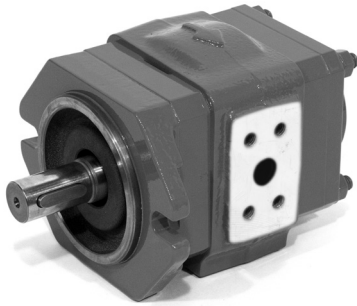


Internal Gear Pumps Installation Manual



MEDIUM HEAVY DUTY SERIES SIZE 2

PGI100

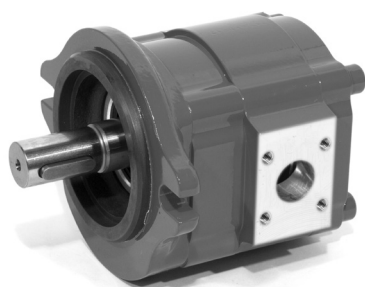
PGI100-2-005
 PGI100-2-006
 PGI100-2-008
 PGI100-2-011
 PGI100-2-013
 PGI100-2-016
 PGI100-2-019
 PGI100-2-022
 PGI100-2-025



MEDIUM HEAVY DUTY SERIES SIZE 3/6

PGI101

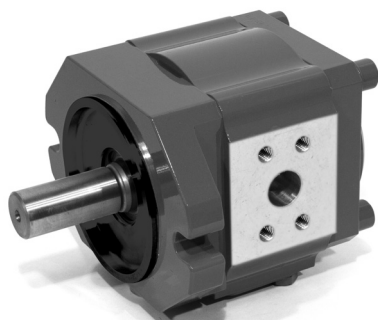
| | |
|--------------|--------------|
| PGI101-3-020 | PGI101-6-125 |
| PGI101-3-025 | PGI101-6-160 |
| PGI101-3-032 | PGI101-6-200 |
| PGI101-3-040 | PGI101-6-250 |
| PGI101-3-050 | |
| PGI101-3-064 | |



HEAVY DUTY SERIES SIZE 2/3/6

PGI102

| | | |
|--------------|--------------|--------------|
| PGI102-2-004 | PGI102-3-014 | PGI102-6-040 |
| PGI102-2-005 | PGI102-3-016 | PGI102-6-050 |
| PGI102-2-006 | PGI102-3-020 | PGI102-6-064 |
| PGI102-2-008 | PGI102-3-025 | PGI102-6-080 |
| PGI102-2-011 | PGI102-3-032 | PGI102-6-100 |
| PGI102-2-013 | PGI102-3-040 | PGI102-6-125 |
| PGI102-2-016 | PGI102-3-050 | PGI102-6-160 |
| PGI102-2-019 | PGI102-3-064 | PGI102-6-200 |
| PGI102-2-022 | | PGI102-6-250 |
| PGI102-2-025 | | |



MEDIUM HEAVY DUTY SERIES SIZE 5/6

PGI103

| | |
|--------------|--------------|
| PGI103-5-064 | PGI103-6-125 |
| PGI103-5-080 | PGI103-6-160 |
| PGI103-5-100 | PGI103-6-200 |
| | PGI103-6-250 |

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 incorrect 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 re-start 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 with the specified torque. Failure to comply with the specifications may cause 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 in the hydraulic system or solenoid valves may occur. Wear protective equipment on hands and body 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.



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

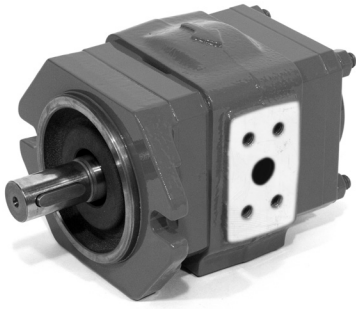
5. Read the manual thoroughly and ensure that the seals are replaced properly.

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.



