

**MAYSER®**

Innovative by tradition.



# Industry, Automation & Logistics

Mayser makes factory facilities safe.



## More safety for machine assemblies & logistics

Production and storage processes are becoming more automated to increase economic efficiency. That requires reliable protection of dangerous zones on machines, systems, transfer lines, and storage halls in industrial production as stated in the Machinery Directive. Mayser specializes in making pinching and shearing edges secure.

Mayser offers pressure-sensitive protection devices that can be combined with each other. It thus enables a holistic problem-solving approach. This reliably protects the entire working environment from the area directly surrounding the machine all the way to the transfer lines.

The pressure sensitive devices that Mayser offers are:

- Safety mats
- Safety edges
- Safety bumpers

Mayser Technology allows for the addressing of safety risks with a highly customized approach. All safety components from Mayser comply with the EN ISO 13849 and/or EN ISO 13856 standards and therefore meet the requirements of the Machinery Directive.

## Table of contents

<b>1</b>	<b>Our solutions</b>	<b>4</b>
<b>1</b>	<b>Ultrasonic sensors</b>	<b>8</b>
	Your benefits	9
	Technical data	10
<b>2</b>	<b>Sensor profiles</b>	<b>12</b>
	Technical data	12
	Your benefits	13
<b>3</b>	<b>Sensor profiles: DIY Assembly</b>	<b>14</b>
<b>4</b>	<b>Safety edges</b>	<b>16</b>
	Your benefits	16
	Technical data	17
<b>5</b>	<b>Miniature safety edges</b>	<b>18</b>
	Your benefits	18
	Technical data	19
<b>6</b>	<b>Safety bumpers</b>	<b>20</b>
	Technical data	21
	Your benefits	21
<b>7</b>	<b>Safety mats</b>	<b>22</b>
	Technical data	22
	Your benefits	23

