PVQ Series Piston Pumps
### PVQ - Variable Displacement Piston Pump

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<thead>
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<th>Model Series</th>
<th>SE</th>
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<tr>
<td>13</td>
<td>Variable Volume Quiet Series</td>
<td>4</td>
<td>R - Right hand, standard</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>10</td>
</tr>
</tbody>
</table>

#### 1 Model Series
- **PVQ** - Inline Piston Pump
- Variable Volume Quiet Series

#### 2 Displacement
- **10** – 10.5 cc/rev (0.64 cir)
- 210 bar (3000 psi)
- **13** – 13.8 cc/rev (0.84 cir)
- 140 bar (2000 psi)
- **20** – 20 cc/rev (1.28 cir)
- 210 bar (3000 psi)
- **32** – 32 cc/rev (2.01 cir)
- 140 bar (2000 psi)

#### 3 Mounting Flange
- **A2** – Flange SAE “A”
- **B2** – SAE “B” 2-bolt

#### 4 Rotation
- Viewed from shaft end
- **R** – Right hand, standard
- **L** – Left hand, optional

#### 5 Ports, Type and Location
- **SE** – SAE O-ring rear port
- **SS** – SAE O-ring side port

#### 6 Shaft, Inputs
- **1** – Straight keyed SAE “A” modified (.75” dia. X 1.75” long)
- **3** – Splined SAE “A” modified (9T 16/32 DP major dia. Fit)

#### 7 Seals
- **S** – Buna N, standard
- **F** – Fluorocarbon, optional

#### 8 Pump Design Series
- **20**

#### 9 Control Type
- **C-11** – Pressure Compensator
- **CM-11** – Low Pressure Compensator
- **C** **V** **B-12** – Load Sensing with bleed down orifice
- **C** **V** **P-12** – Load sensing without bleed orifice
- **CG-20** – pressure compensator modified for hydraulic remote control

#### 10 Control Option
- **Blank** – Without adjustable Max. displacement stop (standard)
- **D** – Max. adjustable displacement stop (optional)

*All manufactures names and part numbers are used for reference only.*
Performance Curves
PVQ10

Oil type: SAE 10W
Oil temperature: 49°C (120°F)
Inlet: 0.2 bar (5 in. Hg)

Note: To obtain full flow operation of pump, pressure compensator setting must be 14 bar (200 psi) above desired operating pressure. Full flow curves were obtained with compensator settings 14 bar (200 psi) above 210 bar (3000 psi) max. rated pressure.
Performance Curves

PVQ13

Oil type: SAE 10W
Oil temperature: 49°C (120°F)
Inlet: 0.2 bar (5 in. Hg)

Note: To obtain full flow operation of pump, pressure compensator setting must be 14 bar (200 psi) above desired operating pressure. Full flow curves were obtained with compensator settings 14 bar (200 psi) above 210 bar (3000 psi) max. rated pressure.
Installation Dimensions

PVQ10 and PVQ13 with Rear Ports

Millimeters (inches)

Compensator position for R.H. rotation models

Case drain connection .562-18 UN-2B straight thd. for .375 O.D. tubing

Compensator position for L.H. rotation models

Model number shown here

Direction of rotation shown here

Compensator adjustment screw 0.94 hex

Outlet connection for R.H. rotation models 1/16-12 UN-2B straight thd. (0.75 O.D. tubing)

Outlet connection for L.H. rotation models 1/16-12 UN-2B straight thd. (0.75 O.D. tubing)

Alternate case drain connection

Outlet connection 1.3125-12 UN-2B straight thd. (1.00 O.D. tubing) for R.H. rotation models

Outlet connection 1.3125-12 UN-2B straight thd. (1.00 O.D. tubing) for L.H. rotation models

PVQ10 and PVQ13 with Side Ports
Controls
Electric Dual Range Pressure Compensator Control

Adjustment
1. With the directional valve de-energized, loosen locknut “5” and turn the adjusting screw “4” to the desired first stage pressure setting, then tighten locknut “5.”
2. With solenoid de-energized, turn adjusting spool “1” counterclockwise (CCW) until nut “3” is bottomed in adjusting screw slot. (Second stage setting is now equal to first stage pressure setting.) Turn adjusting spool clockwise (CW) to desired second stage pressure requirements. One complete turn of adjusting spool equals approximately 41 bar (600 psi). Energize solenoid and check pressure setting. De-energize solenoid and re-adjust if necessary. Secure this setting by tightening locknut “2.”