INTERNAL GEAR PUMPS

Technical specifications

Medium Heavy Duty Series Size 2

PGI100

| Series | Geometric displacement [cm ³ /rev] | Operating pressure | | | Maximum drive speed [rpm] |
|--------------|---|--------------------|--------------------|------------|---------------------------|
| | | Rated [bar] | Intermittent [bar] | Peak [bar] | |
| PGI100-2-005 | 5.4 | 250 | 320 | 350 | 4200 |
| PGI100-2-006 | 6.4 | | | | |
| PGI100-2-008 | 7.9 | | | | |
| PGI100-2-011 | 10.9 | | | | |
| PGI100-2-013 | 13.3 | | 300 | 325 | 4000 |
| PGI100-2-016 | 15.8 | | | | |
| PGI100-2-019 | 19.3 | | | | |
| PGI100-2-022 | 22.2 | | | | |
| PGI100-2-025 | 25.2 | | | | 280 |

Medium Heavy Duty Series Size 3

PGI101

| Series | Geometric displacement [cm ³ /rev] | Operating pressure | | | Maximum drive speed [rpm] |
|--------------|---|--------------------|--------------------|------------|---------------------------|
| | | Rated [bar] | Intermittent [bar] | Peak [bar] | |
| PGI101-3-020 | 20.0 | 250 | 320 | 325 | 3600 |
| PGI101-3-025 | 24.8 | | | | 3200 |
| PGI101-3-032 | 32.1 | | | | 3000 |
| PGI101-3-040 | 40.1 | | 300 | 325 | 2500 |
| PGI101-3-050 | 50.3 | | 280 | 300 | 1800 |
| PGI101-3-064 | 64.4 | | | | |

Heavy Duty Series Size 2/3/6

PGI102

| Series | Geometric displacement [cm³/rev] | Operating pressure | | | Maximum drive speed [rpm] | | | |
|--------------|----------------------------------|--------------------|--------------------|------------|---------------------------|-----|------|------|
| | | Rated [bar] | Intermittent [bar] | Peak [bar] | | | | |
| PGI102-2-004 | 3.8 | 330 | 350 | 400 | 4200 | | | |
| PGI102-2-005 | 5.4 | | | | | | | |
| PGI102-2-006 | 6.4 | | | | | | | |
| PGI102-2-008 | 7.9 | | | | 300 | 300 | 4000 | |
| PGI102-2-011 | 10.9 | | | | | | | |
| PGI102-2-013 | 13.3 | | | | | | | |
| PGI102-2-016 | 15.8 | 250 | 300 | 3600 | | | | |
| PGI102-2-019 | 19.3 | | | | | | | |
| PGI102-2-022 | 22.2 | | | | | | | |
| PGI102-2-025 | 25.2 | 280 | 300 | | | | | |
| | | | | | | | | |
| PGI102-3-014 | 14.6 | 330 | 350 | 400 | 4000 | | | |
| PGI102-3-016 | 16.0 | | | | | | | |
| PGI102-3-020 | 20.0 | | | | 280 | 300 | 325 | 2500 |
| PGI102-3-025 | 24.8 | | | | | | | |
| PGI102-3-032 | 32.1 | 300 | 340 | 350 | 2400 | | | |
| PGI102-3-040 | 40.1 | | | | | | | |
| PGI102-3-050 | 50.3 | | | | | 280 | 300 | 325 |
| PGI102-3-064 | 64.6 | | | | | | | |
| | | | | | | | | |
| PGI102-6-040 | 40.8 | 330 | 340 | 350 | 2400 | | | |
| PGI102-6-050 | 50.6 | | | | | | | |
| PGI102-6-064 | 65.3 | 300 | 330 | 340 | 2200 | | | |
| PGI102-6-080 | 80.0 | | | | | | | |
| PGI102-6-100 | 101.2 | 280 | 300 | 320 | 2000 | | | |
| PGI102-6-125 | 125.7 | | | | | | | |
| PGI102-6-160 | 160.1 | 150 | 150 | 165 | 2000 | | | |
| PGI102-6-200 | 200.9 | | | | | | | |
| PGI102-6-250 | 249.9 | | | | | | | |

