2-Jaw-Parallel Gripper

(with roller guide)

RP-50
RP-100

Version 2.0 Last revision July 2012

Dear customer,

Thank you for the confidence that you have placed in our company by purchasing an IPR gripper.

Every gripper is fully assembled in the plant and is subject to an individual test. This includes examining their complete proper functioning and safe working.

These instructions illustrate how the gripper is set up and operates. In addition, all the main details for assembly, commissioning and maintenance are clearly arranged.

Please carefully read through the contents.

Do directly contact us if any of your questions are not answered in these instructions. We are at the following address.

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Translation of the original assembly instructions

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1. General

1.1. Information on these instructions

These instructions enable the gripper to be safely and effectively handled. These instructions form part of the machine and should be kept close to it so that the personnel responsible can easily access them.

The personnel involved must have carefully read through these instructions and understood them before beginning any work. Keeping to all the safety and handling pointers in these instructions is the basis on which work is done safely.

Also applying are any local health & safety regulations and the general safety conditions where the machine is used.

Illustrations in these instructions are there to assist in basic understanding; they may deviate somewhat from the actual design.

Also follow the generally valid, statutory and other binding regulations of European and national legislation as well as the accident prevention and environmental protection provisions in force in your country.

1.2. Terms of the guarantee

The terms of the guarantee can be found in the manufacturer's general terms & conditions of business. Please turn to our Customer Service (for contact data see cover) if any matters are not clear.

2. Safety

This section provides an overview on all the important safety aspects for protecting people and for reliable, no-trouble operations. Further task-related safety instructions are included in the sections on the service life phases.

2.1. Symbol explanations

Safety instructions are identified by symbols in these instructions. The safety instructions are introduced by signalling words expressing the degree of hazard involved.

	**CAUTION!** Points to a **possible** dangerous situation which - if not avoided - may result in either minor or slight injuries.
	**NOTE!** Points to a **possible** dangerous situation which - if not avoided - may result in either material or ecological damage.
	This symbol brings useful tips and recommendations to one's notice as well as information on efficient, no-trouble operations.

2.2. Use as intended

The gripper is only for gripping and holding workpieces and other objects.

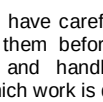
Grippers are not ready-to-use machines as envisaged under the EU Machinery Directive. Grippers are solely for fitting/attaching to machinery and equipment.

	**NOTE!** You must use this gripper exclusively in accordance with the operating conditions and performance specifications established in theses instructions. Never convert or modify it without authorization.

2.3. Inappropriate use

Any other use or one going beyond that described in the "Intended Use" chapter is deemed to be inappropriate and will void all warranty or guarantee claims.

It is the owner - and not the manufacturer - who accepts liability for damage resulting from this.

	**NOTE!** The gripper must not be used in any explosive environment.

2.4. General risks

The gripper was state-of-the-art manufactured at the time of delivery. Even so, dangers could still proceed from it if the safety information listed here in these instructions is not followed.

- The personnel involved must have carefully read through these instructions and understood them before beginning any work.
- The instructions must always be available for all users where the gripper is deployed.
- These instructions are also to accompany the gripper if it is handed over to third parties.
- Do not delve into moving components or handle them during on-going operations.
- Never open protective covers under ongoing operations.
- Only authorized specialist personnel - outside the danger zone - are allowed to carry out any work such as assembly, commissioning, operating, dismantling and maintenance.
- Before any work is begun on the gripper, the energy supply needs to be disconnected and the line system relieved of pressure. Secure the system against being unintentionally reactivated for the duration of the work.
- Ensure during commissioning that all pneumatic connections are either allocated or firmly closed.
- The cover of grippers with a gripping force safeguard is spring-tensioned. Be careful when taking the gripper apart. Ensure stress relief by using a proper device.

2.5. Owner obligations

Together with the safety instructions in these instructions, the valid safety, accident prevention and environmental protection regulations in force where the machine is used must be adhered to.

