



Linear technology

THE KNOW-HOW FACTORY

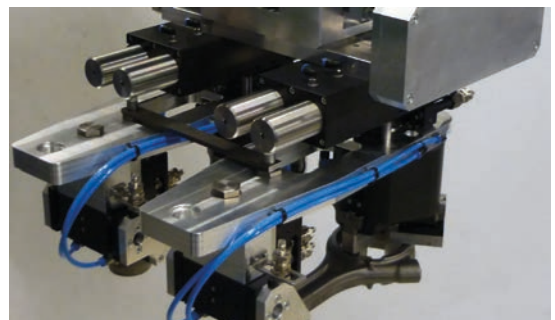
ZIMMER GROUP COMMITTED TO OUR CUSTOMERS

WE HAVE SUCCEEDED FOR YEARS BY OFFERING OUR CUSTOMERS INNOVATIVE AND INDIVIDUALIZED SOLUTIONS. ZIMMER HAS GROWN CONTINUOUSLY AND TODAY WE HAVE REACHED A NEW MILESTONE: THE ESTABLISHMENT OF THE KNOW-HOW FACTORY. IS THERE A SECRET TO OUR SUCCESS?

Foundation. Excellent products and services have always been the foundation of our company's growth. Zimmer is a source of ingenious solutions and important technical innovations. This is why customers with high expectations for technology frequently find their way to us. When things get tricky, Zimmer Group is in its best form.

Style. We have an interdisciplinary approach to everything we do, resulting in refined process solutions in six technology fields. This applies not just to development but to production. Zimmer Group serves all industries and stands ready to resolve even the most unique and highly individualized problems. Worldwide.

Motivation. Customer orientation is perhaps the most important factor of our success. We are a service provider in the complete sense of the word. With Zimmer Group, our customers have a single, centralized contact for all of their needs. We approach each customer's situation with a high level of competence and a broad range of possible solutions.



TECHNOLOGIES



HANDLING TECHNOLOGY

MORE THAN 30 YEARS OF EXPERIENCE AND INDUSTRY KNOWLEDGE: OUR PNEUMATIC, HYDRAULIC AND ELECTRICAL HANDLING COMPONENTS AND SYSTEMS ARE GLOBAL LEADERS.

Components. More than 2,000 standardized grippers, swivel units, robotic accessories and much more. We offer a complete selection of technologically superior products that are ready for rapid delivery.

Semi-standard. Our modular approach to design enables custom configurations and high rates of innovation for process automation.



DAMPING TECHNOLOGY

INDUSTRIAL DAMPING TECHNOLOGY AND SOFT CLOSE PRODUCTS EXEMPLIFY THE INNOVATION AND PIONEERING SPIRIT OF THE KNOW-HOW FACTORY.

Industrial damping technology.

Whether standard or customized solutions, our products stand for the highest cycle rates and maximum energy absorption with minimal space requirements.

Soft Close. Development and mass production of pneumatic and fluid dampers with extraordinary quality and rapid delivery.

OEM and direct. Whether they need components, returning mechanisms or complete production lines – we are the trusted partner of many prestigious customers.



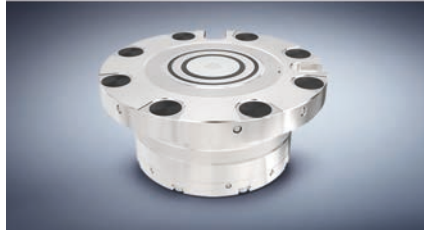
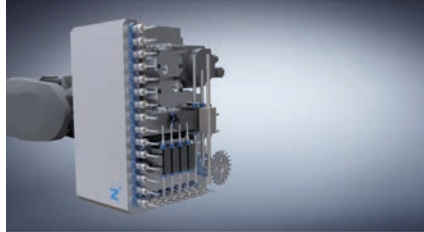
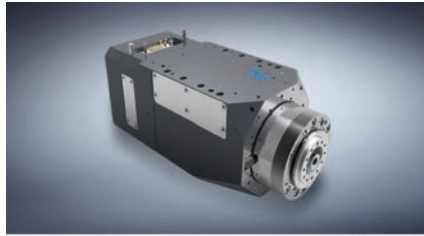
LINEAR TECHNOLOGY

WE DEVELOP LINEAR COMPONENTS AND SYSTEMS THAT ARE INDIVIDUALLY ADAPTED TO OUR CUSTOMERS' NEEDS.

Clamping and braking elements.

We offer you more than 4,000 types for profiled and round rails as well as for a variety of guide systems from all manufacturers. It makes no difference whether you prefer manual, pneumatic, electric or hydraulic drive.

Flexibility. Our clamping and braking elements ensure that movable components such as Z-axes or machining tables maintain a fixed position and that machines and systems come to a stop as quickly as possible in an emergency.



PROCESS TECHNOLOGY

MAXIMUM EFFICIENCY IS ESSENTIAL FOR SYSTEMS AND COMPONENTS USED IN PROCESS TECHNOLOGY. HIGH-LEVEL CUSTOM SOLUTIONS ARE OUR TRADEMARK.

A rich reservoir of experience. Our know-how ranges from the development of materials, processes and tools through product design to production of series products.

Deep production capabilities. The Zimmer Group pairs these capabilities with flexibility, quality and precision, even when making custom products.

Series production. We manufacture demanding products out of metal (MIM), elastomers and plastics with flexibility and speed.

MACHINE TECHNOLOGY

ZIMMER GROUP DEVELOPS INNOVATIVE METAL, WOOD AND COMPOSITE MATERIAL PROCESSING TOOL SYSTEMS FOR ALL INDUSTRIES. NUMEROUS CUSTOMERS CHOOSE US AS THEIR SYSTEMS AND INNOVATION PARTNER.

Knowledge and experience. Industry knowledge and a decades-long development partnership in exchangeable assemblies, tool interfaces and systems make us bound for new challenges around the world.

Components. We deliver numerous standard components from stock and develop innovative, customized systems for OEM and end customers – far beyond the metal and wood processing industries.

Variety. Whether you have machining centers, lathes or flexible production cells, the power tools, holders, assemblies and drilling heads of Zimmer Group are ready for action.

SYSTEM TECHNOLOGY

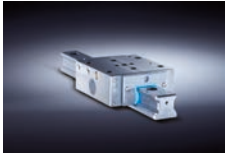
ZIMMER GROUP IS ONE OF THE LEADING SPECIALISTS IN THE DEVELOPMENT OF CUSTOMIZED SYSTEM SOLUTIONS WORLDWIDE.

Customized. A team made up of more than 20 experienced designers and project engineers develop and produce customized solutions for special tasks in close collaboration with end customers and system integrators. It doesn't matter if it is a simple gripper and handling solution or a complex system solution.

Solutions. These system solutions are used in many industries, from mechanical engineering to the automotive and supplier industries to plastics engineering and consumer goods industries, all the way to foundries. The Know-how Factory helps countless companies to thrive competitively by increasing automation efficiency.

FULL PRODUCT LINE OVERVIEW

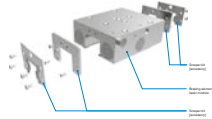
CLAMPING AND BREAKING ELEMENTS



ZIMMER CLAMPING AND BREAKING ELEMENTS

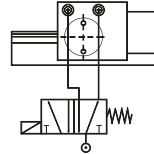
PRODUCT ADVANTAGES

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NUMERICAL CODE

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TECHNICAL FUNDAMEN- TALS

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$$S_{br} = \frac{m \times v_{br}^2}{2 \times F \times A \times \frac{\mu_{br}}{\mu_{st}}} = \frac{50 \text{ kg} \times (2 \frac{\text{m}}{\text{s}})^2}{2 \times 3.100 \text{ N} \times 1 \times \frac{0,06}{0,1}} = 0,054 \text{ m}$$

BRAKING DISTANCE CALCU- LATION

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SELECTION GUIDE

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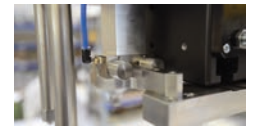
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SPECIAL SOLUTIONS

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CLAMPING AND BREAKING ELEMENTS

IN OVERVIEW

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CLAMPING AND BREAKING ELEMENTS

FOR PROFILE RAIL GUIDES

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CLAMPING AND BREAKING ELEMENTS

FOR ROUND GUIDES

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PIONEERS WITH LEADERSHIP QUALITIES

ZIMMER GROUP IS A PIONEER IN THE FIELDS OF CLAMPING AND BRAKING ON PROFILE AND ROUND SHAFT GUIDES.



More than 20 years of development and market experience have yielded more than 4,000 products. Zimmer Group offers the most comprehensive and innovative portfolio of products and services reflecting the highest possible quality and reliability.

Clamping and braking elements from Zimmer Group routinely perform critical positioning, holding and braking tasks. They ensure precision during cutting processes and boost efficiency with short cycle times. Their secure hold maximizes safety and protects the machines.

ZIMMER CLAMPING AND BRAKING ELEMENTS

HIGH-PERFORMANCE, DURABLE, INNOVATIVE

Our customers have high expectations for reliability, which we fulfill by merging exceptional performance with extraordinary product and manufacturing quality. Naturally we are certified according to DIN EN ISO 9001 and DIN EN ISO 14001:2004.

All of our products pass through multiple development and testing phases before entering series production. We continually optimize the underlying design, meeting new requirements with innovative developments, so our customers can enter new fields and discover new ways to use our products.

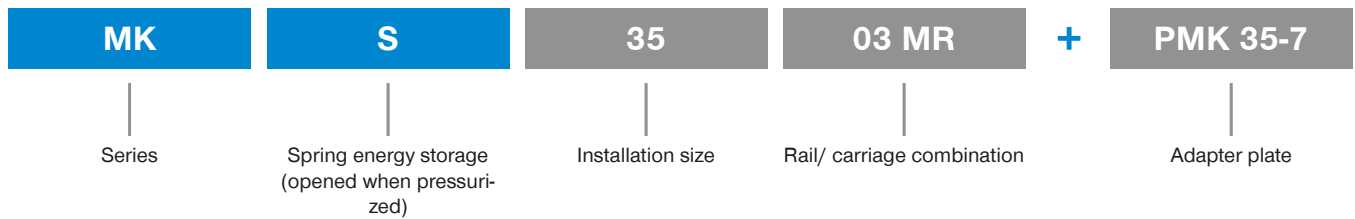
Numerous benefits:

- ▶ Very high holding force on small dimensions
- ▶ No relative movement for the workpiece
- ▶ No clamping forces transferred to the guide block
- ▶ High positional accuracy
- ▶ High stiffness
- ▶ Virtually wear free
- ▶ Very straightforward installation
- ▶ Outstanding price/performance ratio
- ▶ Available for all common guide manufacturers
- ▶ Economical custom solutions
- ▶ Emergency stop-capable series with integrated special surface for braking

With many years of product and market experience, we have a special ability to develop custom solutions that complement our large and diverse range of products. Please share your challenge with us!

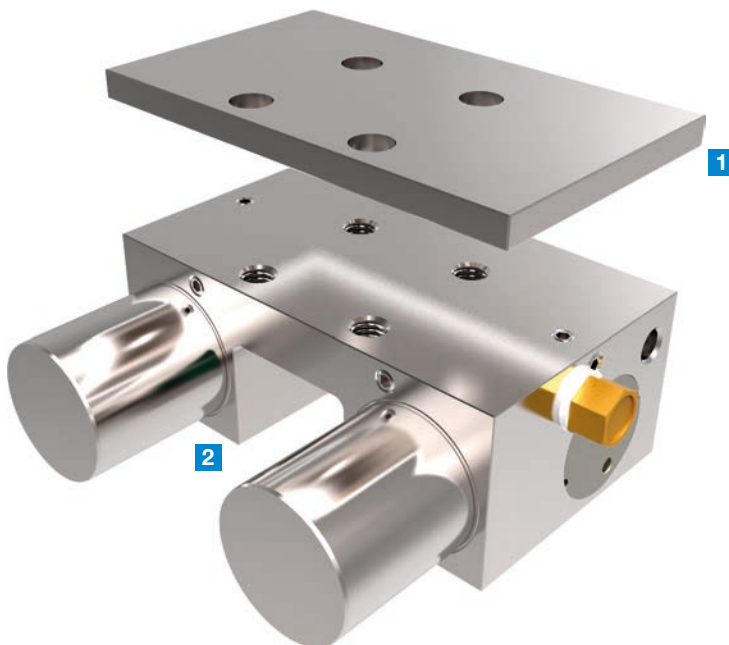
NUMERICAL CODE EXPLANATION

▶ NUMERICAL CODE OF OUR MKS SERIES (SHOWN AS EXAMPLE)



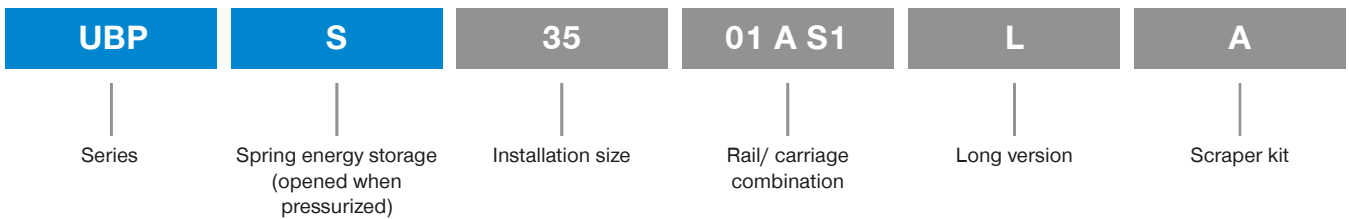
- ▶ The tables on the overview pages contain the order numbers of the elements and, when necessary, the order numbers of the associated adapter plate (accessory).
- ▶ If an adapter plate is required, please provide both order numbers.
- ▶ For dimensions and top view drawings, refer to the respective series.

Example MKS series



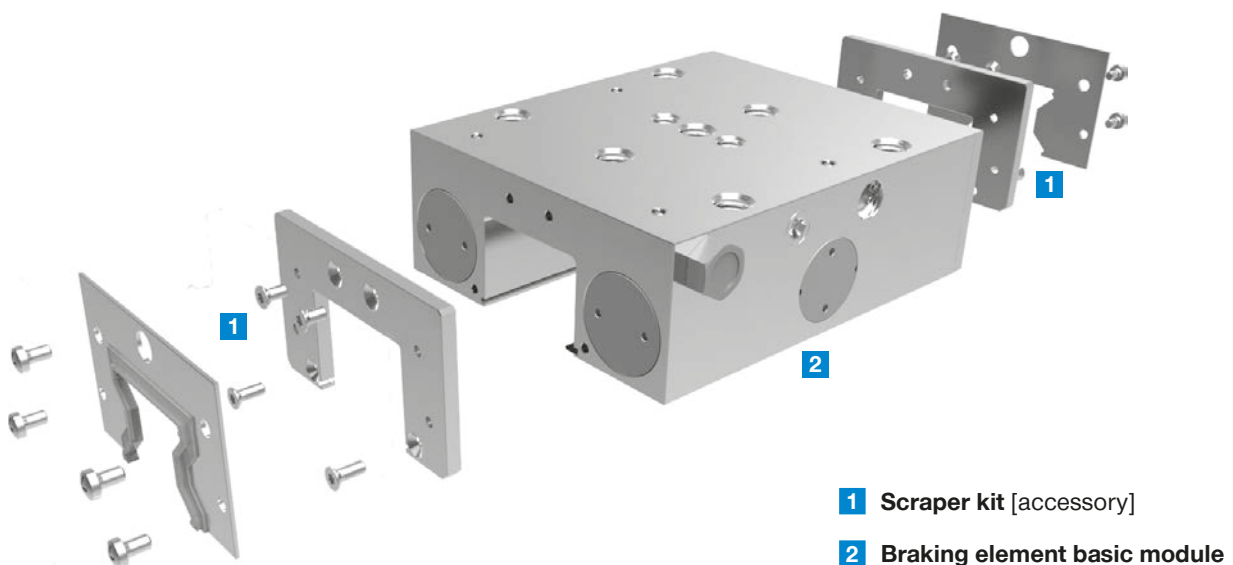
- 1** Adapter plate [Depending on the height of the guide block (dimension D), it may be necessary to order an adapter plate for height compensation.]
- 2** Clamping element basic module

► NUMERICAL CODE OF OUR UBPS SERIES (SHOWN AS EXAMPLE)



- The tables on the overview pages contain all necessary order numbers, with the exception of the wiper kit.
- If a wiper kit is required, please add the letter „A“ to the order number.
- Our KBHS and RBPS series are always equipped with a wiper!
- Our series MBPS, UBPS, KWH, KBH and LBHS are available with a wiper option!
- For dimensions and top view drawings, refer to the respective series.

Example UBPS series



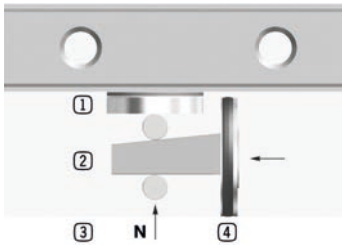
CLAMPING AND BRAKING ELEMENTS

TECHNICAL FUNDAMENTALS

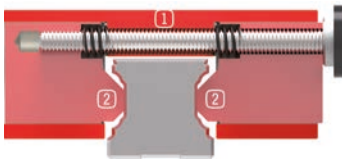
▶ CLAMPING, BRAKING, AREAS OF APPLICATION

Wedge slide gear

- ① Contact section
- ② Wedge slide gear
- ③ Resulting transverse movement
- ④ Piston



- ① floating bearing
- ② free surfaces

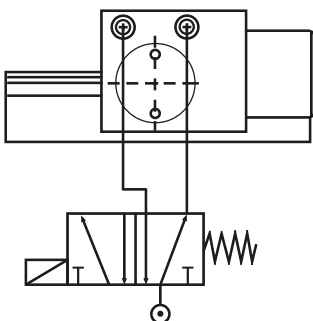


- ▶ The MK/MKS/MBPS/UBPS/LKP/LKPS/LBPS/MKR and MKRS series are constructed with two parallel (synchronized) running wedge-type gears, i.e. the stroke movement of the contact profiles is performed from both sides. Therefore (assuming the proper connection structure), the clamping process is not expected to produce relative movements.
- ▶ Series HK/MK/MKS/LKP/LKPS/miniHK/MCP/MCPS/KWH/KBH/LKE/HKR/MKR/MKRS/TPS and DKHS1000 are designed exclusively for static clamping processes.
- ▶ Series MBPS/UBPS/LBPS/LBHS and RBPS permit the use of corresponding contact profiles for dynamic use (braking) as a safety feature.
- ▶ Series HK/miniHK/MCP/MCPS/KWH/KBH/LKE and HKR have floating bearings, thereby eliminating pinching forces in the connection structure during the clamping process.
- ▶ The frictional connection between the clamping element and the linear guide is generated on the free surfaces of the guide rails, avoiding damage to the running surfaces of the ball guides and roller slides.

▶ PNEUMATIC CONNECTIONS

OPTIMIZED SUPPLY OF COMPRESSED AIR PROVIDES FOR RELIABLE FUNCTIONALITY

- ▶ Purified, oiled air shall be used for the pneumatic elements. Recommended filter size is 25 µm. The line diameter of the elements should be the largest permitted by the air connection. Smaller line diameters result in slower response and reaction times for the elements. Lines should be as short as possible; please observe the installation and operating instructions.
- ▶ All commercially available pneumatic valves are suitable. Inquire with the manufacturer for each valve's reaction time, especially when used as a brake or as fall protection.