# 1 Our solutions

## Areas of application

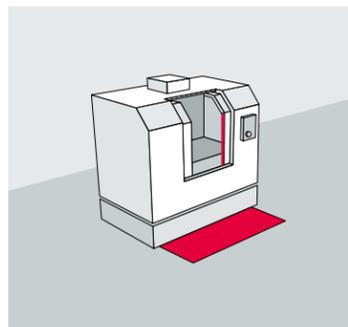
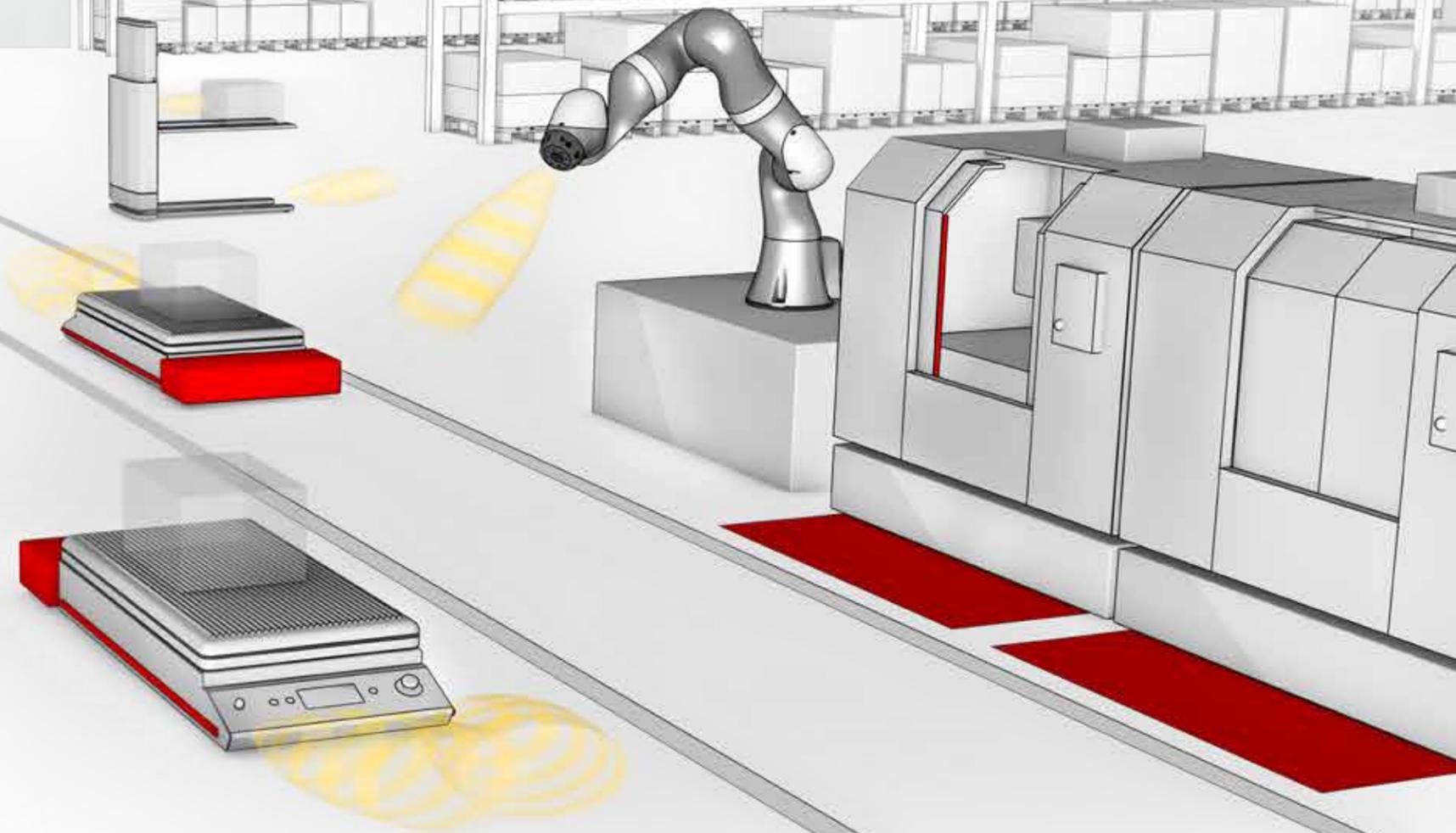
Our pressure-sensitive protection devices are used wherever automated processes pose a danger to people. The system features access detection, of any kind, to hazardous areas in the vicinity of machines or transfer lines. It also provides obstacle detection for protection at linear closing edges, and collision protection for automated guided vehicle systems (AGVS).

With a little pressure applied on the safety mats, safety edges, or the safety bumper, a signal is sent to the controls to stop or reverse the movement. A safe condition is then restored to the operational area.

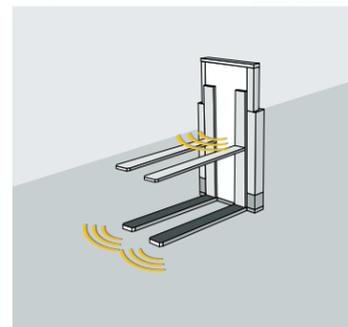
We offer solutions for the following applications:

- Production halls
- Movable machine elements
- AGVs

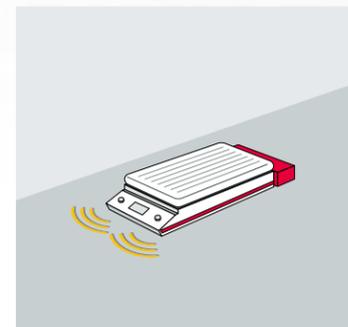
◆ Pressure-sensitive sensors ◆ Non-touch sensor technology



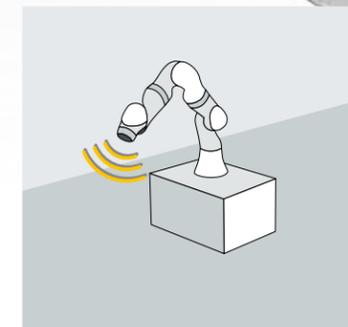
Machine safety



Logistics



AGV systems



Tool protection



### Ultrasonic sensors

These sensors offer non-touch monitoring of dangerous movement areas. As soon as a person steps into the ultrasonic field, the movement of a machine or an AGVS is reduced or stopped.



