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• Axial piston pumps with swash plate design for reliable operation and long life.
• Pressure up to 420 bar. Rated speed up to 1800 min⁻¹. Higher speeds possible.
• Oversize shafts and bearings.

• Rotating and pressure loaded parts are pressure balanced.
• Through drive enable multiple pump installations from a single shaft. Multiple pump combinations are also available.
• Integrated pilot pump, filter and pressure relief valves available.
• “Building block” design gives these pumps a wide range of application.
• Fast response times.

Displacement Controls:
ES - Electric motor displacement control
DF - Pressure compensator controlled
LR - Power control with pressure limiter
SP, SM - Displacement proportional to electric signal
DP - Displacement proportional to pressure signal

Extra functions available for SP, SM & DP:
Pressure Limitation and/or power control overriding function.

Available Displacement Sizes:

<table>
<thead>
<tr>
<th>Size (ccm)</th>
<th>250 ccm</th>
<th>360 ccm</th>
<th>500 ccm</th>
<th>750 ccm</th>
</tr>
</thead>
</table>

Dimensional information listed in this catalog is subject to change without notice.
Form Page
The following 48-digit coding system has been developed to identify all of the configuration options for the "W" series (Open Loop) fixed and variable displacement pumps. Use this model code to specify a unit with the desired features. All 48-digits must be present when ordering. You may want to photocopy the matrix below to ensure that each number is entered in the correct box. If adjustments other than the standard setting (character 40 ... 43) or special features (character 44 ... 46) are needed, please provide the information when ordering.
At the end of this section you may need to provide an additional model code if a combination unit is needed. In case of a combination unit, each single pump section must be specified separately using this or other Eaton catalog information.

Some characters are already filled out and shown on the following pages. For such characters, there is no option available.
Explanation for each character is as follows:

<table>
<thead>
<tr>
<th>CHARACTER</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Pump Model Code</td>
<td>1...23</td>
</tr>
<tr>
<td>Control Options</td>
<td>24...39</td>
</tr>
<tr>
<td>Customer Adjustment Specification</td>
<td>40...43</td>
</tr>
<tr>
<td>Special Features</td>
<td>44...46</td>
</tr>
<tr>
<td>Design Number</td>
<td>47, 48</td>
</tr>
<tr>
<td>Combination Model Code</td>
<td>1...39</td>
</tr>
</tbody>
</table>

SPECIFY NON STANDARD ADJUSTMENT BELOW

SPECIFY SPECIAL FEATURE BELOW
Model Code
Open Loop Pumps

“W” Series - Basic Pumps

<table>
<thead>
<tr>
<th>P * W * — * * * M * * * * * * 1 R * * S V * A #</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24</td>
</tr>
</tbody>
</table>

**Pump**
P - Open Loop Pump

**Displacement**
F - Fixed
V - Variable

**Pump Series**
W - "W" Series (was 30 design)

**Configuration**
S - Single Unit
F - Front Unit
M - Middle Unit
R - Rear Unit

**Separator**

<table>
<thead>
<tr>
<th>1 2 3 4 5 6 7 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>250 - 250 cm³/r [15.3 in³/rev]</td>
</tr>
<tr>
<td>360 - 360 cm³/r [22.0 in³/rev]</td>
</tr>
<tr>
<td>500 - 500 cm³/r [30.5 in³/rev]</td>
</tr>
<tr>
<td>750 - 750 cm³/r [45.8 in³/rev]</td>
</tr>
<tr>
<td>?? - Non-Standard Displacement (PFW Only)</td>
</tr>
</tbody>
</table>

**Basic Standard**
M - Metric

**Mounting Flange**
07 - ISO 3019/2-200B4HW
08 - ISO 3019/2-250B4HW
* See Chart Below

**Rotation Direction**
R - Right Hand [CW]
L - Left Hand [CCW]

**Adjustment Stops**
0 - No Stop
4 - Mechanical Adjustment Stop Side A (PFW only)
5 - Mechanical Adjustment Stop Side B (PFW only)
6 - Mechanical Adjustment Stops Side A and B (PFW only)

NOTE:
4 is used as max. Adjustment on Side A.
5 is used as min. Adjustment side A.

**Thru-Drive Options**
00 - None
0A - SAE A
0B - SAE B
0C - SAE C
0D - ISO125A2HW
0E - ISO160A2HW
0F - ISO125B4HW
0G - ISO160B4HW
0H - ISO200B4HW
0J - ISO250B4HW
0P - Pilot Pump (8cm³/r.) (PFW only)
0R - Double Pilot Pump (8 + 8 cm³/r.) (PFW only)

**Drive Shaft Seal**
S - Single Shaft Seal

**Seal Material**
V - Viton*
*Viton is a trademark of E.I. Dupont (other materials available, contact your Eaton representative.)

**Yoke Position Indicator**
0 - No Position Indicator
V - Visual Position Indicator
P - Position Sensor
M - Sensor with Visual Indicator

**Surface Finish**
A - Blue Painted
*Other options on special request available. Contact Eaton Sales.

**Main Ports**
1 - SAE Ports - Metric Bolts

**Main Port Orientation**
R - Radial (Side Ports)

**Main Drive Shaft End**
01 - ISO Straight Key
02 - ISO Spline

**Mounting Flange Options Available**
<table>
<thead>
<tr>
<th>ISO 3019/2-200B4HW</th>
<th>ISO 3019/2-250B4HW</th>
</tr>
</thead>
<tbody>
<tr>
<td>250</td>
<td>360</td>
</tr>
</tbody>
</table>

**Thru-Drive Options Available**
<table>
<thead>
<tr>
<th>00</th>
<th>0A</th>
<th>0B</th>
<th>0C</th>
<th>0D</th>
<th>0E</th>
<th>0F</th>
<th>0G</th>
<th>0H</th>
<th>0J</th>
</tr>
</thead>
<tbody>
<tr>
<td>250</td>
<td>360</td>
<td>500</td>
<td>750</td>
<td>250</td>
<td>360</td>
<td>500</td>
<td>750</td>
<td>250</td>
<td>360</td>
</tr>
</tbody>
</table>

---

*EATON Vickers Hydrokraft Open Loop Piston Pumps V-PUPI-TM003-E March 2003*
Model Code
Open Loop Pumps

"W" Series - No Control

Control Type
00 - No Control
(for PFW only)

Displacement Adjustment Options
0 - Not Applicable

Electronic Controls
00 - Not Required

Yoke Displacement Zone
A - Single Side of Center “A”

Extra Functions
0 - Not Required

Pressure Control Options
0 - Not Applicable

Power Control
000 - Not Applicable

Pilot Oil Filter
0 - Not Applicable

Bypass/Venting Valve
0 - Not Applicable

Position Monitoring
0 - No Position Monitoring

Electric Motor Type
0 - No Electric Motor

Control Voltage
0 - Not Applicable

Customer Adjustment Specification
0000 - None

Special Features
Add special feature description (characters 44...46) on page 14 if required.
Control Type  
DF – Pressure Compensator

Displacement Adjustment Options  
0 – Not Applicable

Electronic Controls  
00 – Not Required

Yoke Displacement Zone  
A – Single Side of Center “A”

Extra Functions  
0 – Not Required  
1 – Load Sensing

Extra Function

Pressure Control Options  
0 – Not Applicable  
F – Remote Port Only  
K – Electro Proportional Relief Valve  
- Incl. Electronic Card

Power Control  
000 – Not Applicable

Pilot Oil Filter  
0 – Not Applicable

Venting Valve  
0 – Not Applicable  
1 – With Solenoid Valve

Position Monitoring  
0 – No Position Monitoring

Electric Motor Type  
0 – No Electric Motor

Control Voltage  
B – 110 AC 50 HZ/120 AC 60 HZ  
D – 220 AC 50 HZ/240 AC 60 HZ  
G – 12 VDC  
H – 24 VDC

CUSTOMER ADJUSTMENT SPECIFICATIONS

<table>
<thead>
<tr>
<th></th>
<th>Unit</th>
<th>Standard Adjustment</th>
<th>Customer Specified Adjustment</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Revolution Adjustments below set at ..</td>
<td>rpm</td>
<td>1500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mech. Stop Side A</td>
<td>L/min</td>
<td>Q&lt;sub&gt;max&lt;/sub&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(used as max Adjustment Stop Side A)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mech. Stop Side B</td>
<td>L/min</td>
<td>Q&lt;sub&gt;min&lt;/sub&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(used as min Adjustment Stop Side B)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure Control Main Stage</td>
<td>bar</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure Control Pilot Valve</td>
<td>bar</td>
<td>90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load Sense p</td>
<td>bar</td>
<td>15</td>
<td></td>
<td>&lt;15% bar not possible</td>
</tr>
</tbody>
</table>
Model Code
Open Loop Pumps

“W” Series - LR Control

Control Type
LR – Power Control

Displacement Adjustment Options
0 – Not Applicable

Electronic Controls
00 – Not Required

Yoke Displacement Zone
A – Single Side of Center “A”

Extra Functions
1 – Load Sensing & Pressure Limiter Extra Function
2 – Pressure Limiter Extra Function

Pressure Control Options
0 – Not Applicable
F – Remote Port Only
K – Electro Proportional Relief Valve
- Incl. Electronic Card

Pilot Oil Filter
0 – Not Applicable

Venting Valve
0 – Not Applicable
1 – With Solenoid Valve

Position Monitoring
0 – No Position Monitoring

Electric Motor Type
0 – No Electric Motor

Control Voltage
0 – Not Applicable
B – 110 AC 50 HZ/120 AC 60 HZ
D – 220 AC 50 HZ/240 AC 60 HZ
G – 12 VDC
H – 24 VDC

Customer Adjustment Specification
0000 – None
???? – Yes (final number will be assigned by Eaton. Specify on table below)

Special Features
Add special feature description (characters 44...46) on page 14 if required.

