



INSTALLATION AND OPERATING INSTRUCTIONS

Magnetic gripper

HPM2000

DDOC02086

THE KNOW-HOW FACTORY

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1 Supporting documents

NOTICE



Read through the installation and operating instructions before installing or working with the product.

The installation and operating instructions contain important notes for your personal safety. They must be read and understood by all persons who work with or handle the product during any phase of the product lifetime.



The documents listed below are available for download on our website www.zimmer-group.com.

- Installation and operating instructions
 - Catalogs, drawings, CAD data, performance data
 - Information on accessories
 - Technical data sheets
 - General Terms and Conditions, including warranty information.
- ⇒ Only those documents currently available on the website are valid.

In these installation and operating instructions, "product" refers to the product designation on the title page!

1.1 Notices and graphics in the installation and operating instructions

DANGER



This notice warns of an imminent danger to the life and health of people. Ignoring these notices can lead to serious injury or even death.

► You absolutely must comply with the described measures for avoiding these dangers!

⇒ The warning symbols are assigned according to the type of danger.

WARNING



This notice warns of a situation that is potentially hazardous to personal health. Ignoring these notices can cause serious injury or damage to health.

► You absolutely must comply with the described measures for avoiding these dangers!

⇒ The warning symbols are assigned according to the type of danger.

CAUTION



This notice warns of a situation that is potentially hazardous to persons. Ignoring these notices can cause minor, reversible injuries.

► You absolutely must comply with the described measures for avoiding these dangers!

⇒ The warning symbols are assigned according to the type of danger.

NOTICE



This notice warns of possible material and environmental damage. Ignoring these notices can result in damage to the product or the environment.

► You absolutely must comply with the described measures for avoiding these dangers!

⇒ The warning symbols are assigned according to the type of danger.

INFORMATION



This category contains useful tips for handling the product efficiently. Failure to observe these tips will not result in damage to the product. This information does not include any information relevant to health or workplace safety.

2 Safety notices

DANGER



Risk of death due to accidental ignition sources

- Do not use the product in a potentially explosive environment.

WARNING



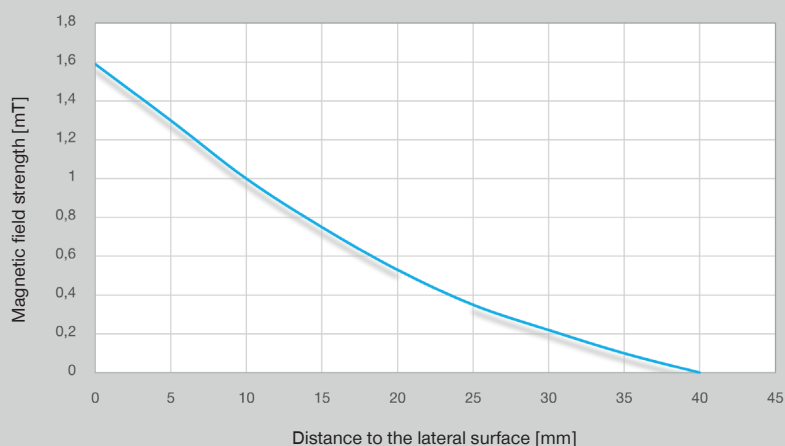
Health hazard due to magnetic field

The product contains a permanent magnet and can affect implants such as cardiac pacemakers.