Solenoid Data
(110V AC 50 Hz and 115/120V AC 60 Hz)

<table>
<thead>
<tr>
<th>Solenoid current</th>
<th>Inrush amps (R.M.S.)</th>
<th>Holding amps</th>
</tr>
</thead>
<tbody>
<tr>
<td>115/120V AC 60 Hz -</td>
<td>2.0</td>
<td>.54</td>
</tr>
<tr>
<td>110V AC 50 Hz</td>
<td></td>
<td>.64*</td>
</tr>
</tbody>
</table>

*Maximum peak inrush amps approximately 1.4 x R.M.S. value shown.
Refer to catalog GB-C-2015B for additional solenoid valve data.
**Controls**

**Electric Dual Range Pressure Compensator with Maximum Displacement Stop**

**Maximum Flow Adjustment**

With the system pressure below both compensator settings, loosen maximum stop adjusting screw locknut and adjust screw to desired flow position (turning screw clockwise decreases flow and turning screw counterclockwise increases flow). To lock screw in position tighten locknut. To assist initial priming, adjust control setting to at least 40% of maximum flow position.

**Compensator Control**

1. With the directional valve de-energized, loosen locknut “5” and turn the adjusting screw “4” to the desired first stage pressure setting, then tighten locknut “5”.

2. With directional valve de-energized, turn adjusting spool “1” counterclockwise until nut “3” is bottomed in adjusting screw slot. (Second stage setting is now equal to first stage pressure setting.) Turn adjusting spool clockwise to desired second stage pressure requirements. One complete turn of adjusting spool equals approximately 41 bar (600 psi). Energize solenoid and check pressure setting. De-energize solenoid and re-adjust if necessary. Secure this setting by tightening locknut “2”.

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[Diagram of the compensator control system with specific dimensions and labels for each component, including a section on electrical conduit connections and position markings for R.H. models.]
Performance Curves

PVQ20

Oil type: SAE 10W
Oil temperature: 49°C (120°F)
Inlet: 0.2 bar (5 in. Hg)

Note: To obtain full flow operation of pump, pressure compensator setting must be 14 bar (200 psi) above desired operating pressure. Full flow curves were obtained with compensator settings 14 bar (200 psi) above 210 bar (3000 psi) max. rated pressure.
Performance Curves
PVQ32

Oil type: SAE 10W
Oil temperature: 49°C (120°F)
Inlet: 0.2 bar (5 in. Hg)

Note: To obtain full flow operation of pump, pressure compensator setting must be 14 bar (200 psi) above desired operating pressure. Full flow curves were obtained with compensator settings 14 bar (200 psi) above 140 bar (2000 psi) max. rated pressure.
Installation Dimensions

Rear Ports, “C” and “CM” Controls, No. 1 Shaft

Caution – while pump is operating do not back compensator adjustment screw out beyond dimension shown.
Installation Dimensions

Side Ports

No. 3 Shaft

“N” Shaft with “MB” Flange

(Flange and shaft end ISO 3019/21000A2HW-E25N)
**Controls**

Electric Dual
Range Pressure Compensator
with Maximum Displacement Stop

**Maximum Flow Adjustment**

With the system pressure below both compensator settings, loosen maximum stop adjusting screw locknut and adjust screw to desired flow position (turning screw clockwise decreases flow and turning screw counterclockwise increases flow). To lock screw in position, tighten locknut. To assist initial priming, adjust control setting to at least 40% of maximum flow position.

**Compensator Control**

1. With the directional valve de-energized, loosen locknut “5” and turn the adjusting screw “4” to the desired first stage pressure setting, then tighten locknut “5.”

