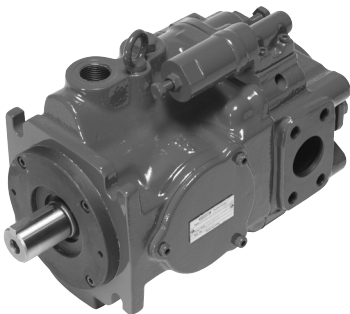


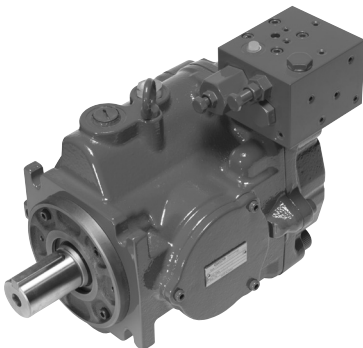
## Variable Displacement Axial Piston Pumps:

### Installation Manual



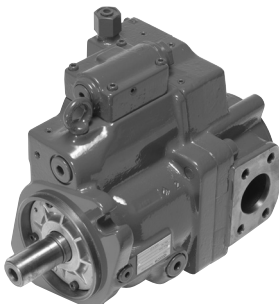
#### MEDIUM HEAVY DUTY SERIES

PPV100S16  
PPV100S37  
PPV100S56  
PPV100S71  
PPV100S100  
PPV100S145  
PPV100S180



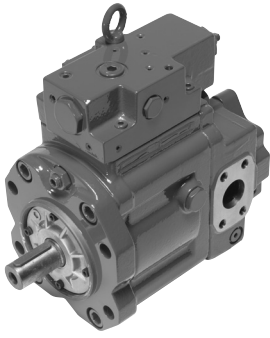
#### MEDIUM HEAVY DUTY SERIES

PPV100-16  
PPV100-37  
PPV100-56  
PPV100-71  
PPV100-100  
PPV100-145  
PPV100-180



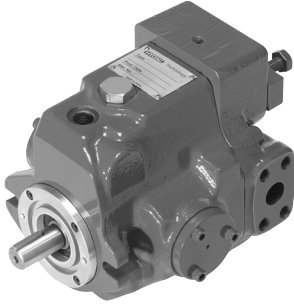
#### MEDIUM HEAVY DUTY SERIES

PPV101-45  
PPV101-80  
PPV101-112  
PPV101-140  
PPV101-200



## HEAVY DUTY SERIES

PPV102-63  
PPV102-112  
PPV102-180  
PPV102-280  
PPV102-360  
PPV102-560



## LIGHT DUTY SERIES

PPV103-10  
PPV103-16  
PPV103-22  
PPV103-37  
PPV103-56  
PPV103-70  
PPV103-90  
PPV103-145



To prevent serious accidents, equipment damage, and other property damage, please observe the following precautions, as well as all related regulations regarding safety.

Before using the product, make sure you read and understand all the instructions in the Operator's Manual entirely.

In this catalogue, safety precautions are classified under three headings:

**DANGER, WARNING, and CAUTION.**

These words are defined as follows:



**DANGER**

Indicates an imminent danger that is very likely to cause death or severe injury unless the situation is avoided.



**WARNING**

Indicates a potential danger that may cause death or severe injury unless the situation is avoided.



**CAUTION**

Indicates a potential danger that may cause a minor or moderate injury or that may result in property damage.



**INFORMATION**

Indicates useful hints and system tips. They are necessary for correct installation and safe use of the product.

## PRECAUTIONS FOR USE



**CAUTION**

1. To avoid possible injury when handling the products, wear protective safety equipment in accordance with the instructions in the Operator's Manual.



**CAUTION**

2. Failure to support the weight of the product or lifting the product with improper posture may result in injury to the hands or back. Be sure to follow the instructions in the Operator's Manual.



**CAUTION**

3. Do not climb on, strike, drop or exert unnecessary force on the product. This may lead to injury or fire due to incorrect operation, damage, or oil leakage.



**CAUTION**

4. Oil on the product or floor must be cleaned up thoroughly. Oil could cause you to drop the product or slip on the floor.

## PRECAUTIONS FOR INSTALLATION, REMOVAL, AND MAINTENANCE



**WARNING**

1. All installation, removal, maintenance, piping or wiring work should be carried out by properly trained personnel.



**WARNING**

2. Before beginning any installation, removal, maintenance, piping or wiring work, the following procedures must be carried out. Failure to carry out these procedures may cause the equipment to move suddenly or oil to spill during the work, which may result in serious accidents.

- Shut off the power supply to the equipment and make sure that all the electrical motors or machines cannot restart unintentionally.
- Secure the cylinder rods before installing/removing the cylinder.
- Reduce the pressure in the pipes and cylinders in the hydraulic system to zero pressure.



**WARNING**

3. Before working on any electrical wiring, be sure to shut off the power supply. Failure to do this may cause an electric shock.



**CAUTION**

4. Keep all installation holes and surfaces clean. Failure to do this may cause insufficient tightening of the bolts which may lead to a fire due to oil leakage.



**CAUTION**

5. Before commissioning the device, make sure that all bolts are tightened to the specified torque. Failure to do so may result in incorrect operation, damage, oil leakage, etc.

## PRECAUTIONS FOR OPERATION



### DANGER

1. Never operate any device in an environment where there is danger of explosion or fire, unless the device is fully protected. This may lead to major and serious accidents including explosion or fire.



### WARNING

2. Do not approach the pumps or motors when in operation. Hands or clothes can be caught up and wound into the pumps and motors which can lead to serious injury.



### WARNING

3. In event of abnormal operation (unusual sounds, oil leakage, smoke, etc.), immediately stop operation and take appropriate corrective measures.



### WARNING

4. Completely discharge air from the cylinder at low pressure. Failure to do so may result in unexpected movement of the cylinder, which in turn may cause injury.



### WARNING

5. To adjust the damping, gradually increase the cylinder speed from a low speed (50 mm/s or less). Rapidly accelerating the cylinder may produce an abnormal pressure surge, resulting in damage to the cylinder or the machinery and causing a serious accident.



