



INSTALLATION AND OPERATING INSTRUCTIONS

Lockable spring plunger

ZSL

DDOC02627

THE KNOW-HOW FACTORY

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1 Introduction

1.1 Supporting documents

NOTICE



Read through the instructions before installing or working with the product.

The instructions contain important notices 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:

- Instructions
 - Catalogs, drawings, CAD data, performance data
 - Information on accessories
 - Technical data sheets
 - General Terms and Conditions (GTCs), including warranty information.
- ⇒ Only the documents currently available on the website are valid.

In these instructions, “product” replaces the product designation on the title page.

1.2 Notes and illustrations in the 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 people. 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 or 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.

1.3 Figures

The figures may deviate from the actual state.

2 Safety notices

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 instructions and the system'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 accepts 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.
- ▶ Perform maintenance tasks, retrofitting or attachment work outside of the machine's danger zone when possible.
- ▶ When using the product under extreme conditions, adjust the maintenance interval according to the degree of soiling.
- ▶ 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 instructions.
- ▶ Operate the product only when it is in a technical condition that corresponds to the guaranteed parameters and operating conditions.
- ⇒ Zimmer GmbH accepts no liability for any damage caused by improper use. The operator bears sole responsibility.

- The product is designed for securing, holding and moving workpieces.
- The product must not be operated in an environment that is subjected to vibrations and impacts.
- The product must not be operated in an environment that is subjected to corrosive gases, chemicals, seawater, water or steam.
- The product is intended for industrial use.
- The product is not suited for use in a potentially explosive atmosphere.
- Protection, such as a cover, must be provided in areas exposed to direct sunlight.
- Direct contact with perishable goods/food is not permitted.

4 Personnel qualification

WARNING



Injuries and material damage due to inadequate qualification

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 types of 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.

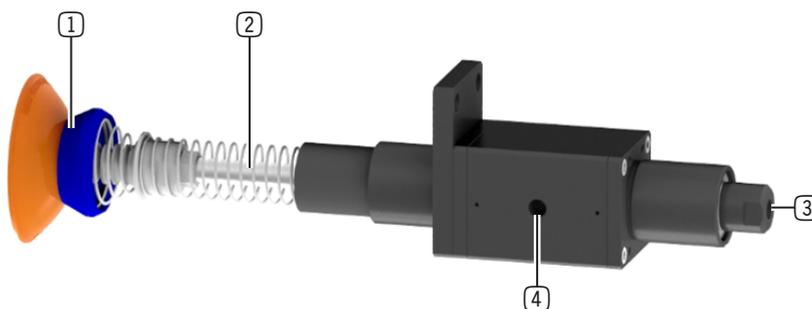
4.5 Additional qualifications

Personnel 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

- ① Smart Cup
- ② Piston rod
- ③ Vacuum connection
- ④ Pneumatic connection



6 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.

7 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.
- ▶ For information on optional accessories and those included in the scope of delivery, refer to our website.

8 Storage

- ▶ Visually inspect all components.
- ▶ Clean all components until all contamination has been removed.
- ▶ Remove potential corrosion spots properly.
- ▶ Seal pneumatic connections with suitable covers.
- ▶ Observe the following points when storing the product for longer periods of time:
 - ▶ Monitor the relative air humidity in the storage area.
 - ▶ Keep the storage location as dust-free and dry as possible.
 - ▶ Observe the temperature range and avoid temperature fluctuations.
 - ▶ Avoid wind, drafts and formation of condensation.
 - ▶ Avoid direct sunlight.

9 Installation

WARNING



Risk of injury due to uncontrolled movement

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

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

NOTICE



Malfunction in case of non-compliance

- ▶ Make sure that the exhaust air can escape unimpeded.
- ▶ Make sure that there is no grease, water or dirt on the connections.

NOTICE



Malfunction in case of non-compliance

If the brake is not released and a force is applied to the piston rod, workpieces that have been sucked in may be damaged or deformed.

