| HYDAC | INTERNATIONAL   |         |                           |
|-------|---|---------|---------------------------|
|       | Fixed Displacement<br>Vane Pumps  |         |                           |
|       | <b>Installation Manual</b>  |         |                           |
|       | FIXED DISPLACEMENT     PVF100-1-6     PVF100-1-8     PVF100-1-10     PVF100-1-12     PVF100-1-14     PVF100-1-17     PVF100-1-23     PVF100-1-25     PVF100-1-31     PVF100-2-47     PVF100-2-53     PVF100-2-53     PVF100-3-76     PVF100-3-116     PVF100-4-133     PVF100-4-134     PVF100-4-134     PVF100-4-134     PVF100-4-134     PVF100-4-134     PVF100-4-134     PVF100-4-134     PVF100-4-134     PVF100-4-134 |         |                           |
|       | PVF100-4-237<br><b>FIXED DISPLACEMENT – DOUBLE PUMP</b><br>PVF101-12-<br>PVF101-23-<br>PVF101-33-<br>PVF101-24-<br>PVF101-34-   |         | E <b>2.909.M</b> .0/02.14 |
|       |   | (HYDAC) | 287                       |

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.



#### CAUTION

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



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 do so 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 comply with the specifications may result in

incorrect operation, damage, oil leakage, etc.

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# 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 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 improper operation, damage or injury.



#### WARNING

8. During operation, high temperatures in the hydraulic system or solenoid valves may occur. Wear protective gloves and clothing 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 the specified limits may result in incorrect operation or fire due to oil leakage.

# **GENERAL PRECAUTIONS**

#### WARNING

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

# 

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.

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.

#### 

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.

(HYDAC)



# VANE PUMPS FIXED DISPLACEMENT

# Technical specifications

| Cocreation Operating |   |                            |                                     |  |  |  |  |
|----------------------|---|----------------------------|-------------------------------------|--|--|--|--|
| Series               | Geometric<br>displacement<br>[cm <sup>3</sup> /U] | pressure<br>Rated<br>[bar] | Drive speed<br>[min <sup>-1</sup> ] |  |  |  |  |
| PVF100-1-6           | 5.8   |                            | 1800                                |  |  |  |  |
| PVF100-1-8           | 8.0   |                            | 1800                                |  |  |  |  |
| PVF100-1-10          | 9.4   |                            | 1800                                |  |  |  |  |
| PVF100-1-12          | 12.2  |                            | 1800                                |  |  |  |  |
| PVF100-1-14          | 13.7  | 210                        | 1800                                |  |  |  |  |
| PVF100-1-17          | 16.6  |                            | 1800                                |  |  |  |  |
| PVF100-1-19          | 18.6  |                            | 1800                                |  |  |  |  |
| PVF100-1-23          | 22.7  |                            | 1800                                |  |  |  |  |
| PVF100-1-25          | 25.3  |                            | 1800                                |  |  |  |  |
| PVF100-1-31          | 31.0  | 160                        | 1800                                |  |  |  |  |
| PVF100-2-41          | 41.3  |                            | 1800                                |  |  |  |  |
| PVF100-2-47          | 47.2  |                            | 1800                                |  |  |  |  |
| PVF100-2-53          | 52.5  |                            | 1800                                |  |  |  |  |
| PVF100-2-59          | 58.2  | 210                        | 1800                                |  |  |  |  |
| PVF100-2-65          | 64.7  |                            | 1800                                |  |  |  |  |
| PVF100-3-76          | 76.4  |                            | 1800                                |  |  |  |  |
| PVF100-3-94          | 93.6  |                            | 1800                                |  |  |  |  |
| PVF100-3-116         | 115.6   | 160                        | 1800                                |  |  |  |  |
| PVF100-4-136         | 136.0   |                            | 1800                                |  |  |  |  |
| PVF100-4-153         | 153.0   |                            | 1800                                |  |  |  |  |
| PVF100-4-184         | 184.0   | 175                        | 1800                                |  |  |  |  |
| PVF100-4-200         | 201.0   |                            | 1800                                |  |  |  |  |
| PVF100-4-237         | 237.0   |                            | 1800                                |  |  |  |  |

#### Documentation

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

| (HYDAD)  | SYSTEM<br>PSG / Reserve COMMI<br>PSG / Reserve Common<br>PSG / Reserve C  |   |                  |   | HYDAC   | SYSTEM<br>Profession COURT<br>Profession 1281, D-48222 0<br>Industry 1281, D-48220 0<br>Industry 1281, D-48220 0<br>Industry 128275 1280-01<br>Industry 128275 1280-01<br>Industry 128275 1280-01<br>Industry 128275 1280-01 | -   |   |
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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.

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# Ports

Suction and discharge port



| Pump<br>Size    |                      | Suction pressure |                                  |              |  |  |  |
|-----------------|----------------------|------------------|----------------------------------|--------------|--|--|--|
|                 |                      | Mir              | Maximum                          |              |  |  |  |
|                 |                      | Mineral          | Synthetic fluids, aqueous fluids |              |  |  |  |
| PVF100 series   | PVF100-1<br>PVF100-2 | 0.8 bar abs.     | 0.94 bar aba                     | 1.3 bar abs. |  |  |  |
| F VF 100 series | PVF100-3<br>PVF100-4 | 0.8 bar * abs.   | 0.84 bar abs.                    |              |  |  |  |

\* Minimum suction pressure at drive speeds > 1700 rpm: PVF100-3-116: 1 bar abs. PVF100-4-237: 0.87 bar abs.