### WARNING

6. Before operating this device for the first time, check that hydraulic and electrical circuits are properly connected and that adjoining surfaces are tightly aligned.



### WARNING

7. Do not use the product outside of the specifications described in the catalogue, related data sheets, drawings, etc. Failure to adhere to them may cause incorrect operation, damage or injury.



### WARNING

8. During operation, high temperatures may occur in the hydraulic system or solenoid valves. Protective gloves and suits must be worn when in the vicinity of these devices.



### WARNING

9. Always operate the device with clean oil, and within established ranges for temperature, viscosity and cleanliness. Failure to adhere to specified limits may result in incorrect operation or fire due to oil leakage.

## GENERAL PRECAUTIONS



### WARNING

1. Never modify the equipment. If any alterations are made, unexpected machine movement may cause injury.



### CAUTION

2. Do not disassemble the products without prior consent of the manufacturer. Failure to adhere to this can cause the products to operate incorrectly which can lead to accidents or damage.



### CAUTION

3. For transportation / storage of the product, pay attention to environmental conditions, such as ambient temperature and humidity, and implement anti-dust / anti-corrosion measures.



### CAUTION

4. The seals may need to be replaced if the product is used after long-term storage.



### CAUTION

5. Read the manual thoroughly and ensure that the seals are replaced properly.

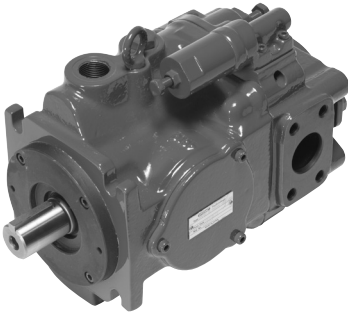
## RELATED REGULATIONS



### CAUTION

To ensure that this product is used in a safe manner, it is essential to observe the above precautions, as well as all related regulations regarding safety.

## MEDIUM HEAVY DUTY SERIES



### Technical specifications

Series	Geometric displacement [cm <sup>3</sup> /rev]	Operating pressure		Drive speed [rpm]
		Rated [bar]	Peak [bar]	
PPV100S16	16.3	315	350	3600
PPV100S37	37.1			2700
PPV100S56	56.3			2500
PPV100S71	70.7			2300
PPV100S100	100.5			2100
PPV100S145	145.2			1800
PPV100S180	180.7			1800

### Documentation

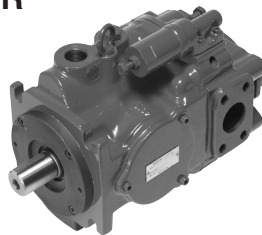
Check the product's model code and compare it with your paper work.

Delivery note and / or sales acknowledgement.

### Direction of rotation

Check the direction of rotation of the shaft and compare it to the drive unit.

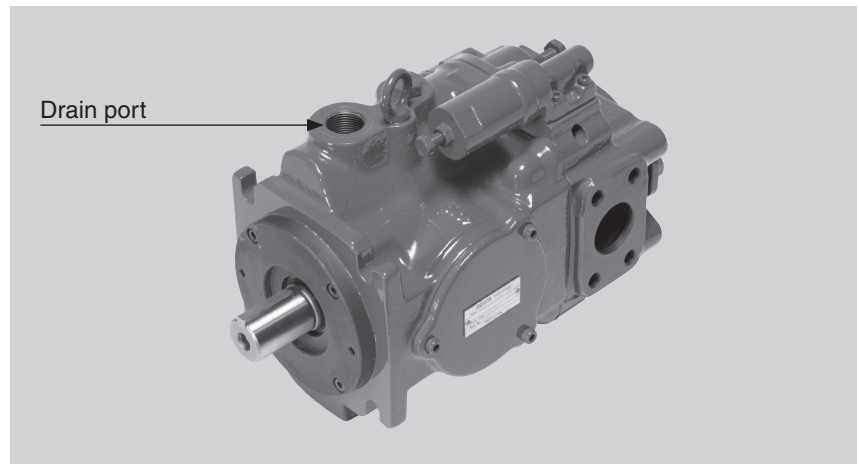
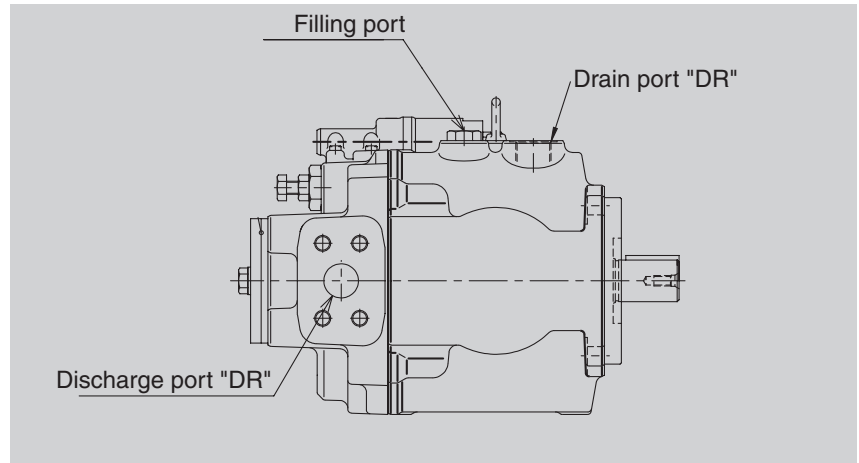
**R**



Clockwise shaft rotation.  
Viewed from (front) end of shaft.