- ▶ Use a 3/2-way solenoid valve to control the brake.
- ▶ Install a breathable silencer on the exhaust air connection of the brake control valve to ensure unhindered air discharge.
- ▶ Install the brake control valve as close as possible to the brake cylinder to ensure a fast and reliable brake release.
- ▶ Make sure that the compressed air supply pressure applied to the brake is at least 3.5 bar.
- ▶ Only use standardized connection components for the compressed air and vacuum connections of the brake cylinder.
- ▶ With PT-1/8 threads in particular, make sure that the screw fittings are firmly seated and properly sealed to prevent air or vacuum leaks and the resulting loss of performance.

INFORMATION



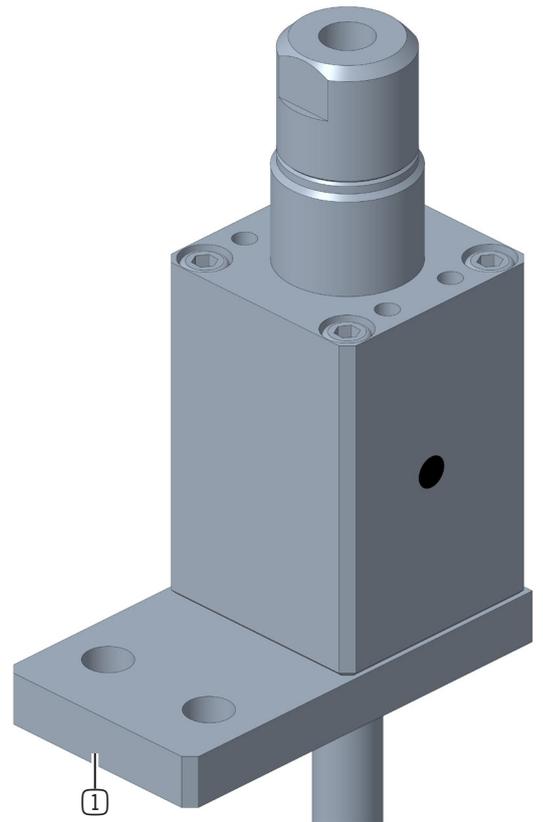
Further installation information:

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

- ▶ Mount the product on a sufficiently flat mounting surface.
- ▶ Make sure that the mounting piece is sufficiently rigid.
- ▶ Ensure the cleanliness of the connection surfaces.
- ▶ Comply with the permitted tightening torques of the mounting screws.

9.1 Installing the product

- ▶ Position the mounting surface on the mounting piece.
- ▶ Tighten the mounting screws without distortion.



① Mounting surface

9.2 Installing the power supply

NOTICE



Material damage in case of non-compliance

- ▶ You can find the information in the technical data sheet on our website.
- ▶ Keep the supply lines as short as possible and ensure a sufficiently large cross-section.
- ▶ Make sure that the hoses cannot be pinched.

NOTICE



Malfunction in case of non-compliance

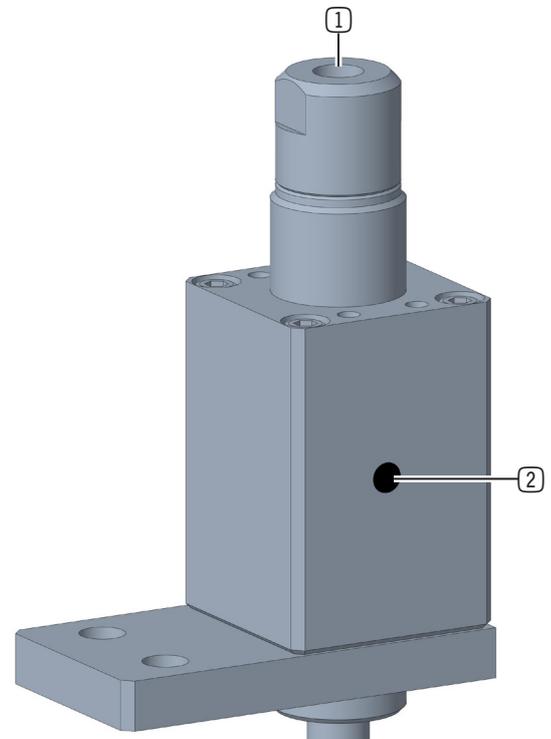
An inner diameter that is too small on the compressed-air side results in an insufficient supply of compressed air. Because of this, the maximum output of the system cannot be achieved.