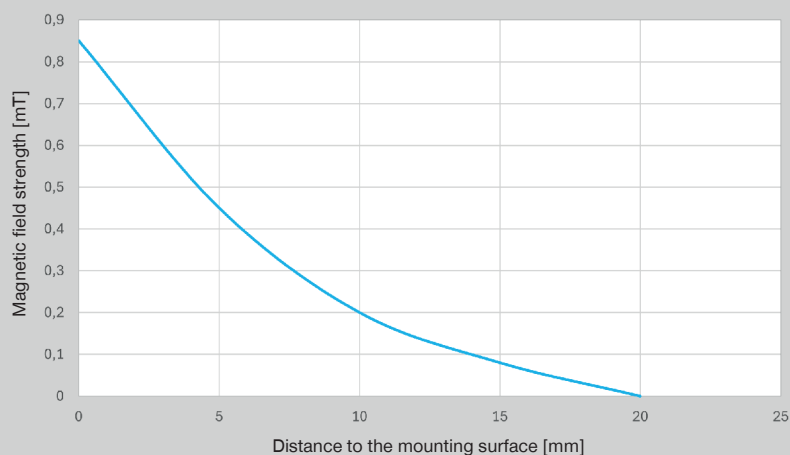
- If you wear any electronic implants, keep a sufficient distance from the magnetic field.

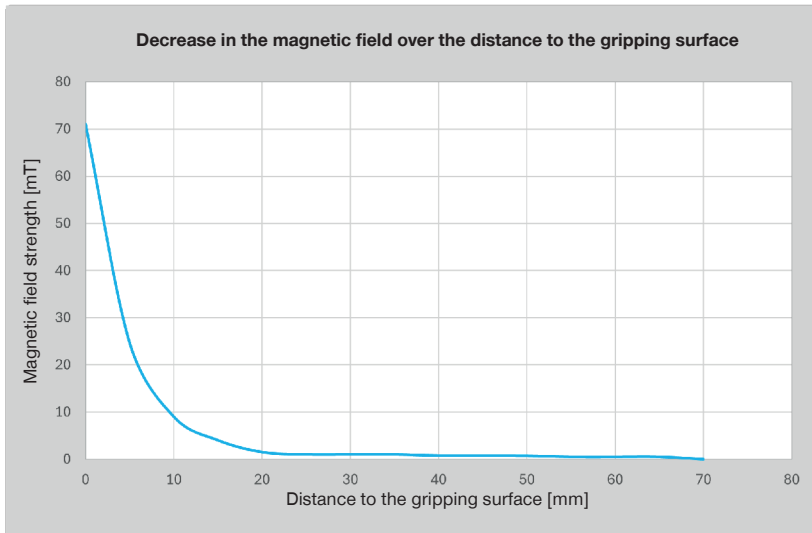


Decrease in the magnetic field over the distance to the lateral surface



Decrease in the magnetic field over the distance to the mounting surface





WARNING



Suspended loads can cause injury

Falling loads can cause severe injuries.

- ▶ Always keep an adequate safety distance from suspended loads.
- ▶ Do not stand or walk underneath suspended loads.

CAUTION



Risk of injury and material damage in case of non-compliance

The product is state-of-the-art.

The following are examples of situations in which the product may cause a hazard:

- The product is not properly installed, used or maintained.
- The product is not used for its designated purpose.
- The locally applicable regulations, laws, directives or guidelines are not observed.
- ▶ The product may only be used in accordance with these installation and operating instructions and the product's technical data. Any changes or additions to the intended use of the product, as well as modifications to the product, such as those in the following examples, require the written permission of the manufacturer:
 - Use of the product under extreme conditions, such as aggressive fluids or abrasive dusts
 - Additional drilled holes or threads
- ⇒ Zimmer GmbH shall accept no liability for any damage caused by improper use. The operator bears sole responsibility.
- ▶ Make sure that the power supply is disconnected before you mount, adjust, modify, maintain or repair the product.
- ▶ Whenever work is carried out on the product, make sure that the product cannot be actuated by mistake.
- ▶ Perform maintenance tasks, renovation work or attachment work outside of the machine's danger zone when possible.
- ▶ Do not reach into the operational range of the product.
- ▶ Observe the specified maintenance intervals and specifications regarding the quality of the operating material.
- ▶ When using the product under extreme conditions, adjust the maintenance interval according to the degree of contamination.
- ▶ Check the completeness and tightening torques of all mounting screws.

3 Proper use

NOTICE



Material damage and malfunction in case of non-compliance

The product is only to be used in its original state with its original accessories, with no unauthorized changes and within the stipulated parameter limits and operating conditions.