### Sensor profiles

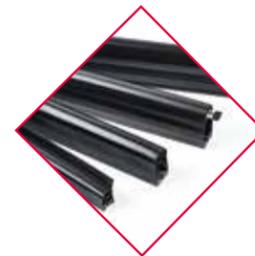
The SP sensor profile series is available as a pre-configured or DIY solution for protection at closing edges.

In combination with variable aluminum profiles and end caps the DIY solution enables fast and easy assembly and installation directly at the gate to create functioning safety edges according to degree of protection IP67 – without gluing.



### Safety mats

Pressure-sensitive safety mats detect persons in dangerous movement areas (e.g. on robots and machines). This solution is especially suitable for dirty environmental conditions.



### Safety edges, miniature safety edges

Safety edges provide anti-pinch protection at pinching and shearing edges.



### Safety bumpers

Safety bumpers protect people against machine components with long over travel distances, for instance in machining centers, AGVs, measuring machines and lifting platforms.

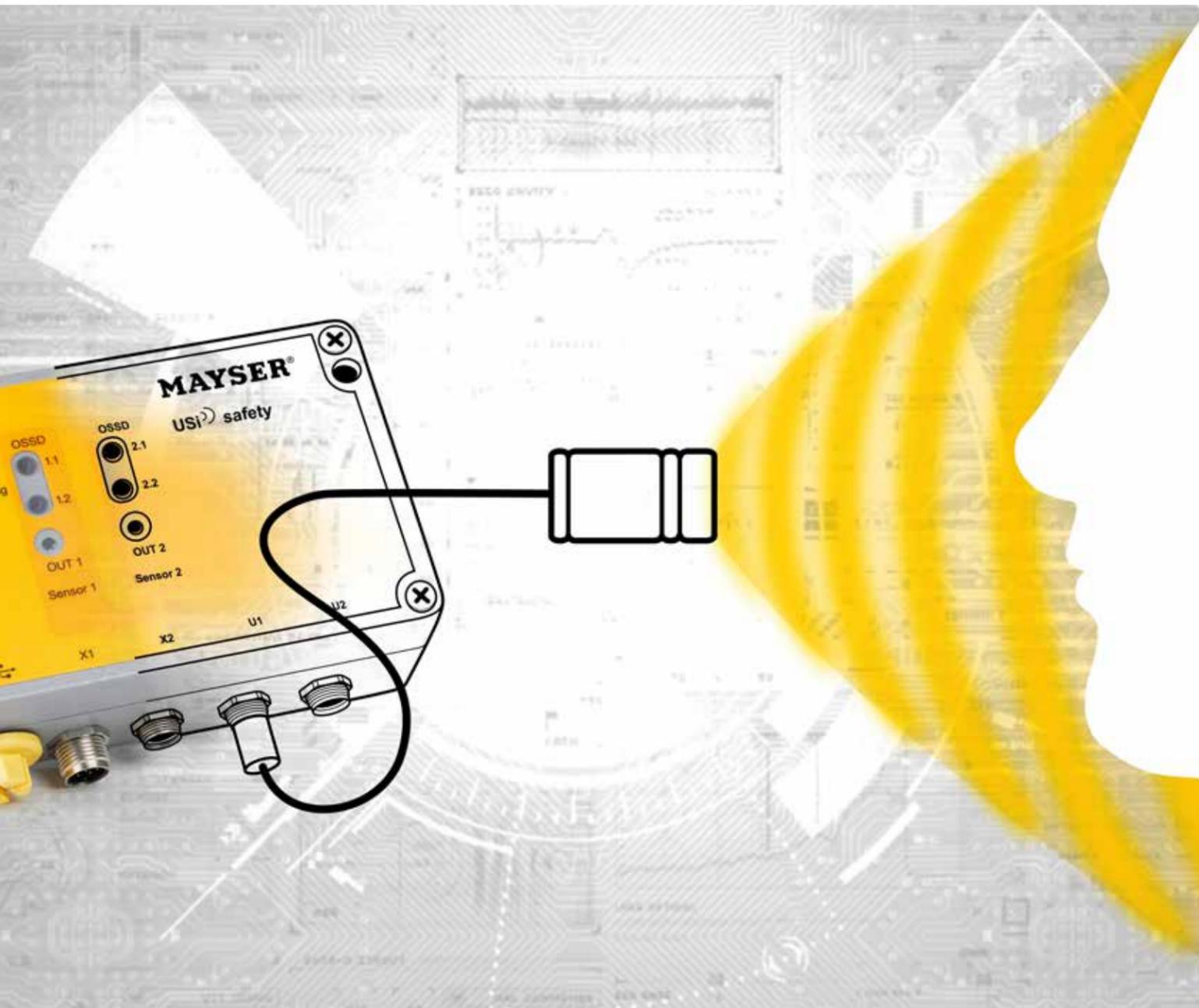


## 1 Ultrasonic sensors



Environment, access and area monitoring via ultrasound is the ideal solution for non-touch detection of persons and objects. If a person or object is detected in the monitored field, an au-

tomatic movement (robot, AGVS, machine) can be slowed or stopped. Even the smallest objects are reliably detected across the entire distance, regardless of material, form, transparency and color.



### Your benefits

- ✓ Non-touch monitoring of three-dimensional spaces
- ✓ Two very small ultrasonic transducers that can be positioned freely and separately from the electronics, and they will fit anywhere
- ✓ Reliably detects people but also objects made of various materials regardless of shape, transparency and color
- ✓ Insensitive to contamination, extraneous sound, air flows and moisture, and thus suitable for ambient surveillance, collision protection or access control
- ✓ Detects virtually without blind zone in an elliptical sound field ( $\pm 17^\circ$ ,  $\pm 5^\circ$ ) up to a distance of 2.50 meters
- ✓ A teach-in function allows the system to learn the complete measuring environment