## Ports

Suction, discharge, drain and filling ports



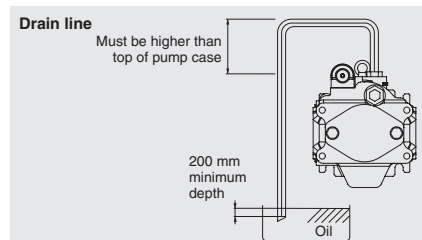
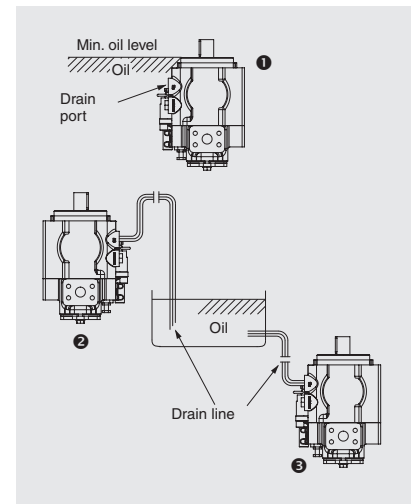
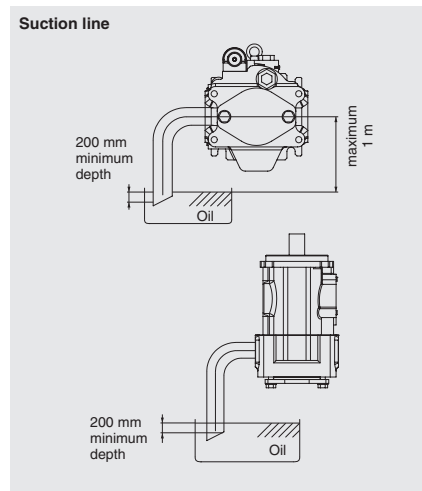
Minimum pump suction pressure under static and dynamic load:

$$p_{in\ Min} = 0.833 \text{ bar absolute}$$

Maximum pump inlet pressure:

$$p_{in\ Max} = 1.500 \text{ bar absolute}$$

## Pump arrangement



## Piping



### Drain line

Do not combine drain lines.  
Always run drain lines separately, not longer than 1 m and the pipe end must be immersed in oil.

Do not restrict drain lines.  
A restricted drain line (cooler, filter, valve etc.) can damage the pump.

Do not reduce drain line internal diameter.  
The drain line internal diameter must always correspond to the drain hole size on the pump case.



### Suction line

Do not restrict suction lines.  
A restricted suction line (filter, valve etc.) can generate excessive noise and damage the pump.

Do not reduce the suction line internal diameter.  
The suction line internal diameter must always correspond to the flange size on the pump case.



### General

Use rubber hoses to reduce noise and excessive load on the pump.  
Use high pressure hoses and pipes only at the outlet (discharge port) of the pump.

## Commissioning



Prior to commissioning, the pump case must be filled with hydraulic fluid (use filling port). Initial commissioning 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.

## Hydraulic fluid



- Normal mineral oil (H, HL)
- Premium hydraulic fluid (HLP)
- Phosphate ester (HFD-R)
- Polyolester (HEES, HFD-U)
- Water glycol (HFC)

### Note:

For operating restrictions, please contact HYDAC.

## Filtration



For maximum pump and system component life time, the system should be protected from contamination by effective filtration.  
Cleanliness class to NAS 1638 Class 10 (21/19/16 ISO 4406:1999) or cleaner.

## Viscosity and temperature



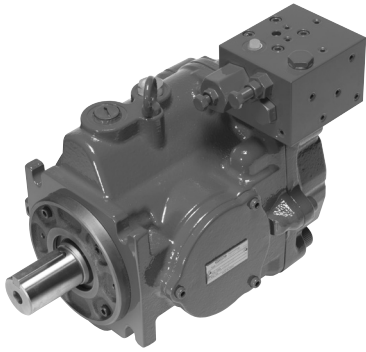
Normal operating viscosity range is 20 – 400 cSt (mm<sup>2</sup>/s).

Normal operating temperature range is -20 to +95 °C.

### Note:

The highest fluid temperature will be at the drain port of the pump, up to 20 °C higher than in the reservoir.





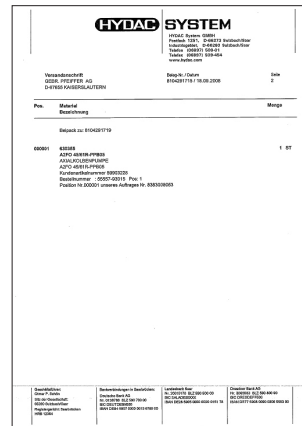
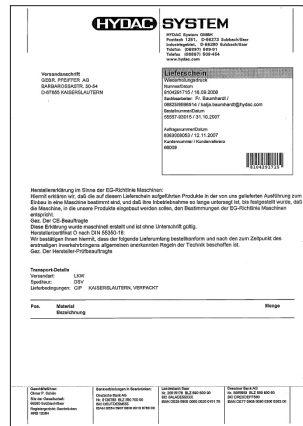
## MEDIUM HEAVY DUTY SERIES

### Technical specifications

Series	Geometric displacement [cm <sup>3</sup> /rev]	Operating pressure		Drive speed [rpm]
		Rated [bar]	Peak [bar]	
PPV100-16	16.3	315	350	3600
PPV100-37	37.1			2700
PPV100-56	56.3			2500
PPV100-71	70.7			2300
PPV100-100	100.5			2100
PPV100-145	145.2			1800
PPV100-180	180.7			1800

### Documentation

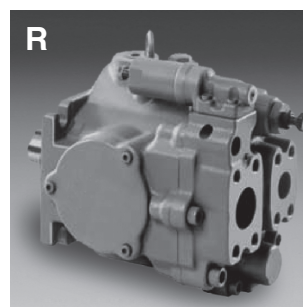
Check the product's model code and compare it with your paper work.



Delivery note and / or sales acknowledgement.