As part of his obligation to exercise due care, the owner is to ensure that:

- The gripper is used as intended
- During the entire period of use of the machine a check is to be made on whether his operating instructions comply with the ongoing status of the standards & codes and, if necessary, he is to adapt them.
- The responsibilities for installation, operation, fault rectification, maintenance and cleaning are clearly settled and laid down.
- All those dealing with the machine have both read these instructions and understood them. In addition, he has to regularly train the personnel involved and inform them as to hazards/risks.
- The personnel are provided with the requisite personal protective gear which it is mandatory upon them to wear.
- The maintenance work and intervals described in these instructions are be kept to and documented in a maintenance manual.
- All safety equipment is regularly checked as to proper functioning and completeness.

2.6. Requirements placed on the personnel

The variety of tasks described in these instructions place differing requirements on the qualifications of those performing these tasks.

Only appropriate specialist personnel or a duly instructed person under the supervision of specialist personnel are allowed to carry out any work such as assembly, commissioning, operating, dismantling and maintenance.

In view of his technical training, knowledge, experience and knowledge of the relevant standards and regulations, the specialist is in a position to perform the work he has been entrusted with and - on his own - to recognize/avoid any hazards.

3. Specifications

(Please refer to the ongoing catalogue and/or Internet for specifications of the individual grippers)

3.1. General basic data

Min. operating pressure:	1.5 bar
Max. operating pressure:	8 bar
Temperature range:	5 °C to 80 °C (higher if requested)
Drive:	Pneumatic
Material:	Casing of high-strength aluminium hard-coated/ Operating parts of hardened tool-steel
Tolerance particulars	
Thread:	+/- 0.1mm
Alignment pin drill hole:	+/- 0.02mm

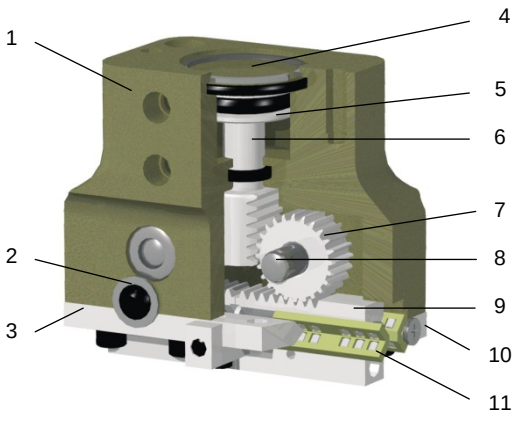
3.2. Operating conditions

The working environment is not to contain any dirt, dust, spray or vapours. The machine is to be used at temperatures between 10 °C and 40 °C.

The maximum (non-condensing) relative air humidity is to be between 10 % and 70 %.

4. Setup and function

4.1. Overview



1	Housing	7	Cog
2	Setting screw	8	Shaft
3	Keyway - adjustable	9	Gripper jaw
4	Cover	10	Keyway - fixed
5	Piston	11	Roller guide
6	Piston rod		

4.2. Brief description

A cog/cog rack drive generates the parallel movement of the jaws. The jaws are controlled by roller bearings.

Roller-controlled 2-jaw parallel grippers provide a number of benefits:

- Precision jaw movement and substantial repeatability thanks to roller guide
- Large opening lift with low external dimensions
- Accessories for ease of developing into the intelligent gripping system
- Finely sensed adjustable gripping force thanks to minimum friction
- Lift monitoring from inductive sensors (optional)
- Double check valve for gripping force safeguard (optional)

5. Transport, packing, storage

5.1. Handling

Immediately check on the delivery when received as to completeness and any transport damage.

Proceed as follows if there are signs of external damage:

- Do not accept the delivery or only under reservation.
- Note down the extent of damage on the transportation documents or on the forwarder's delivery note.
- Initiate the complaint procedure.
-

	Object to any shortcoming as soon as it is discovered. Claims for damages can only be filed within the valid times set aside for complaints.

Transportation temperature -20 °C to 65 °C.

Protect against external impact (jolt, blow, vibration).

5.2. Packing

The packing is to protect the components up to the assembly stage from transportation damage, corrosion and other kinds of damage. Thus, the packing is to be left intact and only removed just before actual assembly.