Any other or secondary use is deemed improper.

- ▶ Operate the product only in compliance with the associated installation and operating instructions.
 - ▶ Operate the product only when it is in a technical condition that corresponds to the guaranteed parameters and operating conditions.
- ⇒ Zimmer GmbH shall accept no liability for any damage caused by improper use. The operator bears sole responsibility.

- The product acts like a permanent magnet and is designed for handling cylindrical cells with a diameter of 46 mm.
- The product is intended for industrial use.
- The product is to be used as intended in enclosed rooms for temporary gripping, handling and holding.
- The product is not suitable for holding workpieces during a machining process.
- Direct contact with perishable goods/food is not permitted.

4 Personnel qualification

WARNING



Inadequate qualification can cause injury and material damage

If inadequately qualified personnel perform work on the product, this can cause serious injuries and significant material damage.

- ▶ All work on the product must be performed by qualified personnel.
- ▶ Before working with the product, read the document in its entirety and make sure that you have understood everything.
- ▶ Observe country-specific accident prevention regulations and the general safety notices.

The following qualifications are a prerequisite for performing various work on the product.

4.1 Electricians

Electricians are able to perform work on electrical systems, can recognize and avoid possible dangers and know the relevant standards and provisions due to their technical training, knowledge and experience.

4.2 Specialists

Specialists are able to perform the assigned work, can recognize and avoid possible dangers and know the relevant standards and provisions due to their technical training, knowledge and experience.

4.3 Instructed personnel

Instructed personnel have been trained by the operating company on the tasks and possible dangers of improper behavior.

4.4 Service personnel

Service personnel are able to perform the assigned work and can recognize and avoid possible dangers due to their technical training, knowledge and experience.

4.5 Additional qualifications

Persons who work with the product must be familiar with the valid safety regulations and laws as well as the standards, guidelines and laws listed in this document.

Personnel who work with the product must have facility-issued authorization to commission, program, configure, operate, maintain and also decommission this product.

5 Product description

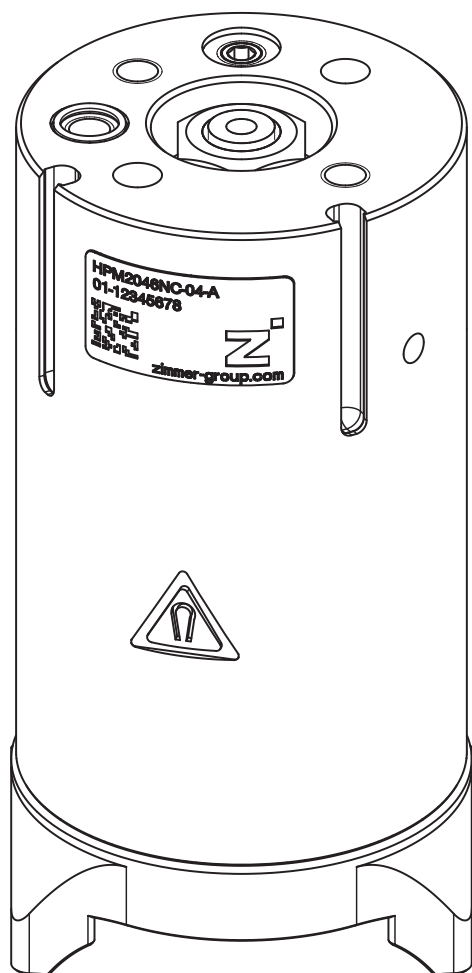
The product generates the holding force using a permanent magnet.

The cover is made of an electrically insulating plastic and there are different designs to choose from.

