pilot Control Valves

2-POSITION, 2-WAY SPOOL DIRECTIONAL VALVE – PILOT CAPACITY

**Performance Curves**

- Maximum operating pressure = 5000 psi
- Maximum leakage at 150 SUS = 10 drops/min. at 5000 psi
- Switching frequency = 15000 cycles/hour
- Cartridge can be installed directly into a cavity in some Sun pilot operated and ventable cartridges to provide electrically operated pilot control functions.
- Proper installation of solenoid valves requires an extra deep socket to clear the solenoid tube. Sockets are available from Snap On tools (P/N SIML280) or Sun Hydraulics (P/N 998-100-006). See www.sunhydraulics.com for details.

**OPTION ORDERING INFORMATION** Model Codes printed in Red are Preferred Versions and most readily available

**D A A A – M ** ** – ** **

- **Nominal Capacity**
  - A 25 GPM

- **Control**
  - M Manual Override
  - C Concealed Override

- **Spool Configuration**
  - H Normally Open
  - C Normally Closed

- **Coil Configuration**
  - A Standard
  - C Canadian Standards Association Certified 3500 psi max.

- **Seal**
  - Buna-N
  - Viton

- **Coil Configuration Options**
  - 206 6 VDC
  - 212 12 VDC
  - 224 24 VDC
  - 223 230 VAC
  - SAE J558
  - 506 6 VDC
  - 512 12 VDC
  - 524 24 VDC
  - Twin Lead
  - 706 6 VDC
  - 712 12 VDC
  - 724 24 VDC

- **Maximum Leakage (drops/min. at 5000 psi)**
  - with 150 SUS oil = 10

- **Diameter Effective Orifice (inches)**
  - 0.045

- **Operating Voltage Tolerance**
  - ± 20%

- **Power Watts**
  - 12

- **Typical response Time (ms)**
  - 30

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Pilot Control Valves

HYDRAULICALLY OPERATED, 2-POSITION 2-WAY, SPOOL DIRECTIONAL VALVE - PILOT CAPACITY

Pressure vs. Flow

- Maximum operating pressure = 5000 psi
- Maximum leakage at 150 SUS = 10 drops/min. at 5000 psi
- Minimum pilot pressure to operate = 200 psi
- All ports will accept 5000 psi including the pilot control port.
- The preferred flow path through the valve is port 2 to port 1.
- The main stage valve should first be installed to the correct torque value followed by the T-8A pilot control section into the main stage valve to its required torque value.

OPTION ORDERING INFORMATION  Model Codes printed in Red are Preferred Versions and most readily available

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**Pilot Control Valves**

**AIR-OPERATED, 2-POSITION 2-WAY, SPOOL DIRECTIONAL VALVE - PILOT CAPACITY**

Maximum operating pressure = 5000 psi

Maximum leakage at 150 SUS = 10 drops/min. at 5000 psi

Maximum pilot pressure = 70 psi

Minimum pilot pressure to operate = 20 psi + port 1 pressure/100 psi

All ports will accept 5000 psi with the exception of the pilot port which accepts 500 psi maximum.

The preferred flow path through the valve is port 2 to port 1.

The main stage valve should first be installed to the correct torque value followed by the T-8A pilot control section into the main stage valve to its required torque value.

**OPTION ORDERING INFORMATION** Model Codes printed in Red are Preferred Versions and most readily available

<table>
<thead>
<tr>
<th>Nominal Capacity</th>
<th>Pilot Port</th>
<th>Spool Configuration</th>
<th>Seal</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 GPM</td>
<td>E SAE-4</td>
<td>H Normally Open</td>
<td>N Buna-N</td>
</tr>
<tr>
<td></td>
<td>F 1/8-27 NPTF</td>
<td>C Normally Closed</td>
<td>V Viton</td>
</tr>
<tr>
<td></td>
<td>P 1/8-28 BSPP</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**Pilot Control Valves**

**MANUALLY OPERATED, 2-POSITION 2-WAY, SPOOL DIRECTIONAL VALVE - PILOT CAPACITY**

- Maximum operating pressure = 5000 psi
- Maximum leakage at 150 SUS = 10 drops/min. at 5000 psi
- The preferred flow path through the valve is port 2 to port 1.
- The main stage valve should first be installed to the correct torque value followed by the T-8A pilot control section into the main stage valve to its required torque value.

**OPTION ORDERING INFORMATION**  
Model Codes printed in Red are Preferred Versions and most readily available

**Performance Curves**

- Maximum operating pressure = 5000 psi
- Maximum leakage at 150 SUS = 10 drops/min. at 5000 psi
- The preferred flow path through the valve is port 2 to port 1.
- The main stage valve should first be installed to the correct torque value followed by the T-8A pilot control section into the main stage valve to its required torque value.