CUSTOMER ADJUSTMENT SPECIFICATIONS

<table>
<thead>
<tr>
<th></th>
<th>Unit</th>
<th>Standard Adjustment</th>
<th>Customer Specified Adjustment</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Revolution Adjustments below set at .</td>
<td>rpm</td>
<td>1500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mech. Stop Side A</td>
<td>L/min</td>
<td>Q_{max}</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(used as max Adjustment Stop Side A)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mech. Stop Side B</td>
<td>L/min</td>
<td>Q_{min}</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(used as min Adjustment Stop Side B)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure Control Main Stage</td>
<td>bar</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure Control Pilot Valve</td>
<td>bar</td>
<td>90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load Sense p</td>
<td>bar</td>
<td>15</td>
<td>&lt;15% bar not possible</td>
<td></td>
</tr>
</tbody>
</table>
Model Code
Open Loop Pumps

"W" Series - ES Control

| E S * 0 0 A 0 0 0 0 0 0 0 0 0 * * 0 * * * * # |
| 24 | 25 | 26 | 27 | 28 |

**Control Type**
- 29 - Electric Motor - Displacement Control

**Displacement Adjustment Options**
- 20 - Electric Motor - Fast Response*
- 21 - Electric Motor - Medium Response*
- 22 - Electric Motor - Slow Response*

**Electronic Controls**
- 23 - Not Required

**Yoke Displacement Zone**
- 24 - Single Side of Center “A”

**Extra Functions**
- 30 - Not Required

**Pressure Control Options**
- 31 - Not Applicable

**Power Control**
- 32 - Not Applicable

**Pilot Oil Filter**
- 33 - Not Applicable

**Venting Valve**
- 34 - Not Applicable

**Position Monitoring**
- 35 - Limit Switches
- 36 - 4 Limit Switches
- 37 - 8 Limit Switches

**Electric Motor Type**
- 38 - Motor With Brake (IP-54)
- 39 - Motor Without Brake

**Control Voltage of Venting Valve**
- 40 - Not Applicable

**Customer Adjustment Specification**
- 41 - None
- 42 - Yes (final number will be assigned by Eaton. Specify on table below)

**Special Features**
Add special feature description (characters 44...46) on page 14 if required.

---

**CUSTOMER ADJUSTMENT SPECIFICATIONS**

<table>
<thead>
<tr>
<th>SIZE</th>
<th>Unit</th>
<th>Standard Adjustment</th>
<th>Customer Specified Adjustment</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>250</td>
<td>rpm</td>
<td>1500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>360</td>
<td>rpm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>500</td>
<td>rpm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>750</td>
<td>rpm</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**All Revolution Adjustments below set at ..**
- 50 Hz 7 9 10 8 14 12
- 60 Hz 11 9 10 8 14 12

**Mech. Stop Side A**
- 20 Hz 17 27 24 20 35 29
- 60 Hz 40 33 55 46 48 70 58

**Mech. Stop Side B**
- 20 Hz 17 27 24 20 35 29
- 60 Hz 40 33 55 46 48 70 58

**Displacement Adjusted to...**
- 50 Hz 7 9 10 8 14 12
- 60 Hz 11 9 10 8 14 12

**Position Monitoring Switch**
- 2 L/min 95% of Q<sub>max</sub> <95% not possible
- 3 L/min
- 4 L/min
- 5 L/min
- 6 L/min
- 7 L/min
- 8 L/min

---

10 EATON Vickers Hydrokraft Open Loop Piston Pumps V-PUPI-TM003-E March 2003
Model Code
Open Loop Pumps

“W” Series - DP Control

![Model Code Image]

---

### Control Type
- **DP** - Pressure Signal
- **Displacement Control**

### Displacement Adjustment Options
- **G** - Mounting Interface
- **CETOP 3 Only**
- **H** - Remote Port G 1/4
- **J** - Proportional Relief Inc. Electronics

### Electronic Controls
- **00** - Not Required

### Power Control
- **000** - Not Applicable
- **???** - KW at 1500 rpm

---

**CUSTOMER ADJUSTMENT SPECIFICATIONS**

<table>
<thead>
<tr>
<th></th>
<th>Unit</th>
<th>Standard Adjustment</th>
<th>Customer Specified Adjustment</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Revolution Adjustments below set at ..</td>
<td>rpm</td>
<td>1500</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Pilot Pressure</td>
<td>bar</td>
<td>60</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Pilot Pressure</td>
<td>bar</td>
<td>80</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Mech. Stop Side A</td>
<td>L/min</td>
<td>( Q_{max} )</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Mech. Stop Side B</td>
<td>L/min</td>
<td>( Q_{min} )</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Pressure Override Side A</td>
<td>bar</td>
<td>90</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>
Model Code
Open Loop Pumps

"W" Series - SM Control

<table>
<thead>
<tr>
<th>Control Type</th>
<th>Extra Functions</th>
<th>Pilot Oil Filter</th>
<th>Venting Valve</th>
<th>Position Monitoring</th>
<th>Electric Motor Type</th>
<th>Control Voltage of Venting Valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>SM - Servo Adjustment</td>
<td>0 - Not Required</td>
<td>0 - Not Applicable</td>
<td>0 - Not Applicable</td>
<td>0 - No Position Monitoring</td>
<td>0 - No Electric Motor</td>
<td>0 - Not Applicable</td>
</tr>
<tr>
<td>Displacement Control - Mech. Feedback</td>
<td>4 - Pressure Limiter Override Function</td>
<td>V - Filter with Visual Indicator</td>
<td>F - Remote Port Only</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 - Not Applicable</td>
<td>5 - Pressure Limiter &amp; Power Control Override Function</td>
<td>E - Filter with Electrical Indicator</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electronic Controls</td>
<td>0 - Not Required</td>
<td>00 - Not Required</td>
<td>000 - Not Applicable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>00 - Not Required</td>
<td></td>
<td></td>
<td>??? - KW at 1500 rpm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yoke Displacement Zone</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A - Single Side of Center “A”</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>000 - Not Applicable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>??? - KW at 1500 rpm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer Adjustment Specification</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0000 - None</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>??? - Yes (final number will be assigned by Eaton. Specify on table below)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Special Features</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Add special feature description (characters 44...46) on page 14 if required.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*CUSTOMER ADJUSTMENT SPECIFICATIONS*

<table>
<thead>
<tr>
<th>All Revolution Adjustments below set at ..</th>
<th>Unit</th>
<th>Standard Adjustment</th>
<th>Customer Specified Adjustment</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>rpm</td>
<td>1500</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pilot Pressure for Size 250 &amp; 360 (External)</td>
<td>bar</td>
<td>60</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Pilot Pressure for Size 500 &amp; 750 (External)</td>
<td>bar</td>
<td>80</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Mech. Stop Side A (used as max Adjustment Stop Side A)</td>
<td>L/min</td>
<td>Q_max</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mech. Stop Side B (used as min Adjustment Stop Side B)</td>
<td>L/min</td>
<td>Q_min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure Override Side A</td>
<td>bar</td>
<td>90</td>
<td>&lt;95% not possible</td>
<td></td>
</tr>
</tbody>
</table>
## Control Type
- **SP** - Proportional Valve

## Displacement Adjustment Options
- **C** – With CETOP 3 Prop Valve
- **F** – With CETOP 5 Prop Valve

## Electronic Controls
- **03** – ER 9.3 - 10 (CETOP 3)
- **04** – ER 9.4 - 10 (CETOP 5)

## Yoke Displacement Zone
- **A** – Single Side of Center “A”

## Extra Functions
- **0** – Not Required
- **4** – Pressure Limiter Overriding Function
- **5** – Pressure Limiter and Power Control Overriding Function

## Pressure Control Options
- **0** – Not Applicable
- **F** – Remote Port Only
- **K** – Electro Proportional Relief Valve - Including Electronic Card

## Power Control
- **000** – Not Applicable
- **???” – KW at 1500 rpm

### CUSTOMER ADJUSTMENT SPECIFICATIONS

<table>
<thead>
<tr>
<th>Unit</th>
<th>Standard Adjustment</th>
<th>Customer Specified Adjustment</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Revolution Adjustments below set at <em>rpm</em></td>
<td>1500</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Pilot Pressure</td>
<td>bar</td>
<td>60</td>
<td>-</td>
</tr>
<tr>
<td>Mech. Stop Side A (used as max Adjustment Stop Side A)</td>
<td>L/min Q&lt;sub&gt;max&lt;/sub&gt;</td>
<td>El Card Adjustment done by customer</td>
<td>Refer to EI card Manual</td>
</tr>
<tr>
<td>Mech. Stop Side B (used as min Adjustment Stop Side B)</td>
<td>L/min Q&lt;sub&gt;min&lt;/sub&gt;</td>
<td>El Card Adjustment done by customer</td>
<td>Refer to EI card Manual</td>
</tr>
<tr>
<td>M. Max. Stop by Control Side A</td>
<td>L/min 95% Q&lt;sub&gt;max&lt;/sub&gt;</td>
<td>El Card Adjustment done by customer</td>
<td>Refer to EI card Manual</td>
</tr>
<tr>
<td>M. Min. Stop by Control Side A</td>
<td>L/min 0+/-2.5%</td>
<td>El Card Adjustment done by customer</td>
<td>Refer to EI card Manual</td>
</tr>
<tr>
<td>Ramp Time 0 ➔ A For 100% Stroke</td>
<td>sec 0</td>
<td>El Card Adjustment done by customer</td>
<td>Refer to EI card Manual</td>
</tr>
<tr>
<td>Ramp Time A ➔ 0 For 100% Stroke</td>
<td>sec 0</td>
<td>El Card Adjustment done by customer</td>
<td>Refer to EI card Manual</td>
</tr>
<tr>
<td>Preset Input Signals S1...S4</td>
<td>L/min</td>
<td>-</td>
<td>El Card Adjustment done by customer</td>
</tr>
</tbody>
</table>
Model Code
Open Circuit Pumps