Medium Heavy Duty Series Size 5/6

PGI103

| Series | Geometric displacement [cm³/rev] | Operating pressure | | | Maximum drive speed [rpm] |
|--------------|----------------------------------|--------------------|--------------------|------------|---------------------------|
| | | Rated [bar] | Intermittent [bar] | Peak [bar] | |
| PGI103-5-064 | 65.3 | 210 | 230 | 250 | 3000 |
| PGI103-5-080 | 80.4 | | | | |
| PGI103-5-100 | 100.5 | | | | 2500 |
| | | | | | |
| PGI103-6-125 | 125.7 | 250 | 280 | 300 | 2200 |
| PGI103-6-160 | 160.1 | | | | 2000 |
| PGI103-6-200 | 200.9 | 140 | 150 | 160 | 2200 |
| PGI103-6-250 | 249.9 | | | | |

Documentation

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

HYDAC SYSTEM

HYDAC System GmbH
 Postfach 1257, D-48273 Bielefeld/Rein
 Telefon: 0521 91 32-0
 Telefax: 0521 91 32-44
 www.hydac.com

LEISTUNGSHYDRAULIK

Vertriebsbereich
 OESB, PFEIFER AG
 D-67558 KAISERSLAUTERN

HYDAC System GmbH
 Postfach 1257, D-48273 Bielefeld/Rein
 Telefon: 0521 91 32-0
 Telefax: 0521 91 32-44
 www.hydac.com

Bestelldatum
 02.07.2005 / 11.12.2007
 Auftragsnummer
 83800803 / 12.11.2007
 Kundennummer
 9809

Herstellererklärung im Sinne der EG-Richtlinie Maschinen:
 Hiermit erklären wir, daß die auf diesem Lieferzettel aufgeführten Produkte in der von uns gelieferten Ausführung zum
 Einsatz in einer Maschine bestimmt sind, und daß diese Einzelkomponenten so lange unbenutzt ist, bis festgestellt wurde, daß
 die Maschine, in die unsere Produkte eingebaut werden sollen, den Bestimmungen der EG-Richtlinie Maschinen
 entspricht.
 GGG: Der CE-Beauftragte
 Diese Erklärung wurde marginal erstellt und ist ohne Unterschrift gültig.
 Herstellerkennr. O nach DIN 6830-18
 Wir bestätigen Ihnen hiermit, dass der folgende Lieferumfang bestellkonform und nach den zum Zeitpunkt des
 erstmaligen Inverkehrbringens allgemein anerkannten Regeln der Technik beschaffen ist.
 GGG: Der Hersteller-Prüfbeauftragte

Transportdetails
 Versandart: LKW
 Sperrmaß: DSV
 Lieferbedingungen: CIP KAISERSLAUTERN, VERPACKT

| Pos. | Material Bezeichnung | Menge |
|------|-------------------------|-------|
| | | |

| Bestellform | Bestellform 1 | Bestellform 2 | Bestellform 3 |
|--|---|---|---|
| Ohne P-Plan ohne Zeichnung ohne Kundennummer ohne Lieferbedingungen ohne LKW | Kunden-Nr. 00 in 0207/08, 02, 09, 10, 11 00-00000000 00-00000000 | Kunden-Nr. 00 in 0207/08, 02, 09, 10, 11 00-00000000 00-00000000 | Kunden-Nr. 00 in 0207/08, 02, 09, 10, 11 00-00000000 00-00000000 |

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Transportdetails
 Versandart: LKW
 Sperrmaß: DSV
 Lieferbedingungen: CIP KAISERSLAUTERN, VERPACKT

| Pos. | Material Bezeichnung | Menge |
|------|-------------------------|-------|
| | | |