An inner diameter that is too small on the vacuum side results in an increased flow resistance along the hose. This reduces the suction capacity and increases suction times.

An inner diameter that is too large also results in longer suction times due to the larger volume of air to be evacuated.

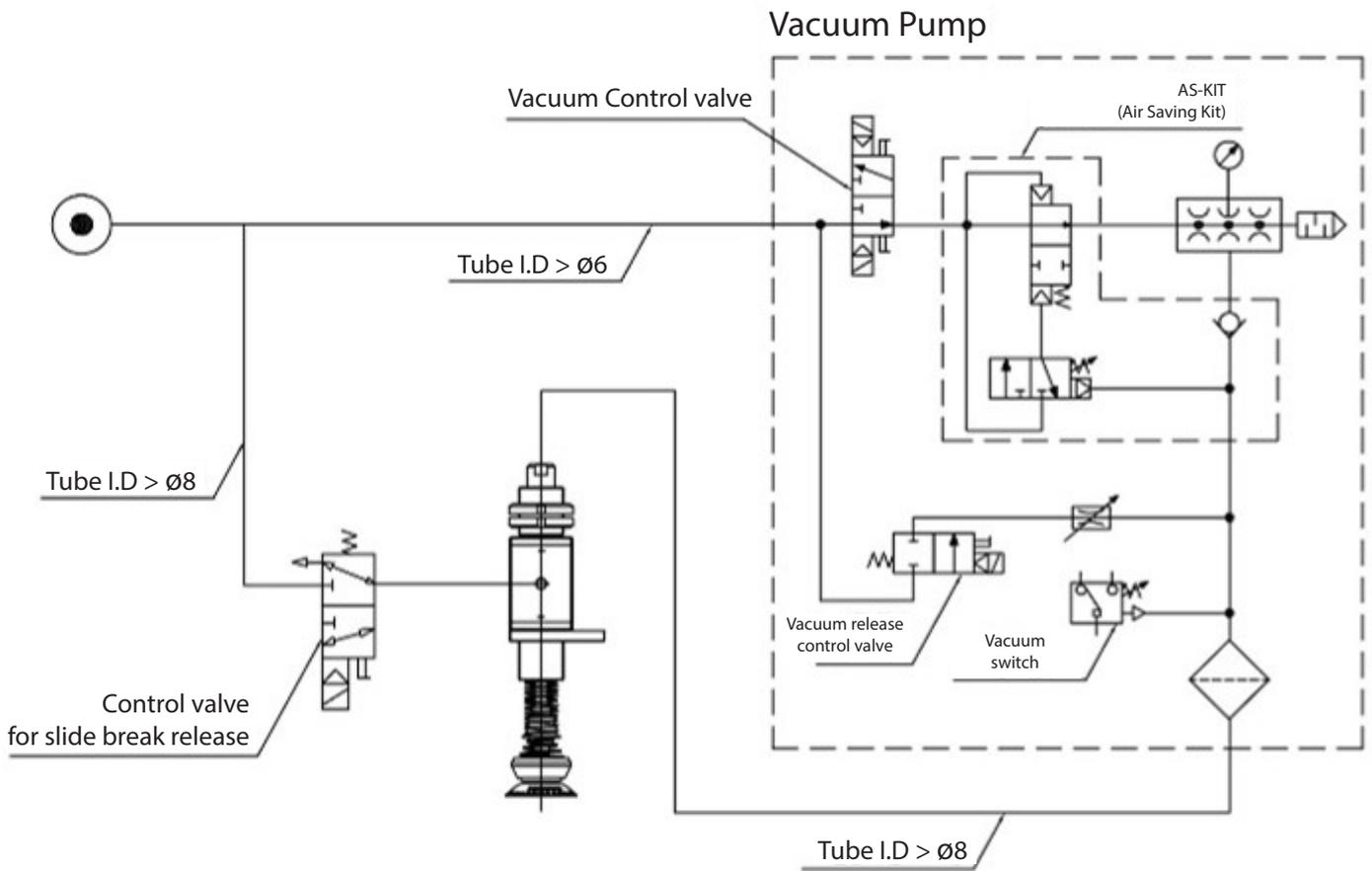
- ▶ Select the correct screw fittings and pneumatic hoses.