"W" Series -
Special Features

* * * 1 0

**44** **45** **46**
**000** – None
**000** – Defined by Eaton

**47** **48**
**10** – Design Number
Model Code
Combination Units

<table>
<thead>
<tr>
<th>* * * C — * * * * * * * * * * * * * * * * * * * * * *</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
</tbody>
</table>

**1 Combination Unit**
- P - Pump
- T - Transmission Pump
- M - Motor

**2 Displacement**
- F - Filled
- V - Variable

**3 Pump Series**
- W - “W” Series
  (was 30 design)
- X - “X” Series
  (was 20 design)

**4 Combination Unit**

**5 Separator**

**6/7/8 First**
Displacement cm³/r
- 066 - 66 cm³/r [4.0 in³/rev]
- 090 - 90 cm³/r [5.5 in³/rev]
- 130 - 130 cm³/r [79 in³/rev]
- 180 - 180 cm³/r [110 in³/rev]
- 250 - 250 cm³/r [15.3 in³/rev]
- 360 - 360 cm³/r [22.0 in³/rev]
- 500 - 500 cm³/r [30.5 in³/rev]
- 750 - 750 cm³/r [45.8 in³/rev]

**9/10 Second**
Displacement cm³/r
- 066 - 66 cm³/r [4.0 in³/rev]
- 090 - 90 cm³/r [5.5 in³/rev]
- 130 - 130 cm³/r [79 in³/rev]
- 180 - 180 cm³/r [110 in³/rev]
- 250 - 250 cm³/r [15.3 in³/rev]
- 360 - 360 cm³/r [22.0 in³/rev]
- 500 - 500 cm³/r [30.5 in³/rev]
- 750 - 750 cm³/r [45.8 in³/rev]

**11/12 Third Control Type**
- 00 - No Control (for Fixed Displacement Only)
- DF - Pressure Compensator
- LR - Power Control
- ES - Electric Motor Control
- HG - Handwheel
- FE - Screw Adjustment
- SM - Servo Adjustment
- DP - Pressure Signal
- SP - Proportional Valve

**13/14 Fourth**
Displacement cm³/r
- 000 - Not Required
- 066 - 66 cm³/r [4.0 in³/rev]
- 090 - 90 cm³/r [5.5 in³/rev]
- 130 - 130 cm³/r [79 in³/rev]
- 180 - 180 cm³/r [110 in³/rev]
- 250 - 250 cm³/r [15.3 in³/rev]
- 360 - 360 cm³/r [22.0 in³/rev]
- 500 - 500 cm³/r [30.5 in³/rev]
- 750 - 750 cm³/r [45.8 in³/rev]

**15/16 Assembly Numbers**
- HCB1 - Defined By Eaton

**17/18 Assembly Numbers**
Defined By Eaton

- Charge and Pilot Pump through drive option must be specified on the rear unit of the combination (as a special feature).
- Front and middle units shall have the through drive option of the following unit in the combination.

- For a combination of two or more units fill out this Combination Model Code.
- Start with the biggest size unit for the first displacement.
- For each unit included in this combination, a separate model code must be chosen. Use the form on page 5.
- Character 26 to 39 will be P/N of the combination. This number will be defined by Eaton and provided in the order acknowledgement.
Example 1: Combination of two open loop pumps
Model Code Rear Unit
Model Code Combination Unit

Example 2: Combination of one closed loop - and two open loop pumps
(For other product model codes refer to the according catalog)
Model Code Rear Unit
Model Code Combination Unit
## Pump Specifications - US

### Design
- **Type of mounting**: Flange or foot-mounted. Combination units foot mounted only.

### Pipe connection SAE Flange
- **Pipe connection**:
  - **Flange B**: psi
  - **A**: psi
- **Pipe connection**:
  - **SAE Flange**
  - **Pipe connection**
  - **SAE Flange**

### Direction of rotation
- **Clockwise when viewing shaft end of pump**
- **Counterclockwise available on request**

### Speed range
- **Speed range**: rpm
- **nmin**
- **nmax**

### Installation position
- **Optional, see mounting information**

### Ambient temperature range
- **min**: °F
- **max**: °F

### Weight
- **Weight**: lb
- **m**: lb

### Mass of inertia
- **Mass of inertia**: lb ft²
- **j**: lb ft²

### Hydraulic Characteristics

#### Nominal pressure (100% duty cycle)
- **pN**: psi
- **5075**

#### Input pressure
- **p1min**: psi
- **p1max**: psi
- **14.5 abs**
- **725**

#### Max. pressure to DIN 24312
- **p2max**: psi
- **6090**

#### Hydraulic fluid
- **Hydraulic fluid**
- **Hydraulic oil to DIN 51524 part 2. Refer to section Application Data-Fluid Recommendations**

#### Hydraulic fluid temperature range
- **min**: °F
- **max**: °F
- **-13**
- **194**

#### Viscosity range for continuous operation
- **min**: cSt
- **max**: cSt
- **10**
- **75**

#### Maximum permissible start viscosity
- **max**: cSt
- **1000**

#### Cleanliness acc. ISO 4406
- **18/15/13**

#### Maximum geometric
- **Displacement**
- **n = 1500 rpm**
- **22**
- **30.5**
- **45.7 (at 1200 rpm)**
- **n = 1800 rpm**
- **3.5**

#### Maximum geometric
- **Pump flow**
- **n = 1500 rpm**
- **99**
- **119**
- **198**
- **238 (at 1200 rpm)**
- **n = 1800 rpm**
- **142**
- **238**

#### Case pressure
- **pV max**: psi
- **max. 7.2 psi over pV**
- **pV max = 58 psi abs.**

#### Pilot Pump
- **V**: in³
- **0.5**

#### Pilot pressure
- **pSt**: psi
- **870**
- **1160**

### Drive

#### Maximum Driving torque
- **M 1 single lb.ft**
- **1232**
- **1774**
- **2463**
- **3688**

#### Maximum Power consumpt.
- **P 1 single hp**
- **422**
- **507**
- **845**
- **845**

### Combination Units

#### Maximum driving torque
- **M 1 lb.ft**
- **2x 1232**
- **2x 1774**
- **3688**
- **3688**
## Pump Specifications - Metric

<table>
<thead>
<tr>
<th>MODEL</th>
<th>PFW/PVW 250</th>
<th>PFW/PVW 360</th>
<th>PFW/PVW 500</th>
<th>PFW/PVW 750</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Design</strong></td>
<td>Swashplate - Axial piston pump</td>
<td>Flange or foot-mounted. Combination units foot mounted only</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Type of mounting</strong></td>
<td>B A psi</td>
<td>3 1/2&quot; = 500</td>
<td>3 1/2&quot; = 500</td>
<td>5&quot; = 500</td>
</tr>
<tr>
<td><strong>Pipe connection</strong></td>
<td>Flange or foot-mounted. Combination units foot mounted only</td>
<td>SAE Flange</td>
<td>3 1/2&quot; = 500</td>
<td>3 1/2&quot; = 500</td>
</tr>
<tr>
<td><strong>Direction of rotation</strong></td>
<td>Clockwise when viewing shaft end of pump</td>
<td>Counterclockwise available on request</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Speed range</strong></td>
<td>( n_{\text{min}} ) min (^{-1})</td>
<td>150</td>
<td>1800</td>
<td>1500</td>
</tr>
<tr>
<td><strong>Installation position</strong></td>
<td>Optional, see mounting information</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ambient temperature range</strong></td>
<td>min °C</td>
<td>-20</td>
<td>-20</td>
<td>-20</td>
</tr>
<tr>
<td><strong>Weight</strong> m kg</td>
<td>212</td>
<td>220</td>
<td>340</td>
<td>395</td>
</tr>
<tr>
<td><strong>Mass of inertia</strong> J kg m(^2)</td>
<td>0.146</td>
<td>0.152</td>
<td>0.5</td>
<td>0.55</td>
</tr>
</tbody>
</table>

### HYDRAULIC CHARACTERISTICS

| Nominal pressure (100% duty cycle) p\(w\) bar | 350 |
| **Input pressure** | p\(\text{min}\) bar | 1 abs |
| **p\(\text{max}\) bar | 50 |
| **Maximum pressure to DIN 24312** | p\(\text{pmax}\) bar | 420 |
| **Hydraulic fluid** | Hydraulic oil to DIN 51524 part 2. Refer to section Application Data-Fluid Recommendations |
| **Hydraulic fluid temperature range** | min °C | -25 |
| **Viscosity range for continuous operation** | max °C | 90 |
| **M\(\text{ax}\) permissible start viscosity** | max cSt | 10 |
| **Case pressure** | max cSt | 75 |
| **Cleanliness acc. ISO 4406** | 18/15/13 |
| **Maximum geometric Displacement** | n\(\text{= 1500 min}^{-1}\) Vg cm\(^3\) | 250 |
| | n\(\text{= 1800 min}^{-1}\) Vg cm\(^3\) | 250 |
| | n\(\text{= 1500 min}^{-1}\) Oq l/min | 375 |
| | n\(\text{= 1800 min}^{-1}\) Oq l/min | 375 |
| **Case pressure** | p\(\text{pmax}\) bar | max. 0.5 bar over p\(p_1\) p\(\text{pmax}\) = 4 bar abs. |
| **Pilot Pump** V cm\(^3\) | 8 |
| **Pilot pressure** p\(p_1\) bar | 60 |
| **Max. Power consumpt. -** \(\eta = 100\%\) P\(1\) single kW | 315 (at 1800 min\(^{-1}\)) |
| **Max. Power consumpt. -** \(\eta = 100\%\) P\(1\) single kW | 378 (at 1500 min\(^{-1}\)) |
| **Max. Power consumpt. -** \(\eta = 100\%\) P\(1\) single kW | 630 (at 1800 min\(^{-1}\)) |