- ▶ PLUS connection for higher holding forces
The holding force of elements MKS/ MCPS and UBPS can be increased with supplementary pressure for the spring energy storage and by installing a 5/2 (overflow free) or 5/3-way valve. In this case, the venting filter is replaced by a second pneumatic line.
- ▶ When used as a safety element, note that the higher holding force (PLUS connection) can be achieved only with additional charging with existing pneumatic pressure.

▶ HYDRAULIC CONNECTIONS

KWH
KBH
LBHS
DKHS1000

- ▶ The hydraulic clamping elements are filled at the factory with HLP 46 hydraulic oil. The hydraulic connection is established at both sides. Charging requires one connection. Special care must be exercised when venting the rigid and flexible hydraulic lines, since air inclusions may lead to damage to sealing elements. Please observe the instructions included with the product during installation and start-up.

▶ CONNECTION STRUCTURE, INSTALLATION OF THE CLAMPING ELEMENTS



PLEASE OBSERVE!

- ▶ In order to avoid negative effects like permanent rubbing at the linear guide, the connection structure must be stiff in its design, in accordance with its loads and requirements. If the clamping elements are askew, this may result in rubbing, wear and ultimately damage to the linear guide.
The default factory setting is adapted to the linear guide and may not be modified during installation. It is very important that you observe the installation instructions for the clamping and braking elements.
All spring-loaded elements are equipped with a transport safety device between the contact profiles. Remove the safety devices during installation by applying pressure to the element. Once pressure is removed, the transport safety device or the associated linear guide must have contact between the contact profiles!
The clamping elements do not perform any guide function. Therefore, it is not possible to exchange a guide block with a clamping element. The ideal position of the clamping element is between two guide blocks. When using multiple clamping elements, they should be distributed evenly on both guide rails in order to achieve maximum rigidity of the overall design.
Additional installation notices may be found at www.zimmer-group.com.

▶ LUBRICATION, SURFACE PROTECTION AND B10D VALUE

NOTE

- ▶ Lubrication is not necessary when using the mandated pressure medium.
- ▶ All housing parts of the clamping elements are nickel plated, giving them a certain amount of rust protection. Smaller parts made of aluminum are nickel plated or hard coated, depending on their requirements.
- ▶ The B10d value indicates the number of switching cycles until 10 % of the components have failed hazardously.

CLAMPING AND BRAKING ELEMENTS

BRAKING DISTANCE CALCULATION

▶ THEORETICAL BRAKING DISTANCE CALCULATION

VALUE

A (number of braking elements)	1
F (holding force of the braking element)	3 100 N
t _R (reaction time)	0,06 s
t _A (response time)	0,01 s
m (mass)	50 kg
v ₀ (initial speed)	2 m/s
μ _G (kinetic friction)	0,06
μ _R (static friction)	0,1
g (weight force)	9,81 m/s ²

▶ Example: Two guide blocks and one braking element UBPS (size 45)

The values for μ_G and μ_R are based on test series and on years of industry experience. Nonetheless, divergent ambient conditions can lead to different results. Values t_R and t_A are based on measured test values.

▶ STOPPING DISTANCE (HORIZONTAL INSTALLATION)

FORMULAS

▶ Stopping distance (horizontal installation)

The stopping distance is the theoretical distance required to bring a known mass with a defined speed to a complete stop. During braking, kinetic energy is converted to friction energy.

The braking distance is additionally extended by the distance that the entire system requires until the braking process is initiated. Short hose lengths, rapid valves and clean rails shorten the stopping distance.

▶ Energy formulas:

$$W_{\text{Kin}} = \frac{1}{2} m \times v_0^2 \qquad W_{\text{Fric}} = F \times A \times \frac{\mu_G}{\mu_H} \times S_B \qquad W_{\text{Kin}} = W_{\text{Fric}}$$

▶ Braking distance S_B:

$$S_B = \frac{m \times v_0^2}{2 \times F \times A \times \frac{\mu_G}{\mu_H}} = \frac{50 \text{ kg} \times (2 \frac{\text{m}}{\text{s}})^2}{2 \times 3.100 \text{ N} \times 1 \times \frac{0,06}{0,1}} = 0,054 \text{ m}$$

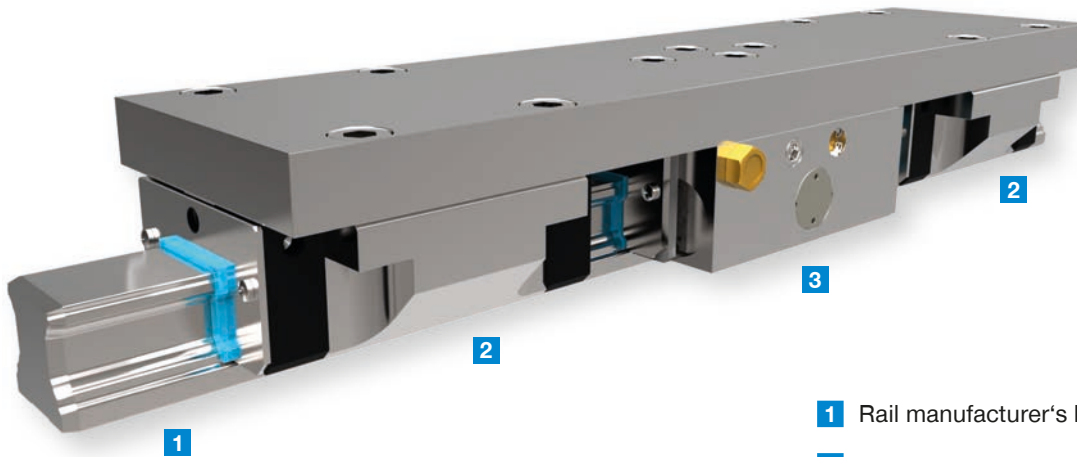
▶ Reaction distance and response distance S_R:

$$S_R = v_0 \times (t_R + t_A) = 2 \frac{\text{m}}{\text{s}} \times (0,06 \text{ s} + 0,01 \text{ s}) = 0,14 \text{ m}$$

▶ Stopping distance S_H:

$$S_H = S_B + S_R = 0,054 \text{ m} + 0,14 \text{ m} = 0,194 \text{ m}$$

► DESIGN



- 1** Rail manufacturer's linear guide
- 2** Rail manufacturer's carriage
- 3** Braking element UBPS

- The relevant mechanical engineering directives shall be observed when designing the axle, including brakes. We will be happy to provide design assistance.

► STOPPING DISTANCE (VERTICAL INSTALLATION)

FORMULAS

► Stopping distance (vertical installation)

With vertical installation, the system is accelerated by gravity until the braking element triggers and the braking process begins.

► Speed when braking begins V_{Brake} :

$$V_{\text{Brake}} = v_0 + g \times (t_R + t_A) = 2 \frac{\text{m}}{\text{s}} + 9,81 \frac{\text{m}}{\text{s}^2} \times (0,06\text{s} + 0,01\text{s}) = 2,69 \frac{\text{m}}{\text{s}}$$

► Braking distance S_B :

$$S_B = \frac{m \times v_{\text{Brake}}^2}{2 \times \left((F \times A \times \frac{\mu_G}{\mu_H}) - m \times g \right)} = \frac{50 \text{ kg} \times (2,69 \frac{\text{m}}{\text{s}})^2}{2 \times \left((3,100 \text{ N} \times 1 \times \frac{0,06}{0,1}) - 50 \text{ kg} \times 9,81 \frac{\text{m}}{\text{s}^2} \right)} = 0,132 \text{ m}$$

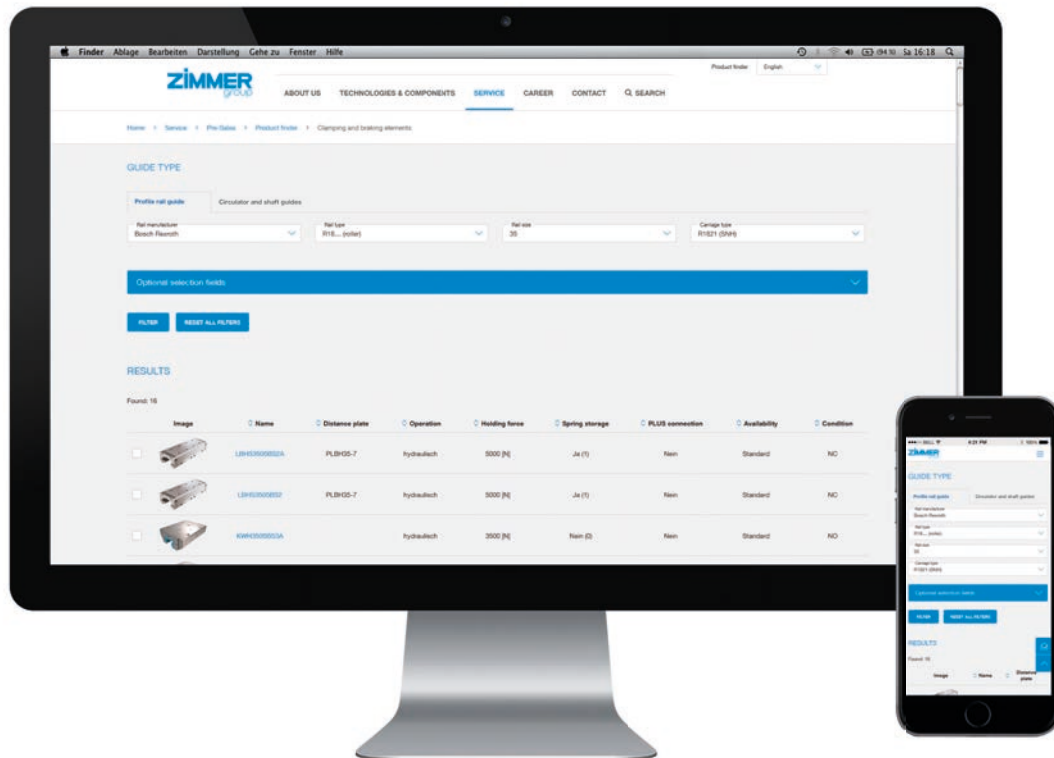
► Reaction distance and response distance S_R :

$$\begin{aligned} S_R &= v_0 \times (t_R + t_A) + \frac{1}{2} \times g \times (t_R + t_A)^2 \\ &= 2 \frac{\text{m}}{\text{s}} \times (0,06\text{s} + 0,01\text{s}) + \frac{1}{2} \times 9,81 \frac{\text{m}}{\text{s}^2} \times (0,06\text{s} + 0,01\text{s})^2 = 0,164 \end{aligned}$$

► Stopping distance S_H :

$$S_H = S_B + S_R = 0,132 \text{ m} + 0,164 \text{ m} = 0,296 \text{ m}$$

CLAMPING AND BRAKING ELEMENTS PRODUCT FINDER



Select clamping and braking elements more quickly

A powerful tool that enables fast and well-founded selections.

Clearly arranged selection guide

The available clamping and braking elements that meet these specifications are shown to the user in an overview table.

Appealing solution, available on mobile devices

Since the selection program is available online, customers do not have to install any software and can access it using any computer or laptop, as well as with any smartphone or tablet.

CLAMPING AND BRAKING ELEMENTS

SAFETY REQUIREMENTS

▶ BASIC KNOWLEDGE OF SAFETY REQUIREMENTS

Mechanical engineering is an important technical subsector and one of the core industrial areas of the EC economy. The social costs of numerous accidents resulting directly from machine operation can be reduced if the aspect of safety is incorporated into the design and construction of machines and these machines are installed and maintained properly.

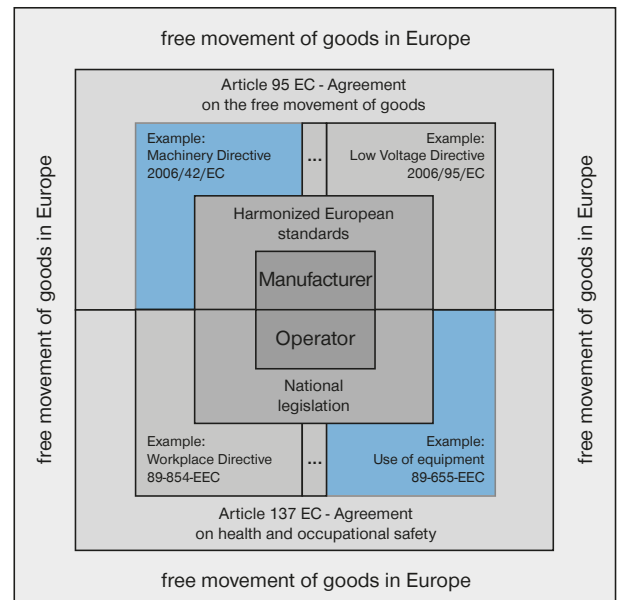
▶ European rules and regulations

Products must be designed such that humans, animals and the environment are protected. This is the principle on which applicable European rules and regulations are based.

▶ CE marking

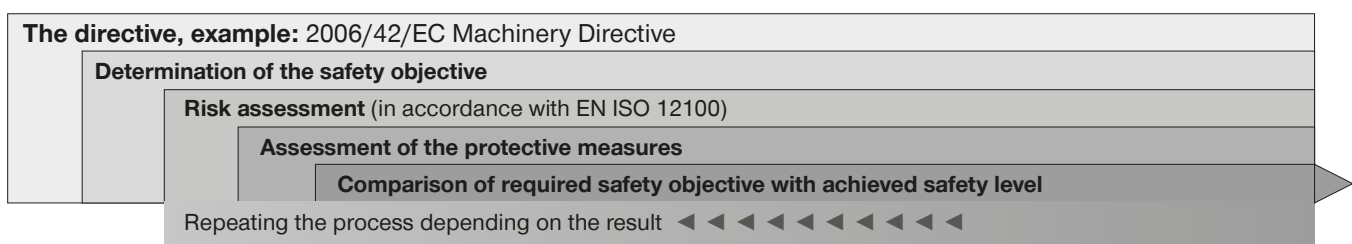
When a manufacturer, distributor or EU authority affixes the CE marking to a product, it is declaring that this product meets the requirements of EU Regulation 765/2008 defined in the legislation of the European Community. The CE marking is a symbol of the free movement of goods within the EU.

Legally, the CE marking is not a seal of approval (quality), and is only intended to document compliance with the minimum legal requirements.



▶ THE PATH TO A SAFE MACHINE

IDENTIFY THE DANGER, ASSESS THE RISK AND MINIMIZE IT



▶ Companies like the ZIMMER-Group that manufacture products subject to the scope of validity of the 2006/42/EC Machinery Directive and that can verify a quality management system certified in accordance with ISO 9001 carry out a procedure for Declaration of Conformity in accordance with Appendix VIII of the Machinery Directive. A risk assessment is an integral part of this process carried out during development.

▶ This risk assessment analyzes danger zones, assesses the associated risks, determines actions for reducing risk and repeats the evaluation until it can be proven that sufficient risk reduction is in place.

Risk = severity of the potential damage + **likelihood** of occurrence

CLAMPING AND BRAKING ELEMENTS

SAFETY REQUIREMENTS

▶ PERFORMANCE LEVEL, FAILURE, DIAGNOSTICS, ETC.

The performance level is a function of:

- ▶ The control category used (Cat. B through 4)
- ▶ The diagnostic coverage (DC)
- ▶ The mean operating time until a failure occurs (MTTF_d)
- ▶ The common cause failures (CCF)

THIS MEANS THAT THE PERFORMANCE LEVEL OF AN INDIVIDUAL LINEAR ELEMENT CAN ONLY EVER BE CALCULATED TOGETHER WITH THE CONTROL ARCHITECTURE USED AND THE APPLICATION-RELATED DATA.

VALUE

▶ B10d value:

According to statistics, the B10 value is the time at which 10% of the test objects fail. With respect to machine safety, only the dangerous failures are relevant. ISO 13849-1 permits the assumption that every second failure is dangerous. Based on this, it is safe to assume the following:

$$B_{10d} = 2 \times B_{10}$$

The B10d value is already specified in the catalog and installation and operating instructions for linear technology. ZIMMER determines this value in its own test laboratories in conjunction with specified authorities.

▶ MTTF_d value:

Mean operating time until a failure occurs (mean time to failure)

For all products installed in safety-related parts of control systems and that have a direct effect on the safety function, this value has to be calculated according to the following formula:

$$MTTF_d = \frac{B_{10d}}{0,1 \times n_{op}}$$

The identifying feature of the variable n_{op} is that it is directly related to the operating conditions for the user.

n_{op} = mean number of annual actuations

d_{op} = operating days / year

h_{op} = operating hours / day

t_{cycle} = cycle time in [s]

$$n_{op} = \frac{d_{op} \times h_{op} \times 3600 \text{ s/h}}{t_{cycle}}$$

► PERFORMANCE LEVEL, FAILURE, DIAGNOSTICS, ETC.

VALUE

► **DC value:**

Diagnostic coverage = measurement of the effectiveness of the process diagnosis. Here, the dangerous failures identified are put in proportion to the total number of dangerous failures:

$$DC = \frac{\sum (\text{dangerous detected failures})}{\sum (\text{total dangerous failures})}$$

The total diagnostic coverage can be formed from the sum of the values of individual elements (1 - n) of a control architecture.

$$DC = \frac{\frac{DC_1}{MTTF_{d1}} + \frac{DC_2}{MTTF_{d2}} + \dots + \frac{DC_n}{MTTF_{dn}}}{\frac{1}{MTTF_{d1}} + \frac{1}{MTTF_{d2}} + \dots + \frac{1}{MTTF_{dn}}}$$

Diagnostic coverage is particularly important in selecting the necessary control category. This value is not relevant for categories B and 1.

Failure mode and effects analyses (FMEA) can be used in accordance with IEC 60812 to estimate the DC.

Appendix E of ISO 13849-1 offers a simplified approach for estimating the DC.

The DC is specified in one of four levels: none, low, medium and high.

If the DC increases due to improved diagnostic measures, a higher performance level (PL) can be achieved for the same control architecture.

WHAT THIS MEANS IN PRACTICE:

- If an activation valve for a clamping element is monitored by a pressure switch in a single-channel control architecture, this can increase machine safety substantially.
- This can be seen in the table in Chapter 4.5.4 of EN ISO 13849-1. Here, this is indicated by the increased PL d in Category 2
- Without the described monitoring measure (no DC), only PL b/c would be reached in Control category 1.

CLAMPING AND BRAKING ELEMENTS

SAFETY REQUIREMENTS

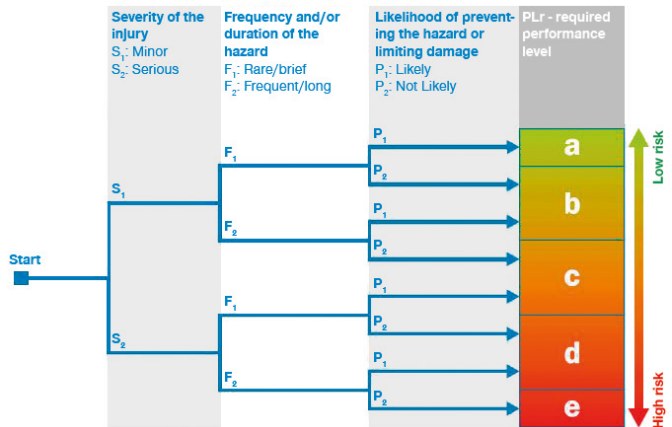
► REQUIRED PLR - ACHIEVED PL

► STEP 1:

EN ISO 13849-1 also uses a risk graph to determine the required **performance level** PLr.

