The Drive & Control Company

Rexroth
Bosch Group

Gerotor pump
PGZ

Series 1X

Instruction manual
RE 10545-B/11.2013

Replaces: 10.2013
English

The data specified above serve to describe the product. Should information be provided on use, these are only examples of applications and suggestions. Information from the catalog are not assured properties. The information given does not release the user from the obligation of own judgment and verification. Our products are subject to a natural wear and aging process.

The cover shows an example application. The product delivered may differ from the image on the cover.

The original instruction manual was created in the German language.

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Contents

1 About this documentation

1.1 Validity of the documentation

This documentation applies to the following products:

• gerotor pump PGZ series 1X

This documentation is intended for machine/system manufacturers, fitters and service technicians.

This documentation contains important information on the safe and appropriate installation, transport, commissioning, maintenance, removal and simple troubleshooting of the gerotor pump PGZ.

- Read this documentation completely and, in particular, chapter 2 "Safety instructions" on page 10 and chapter 3 "General instructions on damage to equipment and the product" on page 15 before you start work with the gerotor pump.

1.2 Required and supplementary documentation

- Only commission the gerotor pump if the documentation marked with the book symbol 🕮 is available to you and you have understood and observed it.

Table 1: Required and supplementary documentation

	Title	Document number	Document type
🕮	**Gerotor pump, fixed displacement volume, type PGZ, series 1X** Contains the permissible technical data, operating condition, performance limits and project planning notes	10545	Data sheet
🕮	**General product information for hydraulic products** Contains general information on hydraulic products	07008	Instruction manual
🕮	**Installation, commissioning and maintenance of hydraulic systems** Contains general information on installation, commissioning and maintenance of hydraulic systems	07900	Data sheet
🕮	**Mineral-oil based hydraulic fluid and related hydrocarbons** Describes the requirements on a mineral-oil based hydraulic fluid and related hydrocarbons for the operation with Rexroth hydraulic components, and assists you in selecting a hydraulic fluid for your hydraulic system.	90220	Data sheet

The gerotor pump PGZ is a system component.

Also observe the manuals for the other system components and the documentation of the system manufacturer.

1.3 Display of information

Standardized safety instructions, symbols, terms and abbreviations are used so that you can use this documentation to work quickly and safely with your product. To give you a better understanding they are explained in the sections below.

1.3.1 Safety instructions

This documentation includes safety instructions in chapter 2.6 "Product-specific safety instructions" on page 34 and in chapter 3 "General instructions on damage to equipment and the product" on page15 and before a sequence of actions or an instruction for action involving a risk of personal injury or damage to equipment. The described danger prevention measures must be observed.

Safety instructions are set out as follows:

⚠ SIGNAL WORD

Type and source of danger!
Consequences in case of noncompliance
- Measure for danger prevention
- <List>

- **Warning sign:** draws attention to the danger
- **Signal word:** identifies the degree of the danger
- **Type and source of danger:** identifies the type and source of the danger
- **Consequences:** describes what occurs if the safety instructions are not complied with
- **Precautions:** states how the danger can be avoided

Table 2: Danger classes in accordance with ANSI Z535.6-2006

Warning sign, signal word	Meaning
⚠ DANGER	Identifies a dangerous situation that will result in death or serious injuries if it is not avoided.
⚠ WARNING	Identifies a dangerous situation that may result in death or serious injuries if it is not avoided.
⚠ CAUTION	Identifies a dangerous situation that may result in minor to moderate injuries if it is not avoided.
NOTICE	Damage to equipment: the product or the environment may be damaged.

1.3.2 Symbols

The following symbols mark notes that are not safety-relevant but which increase the understanding of the documentation.

Table 3: Meaning of the symbols

Symbol	Meaning
	If this information is disregarded, the product cannot be used and/or operated to the optimum extent.
▶	Single, independent step
1. 2. 3.	Numbered instruction: The numbers specify that the steps are completed one after the other.

1.3.3 Abbreviations

This documentation uses the following abbreviations:

Table 4: Abbreviations

Abbreviation	Meaning
ATEX	EU directive for explosion protection (**At**mosphère **ex**plosible)
ISO	**I**nternational **O**rganization for **S**tandardization
RE	**R**exroth document in the **E**nglish language

2 Safety instructions

2.1 About this chapter

The gerotor pump has been manufactured according to the generally accepted rules of current technology. There is, however, still a danger of personal injury or damage to equipment if this chapter and the safety instructions in this documentation are not complied with.

- Read this documentation completely and thoroughly before working with the gerotor pump.
- Keep this documentation in a location where it is accessible to all users at all times.
- Always include the required documentation when you pass the gerotor pump on to third parties.

2.2 Intended use

Gerotor pumps are hydraulic components. The product is exclusively intended for being integrated in a machine/system or for being assembled with other components to form a machine/system. The gerotor pump may only be commissioned after it has been installed in the machine/system for which it is intended and the safety of the entire system has been established in accordance with the Machine Directive.
During project planning, the basic principles of the EU Machine Directive or comparable local regulations outside of the EU are to be observed.
The product is intended for the following use:
Gerotor pumps are intended for the assembly of hydraulic drive systems, particularly in machine-, system- and aggregate construction.

- Observe the technical data, application and operating conditions and performance limits as specified in data sheet 10545. Information about approved hydraulic fluids can be found in data sheet 10545.

The gerotor pump is intended for professional use and not for private use.
Intended use includes having read and understood the complete documentation, especially the chapter 2 "Safety instructions" on page 10.

2.3 Improper use

Any use other than that described as intended use shall be considered as improper and is therefore impermissible.
Bosch Rexroth AG shall accept no liability whatsoever for damage resulting from improper use. The user shall bear all risks arising from improper use.
The following foreseeable forms of misuse of the gerotor pump shall also be considered to be faulty usage (this list does not claim to be exhaustive):

- Use outside the operating parameters approved in the data sheet (unless customer-specific approval has been granted)
- Use for non-approved fluids, e.g. water or polyurethane components
- Use in explosive environments unless the component or machine/system has been certified as compliant with ATEX directive 94/9/EC
- Use in aggressive atmospheres
- Use in aircraft and spacecraft

2.4 Personnel qualifications

The activities described in this documentation require basic mechanical and hydraulic knowledge, as well as knowledge of the associated technical terms. For transporting and handling the product, additional knowledge is necessary with regard to working with a lifting device and the corresponding attachment equipment. In order to ensure safe use, these activities may therefore only be performed by appropriate qualified personnel or an instructed person under the direction and supervision of qualified personnel.
Qualified personnel are those who can recognize possible hazards and institute the appropriate safety measures due to their professional training, knowledge, and experience, as well as their understanding of the relevant regulations pertaining to the work to be done. Qualified personnel must observe the rules relevant to the subject area and have the necessary hydraulics expertise.
Hydraulics expertise means, for instance:

- reading and fully understanding hydraulic schematic,
- fully understanding in particular the interrelationships regarding safety devices, and
- having knowledge on the function and assembly of hydraulic components.

