



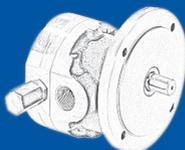
English

Gear pumps

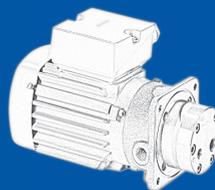
Type PR 1, PR 2, PRMH, PRMV, B and BHM



Type PR1



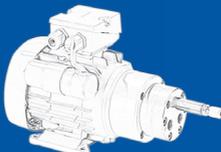
Type B



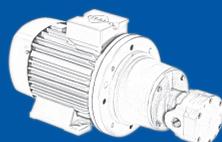
Type PRMV



Type PR2



Type PRMH



Type BHM

Please note the safety information.

This incomplete machine is solely intended to be installed in or assembled with other machines or other incomplete machines and equipment, in order to form a complete machine as defined in the Machinery Directive. It must only be put into operation once a conformity assessment procedure in accordance with the Machinery Directive was carried out for the complete machine.

This documentation is not subject to revision.

January 2013

This incomplete machine is solely intended to be installed in or assembled with other machines or other incomplete machines and equipment, in order to form a complete machine as defined in the Machinery Directive. It must only be put into operation once a conformity assessment procedure in accordance with the Machinery Directive was carried out for the complete machine.

These assembly instructions conform to the „Machinery Directive 2006/42/EC of the European Parliament and of the Council on the approximation of the laws, regulations and administrative provisions of the Member States relating to machinery“ (Machinery Directive), Annex VI.

These assembly instructions are addressed to the factory manager who has to pass them on to the members of staff who are responsible for setting up, connecting, operating and maintaining of the machinery.

The factory manager must ensure that the information contained in the assembly instructions and enclosed documents have been read and understood by the staff.

The assembly instructions must be kept at a known and easily accessible place and must be consulted if there is even the slightest doubt.

The manufacturer assumes no liability for damage to persons, animals or things as well as to the machinery itself that results from improper use due to failure to comply with or insufficient compliance of the safety criteria included in these assembly instructions or by modifying the machinery or the use of spare parts that are not suitable.

The copyright for the assembly instructions shall remain the exclusive property of



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or their legal successors.

These assembly instructions may only be reproduced or passed to third parties with prior written permission. This also applies if only extracts of the assembly instructions are copied or passed on. The same conditions apply when passing on the assembly instructions in digital form.

As at: January 2013

Archiving

- ➔ Please contact the manufacturer immediately if the assembly instructions are missing.
- ➔ Always keep the instructions at the machine.
- ➔ Always keep the instructions to hand.

Symbols and signal words

The following symbols and signal words are used in this documentation. The combination of a pictogram and a signal word classifies the respective safety note. The symbol can vary depending on the type of risk.

Symbol	Comments
DANGER 	This signal word is used if death or irreversible damage to health can occur when disregarding the hazard note.
WARNING 	This signal word advises of personal injury and damage to property, including risks of injury and accidents and health risks.
CAUTION 	This signal word points to the risk of damage to property. In addition, there is a low risk of injury.
ATTENTION	This word may only be used if no health risks can occur. It warns of malfunctions and is presented without a symbol, since the level of risk is low.
IMPORTANT	This word points to easier handling and cross-references. It excludes any risks of damage to property or risks of injury and is presented without a symbol.

Other symbols and icons

Symbol	Usage	Comments
➔	Instruction for operation	Instructs to a specific operation.
1. 2.	Steps of an instruction for operation	The steps must be executed in the specified order.
	Note	Important information for the understanding of the device or for improved operation sequences.

Structure of warning notices

Symbol	Comments
<p>DANGER</p> 	<p>The first line describes the nature and source of danger The second line describes the consequences, if no safety measures to prevent the danger are taken. → The last line describes measures for risk prevention.</p>
<p>WARNING</p> 	<p>Risk of injury due to disregard of the safety symbols Ignoring the warning notices on the unit and in the assembly instructions may lead to injury and other hazards. → Observe warning notices on the unit and in the assembly instructions.</p>
<p>CAUTION</p> 	<p>This signal word points to the risk of damage to property. In addition, there is a low risk of injury.</p>
<p>ATTENTION</p>	<p>This word may only be used if no health risks can occur. It warns of malfunctions and is presented without a symbol, since the level of risk is low.</p>
<p>IMPORTANT</p>	<p>This word points to easier handling and cross-references. It excludes any risks of damage to property or risks of injury and is presented without a symbol.</p>