### DRIVE

| Maximum Driving torque - \(\eta = 100\%\) | M 1 single Nm | 1670 |
| **Max. Power consumpt. -** \(\eta = 100\%\) | P\(1\) single kW | 315 (at 1800 min\(^{-1}\)) |
| **Max. Power consumpt. -** \(\eta = 100\%\) | P\(1\) single kW | 378 (at 1500 min\(^{-1}\)) |
| **Max. Power consumpt. -** \(\eta = 100\%\) | P\(1\) single kW | 630 (at 1800 min\(^{-1}\)) |

### COMBINATION UNITS

| Maximum driving torque combination unit splined shaft only | M 1 Nm | 2x1670 |
| **Maximum driving torque combination unit splined shaft only** | M 1 Nm | 2x2405 | 5000 | 5000 |
Performance Curves - 250 Series

**Power efficiency performance curve**

- 100% $\eta_{vol}$
- 100% $\eta_{tot}$
- 50% $\eta_{tot}$

$\frac{V}{V_{max}} \times 100$ 25% $\eta_{tot}$

- $n=1500 \text{ min}^{-1}$ (rpm)
- $n=1800 \text{ min}^{-1}$ (rpm)

**Roller bearing life**

$L_{10} = \frac{1}{(\frac{V}{V_{max}})^{10/3}}$

**Combination units**

For combination pumps the characteristic values are as for the individual units.

**For reduced swash-angle:**

$L_h = (L \text{ at } V_{max}) \times \frac{1}{(\frac{V}{V_{max}})^{10/3}}$
Performance Curves - 360 Series

**Power efficiency performance curve**

![Power efficiency performance curve](image)

**Roller bearing life**

![Roller bearing life](image)

**Combination units**
For combination pumps the characteristic values are as for the individual units.

**For reduced swash-angle:**

\[
L_h = (L \text{ at } V_{max}) \times \frac{1}{\left(\frac{V}{V_{max}}\right)^{10/3}}
\]
Performance Curves - 500 Series

Power efficiency performance curve

Roller bearing life

Combination units
For combination pumps the characteristic values are as for the individual units.

For reduced swash-angle:

\[ L_h = (L \text{ at } V_{\text{max}}) \times \frac{1}{\left(\frac{V}{V_{\text{max}}}\right)^{\frac{10}{3}}} \]
Performance Curves - 750 Series

**Power efficiency performance curve**

**Roller bearing life**

**Combination units**
For combination pumps the characteristic values are as for the individual units.

**For reduced swash-angle:**

\[
L_h = (L \text{ at } V_{\text{max}}) \times \frac{1}{\left(\frac{V}{V_{\text{max}}}\right)^{\frac{10}{3}}}
\]
This unit is used for flow adjustment. It has a three phase electric servo motor, worm gearing and a switch box with 4 or (optional) 8 limit switches for different positions. A potentiometer for stepless adjustment and/or position monitoring is also available.

The response times from zero to maximum depends on the chosen ratio and the (fixed) speed of the servo motor (this means that once the control is defined and built the response time are not variable during operation.)

Explosion Protection versions are also available.

<table>
<thead>
<tr>
<th>Theoretical Response Time (sec) for Maximum Displacement</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIZE</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Fast</td>
</tr>
<tr>
<td>Medium</td>
</tr>
<tr>
<td>Slow</td>
</tr>
</tbody>
</table>

Response time from 0 to +Qmax
Energy saving hydraulic drives are possible with pressure compensated and/or power controlled pumps, especially in combination with the load-sensing option.

**DF** The system pressure remains constant for the entire volume flow rate. System pressure can be set either manually, hydraulically or electronically. The standard Hydrokraft pressure compensator is pilot operated, has a remote port and is very stable.

**LR** The p/Q characteristic curve is a hyperbola. For constant speed, the drive torque, i.e. the power used, is held constant. The power hyperbola can be continuously adjusted between Pmin and Pmax. Pmin is given by the minimum set value of control’s main stage (app. 20 bar) and power loss of the pump.

Both controllers can be combined with another or with additional options, for possible variations, see the model coding and circuit diagrams. The maximum flow of the pump can be limited mechanically to between 50% and 100% by screw. As an additional option the maximum (or minimum) flow can also be limited by a spacer inside the control cylinder (position no.13 in model coding, options 4, 5 or 6 in combination with customer adjustment speculation position 40-43 for the set values).

This solution is also recommended for very rough operating conditions and the need of a very exact repeatability over a long time period. The setting must be defined before ordering and cannot be modified during operation.

---

Typical controller action: (Closing/opening the directional control valve WV)

CH - 50mm ID x 2 meters

(1) On stroke control time $T_g$ (0 → 0.9 $y$ max.)
(2) Off stroke control time $T_g$ (0.9 $y$ max. → 0)
DF, LR Controls
Open Loop Pumps

"W" Series

DF Pressure Compensator
DF000A...
Control valve adjustable mechanically, electrically or remote port only

LR Power Control
with overriding pressure limiter
LR000A2...
Pressure control pilot valve adjustable mechanically, electrically or remote port only

Alternatively

Minimum pressure approximately 20 bar (280 psi)

Alternatively

Mechanical adjustment
Electrical adjustment
Remote port only
DF, LR Controls
Open Loop Pumps

"W" Series

DF Pressure Compensator
with load sensing

LR Power Control
with load sensing and pressure limiter

DF000A1...
Control valve adjustable mechanically, electrically or remote port only

LR000A3...
Pressure control pilot valve adjustable mechanically, electrically or remote port only

Alternatively

Mechanical adjustment
Electrical adjustment
Remote port only

..DF000A10.. ..DF000A1K.. ..DF000A1F..

..LR000A30.. ..LR000A3K.. ..LR000A3F..
The output flow of the pump is proportional to the pilot pressure.

A separate pilot oil circuit is necessary. From this, the control pressure is reduced to the desired set value by means of a suitable pressure control valve (with P-T line) and throttle in P line 0.8 Ø (0.03 in).

The DP control can be used for steepless flow control with standard requirements for dynamic and precision control. No feedback signal is needed, an optical indicator is recommended (position 22 in model coding, option "V").

A pilot oil filter can be mounted in-line between pump and control (pos. 35 in model coding, option "V" or "E").

The maximum flow of the pump can be limited mechanically to between 50% and 100% by a screw. As an additional option, the maximum (and/or minimum) flow can be limited by a spacer inside the control cylinder (position no.13 in model coding, options 4, 5 or 6 in combination with cust. adj. spec. pos. 40-43 for the set values).

This solution is also recommended for very rough operating conditions and the need of a very exact repeatability over a long time period. The setting must be defined before ordering and cannot be modified during operation.

### Table: Response Time and Pilot Pressure

<table>
<thead>
<tr>
<th>Size</th>
<th>12 L/MIN Pilot Oil Flow</th>
<th>Pilot Pressure P Bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>250/360</td>
<td>1.0</td>
<td>60</td>
</tr>
<tr>
<td>500/750</td>
<td>2.2</td>
<td>80</td>
</tr>
</tbody>
</table>

The output flow of the pump is proportional to the pilot pressure.

![Diagram of pump and control system]
Example for PVW... DP Control with pressure & power limiter
Open Loop Pumps

"W" Series

DP Control with pressure limiter and power control overriding function

example shown: DPJ 00A5...

Note: A setting of the pressure limiter and/or power control lower than the pilot pressure Pst is not possible!
Proportional Valve
Displacement Control SP
Open Loop Pumps

"W" Series

The electrohydraulic displacement control operates a hydrostatic drive and works without throttle losses within electrically adjustable limits. This is done by controlling delivery flow with electrical swash plate angle feedback (electrical closed-loop control). All control values are recorded as an electrical signal and lead back to the control card. The proportional valve and servo piston transform the output signal of the control card to the desired setting. This results in a very precise and dynamic control.

Hysteresis, consistency: approximately 1% of end value. The SP control can also be combined with hydro-mechanical relief valves for pressure and/or power. Electromechanical solution for pressure and power override control is in preparation.

The maximum flow of the pump can be limited mechanically to between 50 and 100% by a screw. As an additional option the maximum (and/or minimum) flow can be limited by a spacer inside the control cylinder (position no. 14 in model coding, options 4, 5 or 6 in combination with customer adjustment speculation position 40-43 for the set values). This solution is also recommended for very rough operating conditions and the need of a very exact repeatability over a long time period. The setting must be defined before ordering and cannot be modified during operation.

