

1. Supporting documents

NOTICE:



Read through the installation and operating instructions carefully before installing the product! The installation and operating 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). Only those documents currently available on the website are valid.

- Catalogs, drawings, CAD data, performance data
- Installation and operating instructions
- Technical data sheets
- General Terms and Conditions of Business with specifications for the warranty entitlement

2. Safety notices

DANGER:



Various components of the element are constantly under spring tension.
 ⇒ Never open the housing!
 Intervention is not permitted and can lead to serious injuries!
 ⇒ Warranty and disclaimer

CAUTION:



Non-compliance may result in severe injuries! Injuries or malfunctions can occur, especially with:

- Crushing during installation due to an unsecured mounting piece
- Improperly installed pneumatic connections
- Pneumatic supply faults, e.g. due to pressure fluctuations
- Damaged or loose pneumatic lines
- Missing or loose fastening screws
- Removal of the safety cover
- Failure to switch off the working medium during assembly or repair work on the element
- Human error
- Failure to observe the safety and warning notices during installation and commissioning

3. Proper use

NOTICE:



The element is only to be used in its original state with its original accessories, with no unauthorized changes and within the scope of its defined parameters for use. Zimmer GmbH shall accept no liability for any damage caused by improper use.

In accordance with EN ISO 13849-1, the MKS/MKRS element is a safety-related component of control systems. Furthermore, we can confirm that the product has been manufactured using the basic and proven safety principles (EN 13849-2, appendix B.1 and B.2) and thus define the element MKS/MKRS as a proven component in accordance with EN 13849-1, chap. 6.2.4, para. b. The element can be used without any control engineering measures in control systems of Category B or 1; for category 2 control systems, a test channel must be provided. For use in higher control categories, the control must be implemented using multiple channels, where each channel must implement the safety function for itself. The element may not be used in any application other than those approved by the manufacturer. Without additional protection or control engineering measures, the element may not:

- be installed in equipment used for transporting personnel (e.g. elevators)
- be used in vehicles
- be used underwater or in other liquids
- be used in a corrosive environment (e.g. in conjunction with acids)
- come in contact with abrasive media (e.g. grinding dust)
- be used in a vacuum
- come in direct contact with food
- be used in areas with a potentially explosive atmosphere

The guidance must be provided externally. The element does not feature any guide characteristics. For questions on the use of the MKS/MKRS series element, please contact Zimmer Customer Service.

4. Personnel qualifications

Installation, commissioning and maintenance may only be performed by trained specialists. These personnel must have read and understood the installation and operating instructions in full.

5. Product description

The pneumatically operated MKS/MKRS series is a safety component. The pneumatically operated MKS series is designed for clamping on profile rail guides, while the MKRS series is designed for clamping on round rail guides. The function is based on a dual-acting wedge-type gear with a spring accumulator. The spring accumulator makes it possible to close the element without pressure. The holding forces may be increased by means of a PLUS connection (not for the MKRS series), provided that this is listed under the technical data, by using the pneumatic pressure support of the spring accumulator. The elements are set to the respective rail dimension by the manufacturer.

①	Distance plate (optional)
A	Air connection
B	Air filter / PLUS connection
④	Thread for mounting screws
⑤	Profile rail guide (MKS series) Round rail guide (MKRS series)
⑥	Wedge-type gear
⑦	Adjustment screw
⑧	Piston
⑨	Spring accumulator

Fig. 1: MKS series element

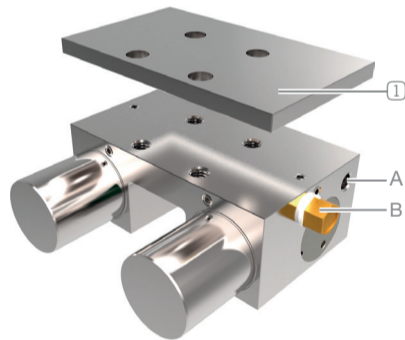
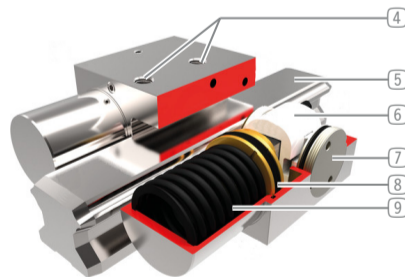


Fig. 2: Cutaway view of the MKS series element



6. Connections

NOTICE:



The MKS/MKRS series elements feature two opposing air connections (A). The air connection preset by the manufacturer as well as air filter (B) can be changed to the opposite side. Only one standard A connection has to be occupied for the safe operation of the MKS/MKRS series elements. When using the PLUS connection on the MKS series, air filter B must be removed and replaced with a second pneumatic line, provided that this is listed under the technical data. In the event of a pressure drop, the holding force increase in PLUS mode will not be available.

The PLUS connection B can alternatively be supplied with the operating pressure. In doing so, the holding force is increased by approximately 35%. If no PLUS connection is being used, the provided air filter must remain screwed into the PLUS connection.

7. Installation

CAUTION:



If the fastening screws are tightened when the element is not clamped, the element may shift and consequently be unable to achieve the optimum clamping force! Furthermore, the guide rail could become damaged.

WARNING:



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

- ▶ Switch off the power supply to the machine before all work.
- ▶ Secure the machine against being switched on unintentionally.
- ▶ Check the machine for any residual energy.