Bericht zu: 810420710

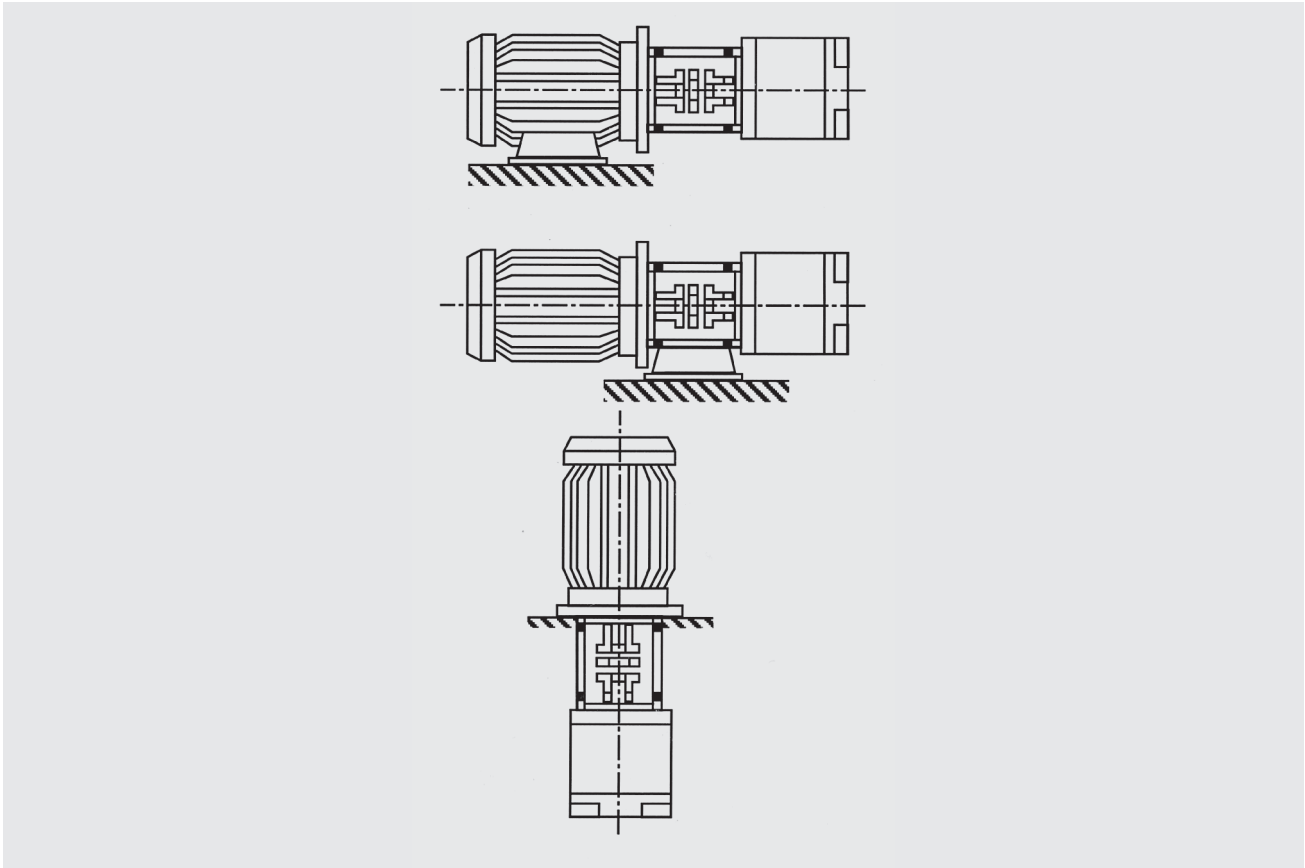
| Bestellform | Bestellform 1 | Bestellform 2 | Bestellform 3 |
|--|---|---|---|
| Ohne P-Plan ohne Zeichnung ohne Kundennummer ohne Lieferbedingungen ohne LKW | Kunden-Nr. 00 in 0207/08, 02, 09, 10, 11 00-00000000 00-00000000 | Kunden-Nr. 00 in 0207/08, 02, 09, 10, 11 00-00000000 00-00000000 | Kunden-Nr. 00 in 0207/08, 02, 09, 10, 11 00-00000000 00-00000000 |

Delivery note and / or sales acknowledgement.

