

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

CAUTION:



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

- Crushing during installation due to an unsecured mounting piece
- ⇒ Protection against crushing as a result of the low stroke (max. 0.4 mm) of the element
- ⇒ Protection by the use of bistable design engineering
- 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 LKE 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 (Appendix D.1 and D.2 of EN 13849-2) and thus define the LKE element as a proven component in accordance with EN 13849-1, Chap. 6.2.4, Par. b). The element can be used in control systems of Category B or Category 1 without any further control engineering measures. A test channel must be provided for Category 2 control systems. For use in higher control categories, the control must be multi-channel, where each channel must implement the safety function separately. The element must not be used in any application other than those approved by the manufacturer.

Without additional protection or control engineering measures, the element must 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)
- come in direct contact with food
- be used in areas with a potentially explosive atmosphere

For questions regarding use of the LKE series element, please contact Zimmer GmbH.

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

NOTICE:



The clamping process during a movement (dynamic) can lead to destruction or damage of the profile rail or the element itself.

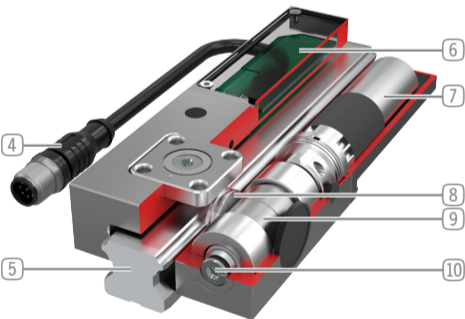
The element of the LKE series is a bistable element and is designed for the static clamping or securing of system components on profile rail guides. Based on the self-locking functional principle, when the clamp is closed there is no need for any supply voltage for the actuator to maintain the holding force. This means that in an open state, the only signal present is the DIR signal (refer to the table found under Point 6, "Connections").

1	Adjustment screw
2	Sliding block
3	Housing
4	Electrical connecting cable
5	Profile rail guide
6	Motor housing
7	Electric drive
8	Clamping jaws
9	Eccentric gear
10	Emergency actuation

Fig. 1: LKE series element



Fig. 2: Cutaway view of the LKE series element



5.1 Type plate

Depending on the installation size, there is a type plate affixed to the housing of the element or the type plate information is laser-etched directly onto the housing.

The serial number and the article number are shown on this type plate.

► The serial number should be assigned to the project.

⇒ Article number: 30

⇒ Serial number: 31



INFORMATION:

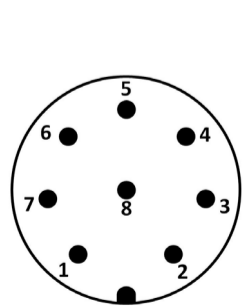


Please state the serial number in case of damage or a complaint. This ensures an unambiguous classification in the event of an update or an overhaul.

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

6. Connections

The element is connected by means of an 8-pin M12x1 plug cable.



1	White	DIR signal, open=1 (24V)/close=0 (0V)
2	Brown	Output status "closed"
3	Green	Output status "error"
4	Yellow	Voltage supply 24 V / Logic
5	Gray	Output status "open"
6	Pink	Voltage supply 24 V / Motor
7	Blue	Not used
8	Red	Voltage supply 0 V / GND

7. Installation

CAUTION:



If the fastening screws are tightened when the element is not clamped, the element can 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.

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

NOTICE:



Access for emergency actuation (10) and access to the element's adjustment screw 1 must be ensured.

- ⇒ The element does not have any guide characteristics!

INFORMATION:



The element is allowed to be closed only if the associated profile rail is between the contact surfaces!

- There must be no control voltage present when an electrical connecting cable (4) is connected or disconnected!
- Avoid changing signals before the specified time (opening/closing), otherwise there may be a malfunction.
- Unauthorized opening of the housing shall void any warranty claim.

If the element is not yet connected to a power supply, the element can be opened and closed manually using the emergency actuation (10).

- ⇒ Turning counterclockwise = close
- ⇒ Turning clockwise = open

- Position the element on the linear guide.
- ⇒ If a spacer plate is used, it is inserted between the element and the mounting piece as level compensation.
- Screw the screws into the tapped holes of the sliding block (2) and tighten them only slightly.
- The element centers itself as a result of a single cycle.
- Close the element.
- Tighten the fastening screws crosswise using the specified torque.
- Open the element.



