Introduction
With thru drive
For single and multiple pumps
Swash plate type for open circuit

1. New type of swash plate and large servo piston with strong bias spring achieves fast response, reduce the noise due to active decompression of system at downstroke.
2. Nine piston and new precompression technology (precompression filter volume) result in unbeaten low outlet flow pulsation.
3. Complete compensator program.
4. Rigid and FEM-optimized body design for lowest noise level.
5. Thru drive for 100% nominal torque.
6. Pump combinations (multiple pumps) of same size and model and mounting interface for basically all metric or SAE mounting interfaces.

Specifications
Selection table and technical data

<table>
<thead>
<tr>
<th>model</th>
<th>Nominal pressure $P_n$ bar</th>
<th>Max. pressure bar</th>
<th>Max. displacement $Q$ In cm$^3$/rev</th>
<th>Output flow In l/min at 1500 min$^{-1}$</th>
<th>Input horse power At 1500 min$^{-1}$ and 350 bar</th>
<th>Max speed In min$^{-1}$</th>
<th>Minimum speed In min$^{-1}$</th>
<th>Mass In kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV16</td>
<td>350</td>
<td>420</td>
<td>16</td>
<td>24</td>
<td>15.5</td>
<td>3000</td>
<td>300</td>
<td>19</td>
</tr>
<tr>
<td>PV20</td>
<td>350</td>
<td>420</td>
<td>20</td>
<td>30</td>
<td>19.5</td>
<td>3000</td>
<td>300</td>
<td>19</td>
</tr>
<tr>
<td>PV23</td>
<td>350</td>
<td>420</td>
<td>23</td>
<td>34.5</td>
<td>22.5</td>
<td>3000</td>
<td>300</td>
<td>19</td>
</tr>
<tr>
<td>PV32</td>
<td>350</td>
<td>420</td>
<td>32</td>
<td>48</td>
<td>31</td>
<td>2800</td>
<td>300</td>
<td>30</td>
</tr>
<tr>
<td>PV40</td>
<td>350</td>
<td>420</td>
<td>40</td>
<td>60</td>
<td>39</td>
<td>2800</td>
<td>300</td>
<td>30</td>
</tr>
<tr>
<td>PV46</td>
<td>350</td>
<td>420</td>
<td>46</td>
<td>69</td>
<td>45</td>
<td>2800</td>
<td>300</td>
<td>30</td>
</tr>
</tbody>
</table>

The maximum speed ratings are shown for an inlet pressure of 1 bar (absolute) and for a fluid viscosity of $v=30\text{mm}^2/\text{s}$

1. Installation outlet port top, the pipe have to less than 2 bar.
2. The use of max. pressure override 6 min, hydraulic oil clean that see General Installation Information.
3. Hansa-Tmp offer multiple pumps, and other pumps connection, the connection type use metric version and SAE version dimensions.
**PV Axial Piston Pump**

### Ordering code (Preferred Program)

<table>
<thead>
<tr>
<th>PV</th>
<th>1</th>
<th>6</th>
<th>A</th>
<th>3</th>
<th>R</th>
<th>M</th>
<th>1</th>
<th>A</th>
</tr>
</thead>
</table>

**Axial piston pump variable displacement high pressure version**

**Size and Displacement**

<table>
<thead>
<tr>
<th>Code</th>
<th>Displacement</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>16 cm³/rev</td>
</tr>
<tr>
<td>20</td>
<td>20 cm³/rev</td>
</tr>
<tr>
<td>23</td>
<td>23 cm³/rev</td>
</tr>
<tr>
<td>32</td>
<td>32 cm³/rev</td>
</tr>
<tr>
<td>40</td>
<td>40 cm³/rev</td>
</tr>
<tr>
<td>46</td>
<td>46 cm³/rev</td>
</tr>
</tbody>
</table>

**Compensator**

<table>
<thead>
<tr>
<th>Code</th>
<th>Rotation Code</th>
<th>Rotation</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>clockwise</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>counter</td>
<td></td>
</tr>
</tbody>
</table>