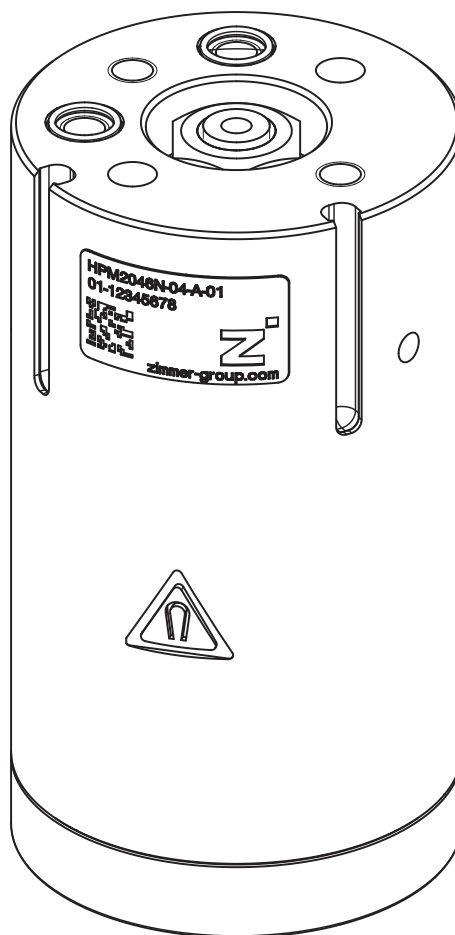
5.1 Product variants

The following illustrations depict example product variants.

HPM2046NC-04-A



HPM2046N-04-A-01

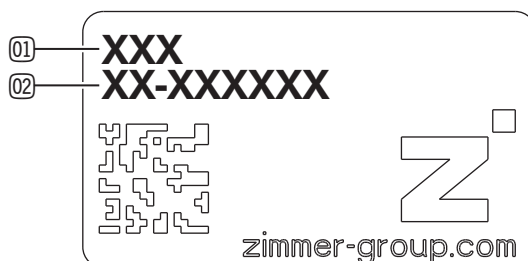


5.2 Type plate

A type plate is attached to the product.

The article number and the confirmation number are shown on the type plate.

- ① Article number
- ② Confirmation number



6 Functional description

INFORMATION



The holding force depends on the surface quality and material thickness of the workpieces to be handled.

- The more rough and uneven the surface, the lower the residual holding force will be.
- The thinner the material thickness, the lower the holding force will be.

The holding force depends on the ferromagnetic properties of the cylindrical cells being handled.

The specified holding force refers to standard cylindrical cells with a diameter of 46 mm.

Depending on its design, the product will have a single or double-acting pneumatic rotor cylinder.

In variants with a double-acting pneumatic rotor cylinder, the piston will be put into motion due to alternating ventilation.

In variants with single-acting pneumatic cylinders, the ventilation counteracts the integrated springs which push the piston outward in a de-energized state.

The magnet is attached to the piston, thus moving towards the cover and/or away from the cover and the cylindrical cell is held and/or released.

When the cylindrical cell is in position, the positive pole presses on an electrically insulating plunger in the center of the product that moves to an inductive sensor.

The sensor detects that the cylindrical cell has been gripped.

When the cylindrical cell is removed, the plunger is moved back to the starting position via a spring.

7 Technical data

INFORMATION



► You can find the information in the technical data sheet on our website.

This data varies within the series, depending on the specific design.

8 Accessories/scope of delivery

INFORMATION



If any accessories not sold or authorized by Zimmer GmbH are used, the function of the product cannot be guaranteed. The accessories from Zimmer GmbH are specifically tailored to the individual products.

- ▶ Please note that the sensors are not part of the scope of delivery.
- ▶ Other Zimmer GmbH sensors can be used as an alternative to the listed examples.

The piston position sensing is performed via magnetic field sensors.

One- or two-point magnet field sensors can be used depending on the desired sensing type.

- MFS02-S-KHC-P1-PNP
- MFS02-S-KHC-P2-PNP

The component sensing is performed via an inductive sensor.