Parameters S, F and P are used to determine the severity of the risk. The result of the procedure is the **required performance level** (PLr - required performance level)

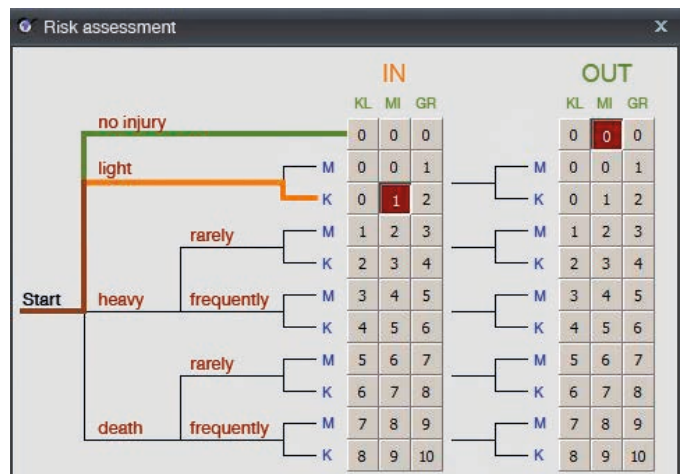
In practice, the PLr is often defined in the customer's requirements specifications.



Note:

When assessing the effectiveness of the actions taken to reduce risk, we once again encountered the structure of risk graphs used to determine the PLr.

A classification of the achieved risk reduction has taken the place of the column for the PLr. It is in the form of a number, which serves as an abstract symbol for the risk severity.



► STEP 2:

The achieved performance level **must be determined for all actions that contain control engineering components and that were implemented** as part of the risk assessment

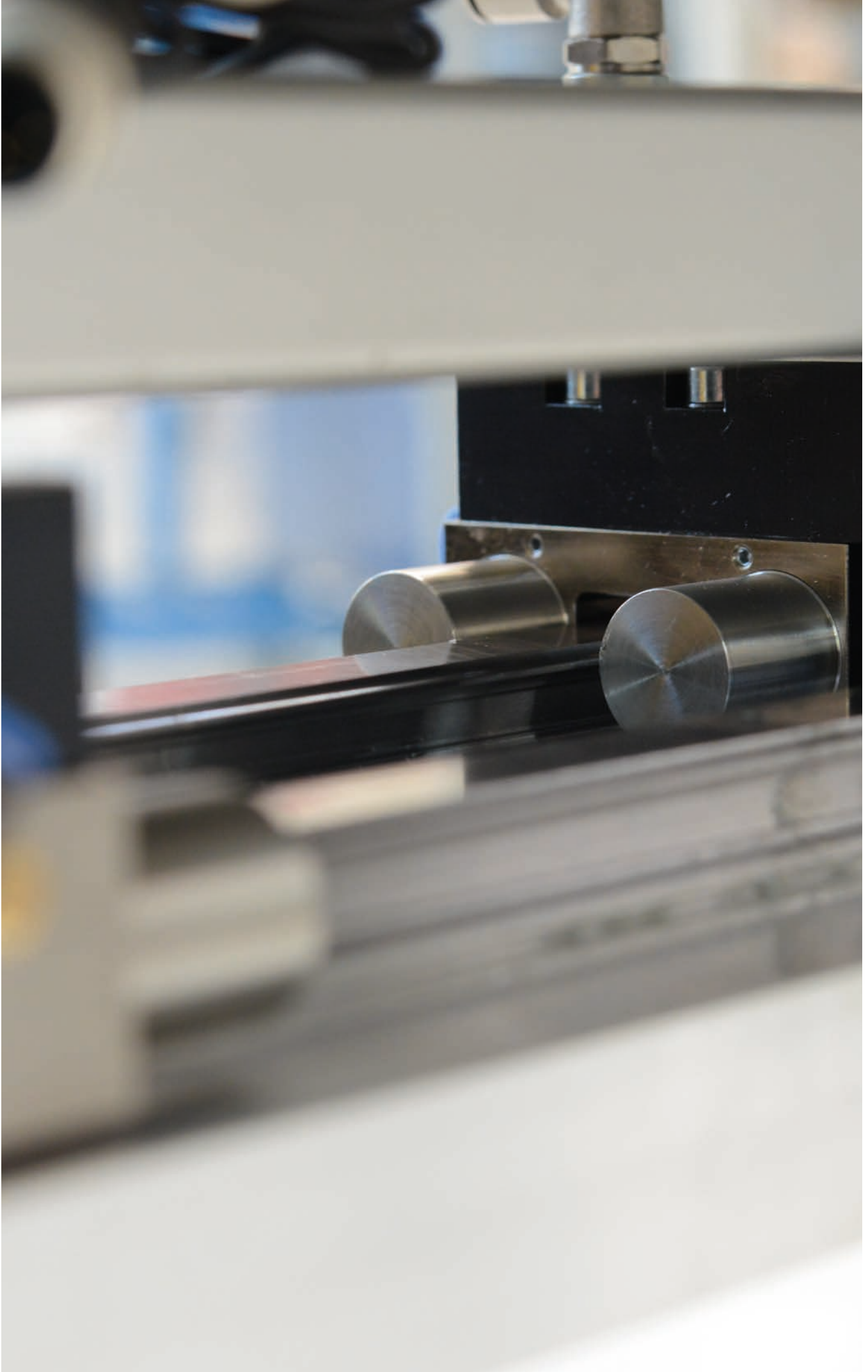
to minimize risk.

In addition, the SISTEMA program of the DGUV (German Social Accident Insurance) is available.

In all cases, the result of this determination must read as follows:

PL ≥ PLr

Achieved performance ≥ required performance level



WIPER IN A TIGHT SPOT

Pneumatic clamping elements ensure that components are held securely in a punching machine

When Trumpf decided to replace the hydraulic drive of the punching head in its punching machines, the company needed a pneumatic solution for fixing the wiper in place. The installation space was limited and the required force density was high. A manufacturer improvised modifications to the pneumatic clamping elements from its standard range for this use.



The new clamping solution had to be integrated into the current, tight installation space

Trumpf manufactures industrial lasers and machine tools for flexible sheet metal processing. For example, the TruPunch 3000 series punching machine can process sheets of up to 6.4 mm without a scrap skeleton. For a long time, the manufacturer had been using hydraulically driven punching heads in this machine series. But the hydraulic system came with various disadvantages, including high maintenance expenses and the risk of leakages. For these reasons, Trumpf wanted to convert the punching head of the series from a hydraulic to an electric drive and use a ball drive with direct-drive technology. But this required Trumpf to find non-hydraulic solutions for supplemental functions such as the drive and securing the wiper – without major design changes. The wiper was therefore converted to a pneumatic drive. As before, it sits on three holding axes arranged radially around the punching cylinder. In addition to the punch and the die, the wiper is the third component of a punching tool. They are adapted to the contours of the punch and usually contact the steel sheet directly, keeping the workpieces in the desired position during the punching process and preventing undesirable deformations. But in another application, the wiper is positioned at a specific distance above the workpiece, which allows it to prevent the steel sheet from becoming stuck on the punch (and getting pulled upward) when the punching die is retracted. In this variation, the wiper is fixed in a defined position and its holding device must be able to safely absorb the wiping forces.

Preventing transverse loads

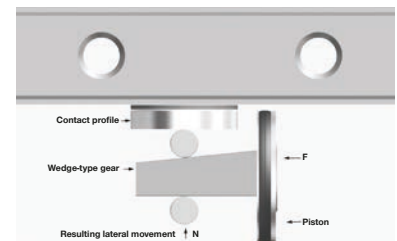
In their search for the best solution for this task, Trumpf engineers discovered clamping elements from Zimmer Group. Zimmer clamping elements are used, for example, to position lifting units, fasten machine tables and fix pneumatically driven axes in place once the desired position is reached. Zimmer Group offers a wide variety of manual, pneumatic, electric and hydraulic clamping elements. Most clamping systems from Zimmer utilize a pair of synchronized wedge-type gears so that the clamping forces act on both sides of an axis or guide. This eliminates virtually all lateral loads from the clamping process. Systems that use floating bearings eliminate all lateral forces by their very design.

Quickly implemented modifications

In order to avoid modifying the proven wiper design when switching from hydraulic to pneumatic clamping, the new clamping solution had to be integrated into the very limited installation space already surrounding the punching cylinder. As a result, the clamping device had to have a compact design and feature a high force density because the process forces up to 30 kN are required. Zimmer engineers addressed these requirements, calculated the necessary holding forces for the clamping device and quickly drafted the layout for a pneumatic clamping unit to be installed on the three axes of the wiper. Since there was no standard solution for this special application, they modified the existing clamping elements, creating a customized system application that addressed this special customer requirement. “In order to offset the axial displacement forces with the necessary holding forces, we integrated six MKR clamping cylinders for each of the three axes into a newly designed round housing that fits perfectly in the existing installation space”, reports Michael Hemler, who heads up the Design and Product Development departments in the Linear Technology division of the Zimmer Group. “With this approach, we were able to offer a usable solution very quickly. We delivered the first test-capable prototypes after just a few weeks, giving Trumpf the opportunity to examine the performance and reliability of the pneumatic clamp.”

Highly refined clamping technology

The MKR-type clamping elements used by Trumpf are intended for static clamping on round guides and, unlike other series, are not designed to brake movements. Their most important task is to secure pneumatic vertical axes, lifting units or other movable components from additional movements after reaching the desired position and to hold this position in case of pressure loss in the pneumatic system. MKR-type clamping elements are available in active and passive versions. Active clamping elements are normally open and are closed with compressed air; passive clamping elements, by contrast, are kept closed without pressure by the force of a spring energy accumulator and must be opened with compressed air. Both variants are characterized by the use of high-ratio wedge-type gears from Zimmer Group. They translate the force of the piston across smooth-running rollers into a lateral holding force, enabling very high holding forces of up to 1850 N without frequent seizing. The MKR clamping elements respond quickly and reach their full clamping force in fewer than 0.05 s.



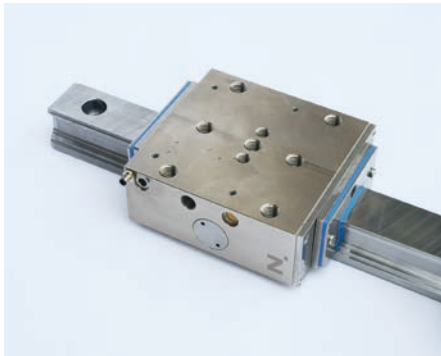
A wedge-type gear uses rollers to convert the force of the piston into a transverse holding force, which enables high holding forces

Reliable use

The MKR clamping elements respond quickly and reach their full clamping force in fewer than 0.05 s. This means that they fulfill the requirements for short cycle times and high machine capacity, while ensuring reliable production over a guaranteed service life of at least 5 million clamping cycles. “This high reliability has also been proven in real-world use,” confirms Dipl.Ing. (Graduate Engineer) Stefan Kerschler, Head of Punching/Combination Machine Design at Trumpf. “Since switching to pneumatic clamping, more than two hundred TruPunch -3000 punching machines have left our factory and we haven’t had a problem with a single one.”

VALVE FOR FAST STOP

Brake and clamping elements with integrated valve. The Zimmer Group is using valves in the braking elements for its UBPS series that shorten response times and braking distance and improve safety.

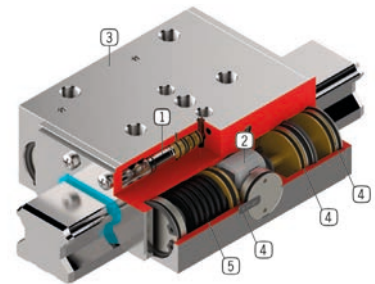


In machining and handling systems, braking elements assume a core safety function by ensuring that machines and systems come to a stop as quickly as possible in an emergency. In the event of a power outage, loss of pressure or emergency shutdown, they absorb the kinetic energy present in moving components such as Z axes or machining tables. The response time of the braking element is of key importance here, because the faster the system comes to a stop, the less damage there will be—and damage may be avoided entirely. To shorten the response time of its braking elements, the Zimmer Group has integrated a globally unique feature into its braking elements for the UBPS series: Here, the electric valve for triggering the braking or clamping process is no longer located a few meters away from the braking element, as was typical in the past. Instead, it is located directly in the braking element. As a result, it is not necessary for the pneumatic hose to be completely emptied until the brake pads are depressurized and can close when braking or clamping (the latter of which occurs much more frequently). Instead, the compressed air right at the braking element is released into the surroundings, which greatly minimizes the time needed for braking and clamping.

Shorter closing time - more safety

“This saves an enormous amount of time because pneumatic lines with typical hose lengths have more air in their pneumatic lines than in the air ducts of the braking element itself,” explains Stefan Heiland, who supervises the product areas of linear technology and industrial damping technology as Product Manager at the Zimmer Group. “Valuable time is lost waiting until this air is discharged. Our integrated valve allows us to save all of this time. Braking using an integrated valve with a typical hose length of 6.5 meters, for instance, only takes 74 milliseconds instead of the 170 milliseconds required previously.” This has considerable effects on the braking distance. For a vertical axis with an initial velocity of 0.5 meters per second, the overall braking distance increases considerably compared to a solution with an integrated valve. The braking distance is almost 50 percent longer for a hose length of one meter and nearly 250 percent longer for a hose length of 6.5 meters. As a result, the integrated valve creates a lot of space for preventing expensive crashes and loss of production. Since the compressed air in the supply line does not have to be bled continuously, air consumption also drops considerably: For a hose length starting as low as 4 meters you achieve savings of more than 90 percent per cycle.

out via the two quick ventilation valves. Thus the integrated valve acts as an accelerated trigger for the two quick exhaust valves. This means air can flow out very quickly and the response time of the entire braking element is substantially reduced.”



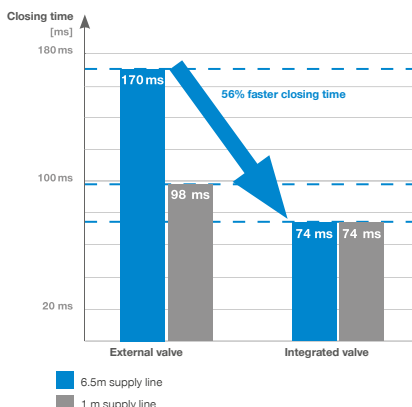
Cutaway view of a braking element: 1 = integrated valve, 2 = wedge-type roller gear, 3 = housing, 4 = three-way piston, 5 = spring package. (Figures: Zimmer)

You know what they say: All good things come in threes

Zimmer Group braking elements can achieve extremely high holding forces because the engineers recently installed three pneumatic pistons connected in series. In addition, highly compact machines and systems can be installed here because these forces can be generated in the smallest of spaces. They also used three coil springs inserted into each other to generate the holding force for the spring load accumulator. They generate a powerful braking force and even improve operating safety. This is one reason why Zimmer Group braking elements have an impressive service life of five million clamping cycles (B10d value). The underlying functional principle of these elements also contributes to their durability and cycle stability. Zimmer Group installs a wedge-type gear with rollers that doubles the gear ratio, allowing it to generate a much greater holding force. It also substantially reduces friction compared to other wedge solutions without rollers. Therefore, this combination of wedge and rollers provides extremely high efficiency, directly resulting in higher holding force in the most compact installation space. The high clamping force plus the high rigidity thanks to brake pads that are integrated with a positive fit and adapted to the profile also ensure that the entire system can absorb high axial forces after clamping. In addition, the positioning accuracy to within two hundredths of a millimeter is exceptionally high.

Clever design: switched in series

In the initial state, the integrated pneumatic valve is de-energized. The braking element is unpressurized and therefore closed because the braking or holding force, respectively, is provided by the braking element's integrated spring accumulator. The same is true during a power outage, because the braking element will close automatically in this case as well. As a result, the braking elements with an integrated valve provide a true fail-safe function. When the integrated valve is opened with a current signal, compressed air flows into the working space. The three series-switched pneumatic pistons overcome the closing force of the spiral springs, the brake pads are lifted from the profile rail, and the braking element can be moved freely. If the valve once again becomes de-energized during a braking or clamping process, it will open and the air can flow out of the piston chamber. “But only a portion of the air flows through the electric valve,” explains Stefan Heiland. “To accelerate the bleeding process as much as possible, there are also two quick exhaust valves integrated into the braking element that open as soon as the pressure in the system falls. As a result, the majority of the compressed air flows



CLAMPING AND BRAKING WITHOUT MOVING PARTS

Zimmer Group demonstrates its technological expertise with a new product: Following a development phase of over two years, the company is launching a hydraulic braking element that consists of a single functional component, contains no moving parts and uses just the internal stress of the base body to generate braking and holding forces.

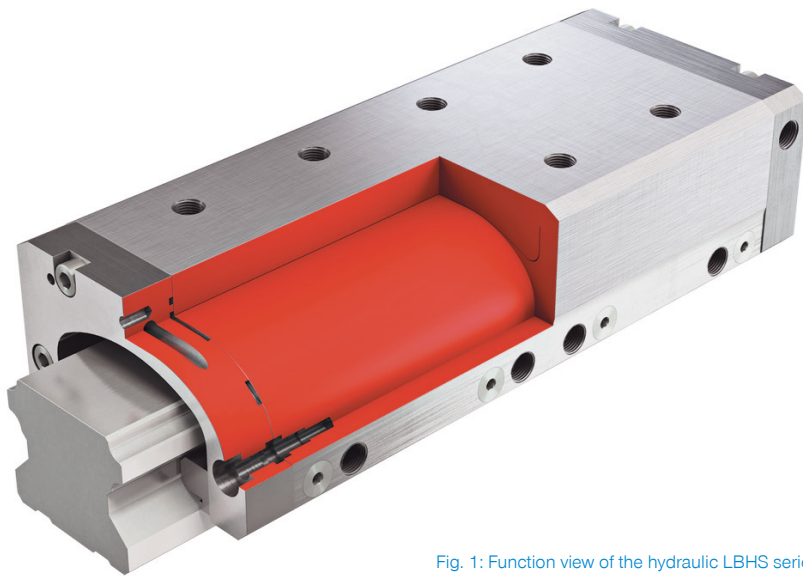


Fig. 1: Function view of the hydraulic LBHS series

The extremely slim LBHS series consists primarily of a patented unibody housing that does not contain any pistons, springs or other moving parts susceptible to wear (Image 1). The housing block merely contains oil ducts and cut-outs created with precision through the use of wire-cut electrical discharge machining. If this base body is pressurized with hydraulic fluid, it opens slightly, releasing the slide on the linear axis. If the hydraulic pressure drops, the element assumes its original shape again, which allows it to compress the two brake pads on the linear axis. The LBHS is closed without pressure and offers an integrated emergency function that ensures that all moving components stop safely if the pressure drops or the entire system fails.

Diverse product range

Zimmer first introduced this new product to the public at Motek 2015. Starting in April 2016, the LBHS series was put on the market to replace the previous KBHS series with an impressive selection of seven sizes, consisting of rail widths from 20 through 65 mm. In addition to the narrow/low LBHS hydraulic elements, Zimmer Group expanded its narrow/low LKP(S) and LBPS pneumatic elements by adding the 45 and 55 mm sizes to both series. Zimmer RBPS braking elements have also proven themselves in numerous applications as fall protection for round guide rails. In the case of a drop in pressure, spring force also closes the braking elements, which are equipped with one of our tried-and-tested wedge-type gears. These gears feature several rollers, allowing them to apply extremely high holding forces. The RBPS series is used primarily in gates to prevent tools and gripping equipment from falling if the drives fail, if the brakes fail, if there is a tear in the belt or if an axis breaks. In order to increase the range of applications further into heavy load range, Zimmer Group has expanded its RBPS series by adding shaft diameters of 50, 55 and 60 mm with an impressive holding force of 48 kN.