**Remote compensator options**

- **G T** Remote pressure compensator
- **H L** Variation R, for quick unload valve
- **H M** Load-sensing compensator
- **H J** Two valve load-sensing compensator

**Electrohydraulic compensator**

- **F V** Proportional displacement control
- **F R** Proportional displacement control with pressure control
- **F G** Proportional displacement control with overriding pressure control

**Electrical unloading**

- **D R** Electrical unloading
- **E F** 2 pressure, electrical selection
- **E D** 2 pressure + electrical unloading

**Horse power compensators**

- **P G** Horse power compensator, pilot flow internal
- **P M** Horse power comp, pilot flow internal
- **P H** Horse power comp, pilot flow external for load-sensing pilot valve included

**Remote compensator options**

- **A 2** 10-140 bar, spindle+lock nut
- **A 3** 40-210 bar, spindle+lock nut
- **A 4** 70-350 bar, spindle+lock nut

**Compensator option**

- **16** cm³/rev
- **20** cm³/rev
- **23** cm³/rev
- **32** cm³/rev
- **40** cm³/rev
- **46** cm³/rev

**Horse power compensator**

<table>
<thead>
<tr>
<th>Displacement</th>
<th>Code</th>
<th>Compensation option</th>
<th>Horse Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td></td>
<td></td>
<td>3 KW</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td>4 KW</td>
</tr>
<tr>
<td>23</td>
<td></td>
<td></td>
<td>5.5 KW</td>
</tr>
<tr>
<td>32</td>
<td></td>
<td></td>
<td>7.5 KW</td>
</tr>
<tr>
<td>40</td>
<td></td>
<td></td>
<td>11 KW</td>
</tr>
<tr>
<td>46</td>
<td></td>
<td></td>
<td>15 KW</td>
</tr>
<tr>
<td>46</td>
<td></td>
<td></td>
<td>18.5 KW</td>
</tr>
<tr>
<td>46</td>
<td></td>
<td></td>
<td>22 KW</td>
</tr>
</tbody>
</table>

**Thru drive & 2nd pump code**

<table>
<thead>
<tr>
<th>Code</th>
<th>Port</th>
<th>Threads</th>
</tr>
</thead>
<tbody>
<tr>
<td>*1</td>
<td>BSPP</td>
<td>Metric</td>
</tr>
<tr>
<td>*2</td>
<td>PT/RC</td>
<td>Pipe taps</td>
</tr>
<tr>
<td>3</td>
<td>UNF</td>
<td>UNC</td>
</tr>
<tr>
<td>4</td>
<td>NPT</td>
<td>Inch</td>
</tr>
<tr>
<td>7</td>
<td>ISO 6149</td>
<td></td>
</tr>
</tbody>
</table>

**Code & shaft**

- **M** Metric ISO3019/2 Cylindric, key
- **K** Metric ISO3019/2 Splined, DIN5480
- **N** Inch ISO3019/1 Cylindric, key
- **D** Inch ISO3019/1 Splined, SAE

**Thru drive option**

- **A** Single pump
- **B** Prepared for thru drive
- **C** With adaptor for 2nd pump

**Horse power**

- **A** 3 KW
- **B** 4 KW
- **C** 5.5 KW
- **D** 7.5 KW
- **E** 11 KW
- **F** 15 KW
- **G** 18.5 KW
- **H** 22 KW

**Other pump are acceptable order**

**Code & material**

- **None** Standard
- **V** FPM
- **E** Ethylen - propylen

---

Via M.L. King, 6 - 41100 MODENA (ITALY)
Tel: +39 059 415 711
Fax: +39 059 415 729 / 059 415 730
INTERNET: http://www.hansatmp.it
E-MAIL: hansatmp@hansatmp.it
Horse power compensators, diagrams
Characteristic Curves, horse power compensators

The diagrams shown are only valid for the following working conditions:

- speed : \( n = 1500 \text{ rev/min} \)
- temperature : \( t = 50 ^\circ \text{C} \)
- fluid : mineral oil HLP, ISO VG46
- viscosity : \( \nu = 46 \text{ mm}^2/\text{s at 40} ^\circ \text{C} \)
PV16-PV23

Efficiency and case drain flows
PV16, PV20, PV23
The efficiency and power graphs are measured at an input speed of n=1500 min⁻¹, a temperature of 50°C and a fluid viscosity of 30 mm²/S.