Response Times - Electronic Control Cards

<table>
<thead>
<tr>
<th>PROPORTIONAL VALE</th>
<th>PILOT OIL FLOW</th>
<th>CONTROL PRESSURE PST</th>
<th>CONTROL ELECTRONICS</th>
<th>RESPONSE TIME</th>
<th>UNIT SIZE</th>
<th>SERVO PISTON DIAMETER</th>
<th>STROKE</th>
<th>VOLUME</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L/min (USgpm)</td>
<td>bar (psi)</td>
<td>[Amp.card][ms]</td>
<td>0 &lt; Vmax (ms)</td>
<td>cm³ (in³)</td>
<td>mm (in)</td>
<td>mm (in)</td>
<td>cm³ (in³) per per chamber</td>
</tr>
<tr>
<td>Medium response</td>
<td>12 (3.17)</td>
<td>60 (857)</td>
<td>ER 9.3-10</td>
<td>500</td>
<td>250 (15.2)</td>
<td>75 (2.95)</td>
<td>18 (.71)</td>
<td>79 (4.82)</td>
</tr>
<tr>
<td>KDG4V3* (CETOP 3)</td>
<td>60 (857)</td>
<td>80 (1142)</td>
<td></td>
<td>700</td>
<td>360 (21.9)</td>
<td>75 (2.95)</td>
<td>25 (.98)</td>
<td>110 (6.71)</td>
</tr>
<tr>
<td></td>
<td>80 (1142)</td>
<td>850</td>
<td></td>
<td>650</td>
<td>500 (30.5)</td>
<td>75 (2.95)</td>
<td>22 (.87)</td>
<td>97 (5.92)</td>
</tr>
<tr>
<td>High response</td>
<td>ON REQUEST</td>
<td></td>
<td></td>
<td>80 (1142)</td>
<td>750 (45.8)</td>
<td>75 (2.95)</td>
<td>30 (1.18)</td>
<td>132 (8.06)</td>
</tr>
</tbody>
</table>

*KDG4V3-2C20NM UH760
Electrohydraulic Servo
Adjustment “SP”
Open Loop Pumps

"W" Series

SP control with pressure limiter and power control overriding function.

Example shown: SPC03A50...E...

Note: A setting of the pressure limiter and/or power control lower than the pilot pressure Pst is not possible!
Servo Adjustment Displacement Control with Mechanical Feedback SM
Open Loop Pumps

"W" Series

The Servo displacement control SM operates a hydrostatic drive and works without throttle losses within electrically adjustable limits. This is done by controlling delivery flow with mechanical swashplate angle feedback (mechanical closed-loop-control). No electronic control card is necessary. The proportional valve and servo piston transform the input signal to the valve to the desired setting. Input signal for Servo-valve is 0-100 mA. The dynamic is similar to the SP control. Hysteresis, consistency: maximum 8% of end value. The SM control can also be combined with hydro-mechanical relief valves for pressure and/or power.

Also available in explosion proof class version for hazardous duty.
### Pump Dimensions

**PFWS - 250**

<table>
<thead>
<tr>
<th>CONTROL</th>
<th>DIRECTION OF ROTATION</th>
<th>INPUT</th>
<th>OUTPUT</th>
<th>Non-Standard Displacements:</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Right hand</td>
<td>A</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>System pressure port SAE 1 1/2&quot;, 415 bar (6000psi)</td>
<td>B</td>
<td>(L1)</td>
<td>Drain port 15/8&quot; - 12 UNF - 2B per mounting position use upper port</td>
</tr>
</tbody>
</table>
| B       | Inlet connection SAE 3 1/2", 35 bar (500psi)       | L2    | (L3)   | Ventilation port for vertical mounting G 3/8" (shaft upwards) (L5) Oil fill plug (MA) Gauge port system pressure G 1/4"

250 ccm/rev Available 220 or 200 ccm/rev

**CONTROL DIRECTION OF ROTATION INPUT OUTPUT**

<table>
<thead>
<tr>
<th>CONTROL</th>
<th>DIRECTION OF ROTATION</th>
<th>INPUT</th>
<th>OUTPUT</th>
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</thead>
<tbody>
<tr>
<td>+Vmax</td>
<td>Right hand</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>to +Vmax</td>
<td>Right hand</td>
<td>B</td>
<td>A</td>
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<table>
<thead>
<tr>
<th>CENTER BORE DM 20 DIN 332</th>
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<td>Ø250</td>
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<table>
<thead>
<tr>
<th>CENTER BORE DM 20 DIN 332</th>
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</thead>
<tbody>
<tr>
<td>Ø200 f7</td>
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</tbody>
</table>

**Port B**

- M 16-30deep
- Ø90
- 120.7
- 69.8

**Port A**

- M 16-30deep
- Ø38
- 79.4
- 36.5

**Drain port**

- 15/8" - 12 UNF - 2B per mounting position use upper port
- Drain port G 1 1/4" per mounting position use upper port

**System pressure port**

- SAE 1 1/2", 415 bar (6000psi)

**Inlet connection**

- SAE 3 1/2", 35 bar (500psi)
Pump Dimensions PVWS - 250 Side Ports

<table>
<thead>
<tr>
<th>CONTROL</th>
<th>DIRECTION OF ROTATION</th>
<th>INPUT</th>
<th>OUTPUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>to +Vmax</td>
<td>Right hand</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>A</td>
<td>System pressure port SAE 1 1/2&quot;, 415 bar (6000psi)</td>
<td>(L1)</td>
<td>Drain port 15/8&quot; - 12 UNF - 2B per mounting position use upper port</td>
</tr>
<tr>
<td>B</td>
<td>Inlet connection SAE 3 1/2&quot;, 35 bar (500psi)</td>
<td>L2</td>
<td>Drain port G 1 1/4&quot; per mounting position use upper port</td>
</tr>
</tbody>
</table>
Pump
Dimensions -
PVWS - 250
DF, 2 stage pilot valve

1 Pilot valve (2nd stage)
2 Pressure compensator
   (1st stage)
3 Max flow adjustment

X1 Remote port pressure
   limiter

DF000A ...

CONTROL DIRECTION OF ROTATION INPUT OUTPUT

<table>
<thead>
<tr>
<th></th>
<th>DIRECTION OF ROTATION</th>
<th>INPUT</th>
<th>OUTPUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td>L2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>System pressure</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>port SAE 1 1/2&quot;, 415</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>bar (6000psi)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Inlet connection</td>
<td>(L3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SAE 3 1/2&quot;, 35 bar</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(500psi)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L1</td>
<td>Drain port 15/8&quot; - 12</td>
<td>(L5)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>UNF - 2B per</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>mounting position</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>use upper port</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L8</td>
<td>Drain port G 1 1/4&quot;</td>
<td>(L8)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>per mounting position</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>use upper port</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MA</td>
<td>Gauge port system</td>
<td>(MA)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>pressure G 1/4&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ML</td>
<td>Gauge port of case</td>
<td>(ML)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>pressure G 1/4&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X1</td>
<td>Air bleed port G 1/4&quot;</td>
<td>(X1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(12.5 deep)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Normally plugged</td>
<td>(...)</td>
<td></td>
</tr>
</tbody>
</table>

Port B

Port A
Pump
Dimensions -
PVWS - 250
DF, with load sensing valve

**1** Pilot valve (2nd stage)
**2** Pilot compensator
(1st stage)
**3** Load sensing valve
**4** Max flow adjustment

**X1** Remote port pressure
limiter

**X2** Load sense port

DF000A1 ...

---

### Control Directions

<table>
<thead>
<tr>
<th>CONTROL</th>
<th>DIRECTION OF ROTATION</th>
<th>INPUT</th>
<th>OUTPUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>System pressure port SAE 1 1/2&quot;, 415 bar (6000psi)</td>
<td>L2</td>
<td>Drain port G 1 1/4&quot; per mounting position use upper port</td>
</tr>
<tr>
<td>B</td>
<td>Inlet connection SAE 3 1/2&quot;, 35 bar (500psi)</td>
<td>(L3)</td>
<td>Ventilation port for vertical mounting G 3/8&quot; (shaft upwards)</td>
</tr>
<tr>
<td>(L1)</td>
<td>Drain port 1 5/8&quot; - 12 UNF - 2B per mounting position use upper port</td>
<td>(L5)</td>
<td>Oil fill plug 1 1/16&quot; - 12 UNF - 2B</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(L8)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(MA)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(ML)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(X1)</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
Pump Dimensions - PVWS - 250
LR, with pressure limiter

1 Pilot valve (2nd stage)  
2 Pilot compensator (1st stage)  
3 Power limiter valve  
4 Max flow adjustment  
X1 Remote port pressure limiter LR000A2 ...

<table>
<thead>
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<td>Oil fill plug 1 1/16&quot; - 12 UNF - 2B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(L8)</td>
<td>Air bleed port G 1/4&quot; (... Normally plugged</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(MA)</td>
<td>Gauge port system pressure G 1/4&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(ML)</td>
<td>Gauge port of case pressure G 1/4&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(X1)</td>
<td>Gauge port G 1/4&quot; x 12.5 deep</td>
</tr>
</tbody>
</table>

CONTROL DIRECTION OF ROTATION INPUT OUTPUT

A to + Vmax Right hand B A

L2 Drain port G 1 1/4" per mounting position use upper port
(L3) Ventilation port for vertical mounting G 3/8" (shaft upwards)
(L5) Oil fill plug 1 1/16" - 12 UNF - 2B
(L8) Air bleed port G 1/4" (... Normally plugged
(MA) Gauge port system pressure G 1/4"
(ML) Gauge port of case pressure G 1/4"
(X1) Gauge port G 1/4" x 12.5 deep

EATON Vickers Hydrokraft Open Loop Piston Pumps V-PUPI-TM003-E March 2003
1 Pilot valve (2nd stage)
2 Pilot compensator (1st stage)
3 Load sensing valve
4 Power limiter valve
5 Max flow adjustment
X1 Remote port pressure limiter
X2 Load sense port
LR000A3 ...