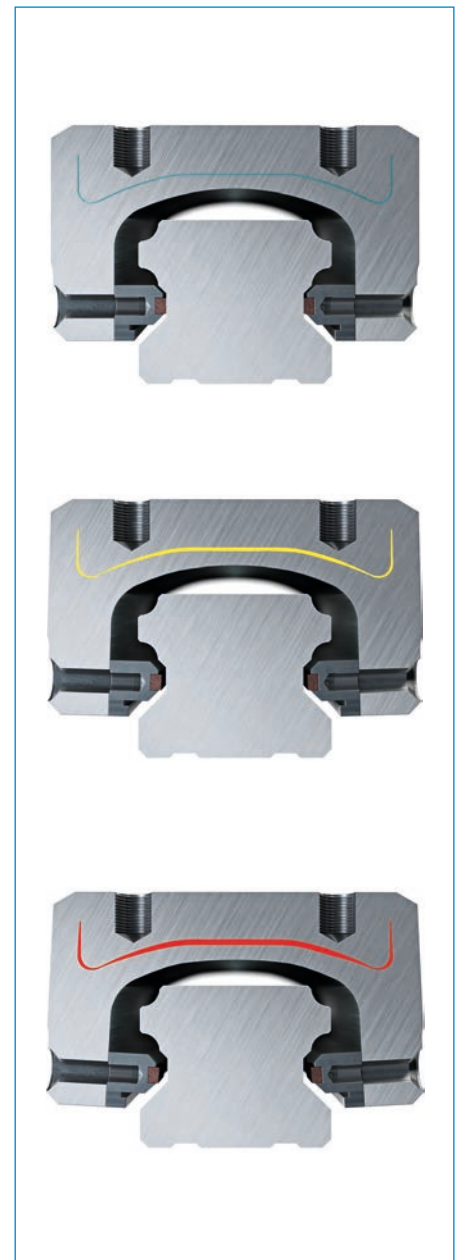


Fig. 2: Functional sequence of LBHS when subjected to hydraulic pressure. Above image: "closed"; center: "open"; bottom: "opened"

CLAMPING AND BRAKING ELEMENTS APPLICATIONS

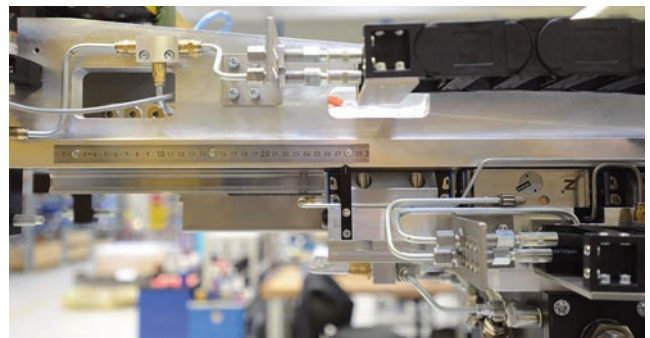
► UBPS SERIES

Handling of cylinder heads for ship engines

UBPS braking element with high positioning accuracy for specifying the gripper position and ensuring that power is stored when the system is in an emergency stop in case of a power supply failure.

Special version with reduced opening pressure of 4.5 bar.

The PLUS connection can be used to increase the holding force again.



► MBPS SERIES

Handling crankshafts with variable gripping distances

MBPS braking elements that use the built-in spring accumulator to hold the grippers securely in position without the need to use power.



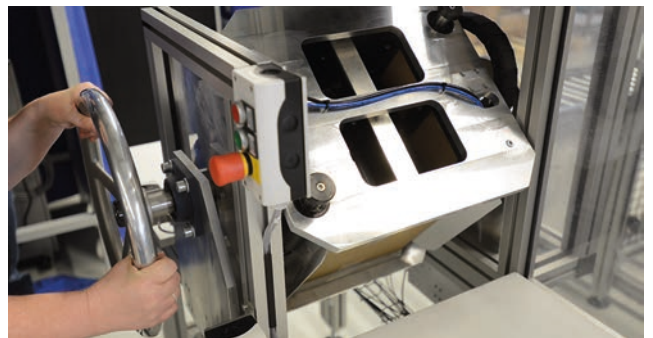
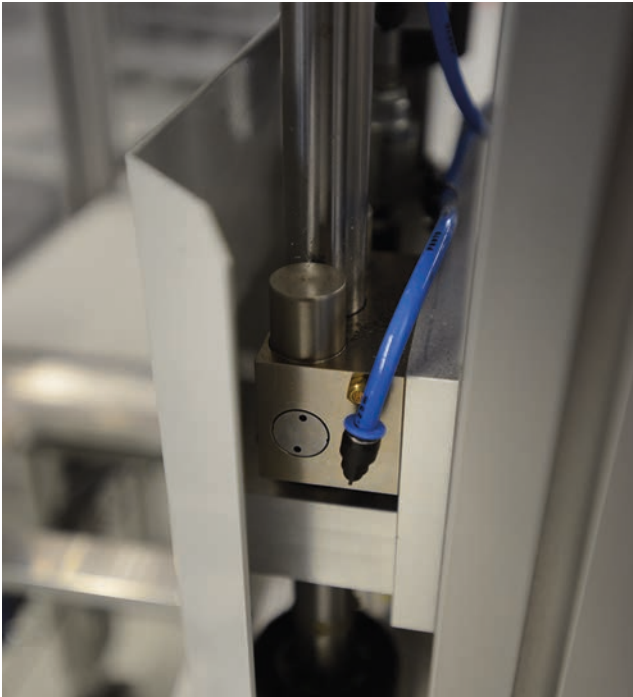
CLAMPING AND BRAKING ELEMENTS

APPLICATIONS

► MKRS SERIES

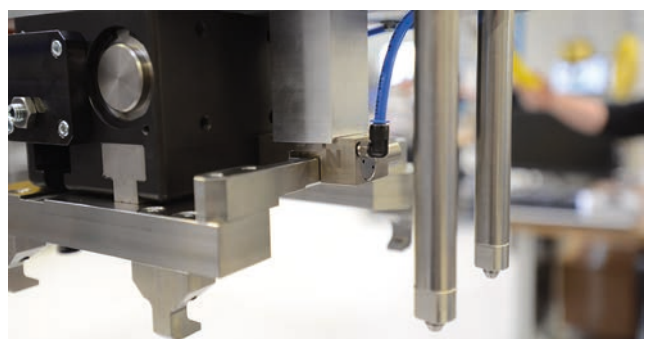
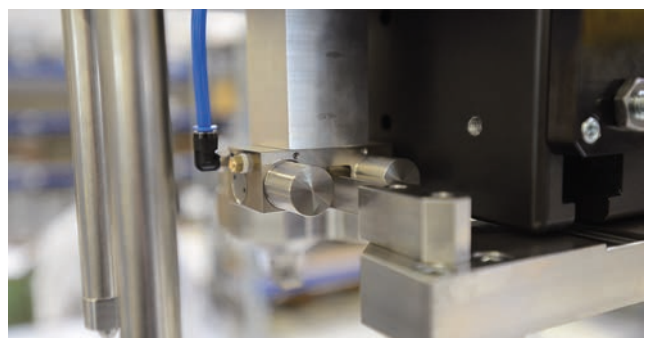
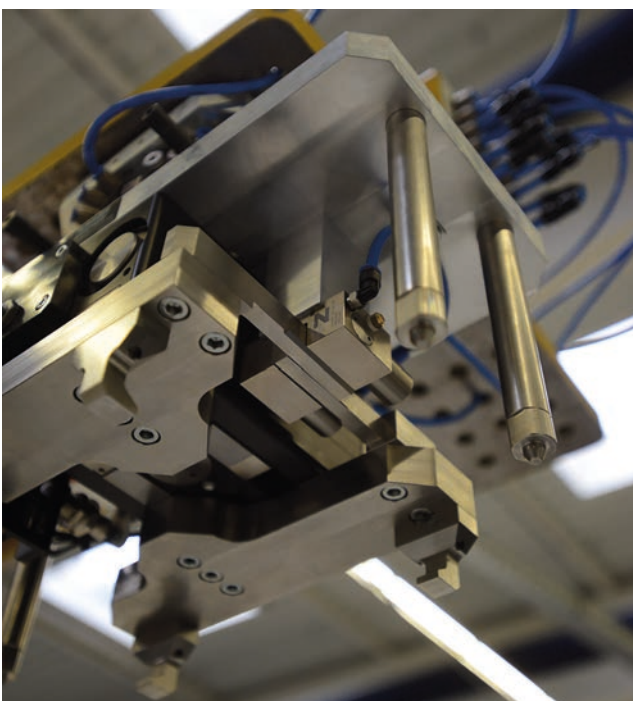
Box filling system

MKRS clamping element for round guides, which holds the box in place during overhead filling.



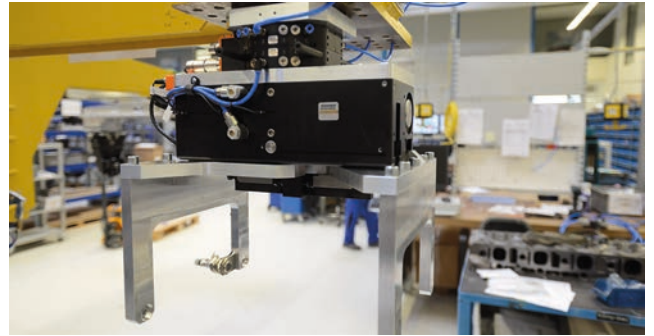
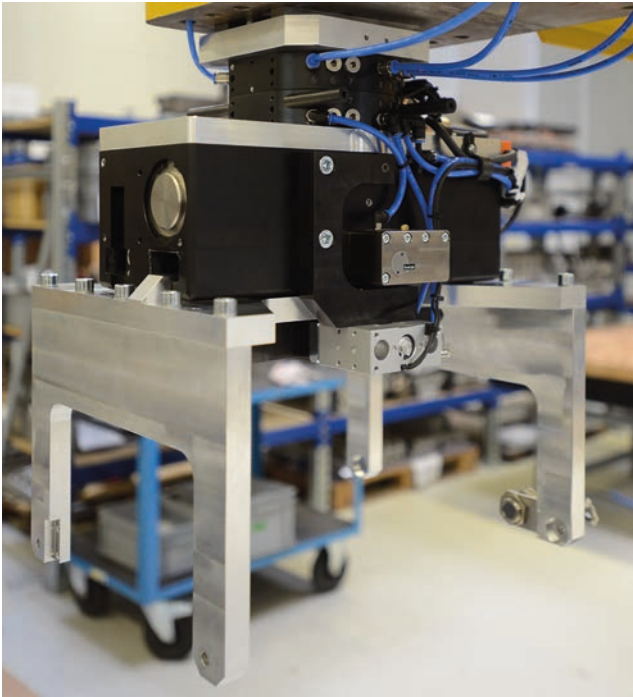
► MKS SERIES

MKS clamping element, which ensures the position of the gripper fingers and the gripper force without using energy via the built-in spring accumulator.



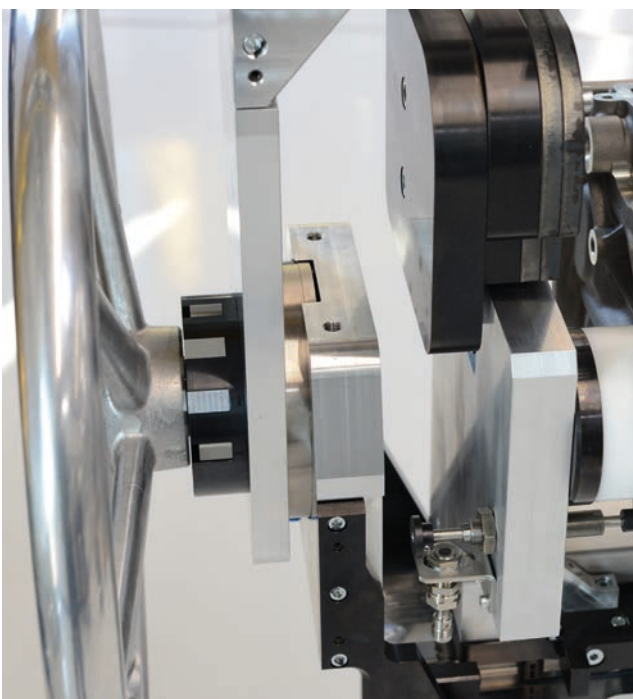
▶ ZIMMER GRIPPER WITH INTEGRATED CLAMPING ELEMENT

GHK gripper with integrated clamping element for friction-locked gripping force safety device in a compact design.



▶ TPS + MKS SERIES

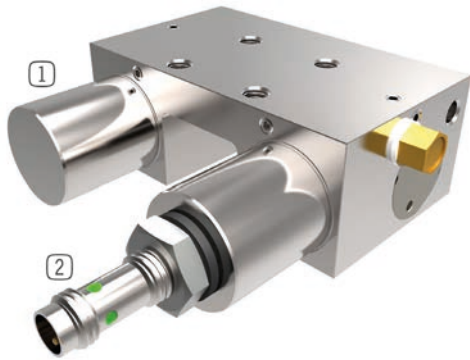
TPS rotation clamping element, which secures the crank housing precisely at the set rotation angle. Combined with two MKS clamping elements, which use the built-in spring accumulator to secure the gripped crankshaft housing.



CLAMPING AND BRAKING ELEMENTS

SPECIAL SOLUTIONS

► SPECIAL SOLUTIONS



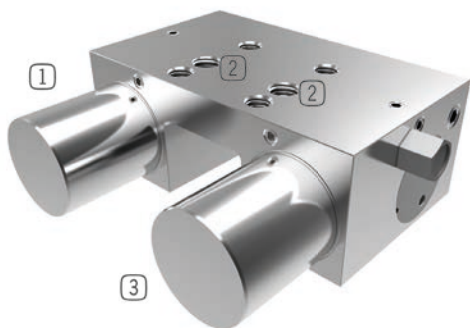
- Pneumatic clamping element with initiator
- for sensing piston position (opened)
- Other series available on request

- ① MKS
- ② Initiator



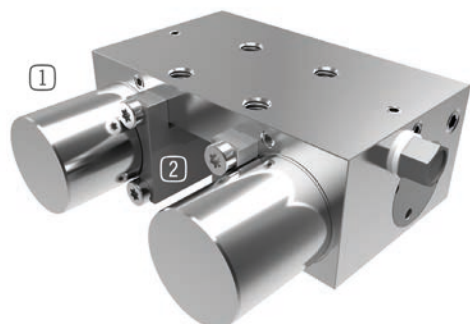
- Manual clamping element with extended clamping lever

- ① HK
- ② Extended manual lever



- Pneumatic clamping element with special screw fitting and 4 bar of opening pressure
- Weaker spring energy storage for opening with 4 bar
- Other series available on request

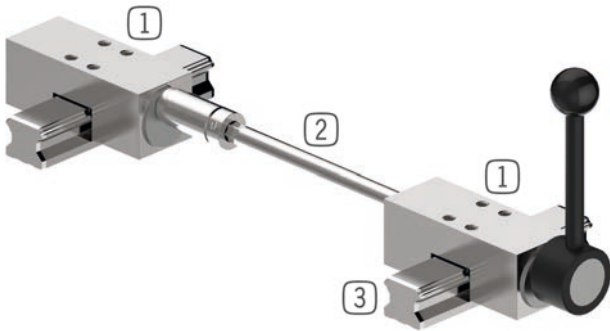
- ① MKS
- ② Special screw fitting
- ③ Spring energy storage



- Pneumatic clamping element with special clamping jaws
- Custom adaptation of clamping jaws to linear guide
- Other series available on request

- ① MKS
- ② Special contact profile

► SPECIAL SOLUTIONS



- Manual clamping element for parallel use on guide rails
- Uniform load support
- Tip prevention
- Possible with alternate lever
- Also available for round guide with HKR round clamping element

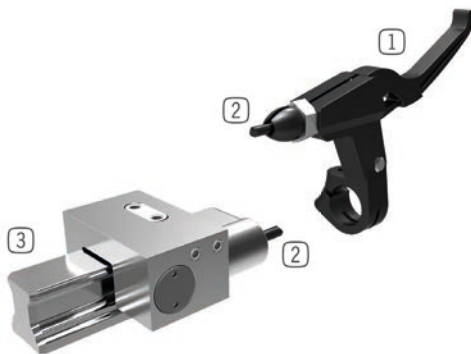
- ① HK
- ② Connecting rod
- ③ Linear guide

► SYSTEMS



- Pneumatic clamping element for circulator and shaft guides
- For a size 30 shaft guide
- Holding force of 6000 N at 10 bar

- ① MKR














- Manually activated clamping element with springenergy storage
- Activated with a bowden cable

- ① Activation lever (release handle)
- ② Bowden cable
- ③ Linear guide



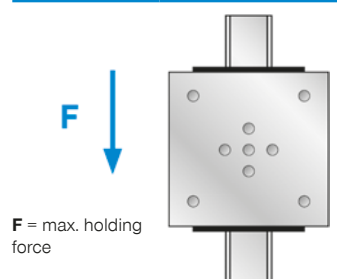
- Pneumatic clamping element for U-profile rails
- Custom adaptation to a roller slide

CLAMPING AND BRAKING ELEMENTS IN OVERVIEW




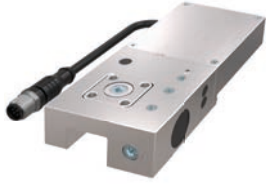
PROFILE RAIL GUIDES			
MANUAL	PNEUMATIC		
CLAMPING	CLAMPING		CLAMPING AND BRAKING
N	NO	NC	NC
HK Holding force up to 2000 N 	MK Holding force up to 2.250 N 	MKS Holding force up to 3.300 N 	MBPS Holding force up to 4.700 N 
			UBPS Holding force up to 7.700 (9.200) N 
	LKP Holding force up to 2.500 N 	LKPS Holding force up to 1.900 N 	LBPS Holding force up to 1.900 N 
MINIHK Holding force up to 300 N 	MCP Holding force up to 550 N 	MCPS Holding force up to 700 N 	

Holding force





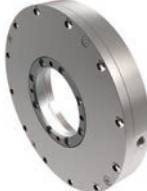

The holding force is the maximum force that can be generated in the axial direction. The specified holding forces are tested on every clamping and braking element before delivery using a slightly lubricated rail (ISO VG 68). Using other oil or lubricating substances can influence the coefficient of friction, which can cause a loss of holding force in individual cases.