Bosch Rexroth offers training support for special fields.
You can find an overview of the training contents on the internet at:
`http://www.boschrexroth.de/didactic`.

2.5 General safety instructions

- Observe the applicable accident prevention and environmental protection regulations.
- Observe the safety regulations and provisions of the country in which the product is used/operated.
- Use Rexroth products only when they are in good technical order and condition.
- Persons who install, operate, remove or maintain Rexroth products must not consume any alcohol, drugs or pharmaceuticals that may affect their ability to respond.
- Only use Rexroth original accessories and spare parts to ensure there is no risk to persons from unsuitable spare parts.
- Conform to the technical data and ambient conditions specified in the product documentation.
- If unsuitable products are installed or used in applications that are of relevance to safety, unexpected operating conditions may occur in the application which could result in injury to persons or damage to equipment. For this reason, only use the product in a safety-relevant application if this use is expressly specified and permitted in the product documentation, for example in ex-protection applications or in safety-related parts of a control system (functional safety).
- You may only commission the product if it has been determined that the end product (e.g., machinery or a system) into which the Rexroth products are installed complies with the country-specific provisions, safety regulations and standards of the application.

2.6 Product-specific safety instructions

The following safety instructions apply for chapters 6 to 14.

⚠ WARNING

Pressurized machine/system!

Danger to life or risk of injury, serious injuries when working on machines/systems not shutdown! Damage to equipment!

- Protect the complete system against being energized.
- Make sure that the machine/system is depressurized. Please follow the machine/system manufacturer’s instructions.
- Do not disconnect any line connections, ports and components when the machine/system is pressurized.
- Switch off all power-transmitting components and connections (electric, pneumatic, hydraulic, mechanical) in accordance with the manufacturer's specifications and secure them against being switched back on.

Escaping oil mist!

Risk of explosion, fire, health hazard, environmental pollution!

- Depressurize the machine/system and repair the leak.
- Only perform welding work when the machine/system is depressurized.
- Keep open flames and ignition sources away from the gerotor pump.
- If gerotor pumps are to be situated in the vicinity of ignition sources or powerful thermal radiators, a shield must be erected to ensure that any escaped hydraulic fluid cannot ignite, and to protect hose lines from premature aging.

Electrical voltage!

Risk of injury due to electric shock or damage to equipment!

- Always de-energize the relevant part of the machine/system before you install the product. Protect the machine/system against being energized.

⚠ CAUTION

Hot surfaces on gerotor pump!
Risk of burns!
- Allow the gerotor pump to cool down sufficiently before touching it.
- Wear heat-resistant protective clothing, e.g. gloves.

Contact with hydraulic fluid!
Hazard to health/health impairment e.g. eye injuries, skin damage, toxication during inhalation!
- Avoid contact with hydraulic fluids.
- When working with hydraulic fluids, strictly observe the safety instructions provided by the lubricant manufacturer.
- Use your personal protective equipment (e.g., safety glasses, safety gloves, suitable working clothes, safety shoes).
- If hydraulic fluid should, nevertheless, come into contact with your eyes or bloodstream or is swallowed, consult a doctor immediately.

Escaping hydraulic fluid due to machine/system leakage!
Risk of burns and risk of injury due to escaping oil jet!
- Depressurize the machine/system and repair the leak.
- Never attempt to block or seal the leak or oil jet with a cloth.

2.7 Personal protective equipment

The personal protective equipment is the responsibility of the user of the gerotor pump. Observe the safety regulations and provisions of your country. All components of the personal protective equipment must be intact.

3 General instructions on damage to equipment and the product

The following notes apply for chapters 6 to 14.

NOTICE

Danger from improper handling!

Product can be damaged!

- Do not expose the product to an impermissible mechanical load.
- Never use the gerotor pump as a handle or step.
- Do not place/lay any objects on the product.
- Do not strike the shaft of the gerotor pump.
- Do not set/place the pump on the shaft.
- Do not strike sealing surfaces (e.g., service line ports).
- Leave the protection covers on the gerotor pump until shortly before the lines are connected.

Damage to equipment due to improper lubrication!

Product can be damaged or destroyed!

- Never operate the gerotor pump with insufficient hydraulic fluid. Make sure in particular that the rotary group has sufficient lubrication.

Mixing of hydraulic fluids!

Product can be damaged!

- Before installation, remove all fluids from the gerotor pump to prevent mixing with the hydraulic fluid used in the machine/system.
- Any mixing of hydraulic fluids of different manufacturers or different types of the same manufacturer is not permissible in general.

Contamination of the hydraulic fluid!

The cleanliness of the hydraulic fluid has a considerable impact on the cleanliness and service life of the hydraulic system. Contamination of the hydraulic fluid could cause premature wear and malfunctions!

- Make sure that the working environment at the installation site is fully free of dust and foreign particles in order to prevent contaminants, such as welding beads or metal cuttings, from getting into the hydraulic lines and causing product wear or malfunctions. The gerotor pump must be installed in a clean condition.
- Use only clean ports, hydraulic lines and attachments (e.g., measuring devices).
- No contaminants may enter the ports when they are plugged.
- Before commissioning, make sure that all hydraulic connections are tight and that all of the connection seals and plugs are installed correctly to ensure that they are leakproof and fluids and contaminants are prevented from penetrating the product.
- Use a suitable filter system to filter hydraulic fluid during filling to minimize solid impurities and water in the hydraulic system.

NOTICE

Improper cleaning!
Product can be damaged!
- Plug all openings with suitable protective equipment.
- Never use solvents or aggressive detergents. Only clean the gerotor pump with a lint-free cloth.
- Do not use a high-pressure cleaner for cleaning.