7.3 Design of the mounting piece

NOTICE:



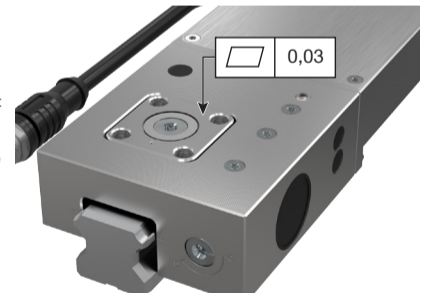
The user alone is responsible for ensuring that the mounting piece is sufficiently rigid in terms of the Machinery Directive 2006/42/EC. Zimmer GmbH accepts no liability for consequential damages to the element, injury to personnel or damage to the system in which the element is installed.

INFORMATION:



The holding force is the maximum force that can be generated in the axial direction. The specified holding forces are tested on every oiling and braking element before delivery using a lightly lubricated rail (ISO VG 68). Using other oil or lubricating substances can influence the coefficient of friction, which can cause a loss of holding force in individual cases. We reserve the right to make additional changes in the course of further development.

- Make sure that the mounting faces (sliding block (2)) are flat (0.03 mm).
- The extension cord, which lengthens the power cable (4), must not exceed a length of 10 m.
- The electric connecting cable (4) must be relieved of strain at the mounting piece. The cable must be installed in such a way that the cable cannot rub against the rail or get pinched.
- The 3D data for the profile rails is not necessarily true to detail in the area of the rail groove. Refer to the catalog or product selection on our website to see whether an element fits on the selected rail.



7.4 Tolerance compensation

CAUTION:

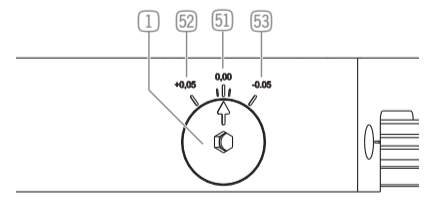


The adjustment screw must not be turned using force above the specified tolerances of ± 0.05 mm!

- The profile rails have a conventional tolerance of ± 0.05 mm. The adjustment screw (1) for the passive contact profile can be used to compensate this tolerance and achieve a centered positioning for the element.
- You can use an Allen key to turn the adjustment screw (1) and adjust the element to the measured dimension of the rail.
- This adjustment is to be set and checked before final assembly of the element.

The centered setting of the element for the profile rail has a critical influence on achieving the maximum possible holding force. Three markings are engraved on the housing of the element.

Marking (51) : Nominal dimension of the rail (xx,xx)
 Marking (52) : Nominal dimension of + 0.05 mm
 Marking (53) : Nominal dimension of - 0.05 mm

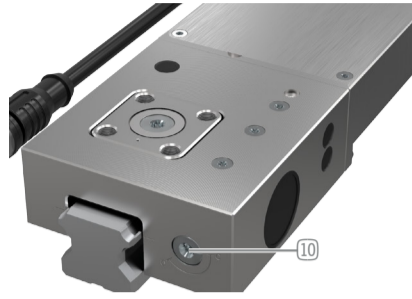


7.5 Manual emergency actuation

CAUTION:



An injury hazard exists (crushing) with the use of emergency actuation with an Allen key.
 ⇒ When using the emergency actuation, make sure that there is sufficient space for persons and tools in the surroundings where movement takes place.
 ⇒ Observe the movement range of the eccentric shaft indicated by the marking on the housing (emergency actuation **(10)**)!
 ⇒ O = Open
 ⇒ C = Close



In the event of a failure of the electrical system, the element offers the option of being manually clamped or opened. For this purpose, the emergency actuation **(10)** with hexagon socket is located on the front side of the eccentric shaft. An Allen key can be used here to move the element.

- ⇒ Turning counterclockwise = close
- ⇒ Turning clockwise = open

7.6 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 ease of movement of the element by manually sliding the element perpendicular to the rail.
 - ⇒ In this process, make sure the sliding block **(2)** moves freely.
- Check the ease of movement of the element on the profile rail by manually sliding the rail carriage.
- Check the clamping process by manually applying force against the closed element.
 - ⇒ When doing so, the maximum holding force must not be exceeded.
- Visually inspect the entire connecting cable to make sure it is properly installed.
- Check all fastening screws for the specified tightening torque.