Only recyclable materials are used for the packing.

Dispose of packaging materials in accordance with the respectively valid statutory regulations and local requirements.

5.3. Storage

Store packs under the following conditions:

- Do not store outdoors.
- Store at a dry and dust-free location.
- Do not expose to corrosive media.
- Protect from direct sunlight.
- Avoid mechanical shocks.
- Temperature for storage: 15 °C to 35 °C.
- Relative air humidity: max. 60 %.
- In cases of storage exceeding 3 months, regularly check on the general condition of all the parts and packing. If need be, either recondition the conservation protection or renew it.

6. Assembly and commissioning

CAUTION!

Before assembling the gripper, the energy supply needs to be disconnected and the line system relieved of pressure.

Make a note of the safety instructions and general hazards listed on Page 2.

6.1. Assembly

The assembly drill holes and pneumatic connections can be taken from our ongoing catalogue and/or the Internet.

The gripper is only to be fastened at the threads provided for the purpose. If needed, manufacture an appropriate holder or adapter flange or acquire from the manufacturer.

Tighten the assembly bolts with thread locking adhesive (e.g. Loctite 4052) or with Schnorr/Nord lock washers, as appropriate.

Provide compressed air at 2-8 bar.

Install pneumatic connections at the housing; close off any connections not needed.

6.2. Commissioning

Pressurize the line system with compressed air. For a possible connection variant, refer to the circuit diagram.

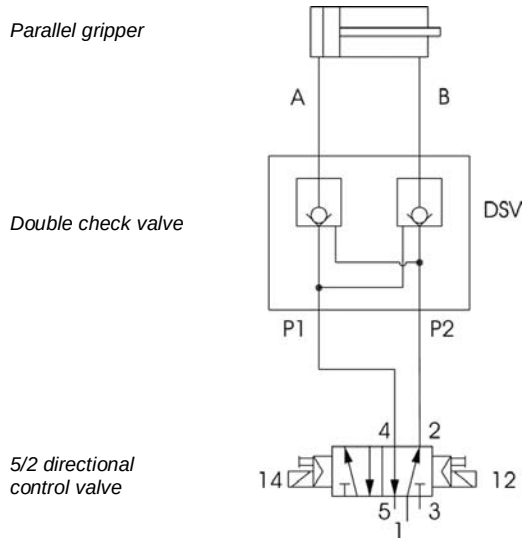
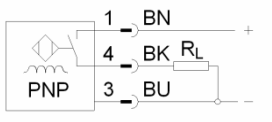


Fig.: Circuit diagram of a connection variant

The gripper is fitted out - as an option - for lifting control purposes with 1 or 2 proximity switches. The connection face and the robot manufacturer's information are to be noted for installation on a robot I/O card as undertaken by the operating company.

Please note - order sensors separately!



7. Malfunctions

Immediately activate the emergency stop given malfunctions which pose a direct hazard for either people or material assets.

Establish reason for malfunctioning, inform the person responsible

The type of fault determines whether it is to be put right by oneself or by an authorised skilled worker.

Possible faults that could arise:

Gripper opens / does not close

- Check on supply of air, replace any non-tight lines, if necessary
- Air pressure too low, raise the air pressure
- Examine gripper seals and renew, if necessary

Gripper opens / closes with a jolt

- Clean gripper and lubricate, if necessary

Gripping force not fully applied

- Examine gripper seals and renew, if necessary

8. Maintenance and repairs

NOTE!

Make a note of the safety instructions and general hazards listed on Page 2.

8.1. Cleaning and upkeep

NOTE!

Corrosive cleaning agents could damage the gripper seals and result in them ageing more rapidly.

Make a note of the following when cleaning and tending to the grippers:

- Use protective caps and the like to firmly close all the openings
- Check that all connections are tight
- Use a metal cleaner
- Remove any coarse dirt and keep components such as sensors clean.

8.2. Maintenance

No particular maintenance is necessary under normal operations given that the gripper is used as originally intended.

