

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:



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 assembled pneumatic connections
- Pneumatic supply faults, e.g. due to pressure fluctuations
- Damaged or loose pneumatic lines
- Missing or loose mounting 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 start-up

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.

The MK/MKR series element is designed for operation with compressed air only. The element is not suited for operation with any other media. In accordance with EN ISO 13849-1, the MK/MKR 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 MK/MKR element 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 multi-channel, where each channel must implement the safety function separately.

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 MK/MKR 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 MK series is designed for clamping on profile rail guides, while the MKR series is designed for clamping on round rail guides. The function is based upon a dual-acting wedge-type gear. The element is open when depressurized. The elements are configured to the respective rail measurement at the factory.

①	Distance plate (optional)
A	Air filter
B	Air connection
④	Thread for mounting screws
⑤	Profile rail guide (MK series) Round rail guide (MKR series)
⑥	Wedge-type gear
⑦	Adjustment screw
⑧	Piston

Fig. 1: MK series element

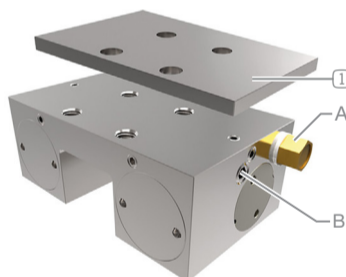
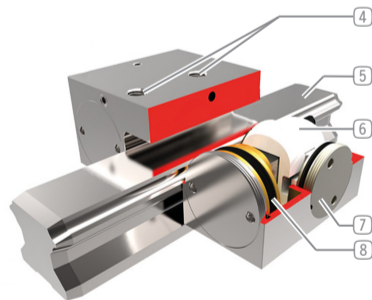


Fig. 2: Cutaway view of the MK series element



6. Connections

NOTICE:



The MK/MKR series elements feature two opposing air connections (B). The air connection preset by the manufacturer as well as air filter can be changed to the opposite side. Only one standard B connection needs be occupied to ensure that the MK/MKR series elements will function safely.

7. Installation

CAUTION:



If the mounting 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 MKR 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 MK/MKR series	Im Salmenkopf 5 D-77866 Rheinau, Germany +49 7844 9138 0 +49 7844 9138 80
DDOC00061 Index j 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 B.
- ▶ Apply a pneumatic connection to air connection B (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 connection B and remove the transport lock.
- ▶ Slide the element over the end of the guide rail. Depending on the rail manufacturer and thus the shape of the contact profile, it may also be possible to mount the element from above.
- ▶ Manually screw the mounting screws into the threaded holes.
- ⇒ The element becomes centered by going through multiple cycles (min. 20x opening and closing cycles within 10 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 the specified tightening torque of all mounting screws (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 can only be removed once the air connection has been pressurized with the minimum air pressure. The element should 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 MK/MKR element is shipped 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 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 5 • 77866 Rheinau, Germany • +49 7844 9138 0 • +49 7844 9138 80 • www.zimmer-group.com

We hereby declare that, as incomplete machines, the following elements of identical design

Product designation: Clamping element, pneumatic

Type designation: MK/MKR

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.

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 the machine or system in which the incomplete machine is to be installed has been determined to satisfy the conditions of the Machinery Directive 2006/42/EC and the EC Declaration of Conformity has been produced in accordance with Annex II 1 A.

Authorized representative for 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