Recommendation of a piston rod (standard piston rod) for the MKRS series	
Tolerance	f8/g8/h7
Roundness	1/2 dimensional tolerance
Surface	Ra 0.2 - 3.2 µm
Material	Yield strength minimum 400 N/mm ²
Hardness	Min. 54HRC with min. hardening depth 0.5 mm or hard-chrome plated 20 µm 800HV (e.g. C45)

Installation and operating instructions MKS/MKRS series	Im Salmenkopf 5 D-77866 Rheinau, Germany +49 7844 9138 0 +49 7844 9138 80
DDOC00060 Index i EN/ 2022-01-27	www.zimmer-group.com

7.1 General installation information

The element must be mounted on a suitable mounting surface in accordance with the flatness specifications.

- Permissible flatness imperfection: 0.03
- The element can be mounted on the mounting piece from above using the threads.
- Make sure the mounting piece is sufficiently rigid and flat.
 - Screw-in depth $\geq 0.9 \times \varnothing$
 - The mounting screws are not included in the scope of delivery.
 - Strength class of the mounting screws ≥ 8.8 (DIN EN ISO 4762)
 - Observe the tightening torque of the mounting screws (www.zimmer-group.com/en/it-td)
 ⇒ Zimmer GmbH recommends verifying the permitted load-carrying capacity of the required screw connections in accordance with VDI 2230.
 - The exact mounting positions can be found on the technical data sheet on our website.

7.2 Installing the element

- ▶ Remove the sealing plugs at air connection A.
- ▶ Apply a pneumatic connection to connection A (the pneumatic connection can be connected to either side). The redundant air connection must be closed off with a sealing screw.

When using the spacer plate, it is inserted between the element and the mounting piece as height compensation.

- ▶ Connect the pneumatic system, release the element via pressurization at air connection A and remove the transport lock.
- ▶ Make sure the mounting face is clean and flat.
- ▶ Depending on the guide rail type, slide the element over the end of the guide rail or attach it from above.
- ▶ If necessary, insert the spacer plate between the element and the mounting piece.
- ▶ Manually screw the mounting screws into the threaded holes crosswise.
- ▶ The element becomes centered by going through multiple cycles (min. 20x opening and closing cycles within 5 seconds).
- ▶ Switch the element into a depressurized state, thereby clamping it. Tighten the mounting screws crosswise to the specified tightening torque.

7.3 Checking operational readiness

After the element has been properly installed, check whether it is ready to be operated according to the following characteristics:

- Check the pneumatic connections for leaks by looking and listening.
- Check that all mounting screws are tightened to their prescribed tightening torque. (see Technical Data).
- Check for leaks in the pressurized element by looking and listening.
- Check for ease of movement on the linear guide rail when the element is open.
- Check the clamping process by manually applying force to the mounting piece.

7.4 Removal/transport lock

CAUTION:



The transport lock may only be removed once the minimum air pressure has been applied to air connection A. The element can only be depressurized when the guide rail or the transport lock is between the contact surfaces!

Removal is carried out in the reverse order of that described in Section 7.2.

The MKS/MKRS series elements are delivered with a transport lock between the contact profiles.

8. Technical data

The element has a product life cycle of (B₁₀₀ value) of 5,000,000 cycles.

The B₁₀₀ value is determined in accordance with ISO 19973-1 (dangerous failures with regard to the safety of machinery).

INFORMATION:



For technical data, please visit our website (www.zimmer-group.com/en/it-td). This data varies within the series, depending on the specific design.

Zimmer Customer Service is available to provide you with assistance if you have any further questions.

9. Maintenance

The element is maintenance-free up to the number of cycles listed in point 8 under the following conditions:

- Use compressed air quality in accordance with DIN ISO 8573-1 [4:4:4].
- The air filter must be kept clean and cleaned, if necessary. The elements must not be operated without this filter.
- The guide rail must be clean and free of greasy films.
 - ▶ Even though the element is, as mentioned, maintenance-free, perform a regular visual inspection to check for corrosion, damage and contamination.
 - ▶ Clean the element as needed using a commercially available machine cleaning agent and then apply an anti-corrosion agent to the housing.
 - ▶ Thanks to the default contact profiles that are set by the manufacturer, no readjustment is required after proper installation.

10. Troubleshooting

INFORMATION:



For a precise and detailed overview of possible faults and corrective measures, please visit our website at www.zimmer-group.com/en/it-faq.

Zimmer Customer Service is available to provide you with assistance if you have any further questions.

11. Transportation/storage/preservation

- ▶ Transport and storage of the element must take place only using the original packaging or similar packaging.
- ▶ If the element is already mounted on the superordinate machine unit, all power and installation connections must be checked prior to commissioning.
- ▶ 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.
 - ⇒ Package the product so that it is protected against corrosion.
- ▶ Clean all components. There must be no soiling left on the components.
- ▶ Close pneumatic connections using suitable covers.
- ▶ There must be a transport lock present between the contact profiles.

12. Decommissioning and disposal

INFORMATION:



When the element reaches the end of its service life, the element can be disposed of. Completely disconnect the element from the power supply. When disposing of it, observe the locally applicable environmental regulations and codes and regulations for disposal.

13. Declaration of Conformity

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

Name and address of the manufacturer:

Zimmer GmbH • Im Salmenkopf 5 • 77866 Rheinau, Germany • +49 7844 9138 0 • +49 7844 9138 80 • www.zimmer-group.com

We hereby declare that the following, identically constructed safety components

Product designation: Clamping element with spring accumulator, pneumatic
Type designation: MKS/MKRS

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 - Risk assessment and risk reduction
 DIN EN ISO 13849-1 / -2 Safety of machinery – Safety-related parts of control systems
 DIN EN ISO 4414 Safety-related requirements for pneumatic systems and their components

The manufacturer has a full list of the applied standards.

Authorized representative for the compilation of relevant technical documents

Michael Hemler	See manufacturer's address	Rheinau, Germany, 2020-05-12	Martin Zimmer, Managing Director
First name, last name	Address	Place and date of issuance	Legally binding signature