- ▶ Note the circuit diagram in section "9.2.1 Circuit diagram".
- ▶ Fit one screw fitting to the vacuum connection and one to the pneumatic connection.
- ▶ Install the pneumatic hoses.



- ① Vacuum connection
- ② Pneumatic connection

9.2.1 Circuit diagram



10 Commissioning

NOTICE

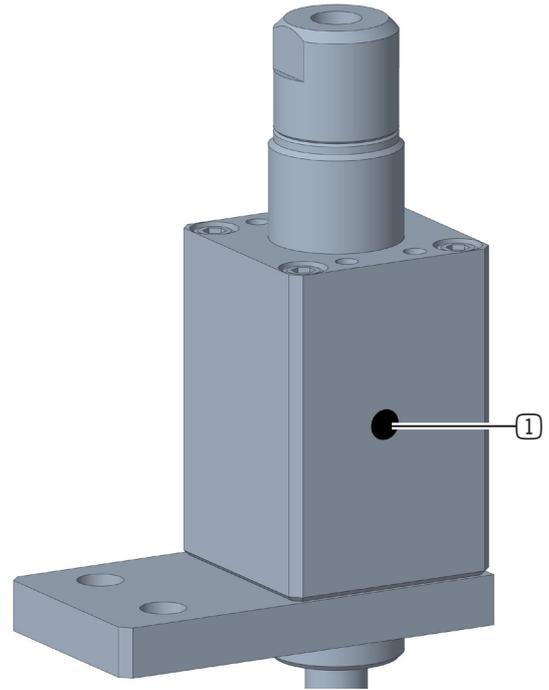


Malfunction in case of non-compliance

If the brake is not released and a force is applied to the piston rod, workpieces that have been sucked in may be damaged or deformed.

- ▶ Make sure that the compressed air supply pressure applied to the brake is at least 3.5 bar.
- ▶ During commissioning of the robot, apply compressed air to the air connection of the brake cylinder to release the brake completely before starting the robot programming (teaching) or moving the piston rod.

- ▶ Release the brake completely before commissioning.
 - ▶ Connect the compressed air to the pneumatic connection so that the brake is fully released.
 - ▶ Make sure that the compressed air applied is at least 3.5 bar so that the brake is released.



① Pneumatic connection

11 Operation

WARNING



Risk of injury caused by falling workpieces

If the compressed air supply is interrupted, the workpiece may fall down and cause injury to persons or damage to the machine.

- ▶ Make sure that you use a double solenoid valve for the control valve of the vacuum pump.
- ▶ Make sure that you use a vacuum pump with an air-saving and non-return function.