Environmental pollution due to incorrect disposal!
Careless disposal of the gerotor pump and its fittings, the hydraulic fluid and the packaging material could lead to pollution of the environment!
- Dispose of the gerotor pump, hydraulic fluid and packaging in accordance with the national regulations in your country.
- Dispose of the hydraulic fluid in accordance with the applicable safety data sheet for the hydraulic fluid.

Escaping or spilling hydraulic fluid!
Environmental pollution and contamination of the ground water!
- When filling and draining the hydraulic fluid, always place a drip tray under the gerotor pump.
- Use an oil binding agent if hydraulic fluid is spilled.
- Observe the information in the safety data sheet for the hydraulic fluid and the specifications provided by the system manufacturer.

The warranty applies only to the delivered configuration.
The entitlement to warranty cover will be rendered void if the product is incorrectly installed, commissioned or operated, or if it is used or handled improperly.

4 Scope of supply

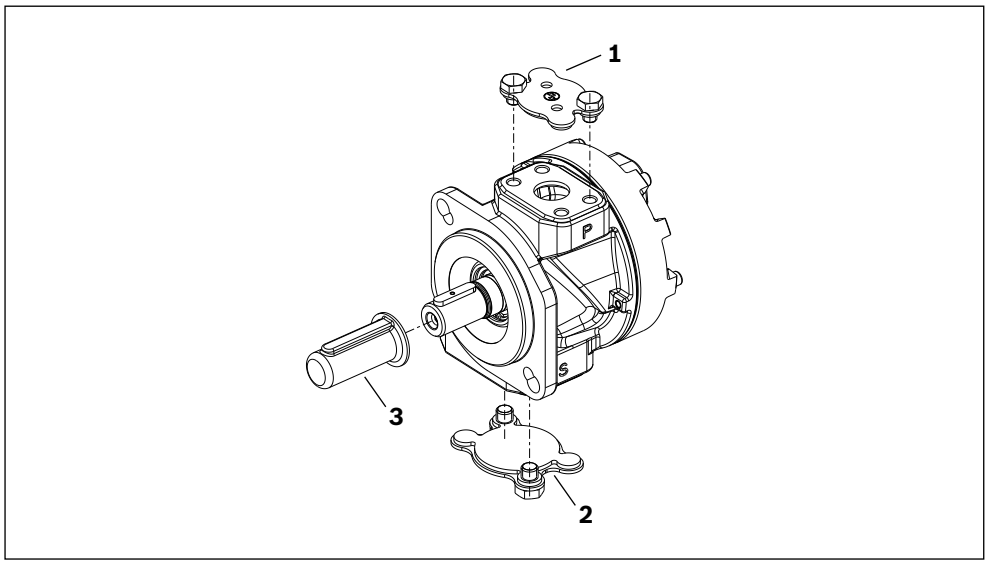


Fig. 1: Gerotor pump PGZ

Included in the scope of supply are:
- Gerotor pump PGZ series 1X

The following parts are also installed on delivery:
- Flange cover for pressure port (**1**)
- Flange cover for suction port (**2**)
- Protection plug for shaft protection (**3**)

5 About this product

Technical data, operating conditions, port dimensions and performance limits of the gerotor pump can be found in data sheet 10545.

5.1 Product description

Hydraulic pumps of type PGZ are gerotor pumps with fixed displacement volume. They mainly consist of: flange housing (**1**), shaft (**2**), the displacer elements inner rotor (**3**) and geared ring (**4**), driving disk (**5**) and cover (**6**). They have a suction port **S** and a pressure port **P**.