### Direction of rotation

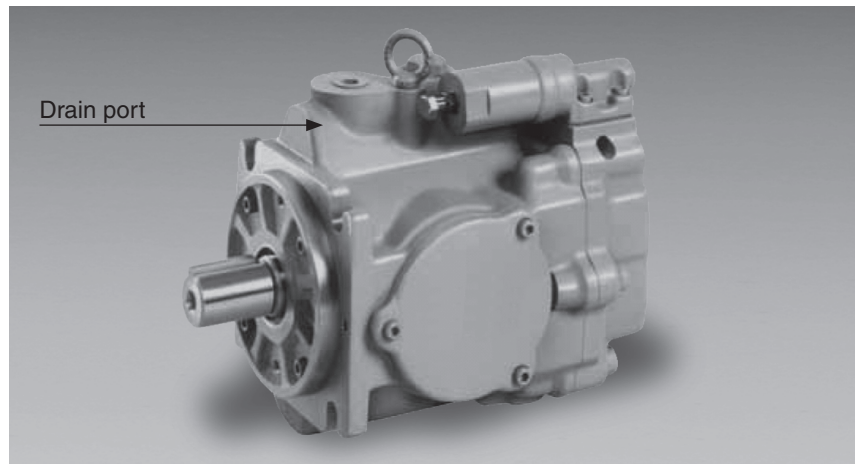
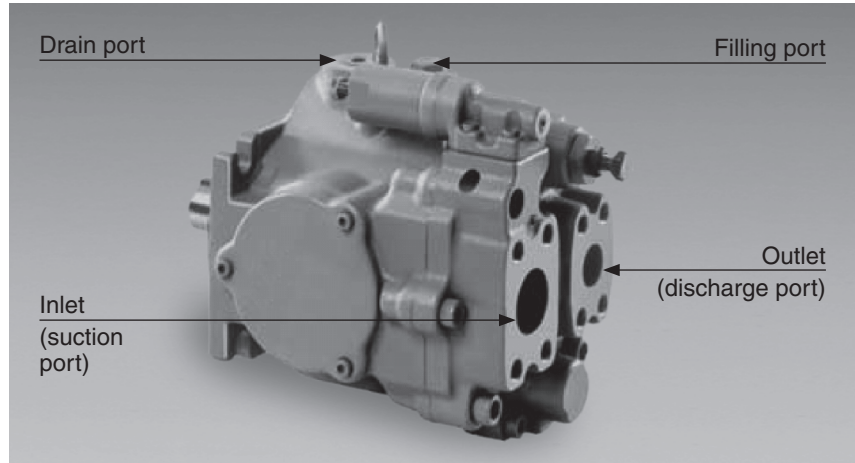
Check the direction of rotation of the shaft and compare it to the drive unit.



Clockwise shaft rotation.  
Viewed from (front) end of shaft.

## Ports

Suction, discharge, drain and filling ports



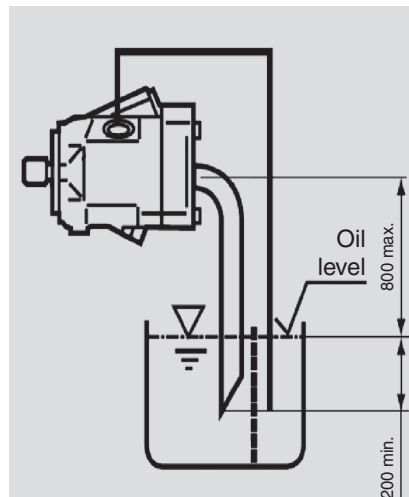
Minimum pump suction pressure under static and dynamic load:

$$p_{in\ Min} = 0.833 \text{ bar absolute}$$

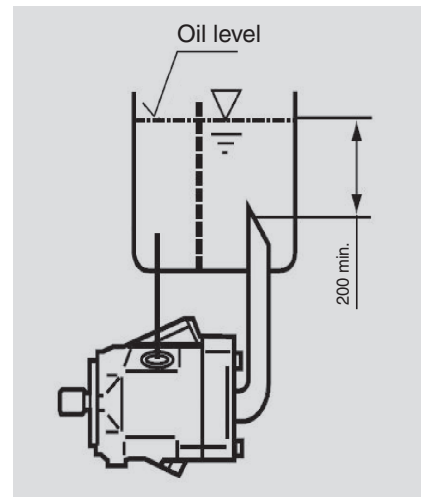
Maximum pump inlet pressure:

$$p_{in\ Max} = 1.500 \text{ bar absolute}$$

## Pump arrangement



Standard arrangement: pump above reservoir.



Preferred arrangement for best suction characteristics and low noise level pump operation. Pump below reservoir.

## Piping



### Drain line

Do not combine drain lines.  
Always run drain lines separately, not longer than 1 m and the pipe end must be immersed in oil.

Do not restrict drain lines.  
A restricted drain line (cooler, filter, valve etc.) can damage the pump.

Do not reduce drain line internal diameter.  
The drain line internal diameter must always correspond to the drain hole size on the pump case.



### Suction line

Do not restrict suction lines.  
A restricted suction line (filter, valve etc.) can generate excessive noise and damage the pump.

Do not reduce the suction line internal diameter.  
The suction line internal diameter must always correspond to the flange size on the pump case.



### General

Use rubber hoses to reduce noise and excessive load on the pump.  
Use high pressure hoses and pipes only at the outlet (discharge port) of the pump.

## Commissioning



Prior to commissioning, the pump case must be filled with hydraulic fluid (use filling port). Initial commissioning 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.

## Hydraulic fluid



- Normal mineral oil (H, HL)
- Premium hydraulic fluid (HLP)
- Phosphate ester (HFD-R)
- Polyolester (HEES, HFD-U)
- Water glycol (HFC)

### Note:

For operating restrictions, please contact HYDAC.

## Filtration



For maximum pump and system component life time, the system should be protected from contamination by effective filtration.  
Cleanliness class to NAS 1638 Class 10 (21/19/16 ISO 4406:1999) or cleaner.

## Viscosity and temperature

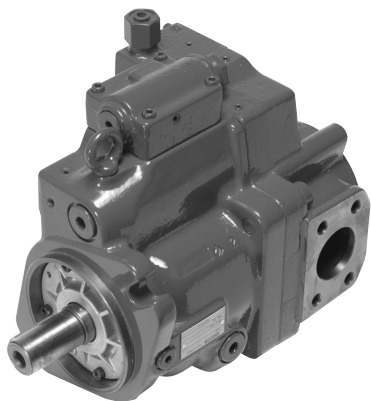


Normal operating viscosity range is 20 – 400 cSt (mm<sup>2</sup>/s).

Normal operating temperature range is -20 to +95 °C.

### Note:

The highest fluid temperature will be at the drain port of the pump, up to 20 °C higher than in the reservoir.