2. With directional valve de-energized, turn adjusting spool “1” counterclockwise until nut “3” is bottomed in adjusting screw slot. (Second stage setting is now equal to first stage pressure setting.) Turn adjusting spool clockwise to desired second stage pressure requirements. One complete turn of adjusting spool equals approximately 41 bar (600 psi). Energize solenoid and check pressure setting. De-energize solenoid and re-adjust if necessary. Secure this setting by tightening locknut “2.”
PVQ25
Performance Curves
Performance at 1800 r/min
Oil type: SAE 10W
Oil temp: 50° C (120° F)
Inlet pressure: 0 psi
Installation Drawings

PVQ25 with Pressure Compensator Control

Note: Ports are reversed for L.H. rotation

Outlet port "B" (see note) 1.0625-12 UN-2B thd. SAE O-ring boss connection .750 O.D. tubing (Shown for R.H. rotation)

Drain port "D2" .750-16 UNF-2B thd. SAE O-ring boss connection .500 O.D. tubing

Compensator position for R.H. rotation (Reverse for L.H. rotation)

Inlet port "A" (see note) 1.625-12 UN-2B thd. SAE O-ring boss connection 1.250 O.D. tubing (Shown for R.H. rotation)

Construction plugs Do not remove

Alternate drain port "D1" 750-16 UNF-2B thd. SAE O-ring connection .500 O.D. tubing

7223 NW 43rd St, DPT 2254 Choice, Miami, FL-33166
**Controls**

Electric Dual Range Pressure Compensator Control

**Adjustment**

1. With the directional valve de-energized, loosen locknut “5” and turn the adjusting screw “4” to the desired first stage pressure setting, then tighten locknut “5”.

2. With solenoid de-energized, turn adjusting spool “1” counterclockwise (CCW) until nut “3” is bottomed in adjusting screw slot. (Second stage setting is now equal to first stage pressure setting.) Turn adjusting spool clockwise (CW) to desired second stage pressure requirements. One complete turn of adjusting spool equals approximately 41 bar (600 psi). Energize solenoid and check pressure setting. De-energize solenoid and re-adjust if necessary. Secure this setting by tightening locknut “2”.

---

**Solenoid Data**

(110V AC 50 Hz and 115/120V AC 60 Hz)

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<thead>
<tr>
<th>Solenoid current (115/120V AC 60 Hz - 110V AC 50 Hz)</th>
<th>Inrush amps (R.M.S.)</th>
<th>Holding amps</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.0</td>
<td>54 .64*</td>
<td></td>
</tr>
</tbody>
</table>

*Maximum peak inrush amps approximately 1.4 x R.M.S. value shown. Refer to catalog GB-C-2015B for additional solenoid valve data.
Controls
Electric Dual Range Pressure Compensator with Maximum Displacement Stop

Maximum Flow Adjustment
With the system pressure below both compensator settings, loosen maximum stop adjusting screw locknut and adjust screw to desired flow position (turning screw clockwise decreases flow and turning screw counterclockwise increases flow). To lock screw in position, tighten locknut. To assist initial priming, adjust control setting to at least 40% of maximum flow position.

Compensator Control
1. With the directional valve de-energized, loosen locknut “5” and turn the adjusting screw “4” to the desired first stage pressure setting, then tighten locknut “5.”
2. With directional valve de-energized, turn adjusting spool “1” counterclockwise until nut “3” is bottomed in adjusting screw slot. (Second stage setting is now equal to first stage pressure setting.) Turn adjusting spool clockwise to desired second stage pressure requirements. One complete turn of adjusting spool equals approximately 41 bar (600 psi). Energize solenoid and check pressure setting. De-energize solenoid and readjust if necessary. Secure this setting by tightening locknut “2.”
Performance Curves
PVQ40

Oil type: SAE 10W
Oil temperature: 82°C (180°F)
Inlet: 0 psi

Note: To obtain full flow operation of pump, pressure compensator setting must be 14 bar (200 psi) above desired operating pressure. Full flow curves were obtained with compensator settings 14 bar (200 psi) above 210 bar (3000 psi) max. rated pressure.
Model Series
PVQ45

Oil type: SAE 10W
Oil temperature: 82°C (180°F)
Inlet: 0 psi

Note: To obtain full flow operation of pump, pressure compensator setting must be 14 bar (200 psi) above desired operating pressure. Full flow curves were obtained with compensator settings 14 bar (200 psi) above 186 bar (2700 psi) max. rated pressure.
Controls
Side Port Controls, No. 2 Mounting and Input Shaft

Millimeters (inches)

Drain port 'D1'. 875-14 UNF-2B thd. SAE O-ring boss connection .625 O.D. tubing

Outlet port 'B' see note. 1.3125-12 UN-2B thd. SAE O-ring boss connection 1.000 O.D. tubing. Shown for R.H. rotation.