5.1.1 Assembly of the gerotor pump

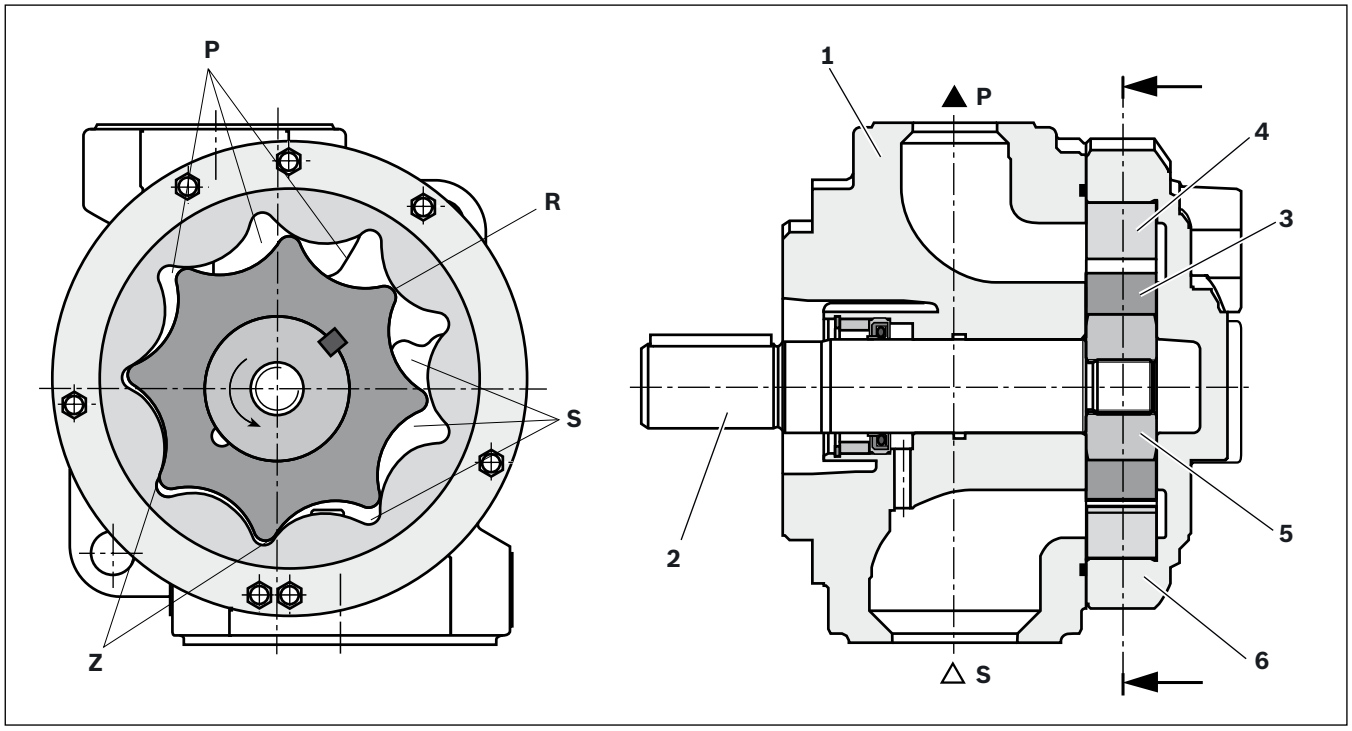


Fig. 2: Assembly of the gerotor pump

1 Flange housing
2 Shaft
3 Inner rotor
4 Geared ring
5 Driving disk
6 Cover
S Suction port
P Pressure port

5.2 Product identification

The gerotor pump can be identified with the name plate. The following example shows the name plate of a gerotor pump of type PGZ:

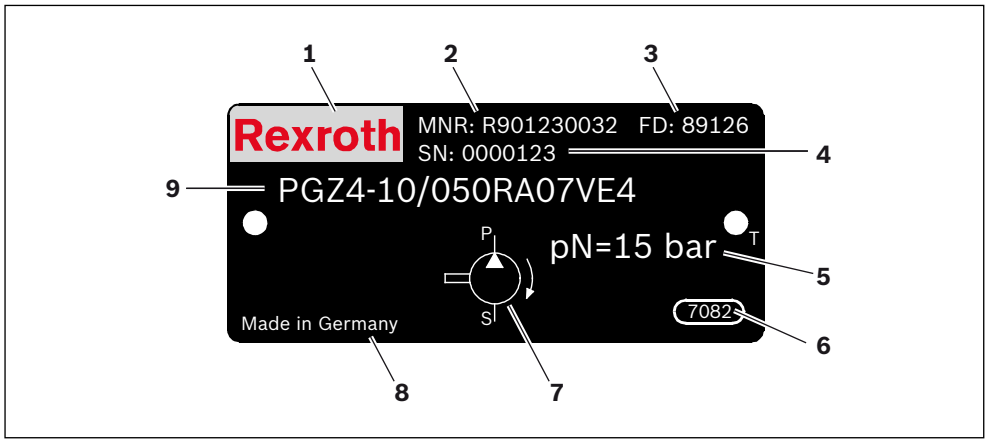


Fig. 3: A4VSO name plate gerotor pump PGZ

1 Manufacturer
2 Material number
3 Manufacturing date
4 Serial number
5 Nominal pressure
6 Area/plant number
7 Symbol according to ISO 1219
8 Designation of origin
9 Material description

6 Transport and storage

- Always observe the required ambient conditions for transport and storage, see chapter 6.2 "Storing the gerotor pump" on page 20.

Notes on unpacking can be found in chapter 7.1 "Unpacking" on page 22.

6.1 Transporting the gerotor pump

Due to the relatively light weight of the gerotor pumps, they contain no special fixtures for transport and can be moved by hand.

Dimensions and weights

Table 5: Dimensions and weights

Frame size		PGZ4						PGZ5			
Size		**20**	**32**	**40**	**50**	**63**	**80**	**63**	**80**	**100**	**140**
Weight	kg	4.7	5.3	5.6	6.0	6.7	7.8	6.6	7.7	8.9	10.7

There is a danger of health damage when carrying gerotor pumps.

- Use your personal protective equipment (e.g., safety gloves, suitable working clothes, safety shoes).
- Carefully place the gerotor pump components on the seating to prevent them from being damaged.

6.2 Storing the gerotor pump

Requirement

- The storage areas must be free from corrosive materials and gases.
- To prevent damage to the seals, ozone-forming equipment (e.g., mercury-vapor lamps, high voltage equipment, electric motors, sources of electrical sparks or electrical discharges) must not be operated in storage areas.
- The storage areas must be dry.
- Ideal storage temperature: +5 °C to +20 °C. The temperature should ideally remain constant.
- Avoid high light irradiation (e.g., bright windows or direct fluorescent lighting).
- Do not stack gerotor pump and store them shock-proof.
- Do not store the gerotor pump on the shaft.

Maximum storage time

The maximum storage time is 24 months.

Storage up to 9 months

- Leave the gerotor pump in the delivery condition (coated in mineral oil).

Storage up to 24 months

- Fill the gerotor pump with mineral oil.

Commissioning after storage

Procedure after expiry of the maximum storage time:

- Check the entire gerotor pump for damage and corrosion prior to installation.
- Check the gerotor pump for proper function and leaks during a test run.
- If the storage time exceeds 24 months, the shaft seal ring must be replaced.

Entitlement to warranty will be rendered void if the requirements and storage conditions are not adhered to or after expiration of the maximum storage time.

After expiration of the maximum storage time, we recommend that you have the gerotor pump checked and the seals replaced by your responsible Bosch Rexroth Service partner.

In the event of questions regarding repair and spare parts, contact your responsible Bosch Rexroth Service partner or the service department of the manufacturer's plant for the gerotor pump, see chapter 10.2 "Repair" on page 30.

After removal

If a removed gerotor pump is to be stored, it must be preserved against corrosion for the duration of storage.

The following instructions only refer to gerotor pumps that are operated with a mineral-oil based hydraulic fluid. Other hydraulic fluids require preservation measures that are specifically designed for them. In such cases, consult with Bosch Rexroth Service, see chapter 10.2 "Repair" on page 30.

Bosch Rexroth recommends the following procedure:

1. Clean the gerotor pump.
2. Drain the gerotor pump.
3. For storage time up to 9 months: moisten the inside of the gerotor pump with mineral oil and fill with approx. 100 ml mineral oil.
   For storage time up to 24 months: fill the gerotor pump completely with mineral oil.
   Filling is performed via suction port **S** or pressure port **P**, see chapter 7.5 "Installing the gerotor pump", Fig. 6 on page 25.
4. Plug all ports airproof.
5. Moisten the unpainted surfaces of the gerotor pump with mineral oil or a suitable, easily removed corrosion protection agent, e.g. acid-free grease.
6. Package the gerotor pump airproof together with desiccant in corrosion protection film.
7. Store the gerotor pump so that it is protected against jolts, see "Requirement" on page 20 in this chapter.