PROFILE RAIL GUIDES

HYDRAULIC		ELECTRICAL	
CLAMPING	CLAMPING AND BRAKING	CLAMPING	
NO	NO	NC	N
KWH Holding force up to 46.000 N Standard 	KBH Holding force up to 46.000 N Standard 	LBHS Holding force up to 15.000 N Narrow 	LKE Holding force up to 1.800 N Standard 

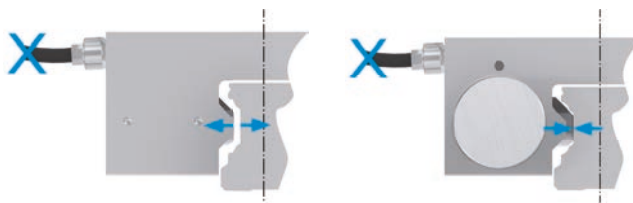
CIRCULATOR AND SHAFT GUIDES

MANUAL	PNEUMATIC		
CLAMPING	CLAMPING	CLAMPING	CLAMPING AND BRAKING
N	NO	NC	NC
HKR Holding force up to 2000 N Standard 	MKR Holding force up to 1.850 N Standard 	MKRS Holding force up to 1.650 N Standard 	RBPS Holding force up to 52.000 N Standard 
		TPS Holding torque static up to 770 Nm Rotary 	DKHS1000 Holding torque static up to 4.200 Nm Rotary 

N (bistable):
remains in current position

NO (Normally Open):
open without pressure

NC (Normally Closed):
closed without pressure



CLAMPING AND BRAKING ELEMENTS

OVERVIEW OF SERIES

Products		Holding force [N]	Sizes / shaft diameters																		
			5	7	9	10	12	15	16	20	25	28	30	32	35	40	45	50	55	60	65
PROFILE RAIL GUIDES																					
MANUAL																					
miniHK series	Page 34	40 - 300	•	•	•	•															
HK series	Page 36	1200 - 2000							•	•	•	•	•	•	•	•	•	•	•	•	
PNEUMATIC																					
MCP series	Page 38	130 - 550			•	•	•	•	•	•											
MCPS series	Page 40	80 - 700			•	•	•	•	•	•											
MK series	Page 42	350 - 2250				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
MKS series	Page 44	250 - 3300				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
MBPS series	Page 46	750 - 4700					•	•	•	•	•	•	•	•	•	•	•	•	•	•	
UBPS series	Page 48	1500 - 7700 (9200)							•	•	•	•	•	•	•	•	•	•	•	•	
LKP series	Page 50	550 - 2500					•	•	•	•	•	•	•	•	•	•	•	•	•	•	
LKPS series	Page 52	400 - 1900					•	•	•	•	•	•	•	•	•	•	•	•	•	•	
LBPS series	Page 54	400 - 1900					•	•	•	•	•	•	•	•	•	•	•	•	•	•	
HYDRAULIC																					
KWH series	Page 56	1600 - 46000									•	•	•	•	•	•	•	•	•	•	
KBH series	Page 58	2200 - 46000									•	•	•	•	•	•	•	•	•	•	
LBHS series	Page 60										•	•	•	•	•	•	•	•	•	•	
ELECTRICAL																					
LKE series	Page 62	600 - 1800							•	•	•			•							
CIRCULATOR AND SHAFT GUIDES																					
MANUAL																					
HKR series	Page 64	1200 - 2000							•	•	•	•	•	•	•	•	•	•	•	•	
PNEUMATIC																					
MKR series	Page 66	650 - 1850					•	•	•	•	•	•	•	•	•	•	•	•	•	•	
MKRS series	Page 68	350 - 1650					•	•	•	•	•	•	•	•	•	•	•	•	•	•	
RBPS series *	Page 70	3500 - 52000	○	○	○	•	○		○	•	○	•	○	○	○	○	○	•	○	○	
Holding torque static [Nm]																					
TORQUE INPUT																					
PNEUMATIC																					
TPS series	Page 72	50 - 500																			
HYDRAULIC																					
DKHS1000 series	Page 74	1600 - 4200																			

* Intermediate sizes on request

Pneumatic elements without spring storage (NO) can be operated at reduced pressures as low as 3 bar.
 Hydraulic elements without spring storage (NO) can be operated at reduced pressures as low as 5 bar.
 The holding force behaves in a manner roughly proportional to the applied pressure.

Technical characteristics													Special version			
Deenergized state	Spring accumulator	CE marking	PLUS connection	Wiper kit available	Narrow	Increased positioning accuracy	Opening pressure [bar]	Tightening torque [Nm]	Operating pressure [bar]	Radial rigidity	Clamping cycles (B10d value)	Brake cycles	Sensor query	Integrated sensing	Reduced opening pressure [bar]	Spot face, from above
N								0,07-2,5			50 000					
N								4-22			50 000					
NO					•				6		5 million					
NC	•	•	•		•		5,5		6		5 million				3/4	
NO									6		5 million					•
NC	•	•	•				5,5		6		5 million		•		3/4	•
NC	•	•					4,5		6		5 million	2 000	•		3/4	•
NC	•	•	•	•		•	5,5		6		5 million	2 000	•		3/4	•
NO					•				6		5 million					•
NC	•	•			•		5,5		6		5 million				3/4	•
NC	•	•			•		5,5		6		5 million	500			3/4	•
NO				•		•			100-150		10 million					•
NO				•		•			100-150		10 million	2 000				•
NC	•	•		•	•	•	120		120	•	500 000	500			•	•
N		•									500 000			•*		
N								5-17			50 000					
NO									6		5 million					•
NC	•	•					5,5		6		5 million		•		3/4	•
NC	•	•		•		•	4/5,5		6	•	5 million	2 000	•		3/4	•
NC	•	•					5,5		6		5 million					
NC	•	•					100		100		5 million		○			

* Status query already integrated

N (bistable):
remains in current position

NO (Normally Open):
open without pressure

NC (Normally Closed):
closed without pressure



CLAMPING ELEMENTS | MANUAL SERIES MINIHK

▶ PRODUCT ADVANTAGES



- ▶ **small construction**
For all common miniature profile rail guides
- ▶ **Tool-free opening and closing (bi-stable)**
By turning the knurled screw
- ▶ **Maintenance free**
Up to 50,000 static clamping cycles

▶ THE BEST PRODUCT FOR YOUR APPLICATION

APPLICATION SCENARIOS

- ▶ **Assembly aids**
- ▶ **Optical equipment**
- ▶ **Medical equipment**

FURTHER INFORMATION

- ▶ **Spacer plate**
In addition, a spacer plate might have to be ordered as height compensation, depending on the height of the rail carriage (dimension D).

► BENEFITS IN DETAIL

① Miniature profile rail guide

- Available for all common miniature profile rail guides

② Stainless knurled screw

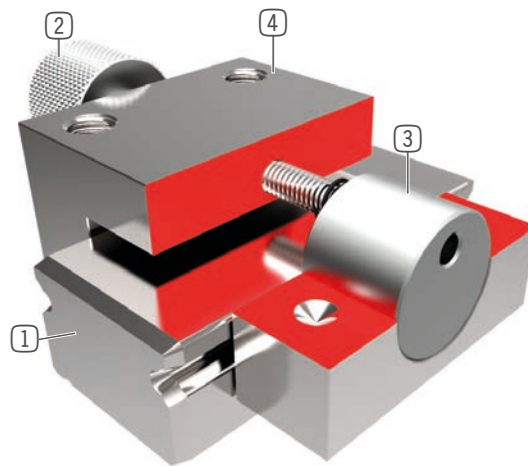
- For opening and closing the clamping unit

③ Clamping jaw

- The floating bearings guarantee symmetrical application of force

④ Housing

- in non corrosive steel



► INFORMATION ON THE SERIES

TECHNICAL DATA

Rail size	3-42 mm
Holding force	40-300 N
Clamping torque knurled screw	0,07-2,5 Nm
Spring storage	inexistent
Static clamping cycles (B10d value)	up to 50 000
Dynamic braking cycles	not suitable
Operation	manual
Operating temperature	-10 ... +70 [°C]



► Technical Information

All information just a click away at: www.zimmer-group.de

Find data, illustrations, 3D models and operating instructions for your installation size using the order number for your desired model.

Quick, clear and always up-to-date.

► Selection guide for clamping and braking elements

Whatever the possible application – here, you'll find the right product.

Easy selection of the right element for any rail-carriage combination: www.zimmer-group.de/de/plr.

CLAMPING ELEMENTS | MANUAL

SERIES HK

▶ PRODUCT ADVANTAGES



- ▶ **broad range of products**
For all common profile rail guides
- ▶ **Tool-free opening and closing (bi-stable)**
By turning the clamping lever
- ▶ **Maintenance free**
Up to 50,000 static clamping cycles

▶ THE BEST PRODUCT FOR YOUR APPLICATION

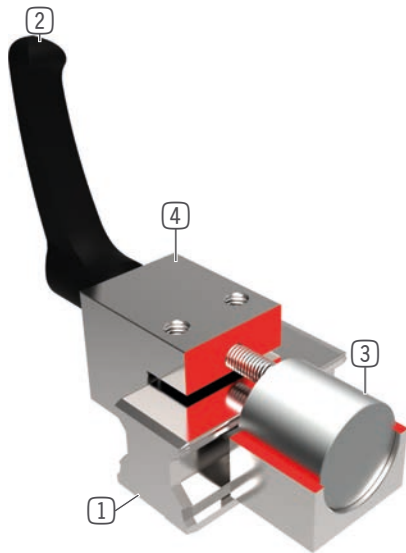
POSIBILIDADES DE
USO

- ▶ **Table size for mesa carriages**
- ▶ **Adjustable anchorage stops**
- ▶ **Positioning for the installation of optical sensors**

FURTHER
INFORMATION

- ▶ **Spacer plate**
In addition, a spacer plate might have to be ordered as height compensation, depending on the height of the rail carriage (dimension D).
- ▶ **Special variants on request, e.g.**
Operation using DIN 912 Allen screws
Extended clamping lever
made of stainless steel

► BENEFITS IN DETAIL



- ① **Profile rail guide**
 - Available for all common profile rail guides
- ② **Clamping lever made from plastic**
 - Freely adjustable (release by lifting)
- ③ **Clamping jaw**
 - The floating bearings guarantee symmetrical application of force
- ④ **Housing**
 - chemically nickel plated steel

► INFORMATION ON THE SERIES

TECHNICAL DATA

Rail size	12-100 mm
Holding force	1200-2000 N
Fastening torque clamp lever	4-22 Nm
Spring storage	inexistent
PLUS connection	No
Static clamping cycles (B10d value)	up to 50 000
Dynamic braking cycles	not suitable
Operation	manual
Operating temperature	-10 ... +70 [°C]



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► Selection guide for clamping and braking elements

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Easy selection of the right element for any rail-carriage combination: www.zimmer-group.de/de/plt.

CLAMPING ELEMENTS | PNEUMATIC SERIES MCP

▶ PRODUCT ADVANTAGES



- ▶ **small construction**
For all common miniature profile rail guides
- ▶ **Energize to close (NO)**
Closing with pressure
- ▶ **high durability**
Up to 5 million static clamping cycles

▶ THE BEST PRODUCT FOR YOUR APPLICATION

APPLICATION SCENARIOS

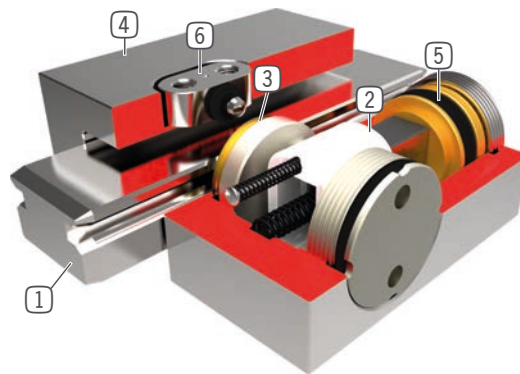
- ▶ **Clamping of machine tables**
- ▶ **Positioning of axes**
- ▶ **Fixing of vertical axes in neutral position**

FURTHER INFORMATION

- ▶ **Special variants on request, e.g.**
With additional air connection (from above, from the front)

► BENEFITS IN DETAIL

- ① **Miniature profile rail guide**
- Available for all common miniature profile rail guides
- ② **Wedge-type gear**
- Power transmission between piston and clamping jaw
- ③ **Clamping jaw**
- Pressed at the free surfaces of the profile rail guide
- ④ **Housing**
- chemically nickel plated steel
- ⑤ **Pneumatic piston**
- The piston moves the wedge-type gear longitudinally
- ⑥ **Sliding block**
- For floating bearings



► INFORMATION ON THE SERIES

TECHNICAL DATA

Rail size	5-25 mm
Holding force	130-550 N
Pressure min. / max.	3 / 6.5
Spring storage	inexistent
PLUS connection	No
Static clamping cycles (B10d value)	up to 5 million
Dynamic braking cycles	not suitable
Operation	pneumatic
Operating temperature	-10 ... +70 [°C]



► Technical Information

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Find data, illustrations, 3D models and operating instructions for your installation size using the order number for your desired model.

Quick, clear and always up-to-date.

► Selection guide for clamping and braking elements

Whatever the possible application – here, you'll find the right product.

Easy selection of the right element for any rail-carriage combination: www.zimmer-group.de/de/plt.

CLAMPING ELEMENTS | PNEUMATIC SERIES MCPS

▶ PRODUCT ADVANTAGES



- ▶ **small construction**
For all common miniature profile rail guides
- ▶ **Energize to open (NC)**
through spring-loaded energy storage
- ▶ **high durability**
Up to 5 million static clamping cycles
- ▶ **Higher holding force**
Via activation with PLUS air
- ▶ **Safety element**
Safe clamping in case of energy failure

▶ THE BEST PRODUCT FOR YOUR APPLICATION

APPLICATION SCENARIOS

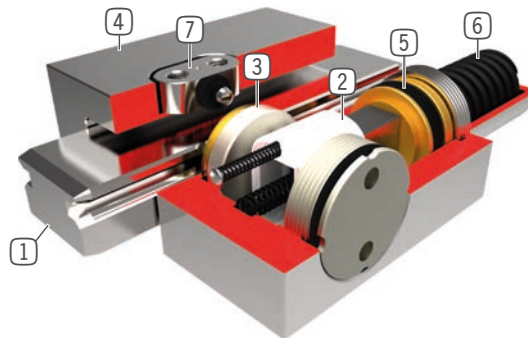
- ▶ **Clamping in case of pressure drop**
- ▶ **Clamping without energy requirement**

FURTHER INFORMATION

- ▶ **Special variants on request, e.g.**
 - With low opening pressure (3.0 bar or 4.0 bar)
 - With additional air connection (from above, from the front)

► BENEFITS IN DETAIL

- ① **Miniature profile rail guide**
- Available for all common miniature profile rail guides
- ② **Wedge-type gear**
- Power transmission between piston and clamping jaw
- ③ **Clamping jaw**
- Pressed at the free surfaces of the profile rail guide
- ④ **Housing**
- chemically nickel plated steel
- ⑤ **Pneumatic piston**
- The piston moves the wedge-type gear longitudinally
- ⑥ **Spring-loaded energy storage**
- For non-pressurized closing of the clamping unit
- ⑦ **Sliding block**
- For floating bearings



► INFORMATION ON THE SERIES

TECHNICAL DATA

Rail size	5-25 mm
Holding force	80-700 N
Pressure min. / max.	5.5 / 6.5
Spring storage	existing
PLUS connection	Yes
Static clamping cycles (B10d value)	up to 5 million
Dynamic braking cycles	not suitable
Operation	pneumatic
Operating temperature	-10 ... +70 [°C]



► Technical Information

All information just a click away at: www.zimmer-group.de

Find data, illustrations, 3D models and operating instructions for your installation size using the order number for your desired model.

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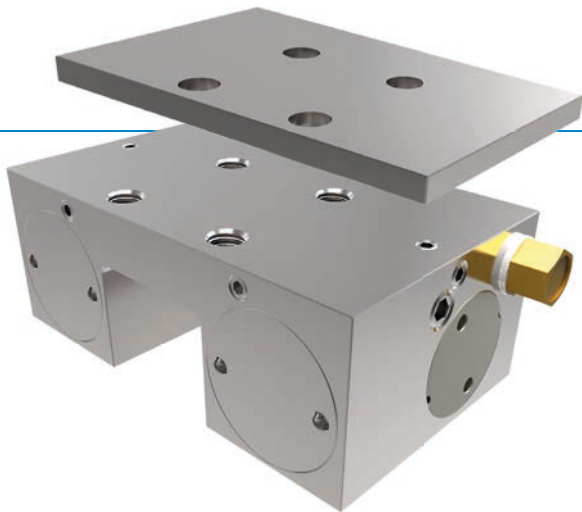
► Selection guide for clamping and braking elements

Whatever the possible application – here, you'll find the right product.

Easy selection of the right element for any rail-carriage combination: www.zimmer-group.de/de/plt.

CLAMPING ELEMENTS | PNEUMATIC SERIES MK

▶ PRODUCT ADVANTAGES



- ▶ **broad range of products**
For all common profile rail guides
- ▶ **Energize to close (NO)**
Closing with pressure
- ▶ **high durability**
Up to 5 million static clamping cycles

▶ THE BEST PRODUCT FOR YOUR APPLICATION

APPLICATION SCENARIOS

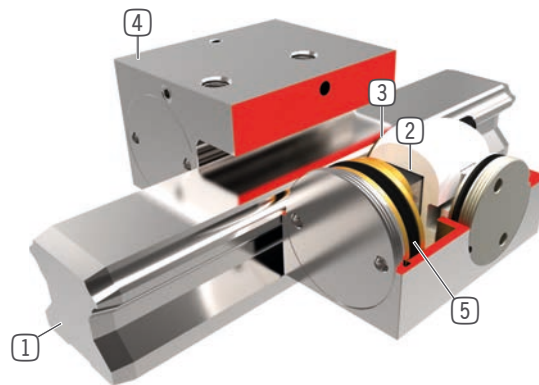
- ▶ **Positioning of axes**
- ▶ **Fixing of vertical axes**
- ▶ **Positioning of lifting units**

FURTHER INFORMATION

- ▶ **Spacer plate**
In addition, a spacer plate might have to be ordered as height compensation, depending on the height of the rail carriage (dimension D).
- ▶ **Special variants on request, e.g.**
With proximity switch monitoring
With additional air connection (from above, from the front)

► BENEFITS IN DETAIL

- ① **Profile rail guide**
- Available for all common profile rail guides
- ② **Wedge-type gear**
- Power transmission between piston and clamping jaw
- ③ **Clamping jaw**
- Pressed at the free surfaces of the profile rail guide
- ④ **Housing**
- chemically nickel plated steel
- ⑤ **Pneumatic piston**
- The piston moves the wedge-type gear longitudinally



► INFORMATION ON THE SERIES

TECHNICAL DATA

Rail size	12-100 mm
Holding force	350-2250 N
Pressure min. / max.	3 / 6.5
Spring storage	inexistent
PLUS connection	No
Static clamping cycles (B10d value)	up to 5 million
Dynamic braking cycles	not suitable
Operation	pneumatic
Operating temperature	-10 ... +70 [°C]



► Technical Information

All information just a click away at: www.zimmer-group.de

Find data, illustrations, 3-D models and operating instructions for your installation size using the order number for your desired model.

Quick, clear and always up-to-date.

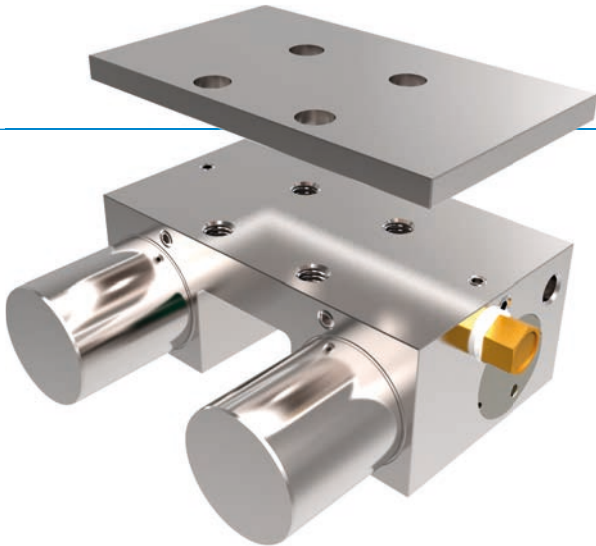
► Selection guide for clamping and braking elements

Whatever the possible application – here, you'll find the right product.