To ensure long-lasting proper functioning of the gripper, we recommend the following maintenance steps to be undertaken at least 1x a year:

- Clean gripper on the outside
- Check on gripper function, effect repairs, if necessary
- Check gripper for signs of external deformation, damage and wear and repair, if necessary
- Examine play and correct, if necessary

The manufacturer recommends the following greases when undertaking corrective maintenance on the gripper (see table).

Under standard application	EMKA Lagerstar LIC
Under foundry applications	Klüber Barrierta LX-55-2

No greases with MoS_2 additives are allowed.

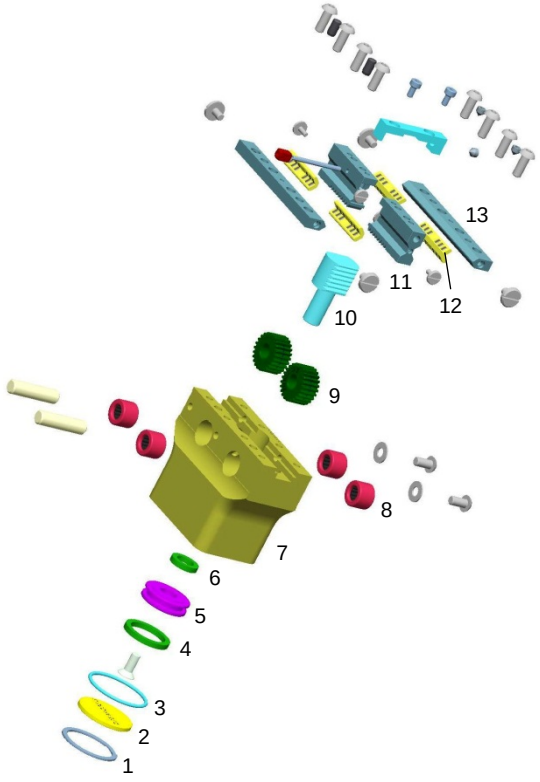
8.3. Corrective maintenance

The point of corrective maintenance is to maintain or restore proper functioning of the gripper - that is to secure its availability. Regular corrective maintenance of the gripper prevents malfunctioning and stoppages and thus ensures the availability of the entire system.

The manufacturer provides you with a comprehensive gripper repair service.

Corrective maintenance is only to be carried out by authorized specialist personnel.

Make a note of the gripper assembly drawings when undertaking corrective maintenance.



1	Circlip	8	Needle bearing
2	Cover	9	Cog
3	Set of seals (O-ring	10	Piston rod
4	Set of seals (quad-ring)	11	Gripper jaws
5	Piston	12	Roller bearing
6	Set of seals (quad-ring)	13	Guide rails
7	Housing		

Spare parts and a full set of seals can be obtained through the manufacturer.

9. Dismantling, decommissioning, disposal

CAUTION!

Before dismantling the gripper, the energy supply needs to be disconnected and the line system relieved of pressure.

Make a note of the safety instructions and general hazards listed on Page 2.

9.1. Dismantling

At the end of its useful life, the gripper must be dismantled and disposed of in an environmentally compatible manner.

Properly clean sub-assemblies and components and disassemble them with consideration given to the prevailing local health & safety and environmental protection provisions.

9.2. Decommissioning

You carry out decommissioning in the reverse order to commissioning.

- Any gripper malfunctioning needs to be corrected before decommissioning
- Gripper needs to be cleaned
- Re-lubricate lubricating points before decommissioning
- Cylinders have to be retracted
- Non-plugged connection openings need to be firmly closed

9.3. Disposal

Pass on disassembled parts for recycling if no arrangements have been made for returning them or disposal:

- Turn metals into scrap.
- Hand in plastic elements for recycling.
- Sort the rest of the components by material properties and dispose of accordingly.

10. Accessories

(Please refer to the ongoing catalogue and/or Internet for individual gripper accessories)

OPTION:

Lift monitor/control

Option "Gripper closed"

Option "Gripper opened"

Arrangement of the inductive sensors can be taken from the specifications of the grippers in question.

Gripping force safeguard

by means of double check valve DSV (see catalogue)