### Additional advantages of ultrasonic safety

- ✓ Dual-channel system for personnel safety
- ✓ Certified according to ISO 13849-1, Category 3 PL d
- ✓ Unique development in the ultrasonic field

## Technical data

	Ultrasonic safety	Industrial ultrasonic sensor USi
		
Measuring principle	Ultrasonic pulse echo method	Ultrasonic pulse echo method
Applied standards	IEC 60947-5-2, IEC 60204-1	IEC 60947-5-2, IEC 60204-1
Safety category	EN ISO 13849, Category 3 PL d	
Operating temperature	-10 °C to +50 °C	-25 °C to +80 °C
IEC 60529: Degree of protection		
Evaluation unit	IP65	IP65
Sensor	IP69K	IP69K
Ultrasonic frequency	Typ. 103 kHz	103 kHz
Sound field geometry	±17° / ±5°	±17° / ±5°
Measurement frequency	33 Hz	Typ. 20 Hz (2 – 250 Hz)
Response time	Typ. 100 ms (for multiple scan 3)	Typ. 150 ms (3 – 500 ms)
Measurement distance	Typ. 200 cm (1 – 250 cm)	Typ. 2000 mm (10 – 2500 mm)
Resolution	1 cm	1 mm
Connection type	M12 plug-in connector	M12 plug-in connector
Connecting voltage $U_s$	DC 21 to 28 V	DC 15 to 30 V, reverse polarity protection
Input current	150 mA (evaluation unit with two ultrasonic transducers, with no output circuit)	Typ. 80 mA (40 to 150 mA)
Power consumption	max. 3.6 W	max. 2.5 W (without load)
OSSD outputs as <b>safe outputs</b>	2 OSSD per connected ultrasonic transducer results in 2 x 2 safe PNP semiconductor outputs, each with 150 mA, short-circuit-proof, cross-circuit monitored	
Outputs OUT as message outputs	1 output for each connected ultrasonic transducer, for 2 x 1 PNP semiconductor outputs, each with 150 mA	USi-PP: 4 x Power FET PNP USi-IP: 1 x 4 to 20 mA 3 x Power FET PNP USi-UP: 1 x 0 to 10 V 3 x Power FET PNP
Interface / software	USB 2.0	USB 2.0



## 2 Sensor profiles

The SP sensor profile series is specially designed for the requirements of the door and gate market. The design allows convenience of handling and offers a high degree of flexibility. In combination with different aluminum profiles and end caps, the DIY sensor profiles can be assembled and installed directly on site with ease to make functioning safety edges.