- NJ3-E2SK
- CINI01317

9 Transportation/storage/preservation

- ▶ Transport and storage of the product must be done only with the original packaging.
- ▶ If the product has already been installed on the superordinate machine unit, care must be taken during transport to ensure that no unexpected movements can occur.
 - ▶ Before commissioning the product and after transport, check all power and communication connections as well as all mechanical connections.
- ▶ If the product is stored for an extended period, the following points are to be observed:
 - ▶ Keep the storage location as dust-free and dry as possible.
 - ▶ Avoid temperature fluctuations.
 - ▶ Avoid wind/drafts/water condensation formation.
 - ▶ Pack the product and do not expose it to direct sunlight during storage.
- ▶ Clean all components. There must be no soiling left on the components.
- ▶ Visually inspect all components.
- ▶ Remove all foreign substances.
- ▶ Properly remove potential corrosion spots.
- ▶ Close off unused connections using pressure-resistant closures.

10 Installation

WARNING



Risk of injury due to uncontrolled movements

Risk of injury in case of unexpected movement of the machine or system into which the product is to be installed.

- ▶ Switch off the energy supply of the machine before any work.
- ▶ Secure the power supply against being switched on unintentionally.
- ▶ Check the machine for any residual energy that may be present.

CAUTION



Risk of injury due to uncontrolled movements

Risk of injury in the event of uncontrolled movement of the product when the power supply is connected.

- ▶ Switch off the power supply to the machine before carrying out any work.
- ▶ Secure the power supply against being switched on unintentionally.
- ▶ Check the machine for any residual energy that may be present.

Assembly requirements

Permissible flatness tolerance [mm]	Mounting surface length [mm] $\leq$ 100	0.02
	Mounting surface length [mm] $>$ 100	0.05
Strength class of the mounting screws	8.8	

INFORMATION



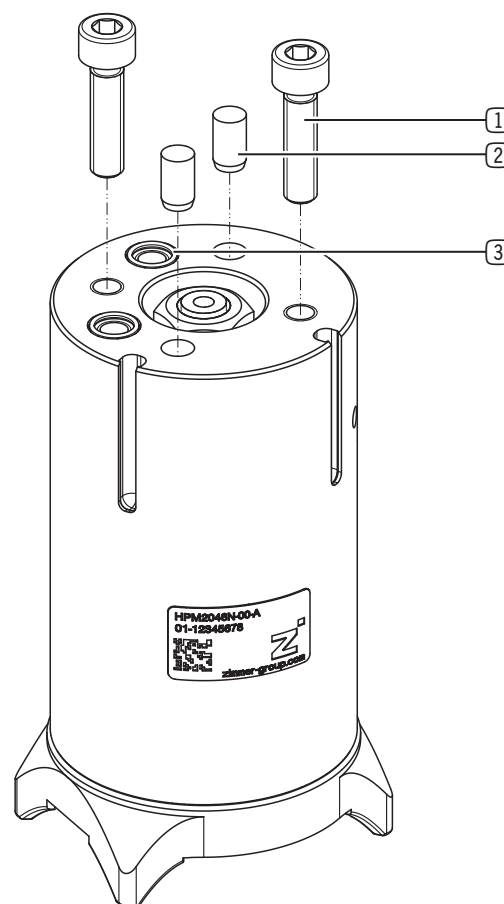
Further installation information:

- The mounting screws are not included in the scope of delivery.

- ▶ Install the product on an appropriate mounting surface in accordance with the flatness specifications.
- ▶ Make sure that the mounting piece is sufficiently rigid.
- ▶ Ensure the cleanliness of the connection surfaces.
- ▶ Please note the permitted tightening torques of the mounting screws at www.zimmer-group.com/en/td.

10.1 Installing the product

- ▶ If you are using a hoseless pneumatic feed-through, insert O-rings into the recesses on the housing.
- ▶ Position the product on the mounting surface using the straight pins.
- ▶ Mount the product on the mounting piece using the appropriate mounting screws.