7 Installation

Prior to installation, the following documents should be ready at hand:
- Hydraulic schematic for the machine/system (available from the machine/system manufacturer)
- Data sheet of the gerotor pump (contains the permissible technical data)

7.1 Unpacking

CAUTION! Danger from parts falling out!
If the packaging is not opened correctly, parts may fall out and damage the parts or even cause injuries!
- ▶ Place the packaging on a flat and solid underground.
- ▶ Only open the packaging from the top.

- ▶ Remove the packaging from the gerotor pump.
- ▶ Check the gerotor pump for transport damages and completeness, see chapter 4 "Scope of supply" on page 17.
- ▶ Dispose of the packaging according to the national regulations of your country.

7.2 Installation conditions

Cleanliness Absolute cleanliness is required. The gerotor pump and all other used parts must be installed in a clean condition. Contamination of the hydraulic fluid can have a considerable impact on the service life of the gerotor pump.

Cleaning Use lint-free cloths for cleaning.

Temperature The temperature of the gerotor pump must be the same as the ambient temperature of the installation site. Allow sufficient time for the gerotor pump to adjust to the temperature conditions.

Mounting the pump For installing and disassembling the pump on or from the drive the accessibility has to be provided for on the system side. On the machine side, the screws have to be accessible in a way that the required tightening torque can be applied. The tightening torque is oriented towards the operating conditions and elements involved in the screw connection and has to be specified by the manufacturer when engineering the power unit, the machine, or the system. Screws of tensile strength class 8.8 or 10.9 have to be provided for mounting purposes.

7.3 Installation instructions

Fluid tank

- The permissible fluid temperature must not be exceeded; provide a cooler if necessary.

Lines and ports

- Remove the protection plugs on the pump.
- Carefully clean the pipelines and fittings prior to installation.
- Under no circumstances may returning fluid be reaspired directly, i.e., select the largest possible distance between suction line and return line.
- Make certain that the suction and return lines lead into the reservoir below the minimum fluid level in all operating conditions. This will prevent air from being primed and foam from being formed.
- Make sure the connections and connecting elements are air-tight.

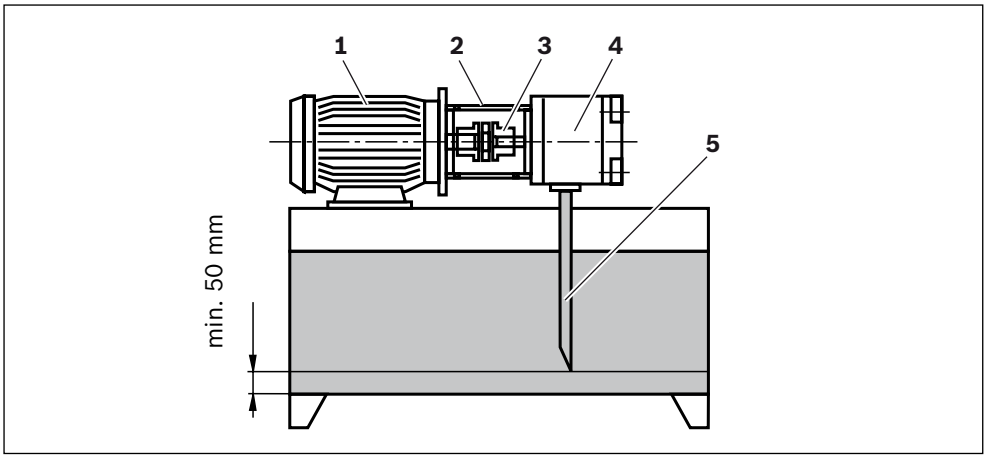


Fig. 4: Recommendation for the arrangement of the suction line

1 Electric motor
2 Pump support
3 Coupling
4 Pump
5 Suction line

Filter

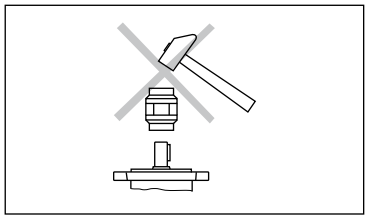
If possible, use return-line filters or pressure filters.
(Only use suction filters in combination with underpressure switch/contamination indicator.)

Hydraulic fluid

- Observe our specifications according to data sheet 90220.
- Different types of hydraulic fluid must not be mixed.
- The hydraulic fluid must be changed at certain time intervals depending on the operating conditions. This involves cleaning residues from the hydraulic fluid tank.

Drive

- No radial or axial forces permissible on the pump drive shaft.
- Make certain that motor and pump are exactly aligned.
- Always use a coupling that is suitable for compensating for shaft offsets.
- When installing the coupling, avoid axial forces, i.e., when installing, do not hammer or press the coupling onto the shaft. Use the female thread of the drive shaft.



7.4 Required tools

Details on the required tools and the tightening torques for the mounting bolts are available from the machine and system manufacturer.

7.5 Installing the gerotor pump

7.5.1 Preparation

- Before installing, completely empty the gerotor pump to prevent mixing with the hydraulic fluid used in the machine/system.

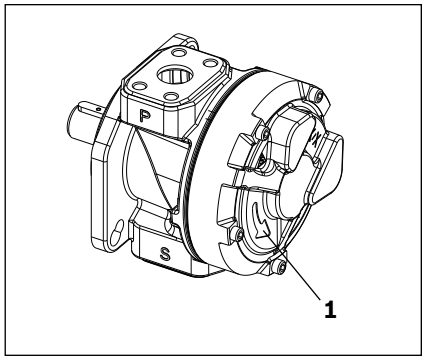


Fig. 5: Direction of rotation gerotor pump

1 Arrow indicating the direction of rotation on the housing

- Make certain that the direction of rotation of the gerotor pump as specified by the arrow indicating the direction of rotation on the cover matches the direction of rotation of the electric motor.