The following special safety symbols are shown at the relevant text passages in these assembly instructions:

Warning signs

Symbol	Comments	Symbol	Comments
	Warning of a danger zone		Warning of dangerous electrical voltage

Prohibition sign

Symbol	Comments	Symbol	Comments
	Fire, naked flames and smoking are prohibited		Depositing and storing of items prohibited

Prohibition sign

Symbol	Comments	Symbol	Comments
	Please take note of the information		Please take note of the additional information

Target group

The assembly instructions are aimed at staff with the following areas of responsibility:

Work area	Competency
Operation	Trained personnel
Maintenance	Qualified personnel

Definition of competencies according to DIN EN 60204-1

Trained personnel:

A person who was informed of, and if required, taught the tasks assigned to him/her and the possible hazards caused by incorrect behaviour as well as instructed on the necessary safety equipment and safety measures by a qualified person.

Qualified personnel:

A person who, as a result of their professional training, knowledge and experience and as a result of their knowledge of the relevant standards can properly assess the work to be carried out and can recognise possible dangers involved in such work.

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1. Identification

1.1 Description

Gear pumps

1.2 Manufacturer



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1.3 Intended use

The gear pumps and gear pump units are used to transfer all off-the-shelf lubricating and hydraulic oils within the viscosity limits (cSt) specified by us.

The pumps can be installed horizontally or vertically.

For complete assemblies, the combination of gear pump, flange, coupling, motor, oil tank, filter, pressure gauge and pressure control valve is used to construct hydraulic or oil circulating lubricating systems.

The gear pumps consist of hydraulic castings. The gears are case-hardened and ground. The sealing is achieved through a shaft seal made from NBR or, on request, from Viton. The shaft seal is pressure-compensated via a bore, which is connected to the suction side.

Any other or an extended use of the gear pumps is considered improper and therefore inappropriate.

This may affect the safety and protection of the pumps. PUTZIN Maschinenbau GmbH is not liable for damages resulting from improper use.

Intended use also includes:

- Observing all notes given in the assembly instructions
- Observing all safety information

1.4 Inappropriate use

Inappropriate use, which could pose a danger to the user, a third party or the machinery is:

- The use of the gear pump and its specification contrary to the intended use.
- The operation of the gear pumps outside of their specified physical limitations of use.
- Modifications to the gear pump as well as attachments or alterations, without prior consultation with PUTZIN Maschinenbau GmbH.
- Operation of the gear pump contrary to the provisions included in the assembly instructions with regard to safety information, installation, operation, maintenance and servicing.
- The operation of the gear pump in case of obvious faults.
- Carrying out repair, cleaning and maintenance work while the installation is in operation.

<p>WARNING</p> 	<p>Risk of injury and disruption of operation caused by improper use</p> <p>There are risks caused by inappropriate use of the gear pump.</p> <p>The gear pump must only be used in accordance with its intended use.</p>
<p>WARNING</p> 	<p>Risk of injury caused by unauthorized modifications</p> <p>There are risks caused by unauthorized modifications to the gear pump and due to the use of spare parts from third-party manufacturers.</p> <p>Only use original spare and wearing parts from the manufacturer. No modifications, attachments or alterations to the gear pump without prior approval from PUTZIN Maschinenbau GmbH are permitted.</p>

2. General information

2.1 Warranty and liability

In principle, the „General Conditions of Sale and Delivery“ of PUTZIN Maschinenbau GmbH apply. These are available to the customer at completion of the contract at the latest.

Warranty and liability claims in the case of personal injury and damage to property are excluded, where traced back to one or several of the following causes:

- Improper use of the gear pump.
- Improper operation of the gear pump.
- Operation of the gear pump with faulty safety equipment.
- Disregard of the notes in the assembly instructions.
- Unauthorized structural modifications to the gear pump.
- Poor maintenance, repair and servicing measures.
- Emergencies resulting from the effects of foreign bodies or force majeure.

2.2 Target group of the assembly instructions

The assembly instructions are aimed at the user/owner and the trained personnel.

Definition according to DIN EN 60204-1:

Trained personnel:

A person who was informed of, and if required, taught the tasks assigned to him/her and the possible hazards caused by incorrect behaviour as well as instructed on the necessary safety equipment and safety measures by a qualified person.