12 Error diagnosis

Error	Possible cause	Measure
Brake release delayed or uneven	• Malfunction of the air control valve of the vacuum pump	▶ Check the function of the air control valve.
	• Kinked or constricted compressed air line	▶ Check the energy supply for faults.
Increased frictional resistance of the piston rod	• Oil or grease deposits on the piston rod	▶ Clean the piston rod. ▶ Please note section "13.1 Cleaning the piston rod".
	• Scratches or damage on the piston rod	▶ Carefully remove light scratches with fine sandpaper (800–1,000 grit).
Sluggish or blocked piston rod	• Bent piston rod	▶ Check the piston rod for deformation. ▶ Replace the piston rod if deformed. ▶ Please note section "13.2 Removing the piston rod".

13 Maintenance

- ▶ Note that the product could become damaged under the following circumstances:
 - Operation with unauthorized compressed air
 - Dirty environment
 - Improper use and use that does not comply with the performance data
 - Permissible temperature range not observed
- ▶ Visually check the product regularly for damage and dirt.
- ▶ 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.

13.1 Cleaning the piston rod

NOTICE

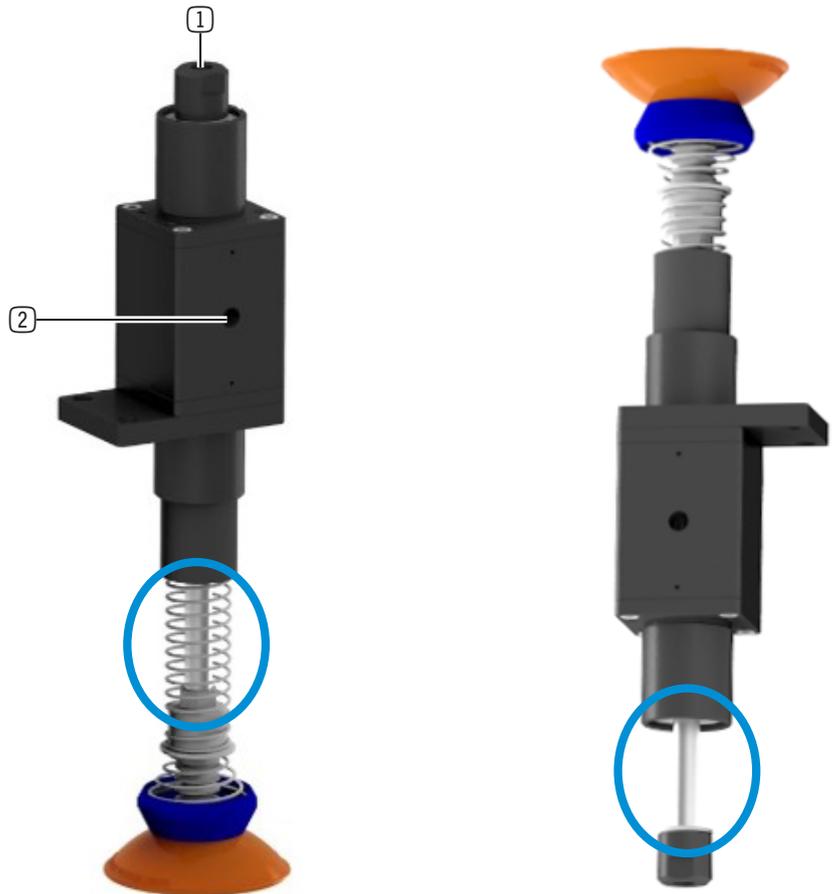


Malfunction in case of non-compliance

Incorrect use of cleaning agents can cause the brake to malfunction.

- ▶ Hold the product in a vertical position so that no cleaning agent enters the inside of the brake.
- ▶ Do not spray the cleaner directly onto the piston rod.
- ▶ Use a dry cloth (e.g., cotton cloth) instead.
- ▶ Soak the cloth with cleaner and wipe the piston rod thoroughly.