Case drain flow and compensator control flow leave via the drain port of the pump. To the values shown are to be added 1 to 1.2 l/min, if at pilot operated compensators (code G*, H* horse power compensator and p/Q-control) the control flow of the pressure pilot valve also goes through the pump.

Please note: The values shown below are only valid for Static operation. Under dynamic conditions and at rapid compensation of the pump the volume displaced by the servopiston also leaves the case drain port.

This dynamic control flow can reach up to 60 l/min! Therefore the case drain line is to lead to the reservoir at full size and without restrictions as short and direct as possible.

Case drain flows
PV16-PV23

Efficiency and power consumption
PV16, PV20, PV23

Noise Levels
PV16-PV23

Efficiency and case drain flows
PV16, PV20, PV23

Via M.L. King, 6 - 41100 MODENA (ITALY)
Tel: +39  059 415 711
Fax: +39  059 415 729 / 059 415 730
INTERNET: http://www.hansatmp.it
E-MAIL: hansatmp@hansatmp.it
PV Axial Piston Pump

Dimensions

PV 16 - 23, metric version

The pump shown above has mounting option M* and thru drive option B (prepared for thru drive).

Mounting option K
Splined shaft W 25 x 1.5 x 15 x 8f DIN 5480

Hansa TMP srl
Via M.L. King, 6 - 41100 MODENA (ITALY)
Tel: +39 059 415 711
Fax: +39 059 415 729 / 059 415 730
INTERNET: http://www.hansatmp.it
E-MAIL: hansatmp@hansatmp.it
PV Axial Piston Pump

Dimensions

PV 16 - 23, SAE version and thru drive

Shown above is mounting option M

mounting option D
splined shaft 13T 16/32 DP, flat root, side fit
ANSI B92.1

pump with thru drive
drive output:
splined shaft
13T 16/32 DP,
flat root, side fit
ANSI B92.1

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>63</td>
<td>10</td>
<td>85</td>
<td>-</td>
<td>M6</td>
<td>100</td>
<td>M6</td>
</tr>
<tr>
<td>80</td>
<td>10</td>
<td>103</td>
<td>-</td>
<td>M6</td>
<td>109</td>
<td>M10</td>
</tr>
<tr>
<td>100</td>
<td>10</td>
<td>125</td>
<td>-</td>
<td>M10</td>
<td>n. avail</td>
<td>n. avail</td>
</tr>
<tr>
<td>50.8</td>
<td>10</td>
<td>-</td>
<td>-</td>
<td>M8</td>
<td>82</td>
<td>M8</td>
</tr>
<tr>
<td>82.55</td>
<td>10</td>
<td>-</td>
<td>-</td>
<td>106</td>
<td>M10</td>
<td></td>
</tr>
<tr>
<td>101.8</td>
<td>10.5</td>
<td>80.8</td>
<td>M10</td>
<td>n. avail</td>
<td>n. avail</td>
<td></td>
</tr>
</tbody>
</table>

Dimension H and available couplings
At threads options 3 and 7
the dimensions E and G are
UNC - 2B threads.
PV Axial Piston Pump

**PV32-PV46**

**Noise Levels**

PV32-PV46

![Sound level graph](image)

Efficiency and case drain flows
PV32, PV40, PV46

The efficiency and power graphs are measured at an input Speed of $n=1500\,\text{min}^{-1}$, a temperature of 50°C and a fluid Viscosity of 30 mm²/s.

Case drain flow and compensator control flow leave via the drain port of the pump. To the values shown are to be added 1 to 1.2 l/min, if at pilot operated compensators (code G*, H* horse power compensator and p/Q-control) the control flow of the pressure pilot valve also goes through the pump.

Please note: The values shown below are only valid for Static operation. Under dynamic conditions and at rapid compensation of the pump the volume displaced by the servo piston also leaves the case drain port.