- ① Mounting screw
- ② Straight pins
- ③ O-ring

10.2 Installing the energy supply

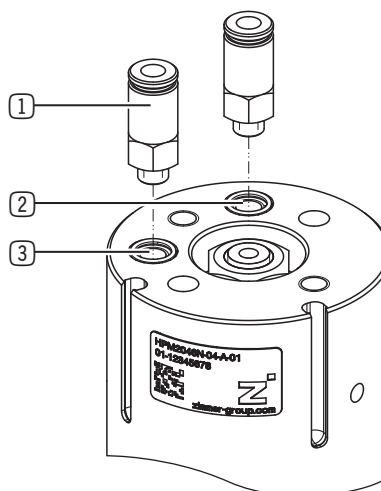
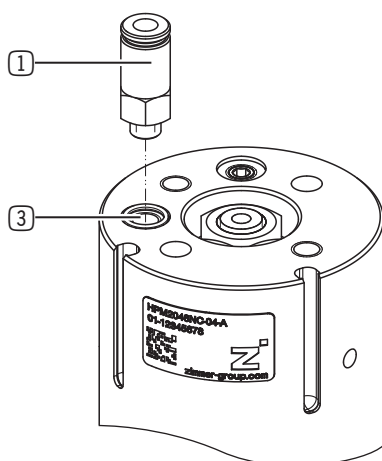
NOTICE



Non-compliance may result in material damage.

- ▶ You can find the information in the technical data sheet on our website.
- ▶ Close off unused connections using pressure-resistant closures.
- ▶ The authorized connections that are available can be found in the accessories list on our website. The necessary ordering information can also be found there.
- ▶ Use compressed air in accordance with DIN ISO 8573-1 [7:4:4].

- ▶ Install the appropriate number of screw fittings based on the design.



- ① Screw fitting
- ② Hold
- ③ Release

10.3 Installing accessories

NOTICE

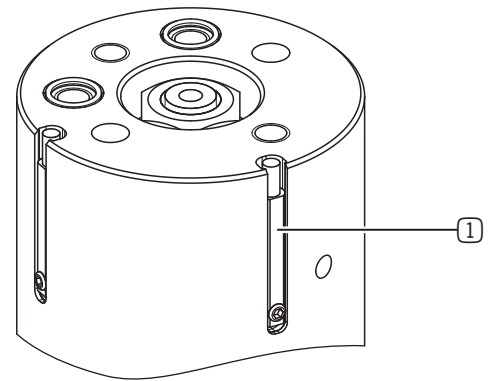


Non-compliance may result in material damage.

- ▶ Before installing an accessory, make sure it is suitable for use with the selected variant.
- ▶ You can find information on our website.
- ▶ Please contact Customer Service if you have any questions.

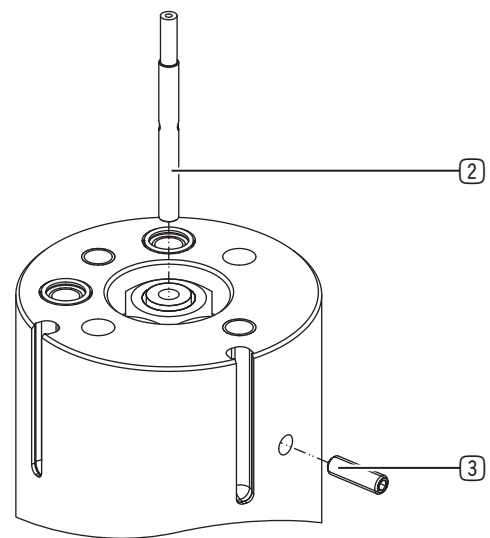
10.3.1 Adjusting the magnetic field sensors

- ▶ Push the sensors into the grooves on the housing to the end stop.
- ▶ Tighten the mounting screws using an Allen key.
- ▶ Comply with the tightening torque of 0.05 Nm.
- ▶ Connect the sensor to the operating voltage.
- ▶ If necessary, readjust the sensors in the grooves to optimize the switching behavior.



10.3.2 Setting the inductive sensors

- ▶ Push the inductive sensor into the hole in the center of the product to the end stop.
- ▶ Clamp the sensor using the grub screw.
- ▶ Comply with the tightening torque of 0.05 Nm.