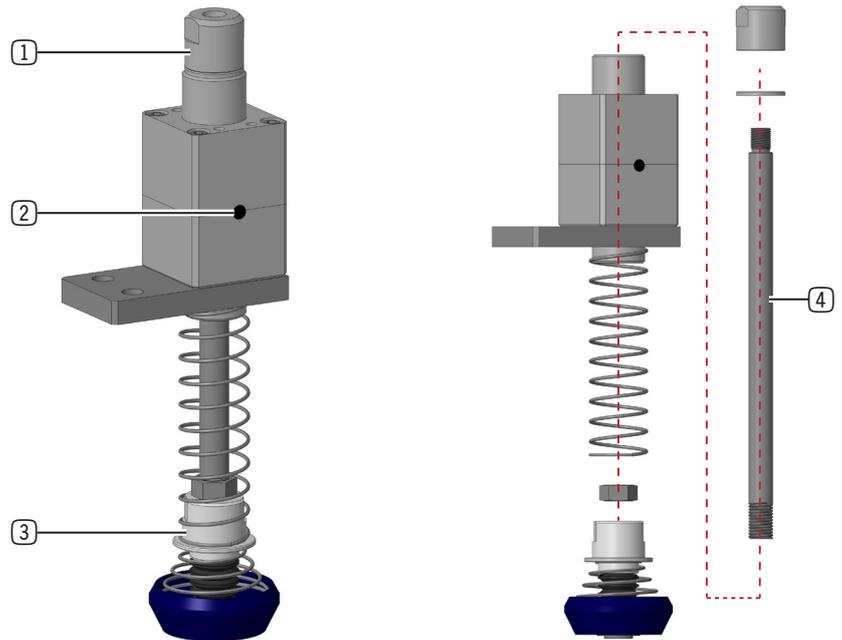
- ▶ Clean the piston rod at the marked points.
- ▶ Apply compressed air to the product during cleaning and move the piston rod manually several times over the entire stroke to remove all residues.



- ① Vacuum connection
- ② Pneumatic connection

13.2 Removing the piston rod

- ▶ Loosen the upper and lower connection plate with a wrench.
 - ▶ Make sure that the brake is secured.
- ▶ Connect compressed air to the pneumatic connection to release the brake.
- ▶ Remove the piston rod.



- ① Upper connection plate
- ② Pneumatic connection
- ③ Lower connection plate
- ④ Piston rod

14 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.

15 REACH

In terms of the EU Regulation 1907/2006

Name and address of the manufacturer:

Zimmer Group GmbH

📍 Am Glockenloch 2
77866 Rheinau, Germany

☎ +49 7844 9138 0

✉ info@zimmer-group.com

🌐 www.zimmer-group.com

REACH stands for **R**egistration, **E**valuation, **A**uthorization and **R**estriction of **C**hemicals.

A full declaration of REACH can be obtained from the manufacturer due to the duty to notify in accordance with Art. 33 of the REACH regulation (“Duty to communicate information on substances in articles”).

Nicolas Steiger

Authorized representative for
compiling the relevant technical
documents

Rheinau, Germany, 2026-01-13

(Place and date of issue)



Martin Zimmer
(Legally binding signature)
Managing Partner

16 Declaration of Conformity

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

Name and address of the manufacturer:

Zimmer Group GmbH

📍 Am Glockenloch 2
77866 Rheinau, Germany

☎ +49 7844 9138 0

✉ info@zimmer-group.com

🌐 www.zimmer-group.com

We hereby declare that the products described below (Art. 2, para. b)

Product designation: Lockable spring plunger

Type designation: ZSL

conform to the requirements of the 2006/42/EC directive in their design and the version we put on the market.

The following harmonized standards have been used:

DIN EN ISO 12100:2011-03 Safety of machinery – General principles for design – Risk assessment and risk reduction

DIN EN ISO 4414 Safety-related requirements for pneumatic systems and their components

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

Nicolas Steiger
Authorized representative for
compiling the relevant technical
documents

Rheinau, Germany, 2026-01-13
(Place and date of issue)



Martin Zimmer
(Legally binding signature)
Managing Partner