Easy selection of the right element for any rail-carriage combination: www.zimmer-group.de/de/plt.

CLAMPING ELEMENTS | PNEUMATIC SERIES MKS

▶ PRODUCT ADVANTAGES



- ▶ **broad range of products**
For all common profile rail guides
- ▶ **Energize to open (NC)**
through spring-loaded energy storage
- ▶ **high durability**
Up to 5 million static clamping cycles
- ▶ **Higher holding force**
Via activation with PLUS air
- ▶ **Safety element**
Safe clamping in case of energy failure

▶ THE BEST PRODUCT FOR YOUR APPLICATION

APPLICATION SCENARIOS

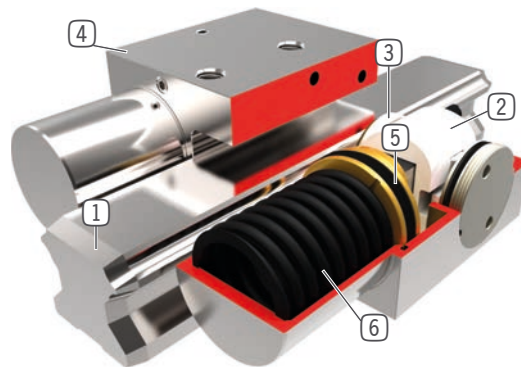
- ▶ **Clamping in case of pressure drop**
- ▶ **Clamping without energy requirement**

FURTHER INFORMATION

- ▶ **Spacer plate**
In addition, a spacer plate might have to be ordered as height compensation, depending on the height of the rail carriage (dimension D).
- ▶ **Special variants on request, e.g.**
 - With low opening pressure (3.0 bar or 4.0 bar)
 - With proximity switch monitoring
 - With additional air connection (from above, from the front)

► BENEFITS IN DETAIL

- 1 Profile rail guide**
- Available for all common profile rail guides
- 2 Wedge-type gear**
- Power transmission between piston and clamping jaw
- 3 Clamping jaw**
- Pressed at the free surfaces of the profile rail guide
- 4 Housing**
- chemically nickel plated steel
- 5 Pneumatic piston**
- The piston moves the wedge-type gear longitudinally
- 6 Spring-loaded energy storage**
- For non-pressurized closing of the clamping unit



► INFORMATION ON THE SERIES

TECHNICAL DATA

Rail size	12-100 mm
Holding force	250-3300 N
Pressure min. / max.	5.5 / 6.5
Spring storage	existing
PLUS connection	Yes
Static clamping cycles (B10d value)	up to 5 million
Dynamic braking cycles	not suitable
Operation	pneumatic
Operating temperature	-10 ... +70 [°C]



► Technical Information

All information just a click away at: www.zimmer-group.de

Find data, illustrations, 3D models and operating instructions for your installation size using the order number for your desired model.

Quick, clear and always up-to-date.

► Selection guide for clamping and braking elements

Whatever the possible application – here, you'll find the right product.

Easy selection of the right element for any rail-carriage combination: www.zimmer-group.de/de/plt.

CLAMPING AND BRAKING ELEMENTS | PNEUMATIC SERIES MBPS

▶ PRODUCT ADVANTAGES



- ▶ **broad range of products**
For all common profile rail guides
- ▶ **Energize to open (NC)**
through spring-loaded energy storage
- ▶ **high durability**
Up to 5 million static clamping cycles
- ▶ **Safety element**
Safe braking in case of energy failure

▶ THE BEST PRODUCT FOR YOUR APPLICATION

APPLICATION SCENARIOS

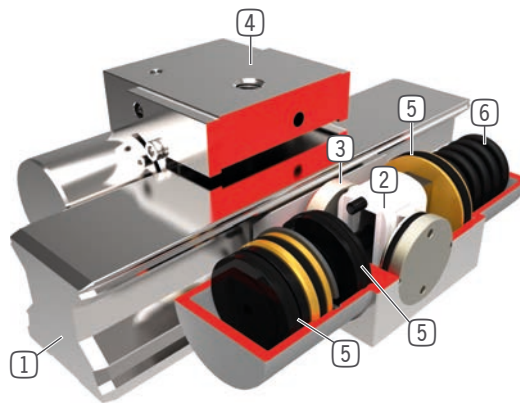
- ▶ **Clamping in case of pressure drop**
- ▶ **Emergency OFF function**
- ▶ **Braking linear motors**

FURTHER INFORMATION

- ▶ **Spacer plate**
In addition, a spacer plate might have to be ordered as height compensation, depending on the height of the rail carriage (dimension D).
- ▶ **Special variants on request, e.g.**
 - With proximity switch monitoring
 - With low opening pressure (3.0 bar)
 - With additional air connection (from above, from the front)

► BENEFITS IN DETAIL

- ① **Profile rail guide**
- Available for all common profile rail guides
- ② **Wedge-type gear**
- Power transmission between the pistons and clamping jaws and brake shoes
- ③ **Clamping jaws and brake shoes**
- Pressed at the free surfaces of the profile rail guide
- ④ **Housing**
- chemically nickel plated steel
- ⑤ **Pneumatic piston**
- The piston moves the wedge-type gear longitudinally
- ⑥ **Spring-loaded energy storage**
- For non-pressurized closing of the clamping unit



► INFORMATION ON THE SERIES

TECHNICAL DATA

Rail size	15-55 mm
Holding force	750-4700 N
Pressure min. / max.	4.5 / 6.5
Spring storage	existing
PLUS connection	No
Static clamping cycles (B10d value)	up to 5 million
Dynamic braking cycles	up to 2000
Operation	pneumatic
Operating temperature	-10 ... +70 [°C]



► Technical Information

All information just a click away at: www.zimmer-group.de

Find data, illustrations, 3D models and operating instructions for your installation size using the order number for your desired model.

Quick, clear and always up-to-date.

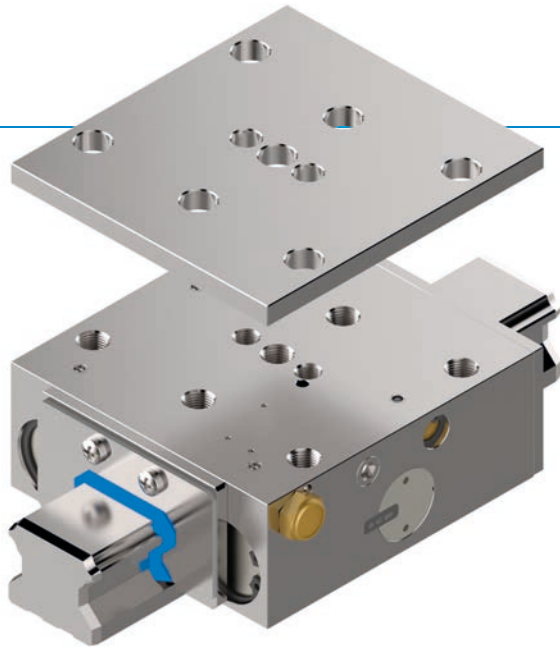
► Selection guide for clamping and braking elements

Whatever the possible application – here, you'll find the right product.

Easy selection of the right element for any rail-carriage combination: www.zimmer-group.de/de/plr.

CLAMPING AND BRAKING ELEMENTS | PNEUMATIC SERIES UBPS

▶ PRODUCT ADVANTAGES



- ▶ **broad range of products**
For all common profile rail guides
- ▶ **Energize to open (NC)**
through spring-loaded energy storage
- ▶ **high durability**
Up to 5 million static clamping cycles
- ▶ **Higher holding force**
Via activation with PLUS air
- ▶ **Safety element**
Safe braking in case of energy failure

▶ THE BEST PRODUCT FOR YOUR APPLICATION

APPLICATION SCENARIOS

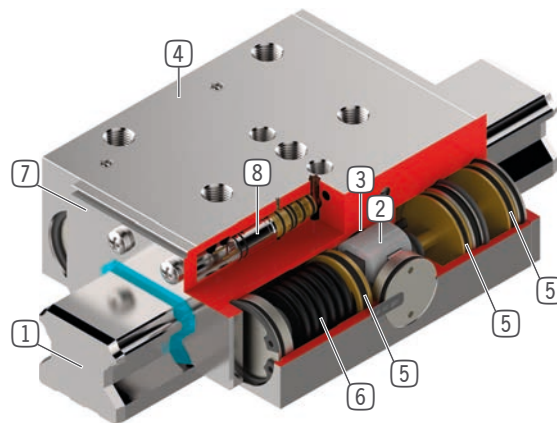
- ▶ **Emergency OFF function**
- ▶ **Z-axes positioning in neutral position**
- ▶ **Machine table clamping of work centre**

FURTHER INFORMATION

- ▶ **Spacer plate**
In addition, a spacer plate might have to be ordered as height compensation, depending on the height of the rail carriage (dimension D).
- ▶ **Special variants on request, e.g.**
 - With proximity switch monitoring
 - With low opening pressure (3.0 bar or 4.0 bar)
 - With additional air connection (from above, from the front)
 - Integrated valve for reduced closing time

► BENEFITS IN DETAIL

- 1 Profile rail guide**
 - Available for all common profile rail guides
- 2 Wedge-type gear**
 - Power transmission between the pistons and clamping jaws and brake shoes
- 3 Clamping jaws and brake shoes**
 - Pressed at the free surfaces of the profile rail guide
- 4 Housing**
 - chemically nickel plated steel
- 5 Pneumatic piston**
 - The piston moves the wedge-type gear longitudinally
- 6 Spring-loaded energy storage**
 - For non-pressurized closing of the clamping unit
- 7 Scraper**
 - Can also be ordered as an option
- 8 Integrated valve (optional)**
 - Up to 60% faster closing time
 - regardless of the cable length



► INFORMATION ON THE SERIES

TECHNICAL DATA

Rail size	20-65 mm
Holding force	1500-7700 (9200) N
Pressure min. / max.	5.5 / 6.5
Spring storage	existing
PLUS connection	Yes
Static clamping cycles (B10d value)	up to 5 million
Dynamic braking cycles	up to 2000
Operation	pneumatic
Operating temperature	-10 ... +70 [°C]



► Technical Information

All information just a click away at: www.zimmer-group.de

Find data, illustrations, 3D models and operating instructions for your installation size using the order number for your desired model.

Quick, clear and always up-to-date.

► Selection guide for clamping and braking elements

Whatever the possible application – here, you'll find the right product.

Easy selection of the right element for any rail-carriage combination: www.zimmer-group.de/de/plt.

CLAMPING ELEMENTS | PNEUMATIC SERIES LKP

▶ PRODUCT ADVANTAGES



- ▶ **broad range of products**
For all common profile rail guides
- ▶ **Energize to close (NO)**
Closing with pressure
- ▶ **high durability**
Up to 5 million static clamping cycles
- ▶ **Small and narrow design**
By using U-form piston

▶ THE BEST PRODUCT FOR YOUR APPLICATION

APPLICATION SCENARIOS

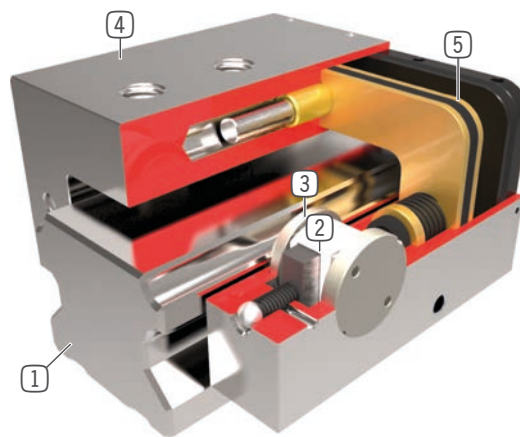
- ▶ **Clamping of machine tables**
- ▶ **Positioning of axes**
- ▶ **Fixing of vertical axes in neutral position**

FURTHER INFORMATION

- ▶ **Spacer plate**
In addition, a spacer plate might have to be ordered as height compensation, depending on the height of the rail carriage (dimension D).
- ▶ **Special variants on request, e.g.**
With additional air connection (from above, from the front)

► BENEFITS IN DETAIL

- ① **Profile rail guide**
- Available for all common profile rail guides
- ② **Wedge-type gear**
- Power transmission between piston and clamping jaw
- ③ **Clamping jaw**
- Pressed at the free surfaces of the profile rail guide
- ④ **Narrow housing**
- chemically nickel plated steel
- ⑤ **Pneumatic piston**
- The piston moves the wedge-type gear longitudinally



► INFORMATION ON THE SERIES

TECHNICAL DATA

Rail size	15-35 mm
Holding force	550-2500 N
Pressure min. / max.	3 / 6.5
Spring storage	inexistent
PLUS connection	No
Static clamping cycles (B10d value)	up to 5 million
Dynamic braking cycles	not suitable
Operation	pneumatic
Operating temperature	-10 ... +70 [°C]



► Technical Information

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Find data, illustrations, 3D models and operating instructions for your installation size using the order number for your desired model.

Quick, clear and always up-to-date.

► Selection guide for clamping and braking elements

Whatever the possible application – here, you'll find the right product.

Easy selection of the right element for any rail-carriage combination: www.zimmer-group.de/de/plt.

CLAMPING ELEMENTS | PNEUMATIC SERIES LKPS

▶ PRODUCT ADVANTAGES



- ▶ **broad range of products**
For all common profile rail guides
- ▶ **Energize to open (NC)**
through spring-loaded energy storage
- ▶ **high durability**
Up to 5 million static clamping cycles
- ▶ **Small and narrow design**
By using U-form piston
- ▶ **Safety element**
Safe clamping in case of energy failure

▶ THE BEST PRODUCT FOR YOUR APPLICATION

APPLICATION SCENARIOS

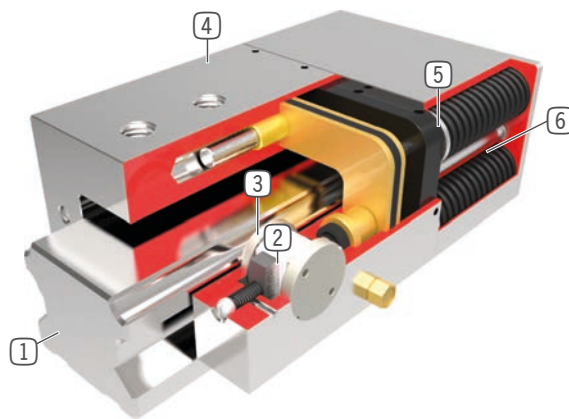
- ▶ **Clamping in case of pressure drop**
- ▶ **Clamping without energy requirement**

FURTHER INFORMATION

- ▶ **Spacer plate**
In addition, a spacer plate might have to be ordered as height compensation, depending on the height of the rail carriage (dimension D).
- ▶ **Special variants on request, e.g.**
With low opening pressure (3.0 bar or 4.0 bar)
With additional air connection (from above, from the front)

► BENEFITS IN DETAIL

- ① **Profile rail guide**
- Available for all common profile rail guides
- ② **Wedge-type gear**
- Power transmission between piston and clamping jaw
- ③ **Clamping jaw**
- Pressed at the free surfaces of the profile rail guide
- ④ **Narrow housing**
- chemically nickel plated steel
- ⑤ **Pneumatic piston**
- The piston moves the wedge-type gear longitudinally
- ⑥ **Spring-loaded energy storage**
- For non-pressurized closing of the clamping unit



► INFORMATION ON THE SERIES

TECHNICAL DATA

Rail size	15-35 mm
Holding force	400-1900 N
Pressure min. / max.	5.5 / 6.5
Spring storage	existing
PLUS connection	No
Static clamping cycles (B10d value)	up to 5 million
Dynamic braking cycles	not suitable
Operation	pneumatic
Operating temperature	-10 ... +70 [°C]



► Technical Information

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Find data, illustrations, 3D models and operating instructions for your installation size using the order number for your desired model.

Quick, clear and always up-to-date.

► Selection guide for clamping and braking elements

Whatever the possible application – here, you'll find the right product.

Easy selection of the right element for any rail-carriage combination: www.zimmer-group.de/de/plt.

CLAMPING AND BRAKING ELEMENTS | PNEUMATIC SERIES LBPS

▶ PRODUCT ADVANTAGES



- ▶ **broad range of products**
For all common profile rail guides
- ▶ **Energize to open (NC)**
through spring-loaded energy storage
- ▶ **high durability**
Up to 5 million static clamping cycles
- ▶ **Small and narrow design**
By using U-form piston
- ▶ **Safety element**
Safe braking in case of energy failure

▶ THE BEST PRODUCT FOR YOUR APPLICATION

APPLICATION SCENARIOS

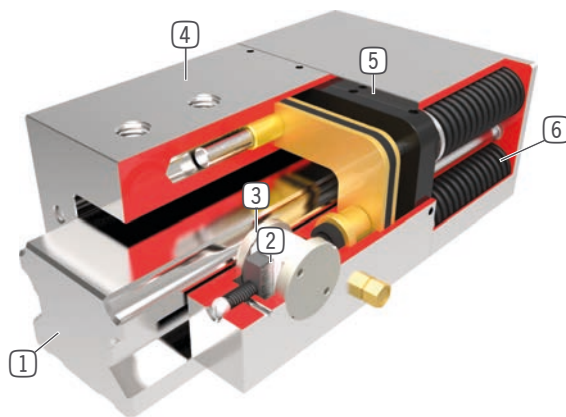
- ▶ **Clamping in case of pressure drop**
- ▶ **Braking linear motors**
- ▶ **Clamping without energy requirement**

FURTHER INFORMATION

- ▶ **Spacer plate**
In addition, a spacer plate might have to be ordered as height compensation, depending on the height of the rail carriage (dimension D).
- ▶ **Special variants on request, e.g.**
 - With proximity switch monitoring
 - With low opening pressure (3.0 bar or 4.0 bar)
 - With additional air connection (from above, from the front)

► BENEFITS IN DETAIL

- ① **Profile rail guide**
- Available for all common profile rail guides
- ② **Wedge-type gear**
- Power transmission between the pistons and clamping jaws and brake shoes
- ③ **Clamping jaws and brake shoes**
- Pressed at the free surfaces of the profile rail guide
- ④ **Narrow housing**
- chemically nickel plated steel
- ⑤ **Pneumatic piston**
- The piston moves the wedge-type gear longitudinally
- ⑥ **Spring-loaded energy storage**
- For non-pressurized closing of the clamping unit



► INFORMATION ON THE SERIES

TECHNICAL DATA

Rail size	15-35 mm
Holding force	400-1900 N
Pressure min. / max.	5.5 / 6.5
Spring storage	existing
PLUS connection	No
Static clamping cycles (B10d value)	up to 5 million
Dynamic braking cycles	up to 500
Operation	pneumatic
Operating temperature	-10 ... +70 [°C]



► Technical Information

All information just a click away at: www.zimmer-group.de

Find data, illustrations, 3D models and operating instructions for your installation size using the order number for your desired model.

Quick, clear and always up-to-date.

► Selection guide for clamping and braking elements

Whatever the possible application – here, you'll find the right product.

Easy selection of the right element for any rail-carriage combination: www.zimmer-group.de/de/plt.