2.3 Purpose of the assembly instructions

These assembly instructions are provided as assistance and include all necessary instructions for the general safety, transportation, installation, operation, maintenance and setting-up.

These assembly instructions and all of the safety information must be:

- Read, understood and observed (particularly the safety instructions) by all persons working with the gear pump.
- Freely accessible to everyone.
- Consulted in case of even the slightest doubt (safety).

Purpose:

- Prevent accidents.
- Increase lifespan and reliability of the gear pump.

3. General safety instructions

3.1 General safety instructions

DANGER



Danger to life, risk of injury and damage to property

Disregarding the assembly instructions and all of the safety information included will pose risks.

- Carefully read the assembly instructions prior to the initial operation.
- Comply with the required safety conditions prior to the initial operation.
- Please note the general safety information.
- Please note the special safety information included in other chapters.

The gear pumps have been built in accordance with state-of-the-art technology and recognised safety rules and regulations.

- To exclude any risks to life and limb of the user or third parties and damages to the gear pump, the gear pumps must only be used for their intended use and in an apparent safe and reliable condition.

Damage to property or personal injury caused by ignoring the instructions given in the assembly instructions is the responsibility of the plant operator or the person assigned by him.

- Eliminate any interference, which may affect the safety.
- Observe all safety guidelines and hazard warnings on the gear pump.
- All safety information and hazard warnings must always be clearly legible.

4. Installation

The gear pumps are installed by the user/owner.

IMPORTANT



Observe the chapter on safety

Please observe the basic safety information in the chapter „General safety instructions“. In addition, observe all safety information given in the manufacturer’s documentation.
Contact details can be found in the chapter „Identification“.

- Check the parts supplied for completeness, damage, or other abnormalities.
- During transport, please take note of the valid safety and accident prevention regulations (German trade association’s regulations BGV D8, D6).
- During installation, pay attention to the direction of rotation of the gear pump.
- Connect the excess pressure connection to the gear pump.
- Connect the pressure relief valve to the gear pump (types PR 2, PRMH only)
- Connect the suction connection to the gear pump.
- Connect the system to the drive voltage 230/400 V, 50 Hz (60 Hz).

IMPORTANT

Install the suction connection correctly to prevent harmful intake of air.

Do not operate the pump without oil. During start-up, the pump must not be operated without oil for a long period of time.

IMPORTANT



Further Installations

Information on the installation of gear pumps and gear pump units can be found in the publication for standard and custom-made products from PUTZIN Maschinenbau GmbH and online at www.putzin.de.

5. Configuration and function

5.1 Drive

The units are driven by three-phase standard motors according to VDE regulations and DIN standards.

Designs:

- For horizontal drive IMB34 with foot mounting.
- For vertical drive IMB14 with flange mounting.

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Connection

The standard voltage is 230/400 V at 50 Hz and $n = 1400$ rpm (special voltages are available).

At an operating frequency of 60 Hz it must be ensured that the speed and power is increased by approx. 20 %.

The engine power is determined by the flow volume and flow pressure of the pumps of the PR series (see table).

	Pressure class I max 35 bar	Pressure class II max. 60 bar	Pressure class III max. 100 bar
from 0,06 ... 0,50 l/min	0,18 kW	0,18 kW	0,25 kW
from 0,75 ... 1,00 l/min	0,25 kW	0,25 kW	0,37 kW
from 1,20 ... 2,00 l/min	0,37 kW	0,55 kW	on request
from 2,50 ... 3,00 l/min	0,55 kW	on request	on request

The rotational direction of the pumps is normally „right“ looking at the drive shaft stub. If a rotational direction „left“ is required, it must be specified on the order. The suction and pressure side will then change.

5.2 Pressure limit

The gear pumps can be fitted with pressure relief valves of various pressure ratings to protect the pump against overloads.