## MEDIUM HEAVY DUTY SERIES

### Technical specifications

Series	Geometric displacement [cm <sup>3</sup> /rev]	Operating pressure		Drive speed [rpm]
		Nominal pressure [bar]	Peak [bar]	
PPV101-45	45.0	320	350	2700
PPV101-80	80.0			2400
PPV101-112	112.0			2200
PPV101-140	140.0			2200
PPV101-200	200.0			1900

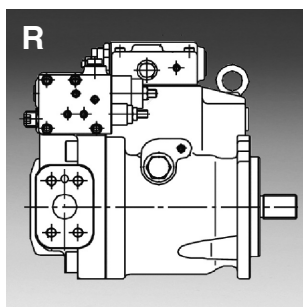
### Documentation

Check the product's model code and compare it with your paper work.

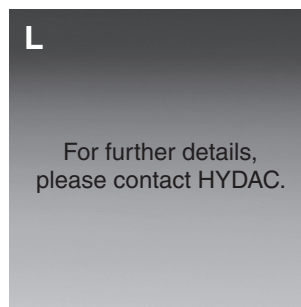
Delivery note and / or sales acknowledgement.

### Direction of rotation

Check the direction of rotation of the shaft and compare it to the drive unit.



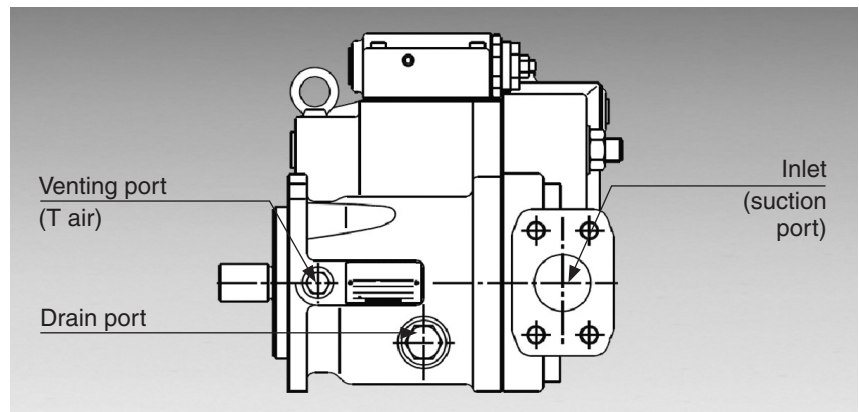
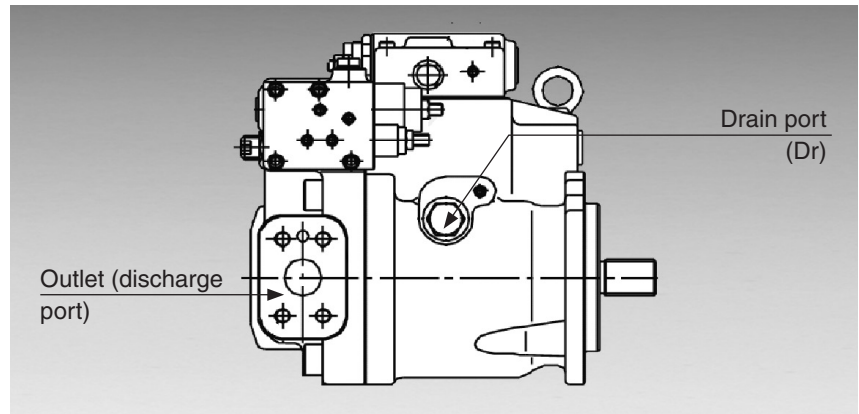
Clockwise shaft rotation.  
Viewed from (front) end of shaft.



Anti-clockwise shaft rotation.  
Viewed from (front) end of shaft.

## Ports

Suction, discharge, drain and venting port



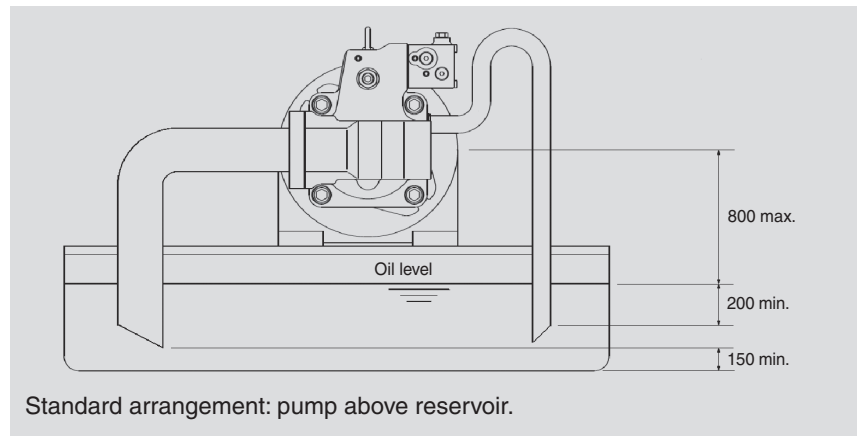
Minimum pump suction pressure under static and dynamic load:

$$p_{in\ Min} = 1.0 \text{ bar absolute}$$

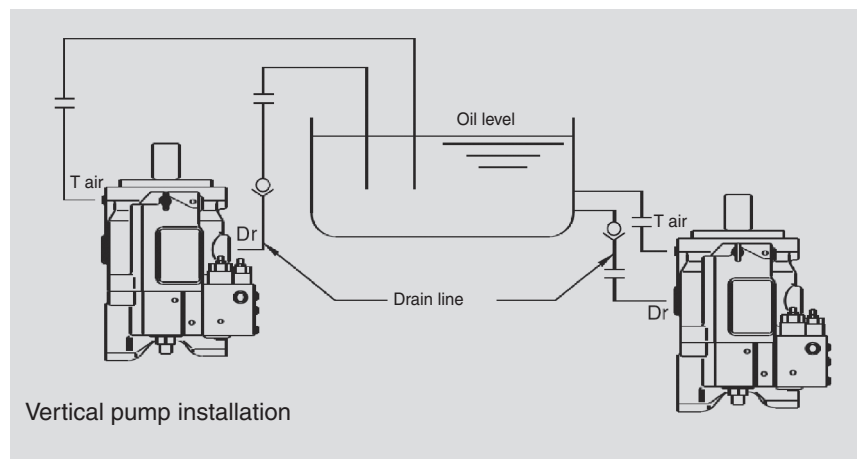
Maximum pump inlet pressure:

$$p_{in\ Max} = 4.5 \text{ bar absolute}$$

## Pump arrangement



Standard arrangement: pump above reservoir.