CLAMPING ELEMENTS | HYDRAULIC SERIES KWH

▶ PRODUCT ADVANTAGES



- ▶ **broad range of products**
For all common profile rail guides
- ▶ **Energize to close (NO)**
Closing with pressure
- ▶ **extremely durable**
Up to 10 million static clamping cycles

▶ THE BEST PRODUCT FOR YOUR APPLICATION

APPLICATION SCENARIOS

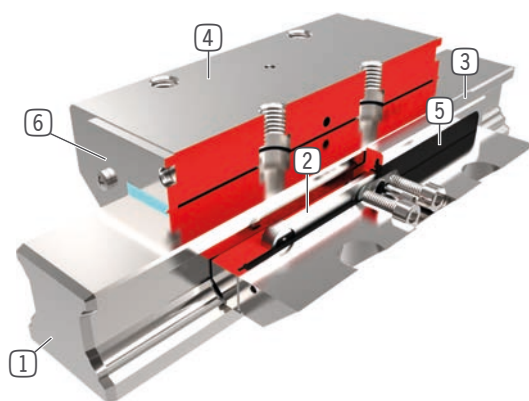
- ▶ **Machine table clamping of heavy cutting work centres**
- ▶ **Clamping of heavy handling systems**

FURTHER INFORMATION

- ▶ **Spacer plate**
In addition, a spacer plate might have to be ordered as height compensation, depending on the height of the rail carriage (dimension D).
- ▶ **Special variants on request, e.g.**
With additional hydraulic connection (from above, from the front)

► BENEFITS IN DETAIL

- ① **Profile rail guide**
- Available for all common profile rail guides
- ② **Return spring**
- Interlocked integration in the jaws
- ③ **Clamping jaw**
- Pressed at the free surfaces of the profile rail guide
- ④ **Housing**
- chemically nickel plated steel
- ⑤ **Membran**
- For pressurization up to 150 bar
- ⑥ **Scraper**
- Can also be ordered as an option



► INFORMATION ON THE SERIES

TECHNICAL DATA

Rail size	25-125 mm
Holding force	1600-46000 N
Allowable operating pressure	100-150 bar
Allowable point pressure	110-160 bar
Spring storage	inexistent
PLUS connection	No
Static clamping cycles (B10d value)	up to 10 million
Dynamic braking cycles	not suitable
Operation	hydraulic
Operating temperature	-10 ... +70 [°C]



► Technical Information

All information just a click away at: www.zimmer-group.de
Find data, illustrations, 3D models and operating instructions for your installation size using the order number for your desired model.
Quick, clear and always up-to-date.

► Selection guide for clamping and braking elements

Whatever the possible application – here, you'll find the right product.
Easy selection of the right element for any rail-carriage combination: www.zimmer-group.de/de/plt.

CLAMPING AND BRAKING ELEMENTS | HYDRAULIC SERIES KBH

▶ PRODUCT ADVANTAGES



- ▶ **broad range of products**
For all common profile rail guides
- ▶ **Energize to close (NO)**
Closing with pressure
- ▶ **extremely durable**
Up to 10 million static clamping cycles

▶ THE BEST PRODUCT FOR YOUR APPLICATION

APPLICATION SCENARIOS

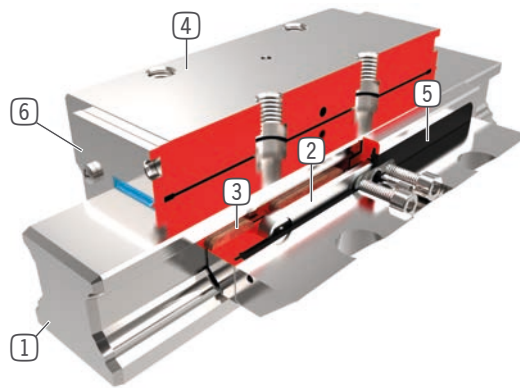
- ▶ **Machine table clamping of heavy cutting work centres**
- ▶ **Clamping and braking of heavy handling systems**
- ▶ **Braking**

FURTHER INFORMATION

- ▶ **Spacer plate**
In addition, a spacer plate might have to be ordered as height compensation, depending on the height of the rail carriage (dimension D).
- ▶ **Special variants on request, e.g.**
With additional hydraulic connection (from above, from the front)

► BENEFITS IN DETAIL

- ① **Profile rail guide**
- Available for all common profile rail guides
- ② **Return spring**
- Interlocked integration in the jaws
- ③ **Clamping jaws and brake shoes**
- Pressed at the free surfaces of the profile rail guide
- ④ **Housing**
- chemically nickel plated steel
- ⑤ **Membran**
- For pressurization up to 150 bar
- ⑥ **Scraper**
- Can also be ordered as an option



► INFORMATION ON THE SERIES

TECHNICAL DATA

Rail size	25-125 mm
Holding force	2200-46000 N
Allowable operating pressure	100-150 bar
Allowable point pressure	110-160 bar
Spring storage	inexistent
PLUS connection	No
Static clamping cycles (B10d value)	up to 10 million
Dynamic braking cycles	up to 2000
Operation	hydraulic
Operating temperature	-10 ... +70 [°C]



► Technical Information

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Find data, illustrations, 3D models and operating instructions for your installation size using the order number for your desired model.

Quick, clear and always up-to-date.

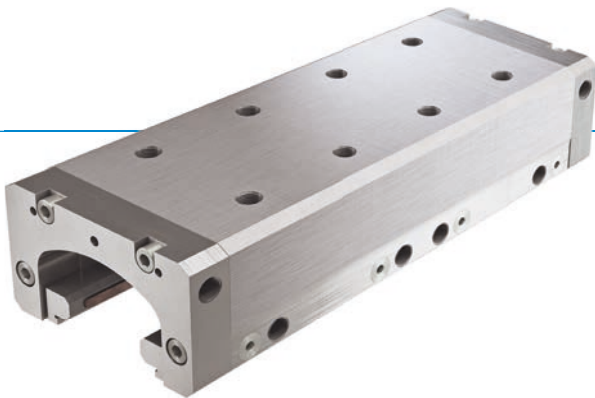
► Selection guide for clamping and braking elements

Whatever the possible application – here, you'll find the right product.

Easy selection of the right element for any rail-carriage combination: www.zimmer-group.de/de/plt.

CLAMPING AND BRAKING ELEMENTS | HYDRAULIC SERIES LBHS

▶ PRODUCT ADVANTAGES



- ▶ **broad range of products**
For all common profile rail guides
- ▶ **Energize to open (NC)**
through residual stress
- ▶ **the power pack**
Up to 0.5 million static clamping cycles
- ▶ **Safety element**
Safe braking in case of energy failure

▶ THE BEST PRODUCT FOR YOUR APPLICATION

APPLICATION SCENARIOS

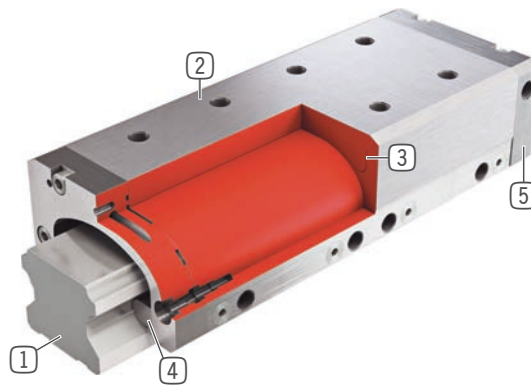
- ▶ **Precise positioning through maximum rigidity**
- ▶ **Clamping measurement applications**
- ▶ **Clamping and braking of heavy handling systems**
- ▶ **Braking in emergency OFF situations**
- ▶ **Clamping in case of pressure drop**

FURTHER INFORMATION

- ▶ **Spacer plate**
In addition, a spacer plate might have to be ordered as height compensation, depending on the height of the rail carriage (dimension D).
- ▶ **Special variants on request, e.g.**
With additional hydraulic connection (from above, from the front)

► BENEFITS IN DETAIL

- ① **Profile rail guide**
 - Available for all common profile rail guides
- ② **Housing - functional component**
 - Generating clamping force by clamping material
 - Narrow and low design
- ③ **Eroding contour**
 - Used for opening the element under pressure
- ④ **Clamping jaws and brake shoes**
 - Pressed at the free surfaces of the profile rail guide
- ⑤ **Sealing plates**
 - for double-sided hydraulic line connection
- ⑥ **Scraper**
 - Optionally available with "A" article ending



► INFORMATION ON THE SERIES

TECHNICAL DATA

Rail size	20-65 mm
Allowable operating pressure	120 bar
Allowable point pressure	130 bar
Spring storage	existing
PLUS connection	No
Static clamping cycles (B10d value)	up to 500 000
Dynamic braking cycles	up to 500
Operation	hydraulic
Operating temperature	-10 ... +70 [°C]



► Technical Information

All information just a click away at: www.zimmer-group.de

Find data, illustrations, 3D models and operating instructions for your installation size using the order number for your desired model.

Quick, clear and always up-to-date.

► Selection guide for clamping and braking elements

Whatever the possible application – here, you'll find the right product.

Easy selection of the right element for any rail-carriage combination: www.zimmer-group.de/de/plr.

CLAMPING ELEMENTS | ELECTRIC SERIES LKE

▶ PRODUCT ADVANTAGES



- ▶ **Energy-efficient (bistable)**
Opens and closes using 24 V DC voltage
- ▶ **Integrated electronics**
Digital control and status signals
- ▶ **Flexible cable outlet**
For maximum space utilization

▶ THE BEST PRODUCT FOR YOUR APPLICATION

APPLICATION SCENARIOS

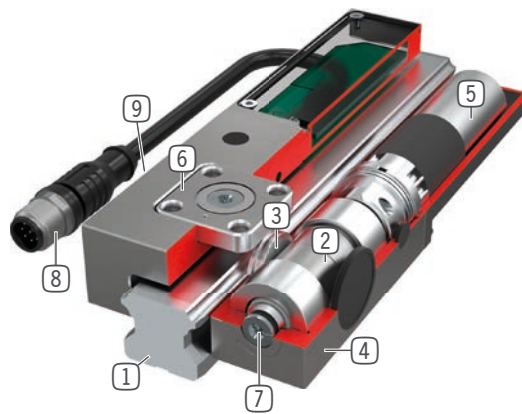
- ▶ **Axes with electric positioning**
- ▶ **Table traverses in medical applications**
- ▶ **Electric clamping of machine tables**

FURTHER INFORMATION

- ▶ **Spacer plate**
In addition, a spacer plate might have to be ordered as height compensation, depending on the height of the rail carriage (dimension D).

► BENEFITS IN DETAIL

- ① **Profile rail guide**
- Available for all common profile rail guides
- ② **Eccentric gear**
- Power transmission between motor and clamping jaw
- ③ **Clamping jaw**
- Pressed at the free surfaces of the profile rail guide
- ④ **Housing**
- chemically nickel plated steel
- ⑤ **electric drive**
- For generating clamping force
- ⑥ **Sliding block**
- For floating bearings
- ⑦ **Emergency actuation**
- Manual opening possible in case of power supply failure
- ⑧ **Electrical connecting cable**
- Control and power supply
- ⑨ **Adjusting screw**
- Correction of the rail tolerance



► INFORMATION ON THE SERIES

TECHNICAL DATA

Rail size	15-35 mm
Holding force	600-1800 N
Spring storage	inexistent
Static clamping cycles (B10d value)	up to 500 000
Dynamic braking cycles	not suitable
Protection to IEC 60529	IP64
Supply Voltage	24 [V DC]
Operation	electric
Operating temperature	+5 ... +50 [°C]



► Technical Information

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Find data, illustrations, 3D models and operating instructions for your installation size using the order number for your desired model.

Quick, clear and always up-to-date.

► Selection guide for clamping and braking elements

Whatever the possible application – here, you'll find the right product.

Easy selection of the right element for any rail-carriage combination: www.zimmer-group.de/de/plt.

CLAMPING ELEMENTS | MANUAL

SERIES HKR

▶ PRODUCT ADVANTAGES



- ▶ **Independent of the manufacturer**
For circular guides and shaft guides
- ▶ **Tool-free opening and closing (bi-stable)**
By turning the clamping lever
- ▶ **Maintenance free**
Up to 50,000 static clamping cycles

▶ THE BEST PRODUCT FOR YOUR APPLICATION

APPLICATION SCENARIOS

- ▶ **Table traverses in wood industry**
- ▶ **Adjustment of width in plastics processing**
- ▶ **Positioning of optic instruments and measuring tables**

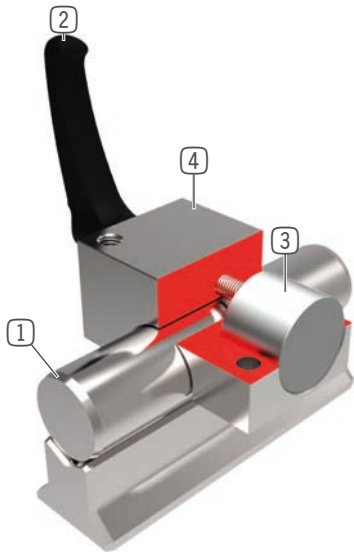
FURTHER INFORMATION

- ▶ **Special variants on request, e.g.**
Operation using DIN 912 Allen screws
Extended clamping lever
made of stainless steel

TECHNICAL DATA

Shaft diameter	12-60 mm
Holding force	1200 - 2000 N
Fastening torque clamp lever	5-17 Nm
Spring storage	inexistent
Static clamping cycles (B10d value)	up to 50 000
Dynamic braking cycles	not suitable
Operation	manual
Operating temperature	-10 ... +70 [°C]
Shaft tolerance	+/- 0,01 mm
Hardness	min. 54 HRC

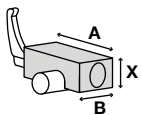
► BENEFITS IN DETAIL



- ① **Circular guide**
- Compatible with circular and shaft guides
- ② **Clamping lever made from plastic**
- Freely adjustable (release by lifting)
- ③ **Clamping jaw**
- The floating bearings guarantee symmetrical application of force
- ④ **Housing**
- chemically nickel plated steel

► TECHNICAL DATA

► SERIES HKR CLAMPING N (BISTABLE) REMAINS IN CURRENT POSITION

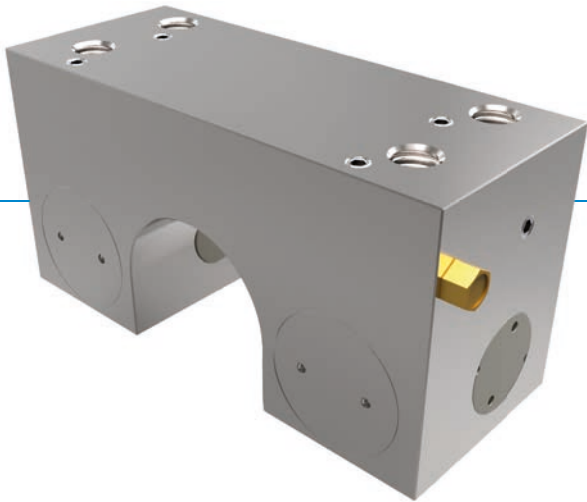


Order no.	Shaft Ø* [mm]	Holding force [N]	Holding torque [Nm]	Max. tightening torque [Nm]	A [mm]	B [mm]	X [mm]
HKR1200A	12	1200	7	5	43	32	18
HKR1600A	16	1200	9.5	5	53	38	22
HKR2000A	20	1200	12	7	60	44	25
HKR2500A	25	1200	15	7	78	52	30
HKR3000A	30	2000	30	12	87	58	35
HKR4000A	40	2000	40	17	108	68	45
HKR5000A	50	2000	50	17	132	76	50
HKR6000A	60	2000	60	17	157	76	60

*Min. hardness of 54 HRC

CLAMPING ELEMENTS | PNEUMATIC SERIES MKR

▶ PRODUCT ADVANTAGES



- ▶ **Independent of the manufacturer**
For circular guides and shaft guides
- ▶ **Energize to close (NO)**
Closing with pressure
- ▶ **high durability**
Up to 5 million static clamping cycles

▶ THE BEST PRODUCT FOR YOUR APPLICATION

APPLICATION SCENARIOS

- ▶ **Fixing of vertical axes**
- ▶ **Positioning of lifting units**
- ▶ **Clamping of machine tables**

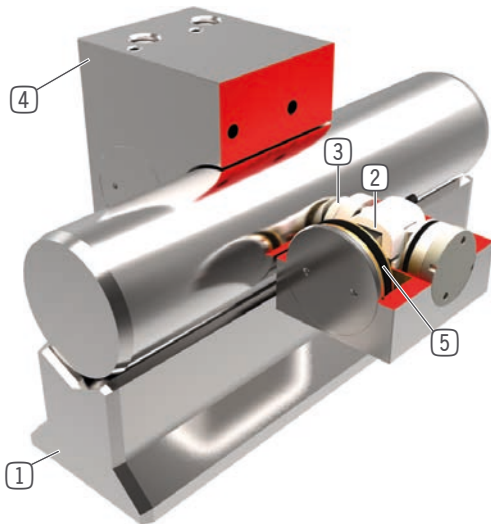
FURTHER INFORMATION

- ▶ **Special variants on request, e.g.**
With proximity switch monitoring
With additional air connection (from above, from the front)

TECHNICAL DATA

Shaft diameter	12-60 mm
Holding force	650-1850 N
Pressure min. / max.	3 / 6.5 [bar]
Spring storage	inexistent
PLUS connection	No
Static clamping cycles (B10d value)	up to 5 million
Dynamic braking cycles	not suitable
Operation	pneumatic
Operating temperature	-10 ... +70 [°C]
Shaft tolerance	+/- 0,01 mm
Hardness	min. 54 HRC

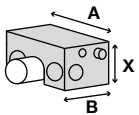
► BENEFITS IN DETAIL



- ① **Circular guide**
 - Compatible with circular and shaft guides
- ② **Wedge-type gear**
 - Power transmission between piston and clamping jaw
- ③ **Clamping jaw**
 - Pressed at the circular guide
- ④ **Housing**
 - chemically nickel plated steel
- ⑤ **Pneumatic piston**
 - The piston moves the wedge-type gear longitudinally

► TECHNICAL DATA

► SERIES MKR CLAMPING NO (NORMALLY OPEN) OPEN WITHOUT PRESSURE

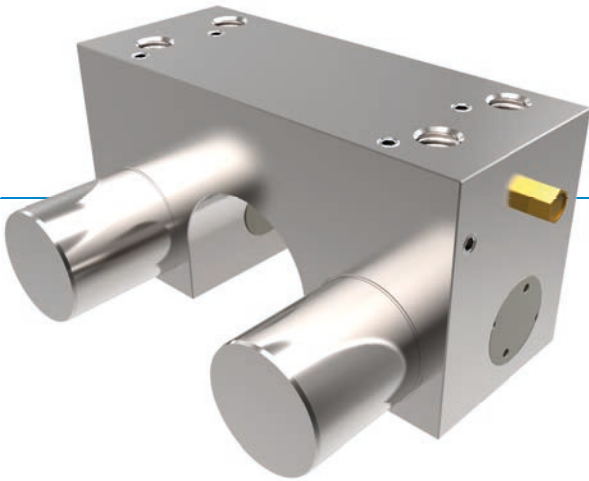


Order no.	Shaft Ø* [mm]	Holding force [N]	Holding torque [Nm]	A [mm]	B1 [mm]	X [mm]
MKR1200A	12	650	4	50.0	37	18
MKR2000A	20	1000	10	66.0	38	25
MKR2500A	25	1200	15	77.0	42	30
MKR3000A	30	1750	26	92.0	48.5	35
MKR3200A	32	1850	37	120.0	49	45
MKR4000A	40	1850	37	120.0	49	45
MKR5000A	50	1850	46	132.0	49	50
MKR6000A	60	1850	56	142.0	49	50