**Cartridge Dimensions**

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Typical Cartridge Model Code</th>
<th>Cavity</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>Installation Torque lb. ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>.25 GPM</td>
<td>DAAM - TCN</td>
<td>T-8A</td>
<td>75</td>
<td>1 1/8”</td>
<td>2.90</td>
<td>1.90</td>
<td>25/30</td>
</tr>
</tbody>
</table>

**Note:** Designed for 10,000 cycles of operation maximum under normal conditions.

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Pilot Control Valves

2-POSITION, 3-WAY SPOOL DIRECTIONAL VALVE – PILOT CAPACITY

Maximum operating pressure = 5000 psi
Maximum leakage at 150 SUS = 10 drops/min. at 5000 psi
Switching frequency = 15000 cycles/hour
Proper installation of solenoid valves requires an extra deep socket to clear the solenoid tube. Sockets are available from Snap On tools (P/N SIML280) or Sun Hydraulics (P/N 998-100-006). See www.sunhydraulics.com for details.

Performance Curves

- Maximum operating pressure = 5000 psi
- Maximum leakage at 150 SUS = 10 drops/min. at 5000 psi
- Switching frequency = 15000 cycles/hour
- Proper installation of solenoid valves requires an extra deep socket to clear the solenoid tube. Sockets are available from Snap On tools (P/N SIML280) or Sun Hydraulics (P/N 998-100-006). See www.sunhydraulics.com for details.

OPTION ORDERING INFORMATION

Model Codes printed in red are Preferred Versions and most readily available

Nominal Capacity
A 25 GPM

Control
M Manual
C Concealed

Spool Configuration
H Normally Open
C Normally Open

Version
A Standard
C Canadian Standards Certified 3500 psi max.

Seal
N Buna-N
V Viton

Coil Configuration*
ISO/DIN
206 6 VDC
212 12 VDC
224 24 VDC
211 115 VAC
223 230 VAC

SAE J858
506 6 VDC
512 12 VDC
524 24 VDC

Twin Lead
706 6 VDC
712 12 VDC
724 24 VDC

* See page 167 for complete technical information on our full line of products.
Pilot Control Valves

HYDRAULICALLY OPERATED, 2-POSITION 3-WAY, SPOOL DIRECTIONAL VALVE - PILOT CAPACITY

Performance Curves

Maximum operating pressure = 5000 psi
Maximum leakage at 150 SUS = 10 drops/min. at 5000 psi
Minimum pilot pressure to operate = 200 psi
All ports will accept 5000 psi including the pilot control port.

OPTION ORDERING INFORMATION  Model Codes printed in Red are Preferred Versions and most readily available

<table>
<thead>
<tr>
<th>Nominal Capacity</th>
<th>Pilot Port</th>
<th>Spool Configuration</th>
<th>Seal</th>
</tr>
</thead>
<tbody>
<tr>
<td>.25 GPM A</td>
<td>1/8-27 NPTF</td>
<td>Normally Open 1-3</td>
<td>N Buna-N</td>
</tr>
<tr>
<td>B</td>
<td>SAE-4</td>
<td>Ports 1 to 2</td>
<td>V Viton</td>
</tr>
<tr>
<td>D</td>
<td>1/8-28 BSPP</td>
<td>Normally Open Ports 1 to 3</td>
<td></td>
</tr>
</tbody>
</table>

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Pilot Control Valves

AIR-OPERATED, 2-POSITION 3-WAY, SPOOL DIRECTIONAL VALVE - PILOT CAPACITY

Performance Curves

- Maximum operating pressure = 5000 psi
- Maximum leakage at 150 SUS = 10 drops/min. at 5000 psi.
- Maximum pilot pressure = 70 psi
- Minimum pilot pressure to operate = 20 psi + port 1 pressure/100 psi
- All ports will accept 5000 psi with the exception of the pilot port which accepts 500 psi maximum.

OPTION ORDERING INFORMATION

Model Codes printed in Red are Preferred Versions and most readily available

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Pilot Control Valves

MANUALLY OPERATED, 2-POSITION 3-WAY, SPOOL DIRECTIONAL VALVE - PILOT CAPACITY

Performance Curves

- Maximum operating pressure = 5000 psi
- Maximum leakage at 150 SUS = 10 drops/min. at 5000 psi
- All ports will accept 5000 psi.

OPTION ORDERING INFORMATION  Model Codes printed in Red are Preferred Versions and most readily available

<table>
<thead>
<tr>
<th>Nominal Capacity</th>
<th>Pilot Port</th>
<th>Spool Configuration</th>
<th>Seal</th>
</tr>
</thead>
<tbody>
<tr>
<td>.25 GPM</td>
<td>D</td>
<td>Dual (Twist/Lock)</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>L</td>
<td>Lock (Detent)</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td>T</td>
<td>Twist (Momentary)</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: Designed for 10,000 cycles of operation maximum under normal conditions.