# Pump arrangement

Standard arrangement: pump above reservoir.



# PIPING

#### 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

- Hydraulic oil based on mineral oil (HL, HLP, ISO VG 32 or 46)
- Synthetic fluids (Phosphate ester, HFD-R, Polyolester, HFD-U, Water glycol, HFC)

#### Note:

For operating restrictions when using special fluids, please contact HYDAC.

## Filtration

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

Cleanliness class: NAS 1638 Class 12 or

23/21/18 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 0 °C to +70 °C. Temperature range when water glycol is

Temperature range when water glycol is used is: 0  $^{\circ}\text{C}$  to +50  $^{\circ}\text{C}$ 



## VANE PUMPS FIXED DISPLACEMENT - DOUBLE PUMP

# Technical specifications

|            | specificati  |  |   |                                 |  |
|------------|--|--|---|---------------------------------|--|
| Series     | Geometric d<br>2nd stage<br>[ccm/rev]                  | lisplacement<br>1st stage<br>[ccm/rev] | Operating<br>pressure<br>Rated<br>[bar] | Maximum<br>drive speed<br>[rpm] |  |
| PVF101-12- | 6<br>8<br>10<br>12<br>14<br>17<br>19<br>23<br>25<br>31 | 26<br>33<br>41<br>47<br>53<br>59<br>65 | 210<br>(160)                            | 1800                            |  |
| PVF101-13- | 6<br>8<br>10<br>12<br>14<br>17<br>19<br>23<br>25<br>31 | 76<br>94<br>116                        | 210<br>(160)                            | 1800                            |  |
| PVF101-23- | 41<br>47<br>53<br>59<br>65                             | 52   60   66 210   76 (160)   94   116 | 1800                                    |                                 |  |
| PVF101-33- | 76<br>94<br>116  | 76<br>94<br>116                        | 210<br>(160)                            | 1800                            |  |
| PVF101-14- | 6<br>8<br>10<br>12<br>14<br>17<br>19<br>23             | 136                                    |   |                                 |  |
| PVF101-24- | 26<br>33<br>41<br>47                                   | 153<br>184<br>200<br>237               | 175                                     | 1800                            |  |
| PVF101-34- | 52<br>60<br>66<br>76<br>94<br>116                      |  |   |                                 |  |

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#### Documentation

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

| (HYDAD)  | NYER Assess Court<br>Particle 1237 Deletanol Rev<br>Inductor 12072 Deletanol Rev<br>Induces Deleta<br>Talais (DEER) Del-1<br>Talais (DEER) Del-1 |                 |      |  | (HYDAD)  | HIGAG Rymem CAREN<br>HIGAG Rymem CAREN<br>Perstan 1331, Delation and<br>Hostan and Annual Carent<br>Teacher Carent State of the<br>Teacher Carent State of the<br>Higher Caren | -  |  |
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|  | 08225/0505514 / Jadjo.texminant2@hydes.com<br>Bestalinumes/Detum<br>55557-00015 / 31.10.2007   |                 | Pos. | Material<br>Bezeichnung  |  |  | Manga  |  |
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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.

41:300 W:0/05:12 HYDAC 2903

# Ports

Suction and discharge port



| Pump type                     |           | Mir            | Maximum                              |                  |
|-------------------------------|-----------|----------------|--------------------------------------|------------------|
|                               |           | Mineral oil    | Phosphate ester,<br>Aqueous<br>fluid |                  |
| PVF101 series<br>Double pumps | PVF101-12 | -0.2 bar       |                                      |                  |
|                               | PVF101-13 |                |                                      |                  |
|                               | PVF101-23 |                |                                      | +0.3 bar<br>abs. |
|                               | PVF101-33 | 0.0 hav* aha   | -0.16 bar abs.                       |                  |
|                               | PVF101-14 | -0.2 bar* abs. |                                      |                  |
|                               | PVF101-24 |                |                                      |                  |
|                               | PVF101-34 |                |                                      |                  |

0 bar (1 bar abs.) -0.07 bar -0.13 bar

\* Min. suction pressure at drive speed > 1700 rpm PVF101 with displacement 94 or 116 cm³/rev: PVF101 with displacement 76 cm³/rev: PVF101 with displacement 237 cm³/rev:

#### Pump arrangement

Standard arrangement: pump above reservoir.



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# PIPING

#### 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

1

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

- Hydraulic oil based on mineral oil (HL, HLP, ISO VG 32 or 46)
- Synthetic fluids (Phosphate ester, HFD-R, Polyolester, HFD-U, Water glycol, HFC)

#### Note:

For operating restrictions when using special fluids, please contact HYDAC.

## Filtration

0 °C to +50 °C

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

Cleanliness class: NAS 1638 Class 12 or

23/21/18 ISO 4406:1999 or cleaner.

#### Viscosity and temperature

Normal operating viscosity range is 20 – 400 cSt (mm²/s). Normal operating temperature range is 0 °C to +70 °C. Temperature range when used with water glycol:

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