Vertical pump installation

## Piping



### Drain line

Do not combine drain lines.  
Always run drain lines separately, not longer than 1 m and the pipe end must be immersed in oil.

Do not restrict drain lines.  
A restricted drain line (cooler, filter, valve etc.) can damage the pump.

Do not reduce drain line internal diameter.  
The drain line internal diameter must always correspond to the drain hole size on the pump case.



### Suction line

Do not restrict suction lines.  
A restricted suction line (filter, valve etc.) can generate excessive noise and damage the pump.

Do not reduce the suction line internal diameter.  
The suction line internal diameter must always correspond to the flange size on the pump case.



### General

Use rubber hoses to reduce noise and excessive load on the pump.  
Use high pressure hoses and pipes only at the outlet (discharge port) of the pump.

## Commissioning



Prior to commissioning, the pump case must be filled with hydraulic fluid (use filling port). Initial commissioning 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.

## Hydraulic fluid



- Normal mineral oil (H, HL)
- Premium hydraulic fluid (HLP)

### Note:

For operating restrictions, please contact HYDAC.

## Filtration



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

Cleanliness class to  
NAS 1638 Class 9 (21/18/15 ISO 4406:1999)  
or cleaner.

## Viscosity and temperature

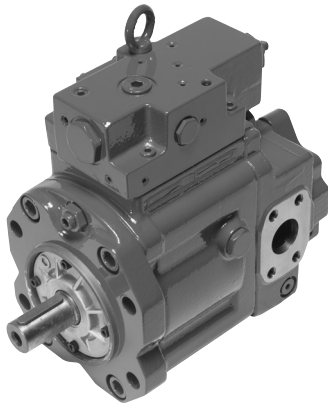


Normal operating viscosity range  
is 10 – 200 cSt (mm<sup>2</sup>/s).

Normal operating temperature range  
is -20 to +95 °C.

### Note:

The highest fluid temperature will be at the drain port of the pump, up to 20 °C higher than in the reservoir.



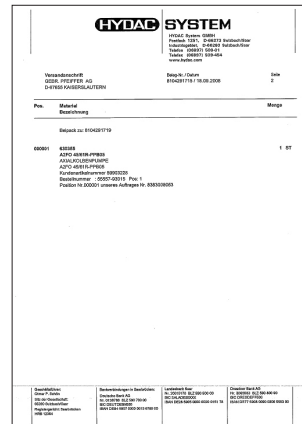
## HEAVY DUTY SERIES

### Technical specifications

Series	Geometric displacement [cm <sup>3</sup> /rev]	Operating pressure		Drive speed [rpm]
		Nominal pressure [bar]	Peak [bar]	
PPV102-63	63.0	350	400	1800
PPV102-112	112.0			1800
PPV102-180	180.0			1800
PPV102-280	280.0			1500
PPV102-360	2x180.0			1800
PPV102-560	2x280.0			1500

### Documentation

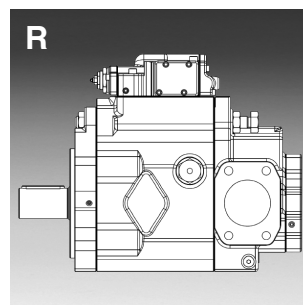
Check the product's model code and compare it with your paper work.



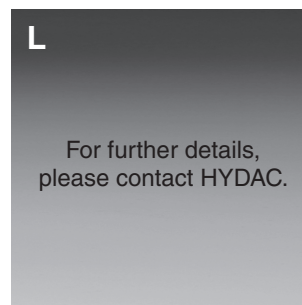
Delivery note and / or sales acknowledgement.

### Direction of rotation

Check the direction of rotation of the shaft and compare it to the drive unit.



Clockwise shaft rotation.  
Viewed from (front) end of shaft.

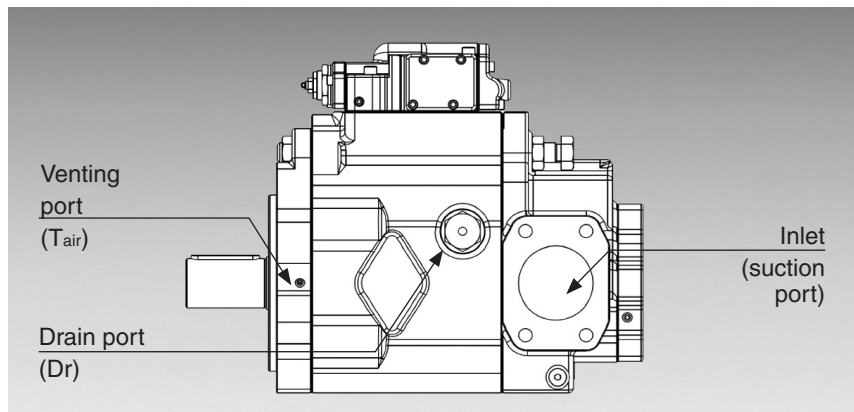
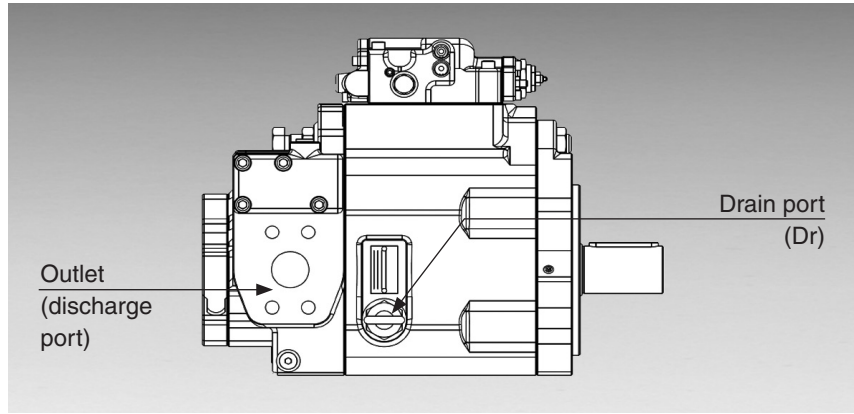


Anti-clockwise shaft rotation.  
Viewed from (front) end of shaft.