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Pilot Control Valves

DIRECT ACTING, ADJUSTABLE PILOT RELIEF

Performance Curves

- Maximum operating pressure = 5000 psi
- Maximum leakage = 5 drops/min. at reseat (reseat = 85% of cracking pressure).
- Ports 1 and 2 may be pressured to 5000 psi.
- Back pressure at port 2 (outlet) is directly additive to the pressure setting at port 1 (inlet).
- The main stage valve should first be installed to the correct torque value followed by the T-8A pilot control section into the main stage valve to its required torque value.

OPTION ORDERING INFORMATION
Model Codes printed in red are Preferred Versions and most readily available

<table>
<thead>
<tr>
<th>Nominal Capacity</th>
<th>Control**</th>
<th>Adjustment Range</th>
<th>Seal</th>
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</thead>
<tbody>
<tr>
<td>A 2.5 GPM</td>
<td>L Standard Screw</td>
<td>A 25 - 3000 psi</td>
<td>N Buna-N</td>
</tr>
<tr>
<td></td>
<td>C Concealed</td>
<td>B 25 - 1500 psi</td>
<td>V Viton</td>
</tr>
<tr>
<td></td>
<td>K Handknob</td>
<td>C 25 - 6000 psi</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>D 25 - 800 psi</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>E 25 - 400 psi</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>W 25 - 4500 psi</td>
<td></td>
</tr>
</tbody>
</table>

Adjustment Range Options:
A, B, C, and W are standard set at 1000 psi.
D Option is standard set at 400 psi.
E Option is standard set at 200 psi.
Customer may specify pressure setting.

** See page 162 for information on Control Options

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**Pilot Control Valves**

**AIR-CONTROLLED, DIRECTING ACTING PILOT RELIEF**

![Diagram of Pilot Control Valve](image)

- **Maximum operating pressure = 5000 psi**
- **Maximum leakage = 5 drops/min. at 5000 psi**
- **Maximum pilot pressure = 150 psi**
- **Ports 1 and 2 may be pressured to 5000 psi.**
- **Back pressure at port 2 has no effect on the valve setting.**
- **The main stage valve should first be installed to the correct torque value followed by the T-8A pilot control section into the main stage valve to its required torque value.**

**OPTION ORDERING INFORMATION**

Model Codes printed in Red are Preferred Versions and most readily available

<table>
<thead>
<tr>
<th>Nominal Capacity</th>
<th>Port</th>
<th>Air Pilot Ratio</th>
<th>Seal</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5 GPM</td>
<td>1/8-27 NPTF Pilot Port</td>
<td>W 50:1</td>
<td>N Buna-N</td>
</tr>
<tr>
<td></td>
<td>SAE-4 Pilot Port</td>
<td>Y 75:1</td>
<td>V Viton</td>
</tr>
<tr>
<td></td>
<td>1/8-28 BSPP Port</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Pilot Control Valves

FULLY ADJUSTABLE NEEDLE VALVE - PILOT CAPACITY

- Maximum operating pressure = 5000 psi
- Maximum leakage at shutoff = less than 5 drops/min. at 5000 psi
- Effective orifice size = .035 in.
- Number of counterclockwise turns fully closed to fully open = 3
- Ports 1 and 2 may be pressured to 5000 psi.

OPTION ORDERING INFORMATION Model Codes printed in Red are Preferred Versions and most readily available

<table>
<thead>
<tr>
<th>Model Code</th>
<th>Control</th>
<th>Maximum Orifice</th>
<th>Seal</th>
</tr>
</thead>
<tbody>
<tr>
<td>NFAB-KXN</td>
<td>K Handknob</td>
<td>X .035 in.</td>
<td>N Buna-N</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>V Viton</td>
</tr>
</tbody>
</table>
Pilot Control Valves

ELECTRO-PROPORTIONAL PILOT RELIEF

Performance Curves

- Maximum operating pressure = 5000 psi
- Maximum leakage = 1.5 in³/min at reseat
- Back pressure on the tank port (port 2) is directly additive at a 1:1 ratio to valve setting
- Reseat exceeds 85% of cracking pressure.
- Hysteresis with dither <4%
- Hysteresis with DC input <8%
- Linearity with dither <2%
- For optimum performance, an amplifier with current sensing and adjustable dither should be used. Dither should be adjustable between 100 - 250 Hz.

OPTION ORDERING INFORMATION

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<tr>
<th>Nominal Capacity</th>
<th>Control</th>
<th>Adjustment Range</th>
<th>Seal</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 25 GPM</td>
<td>M Manual Override (Standard)</td>
<td>A 300 - 3000 psi</td>
<td>N Buna-N</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B 150 - 1500 psi</td>
<td>V Viton</td>
</tr>
<tr>
<td></td>
<td></td>
<td>W 500 - 5000 psi</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: Coil must be ordered separately. Use 12V DC or 24V DC (Series 770-***) coils only. See page 167.

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