INSTALLING THE PUMP

Installation position:

The pumps can be installed vertically (shaft at the top) or horizontally.



Note:

Internal gear pumps are self-priming. They can be installed both above and below the tank level.

The permitted pressure values on the suction side of the pump must not be exceeded (see Technical Specifications).

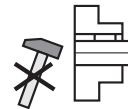
Installation instructions:

Important!

Prior to installing and commissioning the pump, it must be filled with oil from the suction side.

When installing the pump, ensure that:

- the direction of rotation of the drive and pump, marked by an arrow on the case or nameplate, correspond to each other. For example, a drive running anti-clockwise requires a pump which runs clockwise.
- the pump and motor shaft are aligned.
- compensating couplings (flexible drive or curved-gear couplings) are used.
- the pump is driven free of axial and lateral forces. A drive using gear wheels, belts or chains without an adapter bearing is possible only to a limited extent and always requires approval from HYDAC.
- no stresses are caused to the pump by uneven pump support.
- no distortion is caused by incorrectly mounted pipes.
- coupling parts are installed without using force.



When installing a HYDAC pump always ensure that the fluid remains in the pump during stoppages.

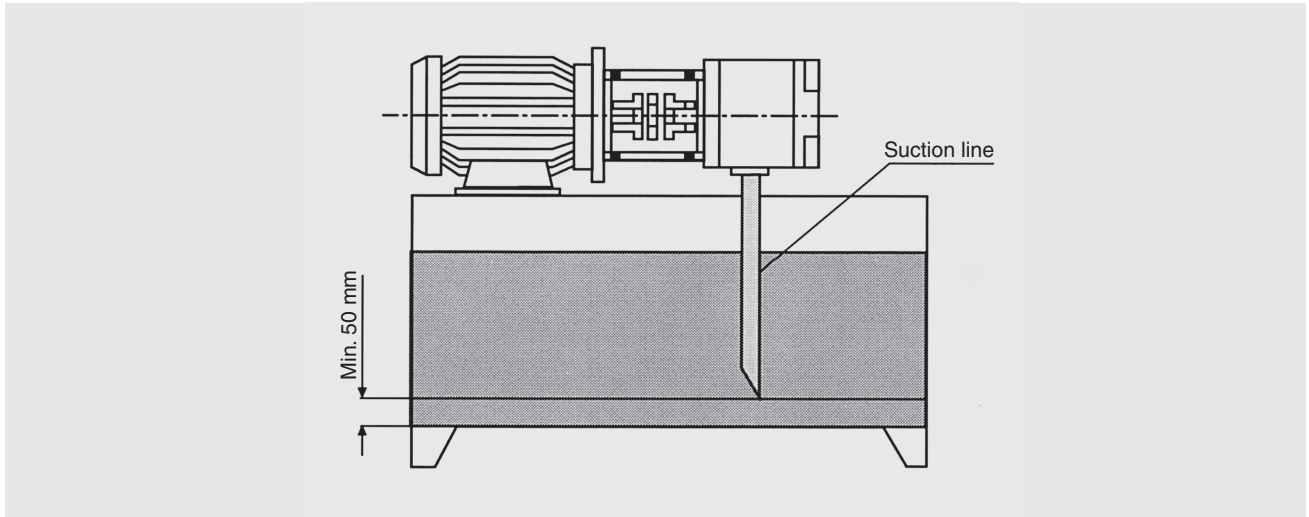
Sealing faces must not be damaged.

Permitted torques for mounting screws at the pump and pipe connections must be adhered to.