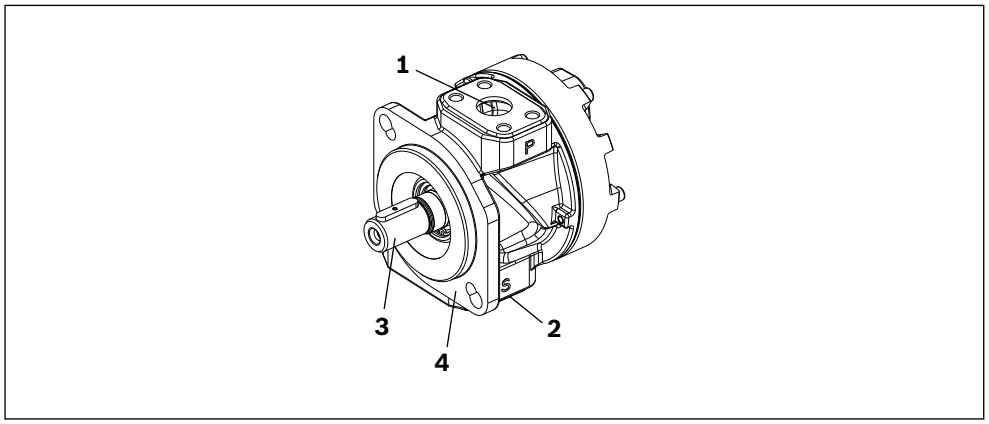


Fig. 6: Installation gerotor pump PGZ

1 Pressure port P
2 Suction port S
3 Shaft
4 Mounting flange

7.5.2 Installing the coupling

1. Remove the protection plugs on the shaft.
2. Lightly grease the shaft end and the coupling half.
3. Push the first coupling half onto the shaft end.
4. Axially align the coupling half according to manufacturer's instructions.
5. Secure the coupling half on the shaft.
6. Check whether the position of the coupling half corresponds to the manufacturer's instructions and correct if necessary.
7. Screw the pump support onto the mounting flange.
8. Grease the motor shaft and its coupling half.
9. Push the second coupling half onto the motor shaft.
10. Align the coupling half on the motor shaft.
11. Secure the coupling half on the motor shaft.
12. Mount the gear crown or another elastic coupling part on the motor-shaft coupling half.
13. Place the pump on the pump support mounted on the motor shaft and fasten the pump. Use suitable screw lengths here that are appropriate for the given load case.
14. Check the required coupling backlash between pump/motor and correct if necessary. See the specifications from the coupling manufacturer for the coupling backlash.
15. When using flexible couplings, check that the drive is free of resonance after completing the installation.

7.5.3 Hydraulically connecting the gerotor pump

- Remove the flange covers on the suction and pressure port.
- Check the lines for cleanliness.
- Make certain that the line connection contains the specified seals.
- If necessary, secure the O-ring against slipping with installation grease.
- Now hydraulically connect the pump according to the instructions of the system or machine manufacturer.

8 Commissioning

During all work for commissioning the gerotor pump, observe the general safety instructions and intended use detailed in chapter 2 "Safety instructions" on page 10.

To commission the gerotor pump, observe the instruction manual for the hydraulic system.
Only commission the gerotor pump with approved hydraulic fluid. Observe data sheet 10545 here.

⚠ CAUTION

Danger of personal injury and damage to equipment!
If the gerotor pump was not correctly installed, persons could be injured and the product or the system damaged or even destroyed during commissioning of the gerotor pump.
- Make certain that the gerotor pump was installed by qualified personnel before commissioning the gerotor pump.
- Make certain in particular that the direction of rotation of the pump is the same as the direction of rotation of the drive motor. Make sure also that the drive motor is correctly connected electrically.

NOTICE

Contamination of the hydraulic fluid!
Contaminated hydraulic fluid can lead to wear and malfunctions. In particular, foreign particles, such as welding beads or metal cuttings in the suction line, may damage the gerotor pump.
- Ensure utmost cleanliness during commissioning.

8.1 Preparing for commissioning

- Make certain that the suction channel is clear.
- Make certain that the piping is clean and was installed leak-tight.
- Check the hydraulic schematic for immediate functions/movements when pressure has built up.
- Check the hydraulic fluid vessel for cleanliness.
- Fill the hydraulic fluid according to the system manufacturer's specifications. To do this, use only filters with the required minimum retention rate.
- Check the suction side for the leak-proof installation.
- Make certain that the direction of rotation of the motor is the same as the direction of rotation of the pump.
- If the pump was nevertheless commissioned with the wrong direction of rotation, it must be air bled again.

8.2 Initial commissioning

To commission the gerotor pump, proceed as follows:

- Place a drip tray under the gerotor pump to collect any hydraulic fluid that may escape.
- Fill the pump with filtered hydraulic fluid. Depending on the installation position, filling can be performed via the suction or pressure port. Refer to the instruction manual of the system for information on a suitable port.
- Air bleed the pump. Refer to the instruction manual of the system for information on how air bleeding the gerotor pump is implemented.
  If no switchable or automatic air bleeding is provided, you must manually air bleed the pump.

Manually air bleeding the pump

1. Switch over to circulation at zero pressure in accordance with the instruction manual of the system or directly connect the pressure output to the reservoir.
2. To air bleed the pump, briefly switch the motor on and then immediately switch it off again (inching mode). Repeat this procedure until the hydraulic fluid drains without bubbles and complete air bleeding is ensured.

   The gerotor pump is now air bled.

- Switch on the drive motor and allow the pump to start up.
- Check that no bubbles or foam forms in the hydraulic fluid.
- Switch the motor off again.

8.3 Recommissioning after standstill

- During recommissioning, check that the direction of rotation of the electric motor matches the direction of rotation arrow on the pump housing after disconnecting from mains.
- Inspect the pump and system for leakage. Loss of fluid indicates leakage below the hydraulic fluid level. An increased hydraulic fluid level in the reservoir indicates leakage above the hydraulic fluid level.
- If the pump is arranged above the hydraulic fluid level, the pump can drain due to leakages, for example due to a worn-out shaft seal ring. In this case, air bleeding is again required during recommissioning. Have repaired.
- Switch on the motor when the system is in flawless condition.