*Min. hardness of 54 HRC

CLAMPING ELEMENTS | PNEUMATIC SERIES MKRS

▶ PRODUCT ADVANTAGES



- ▶ **Independent of the manufacturer**
For circular guides and shaft guides
- ▶ **Energize to open (NC)**
through spring-loaded energy storage
- ▶ **high durability**
Up to 5 million static clamping cycles
- ▶ **Safety element**
Safe clamping in case of energy failure

▶ THE BEST PRODUCT FOR YOUR APPLICATION

APPLICATION SCENARIOS

- ▶ **Clamping in case of pressure drop**
- ▶ **Clamping without energy requirement**

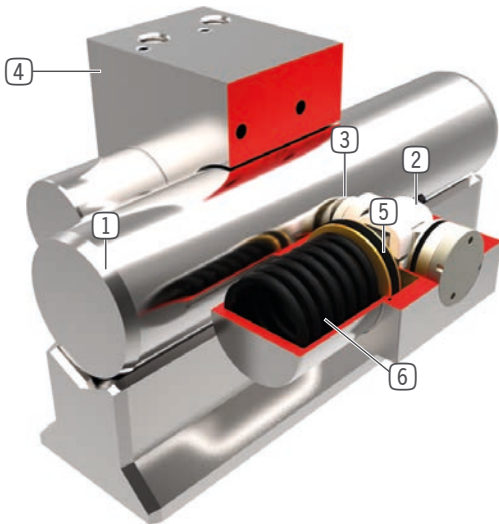
FURTHER INFORMATION

- ▶ **Special variants on request, e.g.**
 - With proximity switch monitoring
 - With low opening pressure (3.0 bar or 4.0 bar)
 - With additional air connection (from above, from the front)

TECHNICAL DATA

Shaft diameter	12-60 mm
Holding force	350-1650 N
Pressure min. / max.	5.5 / 6.5 [bar]
Spring storage	existing
PLUS connection	No
Static clamping cycles (B10d value)	up to 5 million
Dynamic braking cycles	not suitable
Operation	pneumatic
Operating temperature	-10 ... +70 [°C]
Shaft tolerance	+/- 0,01 mm
Hardness	min. 54 HRC

► BENEFITS IN DETAIL

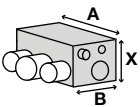


- ① **Circular guide**
- Compatible with circular and shaft guides
- ② **Wedge-type gear**
- Power transmission between piston and clamping jaw
- ③ **Clamping jaw**
- Pressed at the circular guide
- ④ **Housing**
- chemically nickel plated steel
- ⑤ **Pneumatic piston**
- The piston moves the wedge-type gear longitudinally
- ⑥ **Spring-loaded energy storage**
- For non-pressurized closing of the clamping unit

► TECHNICAL DATA

► SERIES MKRS CLAMPING NC (NORMALLY CLOSED) CLOSED WITHOUT PRESSURE

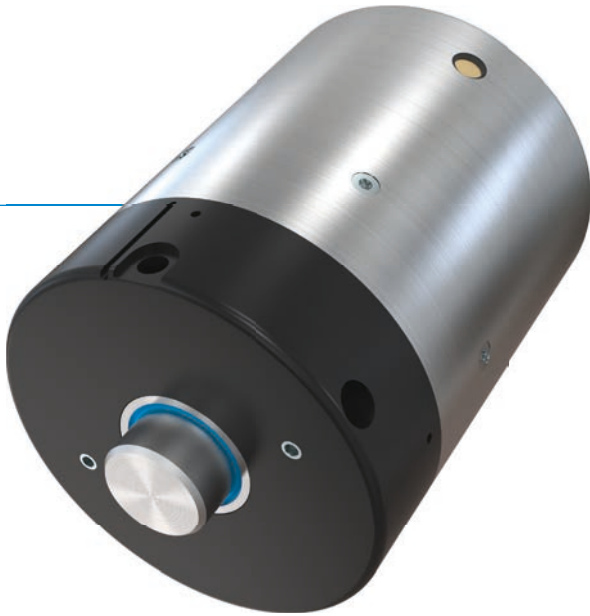
Order no.	Shaft Ø* [mm]	Holding force [N]	Holding torque [Nm]	A [mm]	B [mm]	X [mm]
MKRS1200A	12	350	2	50	56	18
MKRS2000A	20	600	6	66	60	25
MKRS2500A	25	750	9	77	63	30
MKRS3000A	30	1050	16	92	77.5	35
MKRS3200A	32	1650	33	120	82	45
MKRS4000A	40	1650	33	120	82	45
MKRS5000A	50	1650	41	132	82	50
MKRS6000A	60	1650	49	142	82	50



*Min. hardness of 54 HRC

CLAMPING AND BRAKING ELEMENTS | PNEUMATIC SERIES RBPS

▶ PRODUCT ADVANTAGES



- ▶ **sensing with process reliability**
Sensing of opened/closed state (optional)
- ▶ **Energize to open (NC)**
through spring-loaded energy storage
- ▶ **high durability**
Up to 5 million static clamping cycles
- ▶ **Safety element**
Safe braking in case of energy failure

▶ THE BEST PRODUCT FOR YOUR APPLICATION

APPLICATION SCENARIOS

- ▶ **Positioning of axes**
- ▶ **Fixing of vertical axes**
- ▶ **Positioning of lifting units**

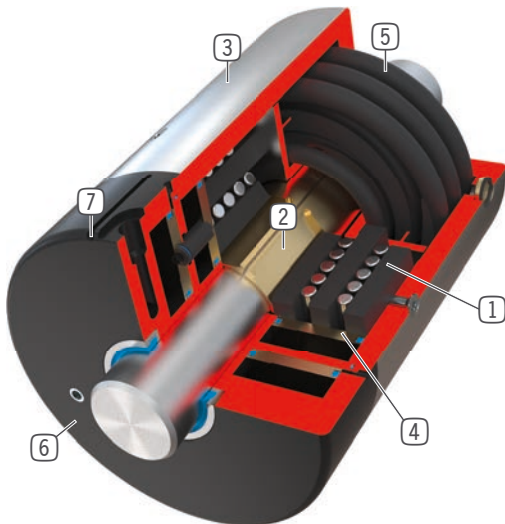
FURTHER INFORMATION

- ▶ **Special variants on request, e.g.**
With low opening pressure (3.0 bar)

TECHNICAL DATA

Shaft diameter	5-60 mm
Holding force	3500-52000 N
Pressure min. / max.	4 / 6.5 [bar]
Spring storage	existing
PLUS connection	No
Static clamping cycles (B10d value)	up to 5 million
Dynamic braking cycles	Up to 2000; only static use for rotating applications
Operation	pneumatic
Operating temperature	-10 ... +70 [°C]
Shaft tolerance	f8/g8/h7
Hardness	min. 54 HRC

► BENEFITS IN DETAIL



- ① **Wedge-type gear**
- Power transmission between piston and collet chuck
- ② **Collet chuck for clamping and braking**
- Pressed at the circular guide
- ③ **Housing**
- chemically nickel plated steel
- ④ **Pneumatic piston**
- The ring piston moves the wedge-type gear longitudinally
- ⑤ **Spring-loaded energy storage**
- For non-pressurized closing of the clamping unit
- ⑥ **Cover**
- hard coated aluminium alloy
- ⑦ **Integrated slot (for size RBPS12 and larger)**
- Mounting and positioning of a magnetic field sensor (optional)

► TECHNICAL DATA

► SERIES RBPS CLAMPING AND BRAKING NC (NORMALLY CLOSED) CLOSED WITHOUT PRESSURE



Order no.	Shaft Ø* [mm]	Holding force [N]	Holding torque** [Nm]	ØD [mm]	L [mm]
RBPS0500	5	3500	5	49	68
RBPS0600	6	3500	6	49	68
RBPS0800	8	3500	8	49	68
RBPS1000 ***	10	3500	11	49	68
RBPS1200-A	12	10000	36	99	150
RBPS1400-A	14	10000	42	99	150
RBPS1500-A	15	10000	45	99	150
RBPS1600-A	16	10000	48	99	150
RBPS1800-A	18	10000	54	99	150
RBPS2000-A	20	10000	60	99	150
RBPS2200-A	22	18000	120	135	165
RBPS2400-A	24	18000	130	135	165
RBPS2500-A	25	18000	140	135	165
RBPS2600-A	26	18000	140	135	165
RBPS2800-A ***	28	18000	150	135	165
RBPS3000-A	30	35000	320	170	220
RBPS3200-A	32	35000	340	170	220
RBPS3500-A	35	35000	370	170	220
RBPS3600-A	36	35000	380	170	220
RBPS3800-A	38	35000	400	170	220
RBPS4000-A	40	35000	420	170	220
RBPS4200-A	42	35000	440	170	220
RBPS4500-A ***	45	35000	470	170	220
RBPS5000-A	50	52000	780	205.0	232.0
RBPS6000-A ***	60	52000	780	205.0	232.0

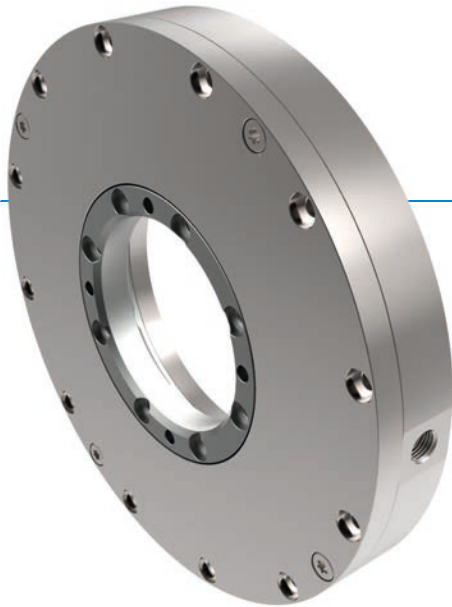
*Min. hardness of 54 HRC

** Only for clamping for static use

*** Preferred size

CLAMPING ELEMENTS | PNEUMATIC SERIES TPS

▶ PRODUCT ADVANTAGES



- ▶ **Independent of the manufacturer**
For circular guides and shaft guides
- ▶ **Energize to open (NC)**
through spring-loaded energy storage
- ▶ **high durability**
Up to 5 million static clamping cycles
Internal torque input
No wear on the shaft
- ▶ **Safety element**
Safe clamping in case of energy failure

▶ THE BEST PRODUCT FOR YOUR APPLICATION

APPLICATION SCENARIOS

- ▶ **Torque take-up of shafts**
- ▶ **For deployment in torque motors**
- ▶ **For deployment in rotating disc contactors**

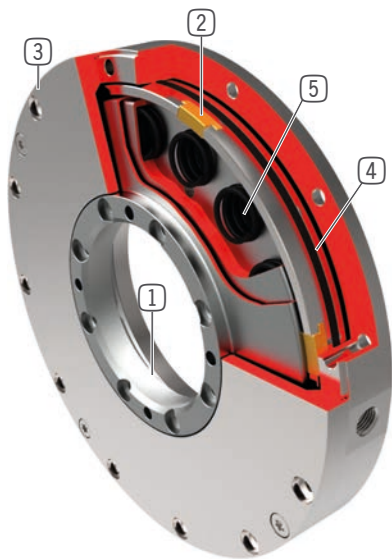
FURTHER INFORMATION

- ▶ **Special variants on request, e.g.**
With proximity switch monitoring
With low opening pressure (3.0 bar or 4.0 bar)

TECHNICAL DATA

Shaft diameter	15-200 mm
Holding torque	50-500 Nm
Pressure min. / max.	4 / 6.5 [bar]
Spring storage	existing
PLUS connection	No
Static clamping cycles (B10d value)	up to 5 million
Dynamic braking cycles	not suitable
Operating temperature	-10 ... +70 [°C]

► BENEFITS IN DETAIL

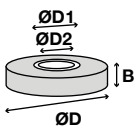


- ① **Clamping flange**
- For fastening to the shaft
- ② **Clamping segments**
- Fastens clamping disk inside the element
- ③ **Housing**
- chemically nickel plated steel
- ④ **Pneumatic piston**
- Ring pistons move the clamping segments longitudinally
- ⑤ **Spring-loaded energy storage**
- For non-pressurized closing of the clamping unit

► TECHNICAL DATA

► SERIES TPS CLAMPING NC (NORMALLY CLOSED) CLOSED WITHOUT PRESSURE

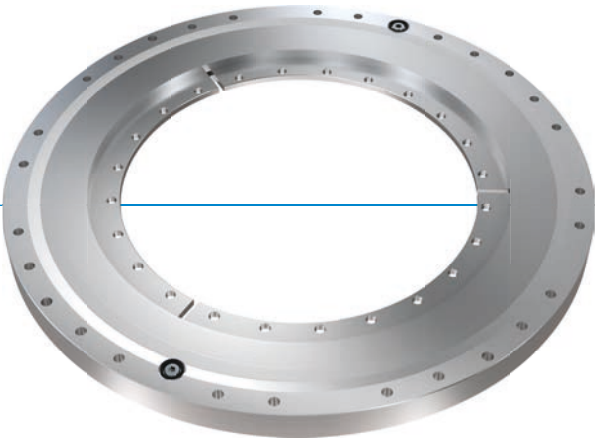
Order no.	Shaft Ø [mm]	Holding torque [Nm]	B [mm]	ØD [mm]	ØD1 [mm]	ØD2 [mm]
TPS050	50	60	25	145	50	28
TPS060	60	80	25	155	60	38
TPS080	80	140	25	175	80	58
TPS090	90	140	28	185	90	70
TPS120	120	180	28	215	120	100
TPS160	160	400	35	288	160	110
TPS200	200	500	35	328	200	150



CLAMPING ELEMENTS | HYDRAULIC

SERIES DKHS1000

▶ PRODUCT ADVANTAGES



▶ Highest accuracy in rotational axis

No moving functional parts and therefore backlash-free
Drive can be taken out of the drive control

▶ Fastest reaction time and pressureless safety function

Due to a low displacement volume and internal stress of the housing

▶ Market leading cycles

Housing strain stays below the elastic fatigue limit

▶ THE BEST PRODUCT FOR YOUR APPLICATION

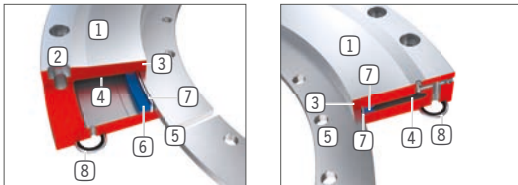
APPLICATION SCENARIOS

- ▶ Torque take-up of shafts
- ▶ Clamping of torque drive
- ▶ Clamping of C-axis
- ▶ Fixing and safeguarding of swivel bridge
- ▶ Clamping of spindle tilting axis

TECHNICAL DATA

Shaft diameter	200-340 mm
Holding torque	1600-4200 Nm
Pressure min. / max.	100 / 110
Spring storage	existing
PLUS connection	No
Static clamping cycles (B10d value)	up to 5 million
Dynamic braking cycles	not suitable
Operation	hydraulic
Operating temperature	5 ... +80 [°C]

► BENEFITS IN DETAIL



- ① **Housing**
- Holding torque due to pre-stressed, high tensile tool steel
- ② **Housing connection**
- Screw connection to the connecting construction
- ③ **Clamping area**
- Backlash-free Clamping of the rotary axis
- ④ **Pressure chamber**
- Opens the element under pressure in the elastic range
- ⑤ **Shaft connection**
- Connection with the rotary axis
- ⑥ **Sealing**
- Prestressed and self-enforcing under pressure
- ⑦ **Retain plate**
- Secures and holds the sealing in position
- ⑧ **Hydraulic connection**
- Sealing through O-Ring and surrounding cutting ring

► TECHNICAL DATA

► SERIES DKHS1000 HYDRAULIC CLAMPING NC (NORMALLY CLOSED) CLOSED WITHOUT PRESSURE

	Order no.	Shaft Ø [mm]	Holding torque [Nm]	B [mm]	ØD1 [mm]	ØLK1 [mm]	ØLK2 [mm]
	DKHS1200-00-A	200	1600	20	328	310	189
	DKHS1260-00-A	260	2600	22	388	370	249
	DKHS1340-00-A	340	4200	22	468	450	329

Customer number	<input type="text"/>	Telephone number	<input type="text"/>
Company	<input type="text"/>	Fax number	<input type="text"/>
Contact	<input type="text"/>	E-Mail	<input type="text"/>
Mr. <input type="checkbox"/> Mrs. <input type="checkbox"/>		Article	<input type="text"/>
Sales data		Target price	<input type="text"/>
Editor	<input type="text"/>	Other	<input type="text"/>
Desired delivery date	<input type="text"/>		
Quantity	<input type="text"/>	Pot. quantity (p.a.)	<input type="text"/>

Information on the guide system

Rail manufacturer	<input type="text"/>		
Rail type	<input type="text"/>	<input type="checkbox"/> with wiper	<input type="checkbox"/> without wiper
Rail size	<input type="text"/>		
Carriage type	<input type="text"/>		
Flat steel/shaft	<input type="text"/>	mm	Tolerance <input type="text"/> +/- μ m

Information on the clamping element/braking element

Actuation	<input type="checkbox"/> manual	<input type="checkbox"/> pneumatic	<input type="checkbox"/> electric	<input type="checkbox"/> hydraulic
Available energy parameters	<input type="text"/>	<input type="checkbox"/> bar	<input type="checkbox"/> VA	
Status	<input type="checkbox"/> NO (normally open)	<input type="checkbox"/> NC (normally closed)	<input type="checkbox"/> N (bistable)	
Series	<input type="text"/>			

Application

Static/dynamic	<input type="checkbox"/> clamping	<input type="checkbox"/> braking (emergency stop)		
Required holding force	<input type="text"/>	N		
Speed	<input type="text"/>	m/s		
Minimum number of cycles	<input type="text"/>			
Max. cycle time	opening <input type="text"/>	ms	closing <input type="text"/>	ms
Installation position	<input type="checkbox"/> horizontal	<input type="checkbox"/> vertical	<input type="checkbox"/> angle <input type="text"/>	°
Environment	<input type="checkbox"/> chips	<input type="checkbox"/> coolant	<input type="checkbox"/> oil / grease	<input type="checkbox"/> vacuum <input type="checkbox"/> dust
	<input type="checkbox"/> other <input type="text"/>		<input type="checkbox"/> Temperature (min./max.) <input type="text"/>	
End seal	<input type="checkbox"/> with end seal	<input type="checkbox"/> without end seal		
Semi-standard	<input type="checkbox"/> stainless steel	<input type="checkbox"/> sensing (initiator)	<input type="checkbox"/> Power connection, top	<input type="checkbox"/> Power connection, front
	<input type="checkbox"/> other <input type="text"/>			

USAGE NOTE

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USAGE NOTE

INDIVIDUAL

DECLARATION OF INCORPORATION IN TERMS OF THE EC DIRECTIVE 2006/42/EC ON MACHINERY (ANNEX II 1 B)

We hereby declare that our elements meet the following basic requirements of the Machinery Directive 2006/42/EC as an incomplete machine

No.1.1.2., No.1.1.3., No.1.1.5., 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.1.7.3, No.1.7.4.

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 the incomplete machine's special documents via 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 A.

The contents and data correspond to the status as of printing, Edition 05/2020.

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