When mounting pumps with an O-ring at the drive shaft, make sure the O-ring has been greased and that there is a lead-in chamfer on the mating part to avoid damage to the O-ring.

OIL RESERVOIR

- The amount of oil required in the reservoir depends on the particular operating conditions. It should be at least twice (for intermittent operation and correspondingly long cooling phases) to five times the amount of the pump delivery rate per minute.
- If the reservoir is too small, cooling of the oil may be required.
- The reservoir must be provided with an air breather filter and a strainer in the filling port.
- Prior to filling the reservoir with oil, it must be thoroughly cleaned.
- Oil-resistant paint must be used to paint the reservoir.
- Use baffles to ensure sufficient distance between the suction and return lines and to enable complete deaeration of the oil.
- Recommended suction velocity 0.5 - 1.5 m/s
Maximum return flow velocity 2.0 - 3.0 m/s



OPERATING FLUID

Hydraulic mineral oils:

Selection

- Branded hydraulic oil to DIN 51524, Part 2 must always be used.
- Blending several types of oil, or oil of different manufacturers, must be avoided because it can have a detrimental effect on the hydraulic characteristics of the fluid.

Operating temperature

- The optimum operating temperature is from 40 °C to 60 °C – a short-term maximum temperature from 80 °C to 100 °C is permitted.

Viscosity

| | |
|-----------------------------|-----------------------------------|
| Minimum operating viscosity | 10 mm ² /s (cSt) |
| Optimum operating viscosity | 25 - 100 mm ² /s (cSt) |
| Maximum starting viscosity | 2000 mm ² /s (cSt) |

When selecting the operating medium's viscosity, consideration must be given to the average operating temperatures whilst maintaining the permitted viscosity values.

FIRE-RESISTANT FLUIDS AND OTHER FLUIDS

Please contact HYDAC.

FILTRATION

Careful filtration of the pressure fluid is essential for a long service life and trouble-free operation of the hydraulic system.

Cleanliness level:

- Cleanliness class of the operating fluid:
Code 20/18/15 to ISO 4406:1999
or NAS 1638 Class 9 or cleaner.
- In order to ensure a longer service life we recommend
to ISO 4406 Code 18/16/13 or cleaner
or NAS 1638 Class 7 or cleaner.
- We recommend using a filter with a minimum retention rate of $\beta_{10} > 100$.
- The filter or filter elements must be maintained regularly and replaced, if necessary.
- To check if the filters are operating correctly, they must be fitted with a visual, or preferably an electrical clogging indicator.

PRESSURE LIMITING

- To avoid excessively high pressures in the pump, the pressure relief valve should be positioned as close to the pump outlet as possible and definitely between the pump and the hydraulic system downstream.
- Select an appropriate setting to ensure that the pump's maximum pressure setting will not be exceeded (see Technical Specifications).

FUNCTIONAL TEST AND COMMISSIONING

Direction of rotation:

Internal gear pumps can be supplied in clockwise and anti-clockwise versions. The pump's direction of rotation is determined when viewing the drive shaft and is marked by an arrow on the pump case or the name-plate.

Prior to commissioning the pump, check that the direction of rotation of the drive and pump correspond!

Drive speed:

The permitted range of drive speeds is given in the brochures.

CAUTION!

When operating a combination of pumps, especially when different pump series or sizes are combined, the drive speed must not exceed that permitted for the pump with the lowest speed!

Commissioning:

- It must be possible for the pump to be started without load, that is with a consumer that is unloaded.
- During the **initial commissioning**, the pressure line **must be vented**.
- Vent the system until all cracking noises and foaming have stopped.
At the same time, check the fluid level in the reservoir until the system has been completely vented. Under no circumstances must the oil fall below the minimum level.
- After venting the pump, it should be loaded to the required pressure, and the pressure relief valve should be protected from unauthorised adjustment.
- Prior to switching off the pump, the system should be unloaded.
- After operating for some time, check the filter and oil temperature.