- ① Magnetic field sensor
- ② Inductive sensor
- ③ Grub screw

11 Commissioning

CAUTION



Reduction of the holding force can cause injury and material damage

Reduced holding force can cause injuries or material damage because the components can no longer be securely gripped and transported.

- ▶ Observe the permitted total load.
- ▶ Do not stand or walk underneath suspended loads.

NOTICE



Malfunction in case of non-compliance

- ▶ Do not handle any workpieces that generate a magnetic field themselves or act as permanent magnets.

12 Maintenance

NOTICE



Material damage resulting from blowing out with compressed air

Blowing out the product with compressed air can cause malfunctions.

- ▶ Never purge the product with compressed air.

NOTICE



Material damage caused by unsuitable cleaning materials

Liquid and solvent-based cleaning agents can cause malfunctions.

- ▶ Do not clean the product with any cleaning agents that are liquid or contain solvents.

Maintenance-free operation of the product is guaranteed for up to **5 million cycles**.

- ▶ Note that the product could become damaged under the following circumstances:
 - Operation with impermissible compressed air
 - Dirty environment
 - Improper use and use that does not comply with the performance data
 - Permissible temperature range not observed
- ▶ Even though the product is maintenance-free as mentioned above, perform a regular visual inspection to check for any damage or contamination.
- ▶ Have maintenance work that requires disassembly of the product performed by customer service only.
- ⇒ Dismantling and reassembling the product without authorization may result in complications, as special installation equipment is required in some cases. Zimmer GmbH accepts no liability for any resulting malfunctions or damage.

12.1 Replacing the cover

CAUTION



Risk of injury due to objects being ejected

Spring-loaded components can jump out when installing or uninstalling.

- Unscrew the mounting screws on spring-loaded components slowly and carefully.

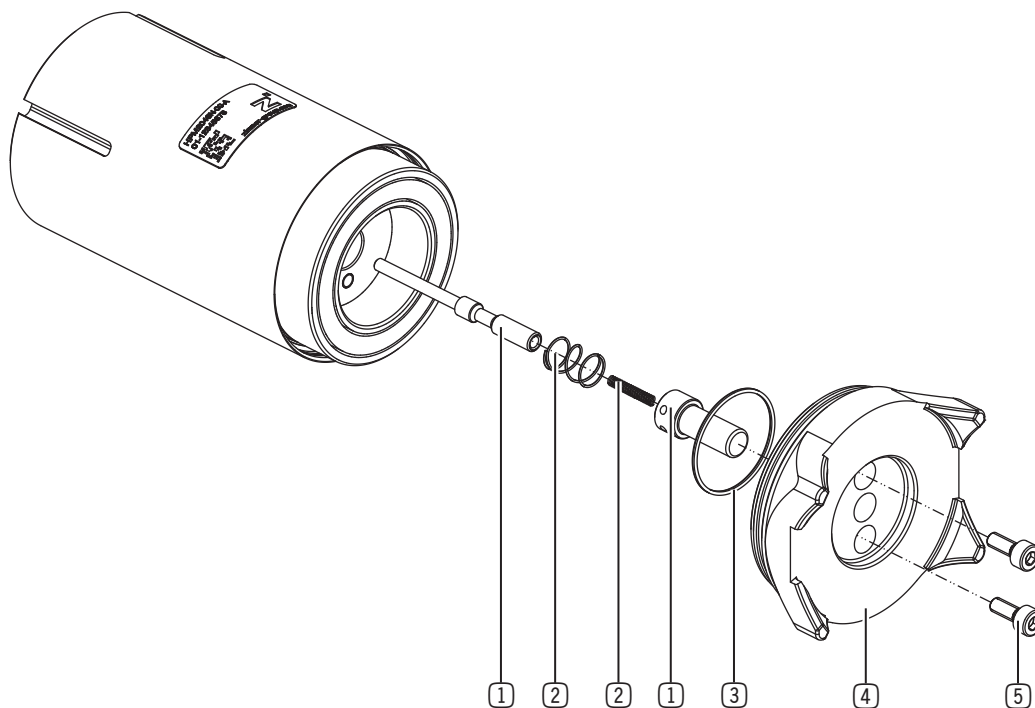
INFORMATION



The covers are available as spare parts.