5.3 Technical data

Technical data		
Flow rate:	Series PR	Series B and BHM
	35 bar, 60 bar, 100 bar	35 bar
Cont. operating pressure:	0.06 ... 3.0 l/min	6.0 ... 18.0 l/min
Motor speed:	n = 1,400 rpm	
Suction pipe connection:	<ul style="list-style-type: none"> • G 1/4" (flow volumes < 1.00 l/min) • G 3/8" (flow volumes < 1.00 l/min) 	
Steel pipes to be used with oil viscosities:	<ul style="list-style-type: none"> • ≤ 80 °E (568 cSt), steel pipe 10 x 1; alternatively 12 x 1 • ≤ 80 °E (568 cSt), steel pipe 10 x 0.5; alternatively 12 x 0.5 	
Suction lift:	<ul style="list-style-type: none"> • max 800 mm (without strainer) • max 550 mm (with strainer) 	
Suction pipe length:	max 1,000 mm	
Pressure pipe connection:	G 1/4" (also with flanges for vertical pump units)	
Screw fittings for steel pipes:	e.g. Ermeto fittings, depending on flow rate 6 x 1, 8 x 1, 10 x 1 and 12 x 1	
Operating pressure:	<ul style="list-style-type: none"> • Pressure class I max 35 bar • Pressure class II max 60 bar • Pressure class III max 100 bar 	
Speed range:	100 ... 3,000 rpm	
Operating temperature:	-15 ... 100 °C	
Operating viscosity:	<ul style="list-style-type: none"> • Q 0.06 ... 0.5 l/min v 2.5 °C (980 cSt) to v 130 °C (17 cSt) at operating temperature 1 cSt = 1 mm²/s • Q 0.5 ... 3.0 l/min v 2.5 °C (800 cSt) to v 105 °C (17 cSt) at operating temperature 1 cSt = 1 mm²/s 	
Fluids:	Mineral oil based lubricating oils and hydraulic oils	
Standard voltage:	230/400 V	
Frequency:	50 Hz 60 Hz (motor speed and power increased by approx. 20 %)	



Further information

Information about operating viscosities at various temperatures can be found in data sheets from the oil companies.

The operating viscosity is decisive in determining the flow volume.

IMPORTANT



Fluids:

The pumps are suitable to transfer mineral oil based lubricating oils and hydraulic oils.

The transfer of synthetic oils or liquids depends, among other things, on the sealing materials used in the pump and must be checked beforehand.

6. Commissioning

Commissioning of the gear pumps is carried out by the user/owner.

- Take note of the directional arrow on the gear pump, gear pump unit and motor.
- Clean the motor housing from dust and dirt
- Care should be taken to ensure that the air intake at the fan blade and the cooling of the motor are guaranteed.
- Only use properly filtered oils.
- Observe the specified viscosity limits.
- Clean the suction and pressure filter.
- Do not operate the gear pump without oil.

**IMPOR-
TANT** **Do not operate the gear pump without oil.**

During start-up, the pump must not be operated without oil for a long period of time.

7. Placing out of service

Disassembly of the gear pumps is carried out by the user/owner.

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TANT



Observe the chapter on safety

Please observe the basic safety information in chapter „General safety instructions“.

In addition, observe all safety information given in the manufacturer’s documentation.

- At the end of your working day, ensure the system cannot be switched back on by unauthorised persons.
- Isolating the power supply must only be carried out by authorised staff.

8. Maintenance and Service

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Please observe the basic safety information in the chapter „General safety instructions“.

The owner/user of the gear pumps is urged to document any maintenance-related observations.

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Modifications and conversions

Any modifications and conversions of the gear pumps must only be carried out by the manufacturer.

8.1 Malfunctions

- Clean the motor housing from dust and dirt
- Clean the air intake at the fan blade to ensure the cooling of the motor is guaranteed.
- Only use properly filtered oils.
- Observe the specified viscosity limits.
- Clean the suction and pressure filters in good time.
- Install the suction connection correctly to prevent harmful intake of air.

9. Malfunctions

- Contact the manufacturer's customer service in case of malfunctions, which cannot be resolved.
- Contact details of the customer service can be found in the chapter „Identification“.

10. Product overview

Gear pump	Gear pump aggregate	Accessories
Type PR 1	Type PRMV	Impulse flow control, Design 6702/1 and 6702/2
Type PR 2	Type PRMH	Pressure relief valve Type 307/E and 316
Type B	Type BMH	



Further Installations

Information on the gear pump and gear pump unit product range can be found in the publication for standard and custom-made products from PUTZIN Maschinenbau GmbH and online at www.putzin.de.

10.1 Accessories

- Impulse flow control, Design 6702/1
- Impulse flow control, Design 6702/2
- Pressure relief valve, angled, type 307/E
- Pressure relief valve, straight, type 316



Further Installations

Information about gear pump and gear pump unit accessories can be found in the publication for standard and custom-made products from PUTZIN Maschinenbau GmbH and online at www.putzin.de.

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Subject to technical modifications and errors. Dimensions are non-binding.