Pump Dimensions - PVWS - 250
LR, with load sensing valve

<table>
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<tr>
<th>CONTROL</th>
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<th>OUTPUT</th>
</tr>
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<tr>
<td>to + Vmax</td>
<td>Right hand</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>A</td>
<td>System pressure port SAE 1 1/2&quot;, 415 bar (6000psi)</td>
<td>L2</td>
<td>Drain port G1 1/4&quot; per mounting position use upper port (L8) Air bleed port G 1/4&quot; x 12.5 deep</td>
</tr>
</tbody>
</table>
| B | Inlet connection SAE 3 1/2", 35 bar (500psi) | (L3) | Ventilation port for vertical mounting G 3/8" (shaft upwards) (MA) Gauge port system pressure G 1/4"
| (L1) | Drain port 1 5/8" - 12 UNF - 2B per mounting position | (L5) | Oil fill plug 1 1/16" - 12 UNF - 2B (ML) Gauge port of case pressure G 1/4"
| | | | (X1) Gauge port G 1/4" x 12.5 deep (...) Normally plugged |
Pump Dimensions - PVWS - 250

SPC03A ...

Control | Direction of Rotation | Input | Output
--- | --- | --- | ---
to + Vmax | Right hand | B | A

A  
System pressure port SAE 1 1/2", 415 bar (6000psi)
B  
Inlet connection SAE 3 1/2", 35 bar (500psi)
(L1)  
Drain port 1 5/8" - 12 UNF - 2B per mounting position use upper port

L2  
Drain port G 1 1/4" per mounting position use upper port

(L3)  
Ventilation port for vertical mounting G 3/8" (shaft upwards)

(L3.1)  
Port G 1/4"

(L5)  
Oil fill plug 1 1/16" - 12 UNF - 2B

(L8)  
Air bleed port G 1/4"

(MA)  
Gauge port system pressure G 1/4"

(ML)  
Gauge port of case pressure G 1/4"

(MSt)  
Gauge port pilot pressure G 1/4"

(SSt)  
Suction port of pilot pump G 3/4"

(PSt)  
Outlet port of pilot pump G 1/2"

(PSt1)  
Port of pilot pressure G 1/2" (alternatively PSt1 or PSt1.1)

(PSt1.1)  
Port of pilot pressure G 3/8"

(XA)  
Pilot port pressure control G 1/4"

(... )  
Normally plugged

---

EATON Vickers Hydrokraft Open Loop Piston Pumps V-PUPI-TM003-E March 2003
A
System pressure port SAE 1 1/2", 415 bar (6000psi)
B
Inlet connection SAE 3 1/2", 35 bar (500psi)

CONTROL | DIRECTION OF ROTATION | INPUT | OUTPUT
--- | --- | --- | ---
to +Vmax | Right hand | B | A

**Non-Standard Displacements:**

<table>
<thead>
<tr>
<th>STANDARD DISPLACEMENT</th>
<th>REDUCED DISPLACEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>360 ccm/rev</td>
<td>Available 308.5 ccm/rev</td>
</tr>
</tbody>
</table>

**System Pressure Port:**

- Drain port 15/8" - 12 UNF - 2B per mounting position use upper port
- Drain port G 1 1/4" per mounting position use upper port

**Ventilation Port:**

- Ventilation port for vertical mounting G 3/8" (shaft upwards)

**Oil Fill Plug:**

- Oil fill plug 1 1/16" - 12 UNF - 2B

**Gauge Port:**

- Gauge port system pressure G 1/4" Normally plugged
Pump Dimensions - PVWS - 360
Side ports

CONTROL | DIRECTION OF ROTATION | INPUT | OUTPUT
---|---|---|---
to +Vmax | Right hand | B | A
A | System pressure port SAE 1 1/2", 415 bar (6000psi) | (L1) | Drain port 15/8" - 12 UNF - 2B per mounting position use upper port
B | Inlet connection SAE 3 1/2", 35 bar (500psi) | L2 | Oil fill plug 1 1/16" - 12 UNF - 2B

Port B
M 16-18deep
6xM 16-30deep
10xM 12-20deep

Opt. position indicator
Max flow adjustment
Center bore DM 20 DIN 332

Mounting pad of control devices

Control direction of rotation
INPUT OUTPUT
B A

Port B
M 16-18deep

A
M A

Port B
M 16-18deep

A
M A

Port B
M 16-18deep

A
M A
Pump
Dimensions - PVWS - 360
DF, 2 stage pilot valve

1. Pilot valve (2nd stage)
2. Pressure compensator (1st stage)
3. Max flow adjustment

X1 Remote port pressure limiter

CONTROL | DIRECTION OF ROTATION | INPUT | OUTPUT
--- | --- | --- | ---
to + Vmax | Right hand | B | A
A | System pressure port SAE 1 1/2", 415 bar (6000psi) | L2 | Drain port G 1 1/4" per mounting position use upper port
B | Inlet connection SAE 3 1/2", 35 bar (500psi) | (L3) | Ventilation port for vertical mounting G 3/8" (shaft upwards)
(L1) | Drain port 1 5/8" - 12 UNF - 2B per mounting position use upper port | (L5) | Oil fill plug 1 1/16" - 12 UNF - 2B
(L8) | Air bleed port G 1/4" (...) | Normally plugged
(MA) | Gauge port system pressure G 1/4"
(M.L) | Gauge port of case pressure G 1/4"
(X1) | Gauge port G 1/4" x 12.5 deep
Pump
Dimensions -
PVWS - 360
DF, with load sensing valve

1 Pilot valve (2nd stage)
2 Pressure compensator (1st stage)
3 Load sensing valve
4 Max flow adjustment

X1 Remote port pressure limiter
X2 Load sense port
DF000A1 ...
Pump
Dimensions -
PVWS - 360
LR, with pressure limiter

1 Pilot valve (2nd stage)
2 Pressure compensator
   (1st stage)
3 Power limitation valve
4 Max flow adjustment
   X1 Remote port pressure
   limiter
   LR000A2 ...

<table>
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<th>OUTPUT</th>
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<tbody>
<tr>
<td>A</td>
<td>System pressure</td>
<td>L2</td>
<td>Drain port G 1 1/4&quot; per mounting position use upper port</td>
</tr>
<tr>
<td></td>
<td>port SAE 1 1/2&quot;, 415</td>
<td></td>
<td>(L8) Air bleed port G 1/4&quot; (…) Normally plugged</td>
</tr>
<tr>
<td></td>
<td>bar (6000psi)</td>
<td></td>
<td>(MA) Gauge port system pressure G 1/4&quot;</td>
</tr>
<tr>
<td>B</td>
<td>Inlet connection</td>
<td>(L3)</td>
<td>Ventilation port for vertical mounting G 3/8&quot; (shaft upwards)</td>
</tr>
<tr>
<td></td>
<td>SAE 3 1/2&quot;, 35 bar</td>
<td></td>
<td>(ML) Gauge port of case pressure G 1/4&quot;</td>
</tr>
<tr>
<td>(L1)</td>
<td>Drain port 1 5/8&quot; -</td>
<td>(L5)</td>
<td>Oil fill plug 1 1/16&quot; - 12 UNF - 2B</td>
</tr>
<tr>
<td></td>
<td>12 UNF - 2B per</td>
<td></td>
<td>(X1) Gauge port G 1/4&quot; x 12.5 deep</td>
</tr>
<tr>
<td></td>
<td>mounting position use</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>upper port</td>
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</tbody>
</table>

EATON Vickers Hydrokraft Open Loop Piston Pumps V-PUPI-TM003-E March 2003
Pump
Dimensions -
PVWS - 360
LR, with load sensing valve

1 Pilot valve (2nd stage)
2 Pressure compensator (1st stage)
3 Load sensing valve
4 Power limitation valve
5 Max flow adjustment
X1 Remote port pressure limiter
X2 Load sense port
LR00A3 ...

CONTROL | DIRECTION OF ROTATION | INPUT | OUTPUT
---|---|---|---
to +Vmax | Right hand | B | A

A  | System pressure port SAE 1 1/2", 415 bar (6000psi) | L2 | Drain port G 1 1/4" per mounting position use upper port
B  | Inlet connection SAE 3 1/2", 35 bar (500psi)  | (L3) | Ventilation port for vertical mounting G 3/8" (shaft upwards)
(L1) | Drain port 1 5/8" - 12 UNF - 2B per mounting position use upper port | (L5) | Oil fill plug 1 1/16" - 12 UNF - 2B
(L8) | Air bleed port G 1/4" | (MA) | Gauge port system pressure G 1/4"
(MA) | Gauge port system pressure G 1/4" | (L) | Gauge port of case pressure G 1/4"
(X1) | Gauge port G 1/4" x 12.5 deep | (...) | Normally plugged
X2  |  |  | Gauge port G 1/4" x 12.5 deep
Pump Dimensions - PVWS - 360

CONTROL DIRECTION OF ROTATION INPUT OUTPUT

A System pressure input port SAE 1 1/2", 415 bar (6000psi) L2 Drain port G 1 1/4" per mounting position (MA) Gauge port system pressure G 1/4"
B Inlet connection SAE 3 1/2", 35 bar (500psi) (L3) Ventilation port for vertical mounting G 3/8" (shaft upwards) (ML) Gauge port of case pressure G 1/4"
(L1) Drain port 1 5/8" - 12 UNF - 2B per mounting position use upper port (L3.1) Port G 1/4" (MSt) Gauge port pilot pressure G 1/4"
(L5) Oil fill plug 1 1/16" - 12 UNF - 2B (L8) Air bleed port G 1/4" (PSSt) Suction port of pilot pump G 3/4"
PSSt Outlet port of pilot pump G 1/2"

Port B M16 - 30 deep Ø 90

Port A M16 - 30 deep Ø 38

Port (PSt) Port of pilot pressure G 1/2" (alternatively PSt1 or PSt1.1 )