9 Operation

The gerotor pump may only be operated with the permissible data, see data sheet 10545.
The pump may only be operated when in perfect condition.
To ensure a long and reliable service life of the gerotor pump, Bosch Rexroth recommends regularly inspecting the hydraulic system and the gerotor pump:
Constantly monitor noises, vibrations and temperatures.
After some time in operation, check the hydraulic fluid in the reservoir for bubbles or the formation of foam on the surface.
During operation, pay attention to changes in the noise characteristics. A slight increase in the noise level is normal due to heating of the hydraulic fluid. A significant increase in the noise level or short-term and irregular changes in the noise characteristics may indicate the aspiration of air. If the suction pipe opening is below – but too close – to the surface the hydraulic fluid, air may be primed via a vortex.
Changes in operating speeds, temperatures, increase in the noise level or power consumption indicate wear or damage to the system or pump.

10 Maintenance and repair

Maintenance Installation, maintenance and repair of the pump may only be performed by the manufacturer or his authorized dealers and subsidiaries. Repairs carried out by the customer render entitlement to warranty cover void!

Inspection Check the lines, line connections and shaft seals for leaks. Follow the system manufacturer's instructions.

Checking warning equipment After completing the maintenance and repair work, check that all warning and safety devices have been remounted and are in perfect condition.

Replacing wear parts When replacing wear parts, use only original spare parts. As a precaution, wear and plastic parts of the drive coupling should be replaced after no more than 5 years, even if they are not yet worn. Also follow the coupling manufacturer's instructions.

Plugging openings For transport, plug all openings with appropriate protection caps or devices to protect dirt or moisture from penetrating the gerotor pump.

10.1 Maintenance

For safe operation and a long service life of the pump, a maintenance schedule has to be developed for the power unit, the machine, or the system. The maintenance schedule must ensure that the operating conditions of the pump remain in the specified range during the entire service life.
In particular, compliance with the following operating parameters has to be ensured:
- Required cleanliness of the hydraulic fluid
- Operating temperature range
- Fill level of the hydraulic fluid.

Furthermore, the pump and the system are to be checked for changes to the following parameters on a regular basis:
- Vibrations
- Noises
- Temperature difference between pump and hydraulic fluid tank
- Foaming in the vessel
- Leaks

Changes to these parameters indicate wear of components (e.g., drive motor, coupling, pump, etc.). The reason has to be determined and remedied immediately. In order to achieve high operational safety of the pump in the machine/system, we recommend checking the parameters mentioned above continuously and automatically and the automatic shut-down in case of changes exceeding the usual fluctuations in the specified operating range.

For preventive maintenance of the pump, we recommend having the shaft seals replaced after an operating period of no more than 5 years by an authorized Bosch Rexroth service company.
Refer to the instruction manual of the system for additional information on maintenance.

10.2 Repair

Repairs to the gerotor pump may only be performed by Bosch Rexroth or dealers authorized by Bosch Rexroth. Repairs carried out by the customer render entitlement to warranty cover void!
Address all questions regarding spare parts and repairs to your responsible Bosch Rexroth Service partner or the service department of the plant that manufactures the gerotor pump:

Bosch Rexroth AG
Service
Bgm.-Dr.-Nebel-Str. 8
97816 Lohr am Main
Tel. +49 9352 18-0
service@boschrexroth.de

For the addresses of foreign subsidiaries, please refer to
www.boschrexroth.com/addresses

11 Removal and replacement

11.1 Required tools

Removal of the gerotor pump can be performed with standard tools.
You will need:

- A set of Allen keys for the housing screws.
- An extractor for the shaft key on the cylindrical shaft end.
- A flat-tip screwdriver to pry off the cover.
- A drip tray and cloths for collecting the remaining oil.

11.2 Preparing for removal

Take the entire system out of service as described in the instruction manual for the system.
Then prepare removal of the gerotor pump as follows:

- ▶ Depressurize the pressure side (P-line).
- ▶ Make sure that the relevant system components are not under pressure or voltage.

11.3 Removing the axial piston unit

Proceed as follows to remove the gerotor pump:

1. Shut off the suction port of the pump. In doing so, follow the instructions in the instruction manual of the system.
2. Place a drip tray under the gerotor pump to collect any hydraulic fluid that may escape.
3. Disconnect the pipe on the pressure side.
4. Loosen the mounting bolts on the pump.

   The pump is removed.

11.4 Preparing the components for storage or further use

- ▶ Proceed as described in chapter 6.2 "Storing the gerotor pump" on page 20.

12 Disposal

Careless disposal of the gerotor pump, the hydraulic fluid and the packaging material could lead to pollution of the environment.
Observe the following points when disposing of gerotor pump:

1. Completely drain the gerotor pump.
2. Dispose of the gerotor pump and the packaging material in accordance with the national regulations in your country.
3. Dispose of the hydraulic fluid according to the national regulations of your country. Also observe the applicable safety data sheet for the hydraulic fluid.
4. Remove the gerotor pump into its individual parts and properly recycle these parts.
5. Separate according to, for instance:
   – Castings
   – Steel
   – Aluminum
   – Seals

13 Extension and conversion

Pump combinations When used together with original Bosch Rexroth combi parts, gerotor pumps can be combined as the rear pump to form multiple pumps.

Conversion Do not modify the gerotor pump in any way.

The Bosch Rexroth warranty only applies for the delivered configuration. In case of conversion or extension, the entitlement under warranty will be rendered void.

14 Troubleshooting

Table 6 and may help you when troubleshooting. The table makes no claim for completeness.
In practical use, problems which are not listed here may also occur.

14.1 How to proceed for troubleshooting

- Always act systematically and purposefully, even under pressure of time. Random and imprudent removal could result in the inability to determine the original fault cause.
- First obtain a general overview of how your product functions in conjunction with the entire system.
- Try to find out whether the product has functioned properly in conjunction with the entire system before the fault occurred.
- Try to determine any changes of the entire system in which the product is integrated
  - Were there any changes to the product's application conditions or operating range?
  - Has maintenance work recently been carried out? Is there an inspection or maintenance log?
  - Were changes (e.g., conversions) or repairs made to the complete system (machine/system, electronics, control) or on the product? If yes, which?
  - Has the hydraulic fluid been changed?
  - Was the product or machine operated as intended?
  - How did the malfunction appear?
- Try to get a clear idea of the error cause. Directly ask the (machine) operator.
- Document the work carried out.
- In the event of faults than cannot be rectified, contact one of the contact addresses listed under `www.boschrexroth.com/addresses` or :

  Bosch Rexroth AG
  Service
  Bgm.-Dr.-Nebel-Str. 8
  97816 Lohr am Main
  Tel. +49 9352 18-0