Construction plug. Do not remove.

Inlet port 'A' see note. 1.875-12 UN-2B thd. SAE O-ring boss connection 1.500 O.D. tubing. Shown for R.H. rotation

Note: Ports are reversed for L.H. rotation

Caution – While pump is operating do not back compensator adjustment screw out beyond dimension shown. Plug shown for industrial models.

Compensator position for R.H. rotation

Compensator position for L.H. rotation

Alternate drain port 'D2'. 875-14 UNF-2B thd. SAE O-ring boss connection .625 O.D. tubing

Date of assembly stamped on flange

7223 NW 43rd St, DPT 2254 Choice, Miami, FL-33166
Controls
Electric Dual Range Pressure Compensator with Maximum Displacement Stop

See preceding page and following page for adjustment procedures.

Solenoid Data
(110V AC 50 Hz and 115/120V AC 60 Hz)

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*Maximum peak inrush amps approximately 1.4 x R.M.S. value shown.

Refer to catalog GB-C-2015B for additional solenoid valve data.

**Note:** Any sliding spool valve, if held shifted under pressure for long periods of time, may stick and not spring return due to fluid residue formation and, therefore, should be cycled periodically to prevent this from happening.

1. Adjusting spool — sets second stage pressure
2. Locknut — 17.3 (0.68) across flats
3. Locknut — must be contained within slot of adjusting screw as shown
4. Adjusting screw 25.4 (1.00) across flats — sets first stage pressure
5. Locknut — 31.7 (1.25) across flats
**Controls**

**Electric Dual Range Pressure Compensator Control**

**Adjustment**
1. With the directional valve de-energized, loosen locknut “5” and turn the adjusting screw “4” to the desired first stage pressure setting, then tighten locknut “5”.
2. With solenoid de-energized, turn adjusting spool “1” counterclockwise (CCW) until nut “3” is bottomed in adjusting screw slot. (Second stage setting is now equal to first stage pressure setting.) Turn adjusting spool clockwise (CW) to desired second stage pressure requirements. One complete turn of adjusting spool equals approximately 41 bar (600 psi). Energize solenoid and check pressure setting. De-energize solenoid and re-adjust if necessary. Secure this setting by tightening locknut “2”.

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*M*aximum peak inrush amps approximately 1.4 x R.M.S. value shown. Refer to catalog GB-C-2015B for additional solenoid valve data.

*Note:* Any sliding spool valve, if held shifted under pressure for long periods of time, may stick and not spring return due to fluid residue formation and, therefore, should be cycled periodically to prevent this from happening.
Thru-drives
PVQ40 and PVQ45 SAE “A”
Thru-drives  
PVQ40 and  
PVQ45 SAE “B”  

Note: Couplings for "B26" are step type for 13 and 15 tooth as shown.

<table>
<thead>
<tr>
<th>Thru-drive Shaft</th>
<th>Spline Data</th>
<th>Max. Torque (Nm in. lb.)</th>
<th>Dimension A (mm in.)</th>
<th>Coupling Type</th>
<th>Thru-drive Coupling</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA</td>
<td>ASA B5.15-1960 9 teeth 16/32 DP Flat root side fit</td>
<td>58 (517)</td>
<td>10.92 (0.43)</td>
<td>9T/9T</td>
<td>864224</td>
</tr>
<tr>
<td>AB</td>
<td>ANSI B92.1-1970 11 teeth 16/32 DP Flat root side fit</td>
<td>118 (1050)</td>
<td>12.57 (0.495)</td>
<td>11T/11T</td>
<td>864325</td>
</tr>
<tr>
<td>AE</td>
<td>Special Eaton 26 teeth 32/64 DP Flat root side fit</td>
<td>179 (1587)</td>
<td>24.89 (0.98)</td>
<td>26T/26T</td>
<td>627168</td>
</tr>
</tbody>
</table>

Note: Coupling, screws, and washers must be ordered separately to mount rear pump. “A” O-ring (AS568-042) and “B” O-ring (AS568-155) are included with each thru-drive pump.