Port (PSt1.1) Port of pilot pressure G 3/8"

(…) Normally plugged

EATON Vickers Hydrokraft Open Loop Piston Pumps V-PUPI-TM003-E March 2003
### Pump Dimensions - PFWS - 500

#### Pump Dimensions - PFWS - 500

<table>
<thead>
<tr>
<th>Control</th>
<th>Direction of Rotation</th>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>System pressure port SAE 2&quot; 415 bar (6000psi)</td>
<td>(L1) Drain port 15/8&quot; - 12 UNF - 2B per mounting position use upper port</td>
<td>(L3) Ventilation port for vertical mounting G 1/4&quot; (shaft upwards)</td>
</tr>
<tr>
<td>B</td>
<td>Inlet connection SAE 5&quot; 35 bar (500psi)</td>
<td>L2 Drain port G 1 1/2&quot; per mounting position use upper port</td>
<td>(…) Normally plugged</td>
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</tbody>
</table>

#### Non-Standard Displacements:

<table>
<thead>
<tr>
<th>Standard Displacement</th>
<th>Reduced Displacement</th>
</tr>
</thead>
<tbody>
<tr>
<td>500 ccm/rev</td>
<td>Available 467 or 364 ccm/rev</td>
</tr>
</tbody>
</table>

#### Control Datasheet:

- **System pressure port SAE 2" 415 bar (6000psi)**
- **Inlet connection SAE 5" 35 bar (500psi)**

- **Drain port 15/8" - 12 UNF - 2B per mounting position use upper port**
- **G 1 1/2" per mounting position use upper port**
- **Ventilation port for vertical mounting G 1/4" (shaft upwards)**
- **Gauge port system pressure G 1/4"**
Pump
Dimensions -
PVWS - 500
DF; 2 stage pilot valve

1 Pilot valve (2nd stage)
2 Pressure compensator (1st stage)
3 Max flow adjustment

X1 Remote port pressure limiter
DF000A ...

<table>
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<th>OUTPUT</th>
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<td>System pressure port SAE 2&quot;; 415 bar (6000psi)</td>
<td>(L1) Drain port 1 5/8&quot; - 12 UNF - 2B per mounting position use upper port</td>
<td>(L3) Ventilation port for vertical mounting G 1/4&quot; (shaft upwards)</td>
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</table>
| B       | Inlet connection SAE 5", 35 bar (500psi) | (L2) Drain port G 1 1/2" per mounting position use upper port | (ML) Gauge port of case pressure G 1/4"
|         |                         |       | (X1) Gauge port G 1/4" x 12.5 deep |
|         |                         |       | (L5) Oil fill plug G 1 1/2" |
|         |                         |       | (L8) Air bleed port G 1/4"
|         |                         |       | (MA) Gauge port system pressure G 1/4"
|         |                         |       | (...) Normally plugged |
Pump
Dimensions -
PVWS - 500
DF, with load sensing valve

1. Pilot valve (2nd stage)
2. Pressure compensator (1st stage)
3. Load sensing valve
4. Max flow adjustment

X1 Load sense port
X2 Remote port pressure limiter
DF000A1 ...

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<tr>
<td>A</td>
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<td>(L8)</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>(MA)</td>
<td>Gauge port system pressure G 1/4&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(ML)</td>
<td>Gauge port of case pressure G 1/4&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(X1)</td>
<td>Gauge port G 1/4&quot; x 12.5 deep</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(X2)</td>
<td>Gauge port G 1/4&quot; x 12.5 deep</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(...)</td>
<td>Normally plugged</td>
</tr>
</tbody>
</table>
Pump
Dimensions -
PVWS - 500
LR, with pressure limiter

1 Pilot valve (2nd stage)
2 Pressure compensator (1st stage)
3 Power limitation valve

CONTROL DIRECTION OF ROTATION INPUT OUTPUT

A System pressure port SAE 2", 415 bar (6000psi)
B Inlet connection SAE 5", 35 bar (500psi)

L1 Drain port 1 5/8" - 12 UNF - 2B per mounting position use upper port
L2 Drain port G 1 1/2" per mounting position use upper port

L3 Ventilation port for vertical mounting G 1/4" (shaft upwards)
L5 Oil fill plug G 1 1/2"
L8 Air bleed port G 1/4"
MA Gauge port system pressure G 1/4"
ML Gauge port of case pressure G 1/4"
X1 Gauge port G 1/4" x 12.5 deep
...
(ML) Normally plugged

EATON Vickers Hydrokraft Open Loop Piston Pumps V-PUPI-TM003-E March 2003
Pump
Dimensions -
PVWS- 500
LR, with load sensing valve

1 Pilot valve (2nd stage)
2 Pressure compensator
   (1st stage)
3 Load sensing valve
4 Power limitation valve
5 Max flow adjustment
X1 Load sense port
X2 Remote port pressure
   limiter
LR000A3 ...

<table>
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<tr>
<th>CONTROL</th>
<th>DIRECTION OF ROTATION</th>
<th>INPUT</th>
<th>OUTPUT</th>
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<tr>
<td>A</td>
<td>System pressure</td>
<td>L2</td>
<td>(L8)</td>
</tr>
<tr>
<td></td>
<td>port SAE 2&quot;, 415</td>
<td></td>
<td>Air bleed port G 1/4&quot;</td>
</tr>
<tr>
<td></td>
<td>bar (6000psi)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Inlet connection</td>
<td>(L3)</td>
<td>(MA)</td>
</tr>
<tr>
<td></td>
<td>SAE 5&quot;, 35 bar</td>
<td></td>
<td>Gauge port system</td>
</tr>
<tr>
<td></td>
<td>(500psi)</td>
<td></td>
<td>pressure G 1/4&quot;</td>
</tr>
<tr>
<td>(L1)</td>
<td>Drain port 1 5/8&quot;-</td>
<td>(L5)</td>
<td>(ML)</td>
</tr>
<tr>
<td></td>
<td>12 UNF - 2B per</td>
<td></td>
<td>Gauge port of case</td>
</tr>
<tr>
<td></td>
<td>mounting position</td>
<td></td>
<td>pressure G 1/4&quot;</td>
</tr>
<tr>
<td></td>
<td>use upper port</td>
<td></td>
<td>(X1)</td>
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<td></td>
<td>Gauge port G 1/4&quot; x</td>
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<td></td>
<td></td>
<td></td>
<td>12.5 deep</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(...)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Normally plugged</td>
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</tbody>
</table>
Pump Dimensions - PVWS- 500

1 Proportional control valve
2 Zero flow stop
3 Pilot pump (8ccm)
4 Adjustment pilot oil relief valve
5 Feedback potentiometer with visual indicator

CONTROL DIRECTION OF ROTATION INPUT OUTPUT

to + Vmax Right hand B A

A System pressure port SAE 2", 415 bar (6000psi) L2 Drain port G 1 1/2" (L8) Air bleed port G 1/4" (PSt ) Port of pilot pressure G 1/2"

B Inlet connection SAE 5", 35 bar (500psi) (L3) Ventilation port for vertical mounting G 1/4" (shaft upwards) (MA) Gauge port system pressure G 1/4" (ML) Gauge port of case pressure G 1/4"

(L1) Drain port 1 5/8" - 12 UNF - 2B per mounting position use upper port (L5) Oil fill plug G 1 1/2" (MSt) Gauge port pilot pressure G 1/4"

(PSt ) Normally plugged

EATON Vickers Hydrokraft Open Loop Piston Pumps V-PUPI-TM003-E March 2003
# Pump Dimensions - PFWS - 750

## Pump Dimensions

<table>
<thead>
<tr>
<th>L1</th>
<th>L2</th>
<th>L3</th>
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</thead>
<tbody>
<tr>
<td>328</td>
<td>310</td>
<td>210</td>
</tr>
<tr>
<td>356</td>
<td>326</td>
<td>166</td>
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</tbody>
</table>

## Center bore

DM 24 DIN 332

## Pump System

- M 16 (4x) - 28 deep
- Ø 250 f7
- W 90x3x28x8g DIN 5480

## Non-Standard Displacements:

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<thead>
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<th>STANDARD DISPLACEMENT</th>
<th>REDUCED DISPLACEMENT</th>
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<tbody>
<tr>
<td>750 ccm/rev</td>
<td>Available 712.5 ccm/rev</td>
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## Control

<table>
<thead>
<tr>
<th>CONTROL</th>
<th>DIRECTION OF ROTATION</th>
<th>INPUT</th>
<th>OUTPUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>System pressure port SAE 2&quot;, 415 bar (6000psi)</td>
<td>(L1) Drain port 15/8&quot; - 12 UNF - 2B per mounting position use upper port</td>
<td>(L3) Ventilation port for vertical mounting G 1/4&quot; (shaft upwards)</td>
</tr>
<tr>
<td>B</td>
<td>Inlet connection SAE 5&quot;, 35 bar (500psi)</td>
<td>(L2) Drain port G 1 1/2&quot; per mounting position use upper port</td>
<td>(MA) Gauge port system pressure G 1/4&quot;</td>
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</table>
Pump Dimensions - PVWS - 750

**Control Direction of Rotation**

<table>
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<th>CONTROL</th>
<th>DIRECTION OF ROTATION</th>
<th>INPUT</th>
<th>OUTPUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>System pressure port SAE 2&quot;, 415 bar (6000psi)</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>B</td>
<td>Inlet connection SAE 5&quot;, 35 bar (500psi)</td>
<td>L2</td>
<td></td>
</tr>
</tbody>
</table>

- **Control**
- **Direction of Rotation**
- **Input**
- **Output**

**System pressure port** SAE 2", 415 bar (6000psi)

**Inlet connection** SAE 5", 35 bar (500psi)

**Drain port** 15/8" - 12 UNF - 2B per mounting position use upper port

**Ventilation port** for vertical mounting G 3/8" (shaft upwards)

**Oil fill plug** 1 1/16" - 12 UNF - 2B

**Gauge port system pressure** G 1/4"

**Gauge port case pressure** G 1/4"

** Normally plugged**
Dimensions -
PVWS-
250/360/500/750
SP Controls

SPC03A ... With CETOP 3
Prop. relief valve

SPC03A4 ... With pressure limiter overriding function

SPC03A5 ... With pressure limiter and power control overriding function

<table>
<thead>
<tr>
<th></th>
<th>L1</th>
<th>L2</th>
<th>B1</th>
<th>H1</th>
<th>H2</th>
<th>H3</th>
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<td>410</td>
<td>230</td>
<td>271</td>
<td>236</td>
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<td>160</td>
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<tr>
<td>360</td>
<td>426</td>
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<td>135</td>
<td>160</td>
</tr>
<tr>
<td>500</td>
<td>541.5</td>
<td>300</td>
<td>330</td>
<td>267.5</td>
<td>172</td>
<td>186</td>
</tr>
<tr>
<td>750</td>
<td>571</td>
<td>307</td>
<td>372</td>
<td>270</td>
<td>172</td>
<td>188.5</td>
</tr>
</tbody>
</table>
Dimensions - PVWS - 250/360/500/750
SM Controls

SM000A ...