7.7 Removal

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

8. Technical data

The element has a product service life (**B₁₀₀ value**) of 500,000 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. Function table / Behavior / Process charts

9.1 Function table

PIN 5 output "open"	PIN 2 output "closed"	PIN 3 output "Error"	Status / description
0	0	0	Status undefined / actuator in motion
1	0	0	The element is open
0	1	0	The element is closed
0/1*	0/1*	1	Error

1 = "high" = there is a signal = a voltage of 24 V is present.
 0 = "low" = there is no signal = there is no voltage (0 V).
 *) The clamp has an undefined status (not "OPEN" and/or "CLOSED").
 Example:
 A signal failure may occur as a result of overvoltage (e.g. after closing or opening).
 ⇒ This means that there is no signal at the respective PIN (not "1" or "0").

9.2 Behavior for "Voltage ON"

- ▶ From an undefined position: The element always tries to open first, then it executes the pending move command. A permanent signal is output in this status at the "Error" output (PIN 3).
- ▶ From a defined position:
 The element stays in the position in front of "Voltage OFF". The DIR signal has to change before the new move command can be executed.

9.3 Process charts

Signal for change of direction (DIR signal, PIN 1) after "Voltage OFF"

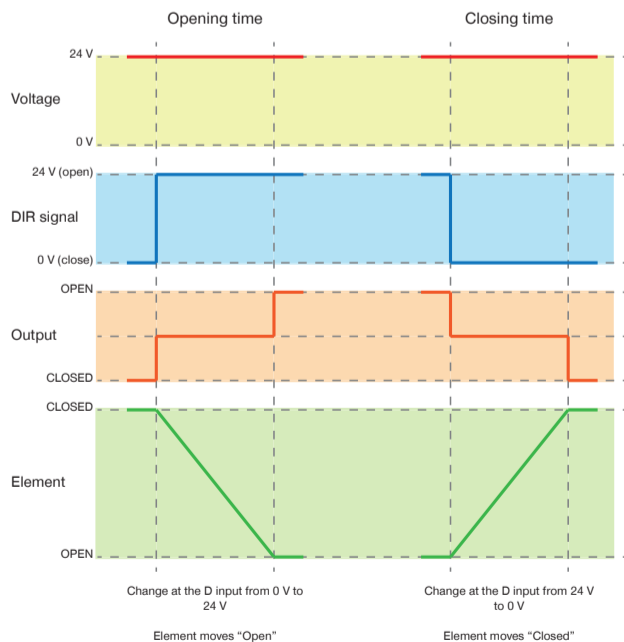
⇒ To achieve the desired status, a signal change is required when the operating voltage is switched on.

Signal (DIR signal, PIN 1) during opening

⇒ The element begins the opening process after a signal change from "Low to High" (0 V to 24 V).

Signal (DIR signal, PIN 1) during closing

⇒ The element begins the closing process after a signal change from "High to Low" (24 V to 0 V).



10. Maintenance

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

- Adherence to the operating parameters
- Proper installation
 - ▶ 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.

11. 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.

12. 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.
- ▶ Apply corrosion protection in the correct manner.
- ▶ There must be a transport lock present between the contact profiles.

13. 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.

14. 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, as incomplete machines, the following elements of identical design

Product designation: Clamping element, electric

Type designation: LKE

conform to the requirements of Machinery Directive

2006/42/EC in their design and the version we put on the market.

The following harmonized standards have been applied:

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 62061	Safety of machinery – Functional safety of electrical, electronic and programmable electronic control systems
DIN EN ISO 13732-1	Ergonomics of the thermal environment – Methods for the assessment of human responses to contacts with surfaces – Part 1: Hot surfaces

The manufacturer has a full list of the applied standards.

Authorized representative for the compilation of relevant technical documents

Dezsi F.

Michael Hemler	See manufacturer's address	Rheinau, Germany, 2020-07-24	Martin Zimmer, Managing Director
First name, last name	Address	Place and date of issuance	Legally binding signature