14.2 Malfunction table

Table 6: Malfunction table gerotor pump PGZ

Fault	Possible cause	Remedy
Pump does not deliver /prime	Pump not air bled	Air bleed pump
	O-ring defective (wrong hydraulic fluid, seal damage, missing O-ring, wrong O-ring)	Insert/replace original O-ring
	Sealing surface soiled or damaged	Ensure cleanliness and intactness of the sealing surface
	Coupling missing or parts of the coupling missing	Supplement coupling or couping parts
	See fault "drive motor rotating in wrong direction"	
	See fault "air entry through output drive"	
Pump too loud	See fault "interfaces leaky“	
	See fault "drive motor rotating in wrong direction"	
	Ambient temperature below -20 °C	Establish suitable ambient temperature
	Intake of air bubbles	Air bleed system
	Vortex formation in the suction area of the hydraulic fluid tank	Check fill level of the hydraulic fluid tank
	See fault "viscosity < 10 mm^2/s"	
	See fault "viscosity > 2000 mm^2/s"	
Interfaces leaky	O-ring defective (wrong hydraulic fluid, seal damage, missing O-ring, wrong O-ring)	Use original O-ring
	Sealing surface soiled or damaged	Ensure cleanliness and intactness of the sealing surface
	Faulty installation (screws too long)	Installation only by authorized, trained and instructed specialist personnel; use only original spare parts
	Combi part does not fit	Observe project planning note in the data sheet of the front pump
System interfaces cannot be installed	Wrong connection flange/screws, suction port and/or pressure port selected	Observe specifications for the dimensions of the flange in data sheet 10545
Viscosity < 10 mm^2/s	Hydraulic fluid too hot	Notes on hydraulic fluids in data sheet 90220; observe project planning note in data sheet 10545; water content, viscosity, check regularly for clouding and odor
	Service life of the hydraulic fluid exceeded	
	Wrong hydraulic fluid filled	
Viscosity > 2000 mm^2/s	Hydraulic fluid temperature too low	Notes on hydraulic fluids in data sheet 90220; observe project planning note in data sheet 10545; water content, viscosity, check regularly for clouding and odor
	Wrong hydraulic fluid filled	
	Thickening due to mixture	

Table 6: Malfunction table gerotor pump PGZ

Fault	Possible cause	Remedy
Volumetric or mechanical efficiency not achieved	See fault "viscosity > 2000 mm^2/s"	
	See fault "viscosity < 10 mm^2/s“	
	See fault "output flow not achieved"	
	Operation with rotational speed that was configured either too low or too high	Observe project planning note in data sheet 10545
	See fault "permissible degree of soiling of the hydraulic fluid exceeded"	
	Mixture of different fluids	Observe notes on hydraulic fluids in data sheet 90220
Permissible degree of soiling of the hydraulic fluid exceeded	Aging hydraulic fluid and residues (abrasion) from system	Check hydraulic fluid for contamination according to maintenance schedule
	Insufficient filtration	Observe project planning note in data sheet 10545 and check according to maintenance schedule
	Unexpected ingress of dirt (e.g., while changing the hydraulic fluid)	Ensure a clean environment, fill only via filter
Drive motor rotating in wrong direction	Drive motor connected incorrectly	Installation only by authorized, trained and instructed specialist personnel
		Check direction of rotation during recommissioning after disconnecting from mains
Motor circuit breaker trips	Drive motor too weak	Observe information regarding required drive power in data sheet 10545
	See fault "drive motor rotating in wrong direction"	
	See fault "pump wear"	
Drive speed too high/too low	Motor configured with insufficient/excessive rotational speed	Observe project planning note in data sheet 10545
Air entry through output drive	O-ring defective (wrong hydraulic fluid, seal damage, missing O-ring, wrong O-ring)	Use original combi part set, replace seals
Discharge of hydraulic fluid	Vessel hangs too high	Observe project planning note during maintenance and commissioning of hydraulic components in data sheet 07900
	Level of hydraulic fluid to high	
	Precharged hydraulic fluid tank (charged with excessively high pressure) or precharge pump	Observe project planning note for precharged vessel or precharge pump
	Seal defect	Replace damaged O-ring
	See fault "interfaces leaky"	
Inlet pressure < 0.7 bar	Faulty dimensioning of the suction line (length, cross section, angle)	Observe project planning note in data sheet 10545
	Rotational speed too high	Observe maximum rotational speed during project planning
	Foreign particles in the suction channel	Remove foreign particles
	Air pressure too low (also for vessels without pressure compensation)	Observe absolute pressure during project planning
Inlet pressure > 2 bar	See fault "discharge of hydraulic fluid"	

Table 6: Malfunction table gerotor pump PGZ

Fault	Possible cause	Remedy
Output flow not achieved	Pump primes air	Check fill level in the hydraulic fluid tank and correct if necessary Observe the notes on the design and lines in the hydraulic trainer, volume 3 and project planning note
	Drive speed too low	Observe average characteristic values of drive power in data sheet 10545 during project planning
	See fault "permissible degree of soiling of the hydraulic fluid exceeded"	
	See fault "pump wear"	
Continuous outlet pressure > 15 bar	Line cross section too low	Observe the notes on the design and lines in the hydraulic trainer, volume 3 and project planning note
	Flow resistance too high	
	Permissible load exceeded	To limit the operating pressure and for solenoid-actuated relief of the operating pressure, install a pump safety block. Observe the notes in data sheet 10545 here
Wear through radial force on the shaft	Incorrect installation	Observe the installation instructions
	Unsuitable parts	Use only original combi part set
	Tightening torque for screws too low	Observe tightening torques in the installation instructions
	See fault "pump wear"	
Wear through axial force on the shaft	Incorrect installation	Observe installation instructions of the coupling manufacturer
	Unsuitable parts	Use only original combi part set
	See fault "pump wear"	
Pump wear	Soiled or incorrect hydraulic fluid	Filter or change hydraulic fluid, perform regular inspections.

15 Technical data

The permissible technical data of the gerotor pump can be found in data sheet 10545.

The data sheet can be found on the internet at www.boschrexroth.com/various/utilities/mediadirectory

Further information can be found in the online product catalog Industrial Hydraulics: www.boschrexroth.com/ics

16 Alphabetical index