SM000A4 ... With pressure limiter overriding function

SM000A5 ... With pressure limiter and power control overriding function

Optional pilot oil filter will be mounted by piping between pilot pump outlet port "pSt" and the "pst1" port.

<table>
<thead>
<tr>
<th></th>
<th>L1</th>
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</tbody>
</table>
Dimensions -
PVWS -
250/360/500/750
DP Controls

DPH ... DPG ... DPJ ...

DP ... 4 With pressure
limiter overriding function

DP ... 5 With pressure
limiter and power control
overriding function

Optional pilot oil filter will be mounted by piping between pilot pump outlet port
"pSt" and the "pst1" port.

<table>
<thead>
<tr>
<th></th>
<th>L1</th>
<th>L2</th>
<th>B1</th>
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<td>270</td>
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<td>188.5</td>
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</tbody>
</table>
Dimensions -
PVW -
250/360/500/750
ES Control

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<tr>
<td>750</td>
<td>571</td>
<td>307</td>
<td>372</td>
<td>270</td>
<td>172</td>
<td>188.5</td>
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</tbody>
</table>
Swash Angle/Flow Direction

Optical indicated Swash angle

Pressure control setting
Thru - Drives
PVW 250 to 750
SAE "A, B, C"
Pump

### SIZE 250/750

<table>
<thead>
<tr>
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<th>B1</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>H1</th>
<th>L1</th>
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<tr>
<td>SAE &quot;A&quot;</td>
<td>106</td>
<td>82.6</td>
<td>M 10 x 16 deep</td>
<td>16/32DP-9T</td>
<td>160</td>
<td>28</td>
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<tr>
<td>SAE &quot;B&quot;</td>
<td>146</td>
<td>102</td>
<td>M 12 x 20 deep</td>
<td>16/32DP-13T</td>
<td>160</td>
<td>28</td>
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<tr>
<td>SAE &quot;C&quot;</td>
<td>181</td>
<td>127</td>
<td>M 16 x 20 deep</td>
<td>12/24DP-14T</td>
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**ISO Pump**

### SIZE 250/360

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<th>D2</th>
<th>D3 (DIN 5480)</th>
<th>D4</th>
<th>H1</th>
<th>L1</th>
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<tbody>
<tr>
<td>ISO - 125</td>
<td>180</td>
<td>125</td>
<td>M 16 x 20</td>
<td>N40x1.25x10a</td>
<td>M 12 x 18 deep</td>
<td>160</td>
<td>92</td>
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<tr>
<td>ISO - 160</td>
<td>160</td>
<td>160</td>
<td>N50x1.25x10a</td>
<td>M 16 x 20 deep</td>
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<td>ISO - 200</td>
<td>200</td>
<td>200</td>
<td>N62x1.25x10a</td>
<td>M 20</td>
<td>250</td>
<td>92</td>
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### SIZE 500/750

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<th>D4</th>
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<tr>
<td>ISO - 125</td>
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<td>125</td>
<td>M 16 x 20</td>
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<td>ISO - 200</td>
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<td>N62x1.25x10a</td>
<td>M 20</td>
<td>250</td>
<td>75</td>
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<td>ISO - 250</td>
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<td>N80x3x28x10a</td>
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<td>315</td>
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### Application Data

**Installation Position**

Installation position is optional, however, note bearing lubrication with respect to mounting.

<table>
<thead>
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<th>DRAIN PIPING</th>
<th>INSTALLATION POSITION</th>
<th>DRAIN PIPING</th>
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<tbody>
<tr>
<td>Shaft horizontal</td>
<td></td>
<td>Shaft pointed downwards</td>
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<tr>
<td></td>
<td></td>
<td>Use ventilation line L_x</td>
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<tr>
<td></td>
<td></td>
<td>(Provided only on request)</td>
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<td></td>
<td></td>
<td>Pre load drain connection L_i (L_i) with 0.2 bar (2.9psi)</td>
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<tr>
<td>Install position</td>
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<tr>
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<td></td>
<td>Use the highest case drain connection L_i or L_j</td>
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</tr>
<tr>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>shaft horizontal</td>
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<td>Shaft pointed downwards</td>
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</tr>
<tr>
<td>Install position</td>
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<td>shaft horizontal</td>
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<tr>
<td>shaft horizontal</td>
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<td>Install position</td>
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<td>Install position</td>
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<td>Use the highest case drain connection L_i or L_j</td>
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<tr>
<td>shaft horizontal</td>
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</tbody>
</table>
Case Flushing Requirements
A check valve must not be used in the drain pipe. The drain pipe must terminate below the oil level in the reservoir.
For all other conditions with low pressure (<20 bar (<300 psi) and low flow (<10% of Qmax), case flushing is required.
For operation with special fluids HFB and HFC, case flushing is recommended.

Flushing Flow
Flushing flow via the pump case should be >1% of maximum pump flow. Maximum flushing flow depends on case pressure.

Notes:
- All listed ratings are based on the use of a good quality fluid.
- Alternative fluids have a reduced tolerance for contamination over petroleum base fluids. Good filtration is therefore, critical.
- The pumps will provide exceptional life when used with a good quality clean fluid at the pump ratings specified for that fluid.

Fluids
Pumps in the catalog are primarily designed to operate with conventional petroleum based hydraulic oil. Alternative fluids and restrictions:
- Fluid maintenance is critical to the durability of all hydraulic components, and particularly with hydraulic pumps. This becomes even more of a factor when alternative fluids are used. All types of alternative fluids require extensive maintenance in order to maintain proper levels of water content, acidity, viscosity and contamination.

Fluid Cleanliness
These pumps are rated for anti-wear petroleum fluids with a contamination level of 18/15/13 per ISO 4406. Operation in fluids with levels more contamination than this is not recommended and may reduce the life of the pump's components. Fluids other than petroleum, severe service cycles, or temperature extremes are cause for adjustment of these codes. Please contact your Eaton representative for special duty cycle recommendations. Eaton pumps, as well as any variable displacement piston pumps, will operate with apparent satisfaction in fluids up to the rating specified here. Experience has shown, however, that pump and hydraulic system life is not optimized with high fluid contamination levels (high ISO cleanliness codes).
Proper fluid condition is essential for long and satisfactory life of hydraulic components and systems. Hydraulic fluid must have the correct balance of cleanliness, materials, and additives for protection against wear of inclusion of air.
Essential information on the correct methods for treating hydraulic fluid is included in Eaton publication 561: "Vickers Guide to Systemic Contamination Control". Available from your local Eaton distributor.

In this publication, filtration and cleanliness levels for extending the life of axial piston pumps and other system components are listed. Included is an excellent discussion of the selection of products needed to control fluid condition.

Ordering Procedure
When ordering, please specify full model designation of items required; see "Model Codes" section of this catalog.
Note the following:
- Designation of variable displacement pumps must include the supplementary designation of the required control.

### Fluids

<table>
<thead>
<tr>
<th>Type</th>
<th>Classification</th>
<th>Max. Pressure Bar</th>
<th>Max. Speed RPM</th>
<th>Recommended Seal Material</th>
<th>Max Operating Temperature °C</th>
<th>Bearing Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil in Water Emulsion</td>
<td>HFAE</td>
<td>Not Rated</td>
<td>1800</td>
<td>Fluorocarbon</td>
<td>49</td>
<td>0</td>
</tr>
<tr>
<td>Water in oil Emulsion</td>
<td>HFB</td>
<td>250</td>
<td>1800</td>
<td>Fluorocarbon</td>
<td>49</td>
<td>50%</td>
</tr>
<tr>
<td>Water Glycol</td>
<td>HFC</td>
<td>250</td>
<td>1800</td>
<td>Fluorocarbon</td>
<td>49</td>
<td>25%</td>
</tr>
<tr>
<td>Phosphate Ester</td>
<td>HFDR</td>
<td>350/420</td>
<td>1800</td>
<td>Fluorocarbon</td>
<td>66</td>
<td>100%</td>
</tr>
<tr>
<td>Polyol Ester</td>
<td>HFDU</td>
<td>350/420</td>
<td>1800</td>
<td>Fluorocarbon</td>
<td>66</td>
<td>100%</td>
</tr>
</tbody>
</table>

*Refer to the general specifications for the displacement speed limitation.
Notes