This dynamic control flow can reach up to 60 l/min! Therefore the case drain line is to lead to the reservoir at full size and without restrictions as short and direct as possible.

**Case drain flows**

PV32-PV46
Dimensions

PV32-46, metric version

View X

Shown with standard pressure compensator

flushing port L3; G 1/2
optional M 22 x 1.5 (threads options 7)
or 7/8 - 14 UNF (threads option 3)

The pump shown above has mounting option M* and thru drive option B (prepared for thru drive)

mounting option K
splined shaft
W 32 x 1.5 x 20 x 8f DIN 5480

HANSA · TMP srl
Via M.L. King, 6 - 41100 MODENA (ITALY)
Tel: +39 059 415 711
Fax: +39 059 415 729 / 059 415 730
INTERNET: http://www.hansatmp.it
E-MAIL: hansatmp@hansatmp.it
PV Axial Piston Pump

Dimensions
PV32 - 46, SAE version and thru drive version

- Dimensions
- Contact information: Via M.L. King, 6 - 41100 MODENA (ITALY)
  Tel: +39 059 415 711
  Fax: +39 059 415 729 / 059 415 730
  INTERNET: http://www.hansatmp.it
  E-MAIL: hansatmp@hansatmp.it

- Thru shaft adaptors are available with the following dimensions:

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>K</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>63</td>
<td>8.5</td>
<td>85</td>
<td>-</td>
<td>M8</td>
<td>100</td>
<td>M8</td>
<td>49</td>
<td>261</td>
</tr>
<tr>
<td>40</td>
<td>8.5</td>
<td>103</td>
<td>-</td>
<td>M8</td>
<td>100</td>
<td>M10</td>
<td>49</td>
<td>261</td>
</tr>
<tr>
<td>100</td>
<td>10.5</td>
<td>125</td>
<td>-</td>
<td>M10</td>
<td>140</td>
<td>M18</td>
<td>49</td>
<td>261</td>
</tr>
<tr>
<td>125</td>
<td>12</td>
<td>160</td>
<td>-</td>
<td>M12</td>
<td>n.avail</td>
<td>n.avail</td>
<td>49</td>
<td>261</td>
</tr>
<tr>
<td>82.65</td>
<td>6</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>106</td>
<td>M10</td>
<td>49</td>
<td>261</td>
</tr>
<tr>
<td>101.6</td>
<td>11</td>
<td>-</td>
<td>89.8</td>
<td>M10</td>
<td>146</td>
<td>M12</td>
<td>49</td>
<td>261</td>
</tr>
<tr>
<td>127</td>
<td>13.5</td>
<td>-</td>
<td>114.5</td>
<td>M12</td>
<td>n.avail</td>
<td>n.avail</td>
<td>64</td>
<td>216</td>
</tr>
</tbody>
</table>

- Dimension H and available couplings
  At threads options 3 and 7
  the dimensions E and G are UNC - 2B threads.

- Diagrams showing mounting options and pump with thru drive.
Compensators

All control ports C1/4
optional M 12 x 1.5
(threads optional)
or 7/16-20 UNF (threads option 3)

2 x M5 - 10deep
optional Tc-32 LNC
(threads option 3 and 7)
Interface NG6

2 x M5 - 10 deep
in
pump body (see note above)

pressure pilot port Pp (code GT)
load-sensing-port Pr (code HL)

Remote pressure compensator, code GT
load-sensing compensator, code HL

load-sensing-port Pr (code HM)
(plugged for code GM)

Remote pressure compensator
with NG6 interface, code GM
load-sensing compensator
with NG6 interface, code HM

2-valve-compensator, code HJ

Proportional p/Q-compensator, code FR
(for code FV lower valve only
without top side valve interface)

round connector
M 12 x 1
5 pins

Valve for prop. compensator

Pilot valve for horse power compensator

PV  Axial Piston Pump

Via M.L. King, 6 - 41100 MODENA (ITALY)
Tel: +39 059 415 711
Fax: +39 059 415 729 / 059 415 730
INTERNET: http://www.hansatmp.it
E-MAIL: hansatmp@hansatmp.it
PV  Axial Piston Pump