For further details, please contact HYDAC.

## Ports

Suction, discharge, drain and venting port



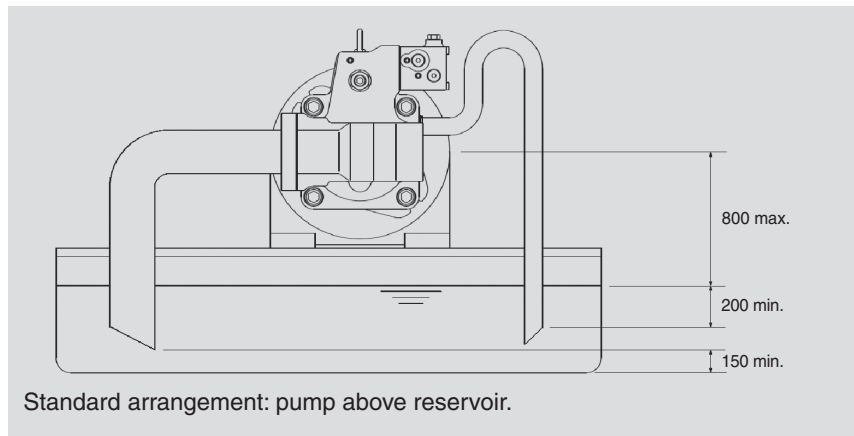
Minimum pump suction pressure  
under static and dynamic load:

$$p_{in\ Min} = 0.9 \text{ bar absolute}$$

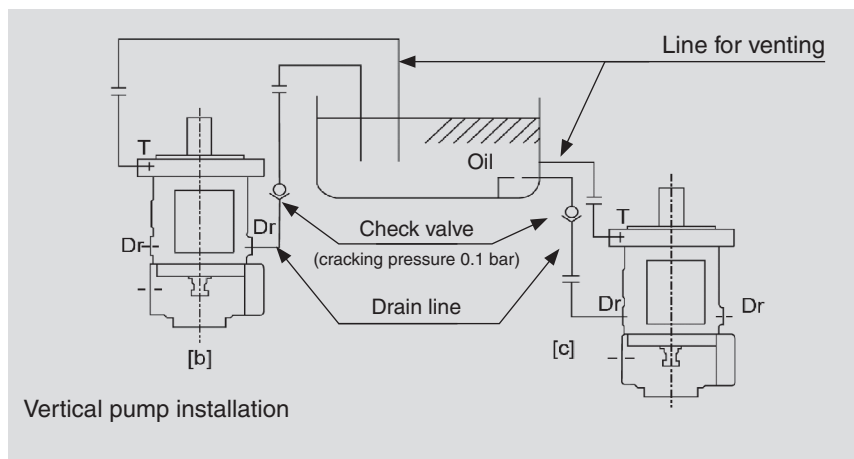
Maximum pump inlet pressure:

$$p_{in\ Max} = 4.5 \text{ bar absolute}$$

## Pump arrangement



Standard arrangement: pump above reservoir.



Vertical pump installation



## Piping



### Drain line

Do not combine drain lines.  
Always run drain lines separately, not longer than 1 m and the pipe end must be immersed in oil.

Do not restrict drain lines.  
A restricted drain line (cooler, filter, valve etc.) can damage the pump.

Do not reduce drain line internal diameter.  
The drain line internal diameter must always correspond to the drain hole size on the pump case.



### Suction line

Do not restrict suction lines.  
A restricted suction line (filter, valve etc.) can generate excessive noise and damage the pump.

Do not reduce the suction line internal diameter.  
The suction line internal diameter must always correspond to the flange size on the pump case.



### General

Use rubber hoses to reduce noise and excessive load on the pump.  
Use high pressure hoses and pipes only at the outlet (discharge port) of the pump.

## Commissioning



Prior to commissioning, the pump case must be filled with hydraulic fluid (use filling port). Initial commissioning 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.

## Hydraulic fluid



- Normal mineral oil (H, HL)
- Premium hydraulic fluid (HLP)

### Note:

For operating restrictions, please contact HYDAC.

## Filtration



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

Cleanliness class to  
NAS 1638 Class 9 (20/18/15 ISO 4406:1999)  
or cleaner.

## Viscosity and temperature

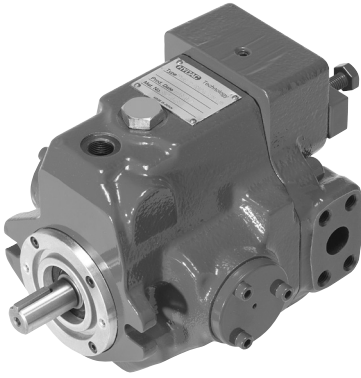


Normal operating viscosity range  
is 10 – 200 cSt (mm<sup>2</sup>/s).

Normal operating temperature range  
is -20 to +95 °C.

### Note:

The highest fluid temperature will be at the drain port of the pump, up to 20 °C higher than in the reservoir.



## LIGHT DUTY SERIES

### Technical specifications

Series	Geometric displacement [cm <sup>3</sup> /rev]	Operating pressure		Drive speed [rpm]
		Nominal pressure [bar]	Peak [bar]	
PPV103-10	10.0	160	210	1800
PPV103-16	15.8			1800
PPV103-22	22.2		160	1800
PPV103-37	36.9		210	1800
PPV103-56	56.2			1800
PPV103-70	70.0	250	250	1800
PPV103-90	91.0			1800
PPV103-145	145.0			1800

### Documentation

Check the product's model code and compare it with your paper work.