- You can find the article numbers in the spare parts list on our website.

- When removing the cover, make sure that the plunger does not fall out.
- Remove the mounting screws.
- Remove the cover.
 - Apply sufficient pull-off force to release the clip connection.
- Install the new cover with the mounting screws.
- If the plunger falls out when replacing the cover, follow the assembly sequence in the figure.



- ① Plunger
- ② Spring
- ③ O-ring

- ④ Cover
- ⑤ Mounting screw

13 Decommissioning/disposal

INFORMATION



When the product reaches the end of its operational phase, it can be completely disassembled and disposed of.

- Disconnect the product completely from the power supply.
- Dispose of the components properly according to the material groups.
- Comply with the locally applicable environmental and disposal regulations.

14 Declaration of Incorporation

In terms of the EU Machinery Directive 2006/42/EC (Annex II 1 B)

Name and address of the manufacturer:

Zimmer GmbH

📍 Im Salmenkopf
77866 Rheinau, Germany
☎ +49 7844 9138 0
✉ info@zimmer-group.com
🌐 www.zimmer-group.com

We hereby declare that the incomplete machine described below

Product designation: Magnetic gripper
Type designation: HPM2000

conforms to the requirements of the Machinery Directive, 2006/42/EC, Article 2g, Annex VII, b – Annex II, b, in its design and the version we put on the market.

Basic health and safety requirements:

No. 1.1.2, No. 1.1.3, No. 1.5, No. 1.3.2, No. 1.3.4, No. 1.3.7, No. 1.5.3, No. 1.5.4, No. 1.5.8, No. 1.6.4, No. 1.7.1, No. 1.7.4

A full list of applied standards can be obtained from the manufacturer.

We also declare that the specific technical documents were produced in accordance with Annex VII Part B of this Directive. We undertake to provide the market supervisory bodies with electronic versions of special documents for the incomplete machine through our documentation department, should they have reason to request them.

The incomplete machine may only be commissioned if it has been ascertained, if applicable, that the machine or system in which the incomplete machine is to be installed satisfies the requirements of Directive 2006/42/EC on Machinery and an EC Declaration of Conformity has been drawn up in accordance with Annex II 1 A.

Kurt Ross

Authorized representative for the
compilation of relevant technical
documents

Rheinau, Germany, 2024-02-14

(Place and date of issuance)



Martin Zimmer
(Legally binding signature)
Managing Partner

15 Declaration of Conformity

As defined by the EC Directive 2014/30/EU on electromagnetic compatibility

Name and address of the manufacturer:

Zimmer GmbH

📍 Im Salmenkopf
77866 Rheinau, Germany
☎ +49 7844 9138 0
✉ info@zimmer-group.com
🌐 www.zimmer-group.com

We hereby declare that the product described below

Product designation: Magnetic gripper
Type designation: HPM2000

conforms to the requirements of the Electromagnetic Compatibility Directive 2014/30/EU in its design and the version we put on the market.

The following harmonized standards have been used:

DIN EN ISO 12100	Safety of machinery - General principles for design - Risk assessment and risk reduction
DIN EN 61000-6-3	EMC Generic standard, Emission standard for residential, commercial and light-industrial
DIN EN 61000-6-2	EMC Generic standard, Emission standard for industrial environments
DIN EN 61000-6-4	EMC Generic standard, Immunity for industrial environments

A full list of applied standards can be obtained from the manufacturer.

Kurt Ross

Authorized representative for the compilation of relevant technical documents

Rheinau, Germany, 2024-02-14

(Place and date of issuance)



Martin Zimmer
(Legally binding signature)
Managing Partner