Dimensions
Pump combination PV/PV  PV/PM

![Diagram of PV Axial Piston Pump]

<table>
<thead>
<tr>
<th>Main pump</th>
<th>Second pump</th>
<th>Interface main pump</th>
<th>L</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>H</th>
<th>K</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV16, 20 or 23</td>
<td>PV16, 20 or 23</td>
<td>100 B4 HW</td>
<td>489</td>
<td>196</td>
<td>170.5</td>
<td>225</td>
<td>220</td>
<td>225</td>
<td>212</td>
</tr>
<tr>
<td>PV32, 40 or 46</td>
<td>PV16, 20 or 23</td>
<td>100 B4 HW</td>
<td>541</td>
<td>208</td>
<td>197</td>
<td>235.5</td>
<td>245</td>
<td>261</td>
<td>212</td>
</tr>
<tr>
<td>PV32, 40 or 46</td>
<td>PV32, 40 or 46</td>
<td>125 B4 HW</td>
<td>574</td>
<td>208</td>
<td>197</td>
<td>261</td>
<td>245</td>
<td>261</td>
<td>245</td>
</tr>
</tbody>
</table>

Pump with thru drive

The drawing displays the mounting possibilities for Hansa-Tmp pumps. Most other pump models with standard metric or SAE interface dimensions can be mounted.
PV  Axial Piston Pump

Thru drive, shaft load limitations
The max. transferable torque in Nm for the different shafts options are:

<table>
<thead>
<tr>
<th>Shaft code</th>
<th>PV16-23</th>
<th>PV32-46</th>
</tr>
</thead>
<tbody>
<tr>
<td>M*</td>
<td>300</td>
<td>550</td>
</tr>
<tr>
<td>K</td>
<td>300</td>
<td>610</td>
</tr>
<tr>
<td>N</td>
<td>300</td>
<td>570</td>
</tr>
<tr>
<td>D</td>
<td>405</td>
<td>675</td>
</tr>
</tbody>
</table>

Important notice
The max. allowable torque of the individual shaft most not be exceeded. For 2-pump combinations there is no problem because PV series offers 100% thru torque. For 3-pump combinations (and more) the limit torque could be reached or exceeded. Therefore it is necessary to calculate the torque factor and compare it with the allowed torque limit factor in the table.

<table>
<thead>
<tr>
<th>Pump</th>
<th>shaft</th>
<th>Torque limit factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV16-PV23</td>
<td>*M</td>
<td>17700</td>
</tr>
<tr>
<td></td>
<td>K</td>
<td>17700</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>17700</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>20130</td>
</tr>
<tr>
<td>PV32-PV46</td>
<td>*M</td>
<td>32680</td>
</tr>
<tr>
<td></td>
<td>K</td>
<td>36380</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>33810</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>40250</td>
</tr>
</tbody>
</table>

Require: calculated torque factor < torque limit factor

To make the necessary calculations easier and more user friendly it is not required to calculate actual torque requirements in Nm and compare them with the shaft limitations. The table on the right shows limit factors that include material specification, safety factors and conversion factors.

The total torque factor is represented by the sum of the individual torque factors of all pumps in the complete pump combination.

The torque factor of each individual pump is calculated by multiplying max. operating pressure p of the pump (in bar) with the max. displacement Vg of the pump (in cm³/rev)

Total torque factor of the combination = sum of individual torque factors of all pumps

Torque factor of any pump = p × Vg (pressure in bar × displacement in cm³/rev)
GENERAL INSTALLATION INFORMATION

Fluid recommendations

Premium quality hydraulic mineral oil fluids are recommended, like H-LP oils to DIN 51524, part 2. The viscosity range should be 25 to 50 mm²/s (cSt) at 50°C. Operating temperatures -10 to +70°C. For other fluids such as phosphoric acid esters or for other operating conditions consult Hansa-Tmp for assistance.

Seals

NBR (Nitrile) seals are used for operation with hydraulic fluids based on mineral oil. For synthetic fluids, as perhaps phosphoric acid esters, Fluorocarbon seals are required. Consult Hansa-Tmp for assistance.