**HYDAC SYSTEM**

Verbindungsart:  
DIN 24342, G1/2" x 1.5  
DIN 24342, G1/2" x 1.5

Produkt-Name: 88887-88887  
Partenr-Nr.: 88887-88887  
Teil-Nr.: 88887-88887  
Serien-Nr.: 88887-88887

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Hersteller: HYDAC  
Produktionsort: GERMANY  
Produktionsdatum: 01.12.2017  
Produktionsmenge: 88887-88887

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Bestandteil-Code: 88887-88887  
Produktionscode: 88887-88887

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Technische Details:  
Material: L200  
Lagerung: L200  
Lagerung: L200  
Lagerung: L200

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Part. Material: Menge

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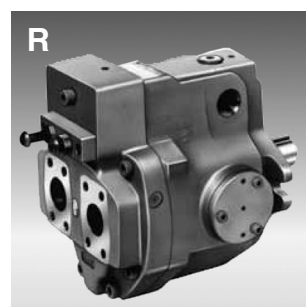
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Part. Material: Menge

Delivery note and / or sales acknowledgement.

### Direction of rotation

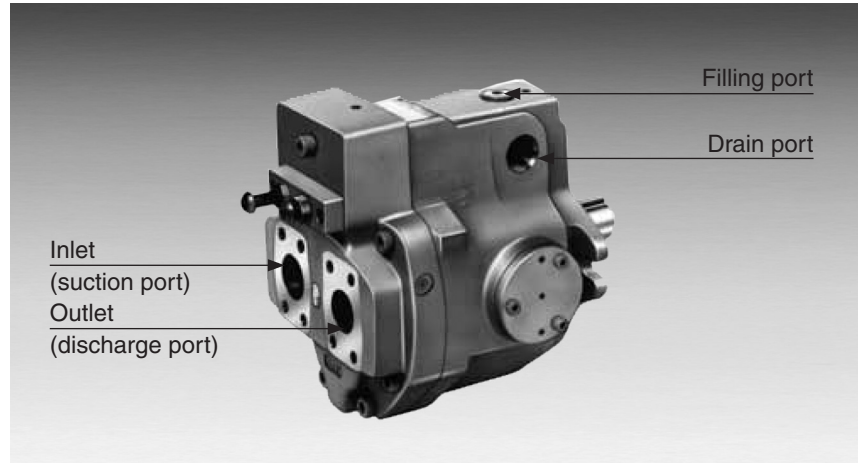
Check the direction of rotation of the shaft and compare it to the drive unit.



Clockwise shaft rotation.  
Viewed from (front) end of shaft.

## Ports

Suction, discharge, drain and filling ports



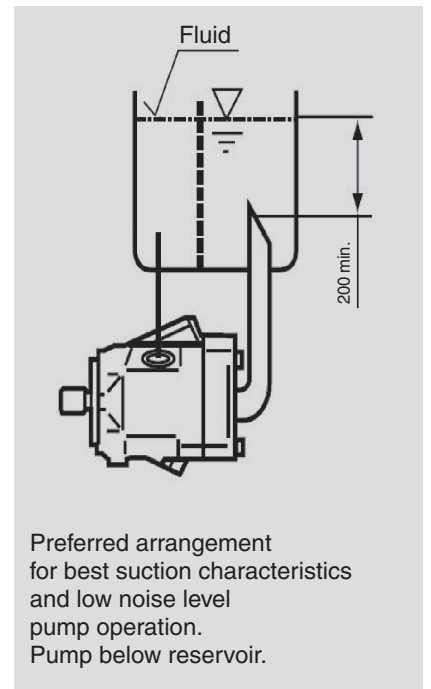
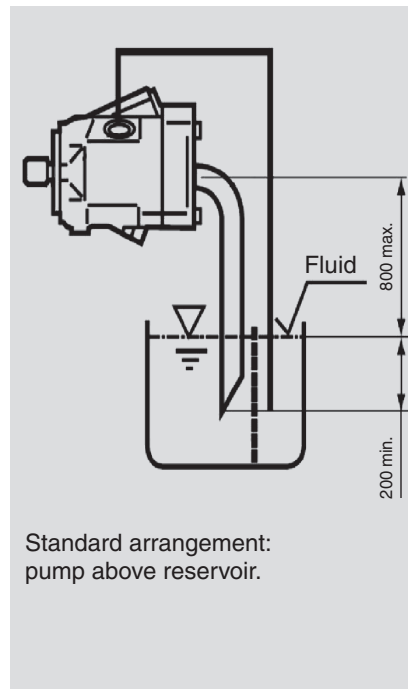
Minimum pump suction pressure under static and dynamic load:

$$p_{in\ Min} = 0.833 \text{ bar absolute}$$

Maximum pump inlet pressure:

$$p_{in\ Max} = 1.500 \text{ bar absolute}$$

## Pump arrangement



## Piping



### Drain line

Do not combine drain lines.  
Always run drain lines separately, not longer than 1 m and the pipe end must be immersed in oil.  
Do not restrict drain lines.  
A restricted drain line (cooler, filter, valve etc.) can damage the pump.  
Do not reduce drain line internal diameter.  
The drain line internal diameter must always correspond to the drain hole size on the pump case.



### Suction line

Do not restrict suction lines.  
A restricted suction line (filter, valve etc.) can generate excessive noise and damage the pump.  
Do not reduce the suction line internal diameter.  
The suction line internal diameter must always correspond to the flange size on the pump case.



### General

Use rubber hoses to reduce noise and excessive load on the pump.  
Use high pressure hoses and pipes only at the outlet (discharge port) of the pump.

## Commissioning



Prior to commissioning, the pump case must be filled with hydraulic fluid (use filling port). Initial commissioning 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.

## Hydraulic fluid



- Normal mineral oil (H, HL)
- Premium hydraulic fluid (HLP)
- Phosphate ester (HFD-R)
- Polyolester (HEES, HFD-U)
- Water glycol (HFC)

### Note:

For operating restrictions, please contact HYDAC.

## Filtration



For maximum pump and system component life time, the system should be protected from contamination by effective filtration.  
Cleanliness class to NAS 1638 Class 10 (21/19/16 ISO 4406:1999) or cleaner.

## Viscosity and temperature



Normal operating viscosity range is 20 – 400 cSt (mm<sup>2</sup>/s).  
Normal operating temperature range is -20 to +95 °C.

### Note:

The highest fluid temperature will be at the drain port of the pump, up to 20 °C higher than in the reservoir.