Filtration

For maximum pump and system component functionality and life, the system should be protected from contamination by effective filtration.

Fluid cleanliness should be in accordance with ISO classification ISO 4406. The quality of filter elements should be in accordance with ISO standards.

Minimum requirement for filtration rate × (mm):

General hydraulic systems for satisfactory operation:
Class 19/15, to ISO 4406
\[ X = 25 \, \mu \text{m} \ (\beta_{25} \geq 75) \] to ISO 4572

Hydraulic systems with maximized component life and functionality:
Class 16/13, to ISO 4406
\[ X = 10 \, \mu \text{m} \ (\beta_{10} \geq 75) \] to ISO 4572

It is recommended to use return line or pressure filters. Hansa-Tmp Filter Division offers a wide range of these filters for all common applications and mounting styles. The use of suction filters should be avoided, specially with fast response pumps.

Bypass filtration is a good choice for best filter efficiency.

Installation and mounting

Horizontal mounting:
Outlet port side or top. Inlet port side or bottom, drain port always uppermost.

Vertical mounting: Shaft pointing upwards.

Install pump and suction line in such a way that the maximum inlet vacuum never exceeds 0.8 bar absolute. The inlet line should be as short and as straight as possible. A short suction line cut to 45° is recommended when the pump is mounted inside the reservoir, to improve the inlet conditions. All connections to be leak-free, as air in the suction line will cause cavitations, noise, and damage to the pump.
Shaft rotation and alignment
Pump and motor shafts must be aligned within 0.25mm T. I. R. maximum. A floating coupling must be used. Bell housings and couplings can be ordered at manufacturers listed in this catalogue. Please follow the coupling manufacturer’s installation instructions. Consult Hansa-Tmp for assistance on radial load type drives.

Start up
Prior to start up, the pump case must be filled with hydraulic fluid (use case drain port). Initial start up should be at zero pressure with an open circuit to enable the pump to prime. Pressure should only be increased once the pump has been fully primed.
Attention: Check motor rotation direction.

Operating noise of pumps
The normal operating noise of a pump and consequently the operating noise of the entire hydraulic system is largely determined by where and how the pump is mounted and how it is connected to the down stream hydraulic system. Also size, style and installation of the hydraulic tubing have a major influence on the overall noise emitted by a hydraulic system.

Noise reduction measures
Flexible elements help to prevent pump body vibration being transmitted to other construction elements, where possible amplification may occur. Such elements can be:
Bell housing with elastic dampening flange with vulcanized labyrinth (1) Floating and flexible coupling (2) Damping rails (3) or silent blocks for mounting the electric motor or the foot mounting flange (4) Flexible tube connections (compensators) or hoses on inlet, outlet and drain port of the pump. (5) Exclusive use of gas tight tube fittings for inlet connections to avoid ingestion of air causing cavitations and excessive noise.

Drain line
The drain line must lead directly to the reservoir without restriction. The drain line must not be connected to any other return line. The end of the drain line must be below the lowest fluid level in the reservoir and as far away as possible from the pump inlet line. This ensures that the pump does not empty itself when not in operation and that hot ariated oil will not be recirculated.
For the same reason, when the pump is mounted inside the reservoir, the drain line should be arranged in such a way that a siphon is created. This ensures that the pump is always filled with fluid. The drain pressure must not exceed 1 bar. Drain line length should not exceed 2 meters. Minimum diameter should be selected according to the port size and a straight low pressure fitting with maximized bore should be used.

<table>
<thead>
<tr>
<th>Size of pipe joints</th>
<th>PV16, PV20, PV23</th>
<th>PV32, PV40, PV46</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.D. of pipes</td>
<td>3/8 (ϕ 8.5 or more)</td>
<td>1/2 (ϕ 12 or more)</td>
</tr>
<tr>
<td>Length of drain piping</td>
<td>Under 1m</td>
<td>Under 1m</td>
</tr>
<tr>
<td>Agent</td>
<td>PV16, PV20, PV23</td>
<td>PV32, PV40, PV46</td>
</tr>
</tbody>
</table>

PV Axial Piston Pump