The sensor profiles provide protection against penetration of water in accordance with degree of protection IP67 – even as a DIY solution.

### Technical data

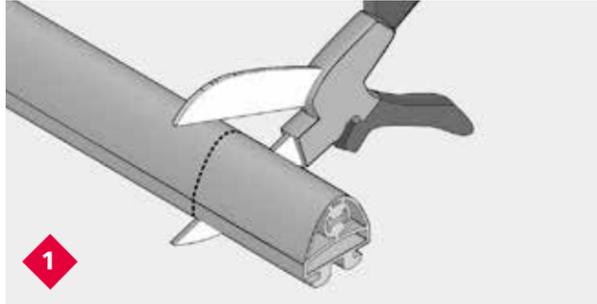
	Sensor profiles
Operating principle	Pressure-sensitive NO contact principle
Overall height	20 – 80 mm
Actuation angle	±45° to ±50°
DIY solution	•
Applied standards	EN 12978 ISO 13856-2 ISO 13849-1
Degree of protection	IP67
Operating temperature	min. -25 °C max. +55 °C
Actuating distance	6 – 8 mm
Rubber envelope profile	TPE

### Your benefits

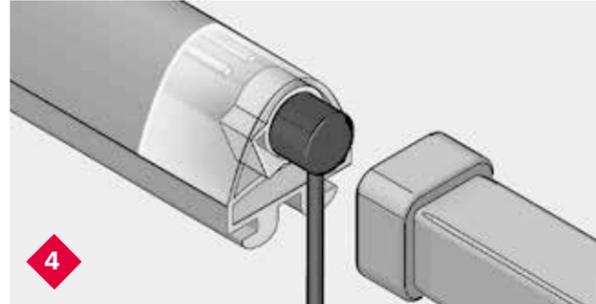
- ✓ High degree of protection (IP67)
- ✓ User-friendly design
- ✓ Fast switching behavior
- ✓ Pre-configured or DIY solution without gluing
- ✓ Testing basis: EN 12978, ISO 13849-1, ISO 13856-2
- ✓ Different mounting variants: snap-in foot, clip, T-foot
- ✓ Compliant according to UL 325



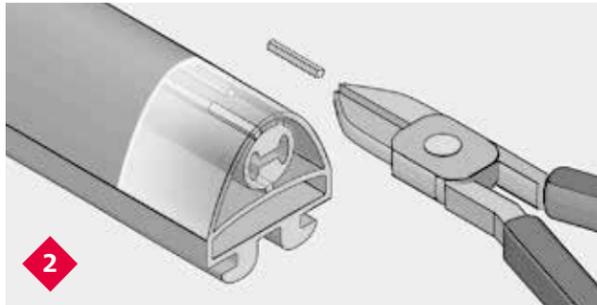
### 3 Sensor profiles: DIY Assembly



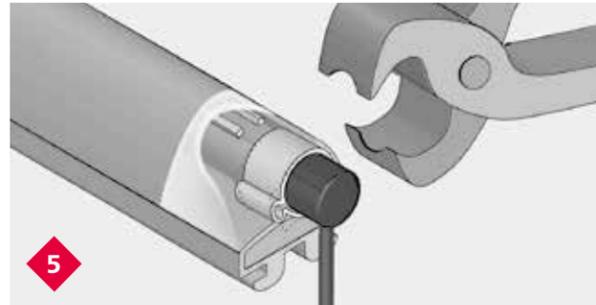
Cut off the contact profile using profile shears.



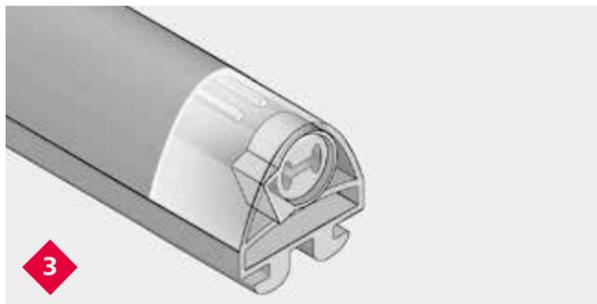
Press sealing plug onto the contact profile as far as it will go with the assembly tool.



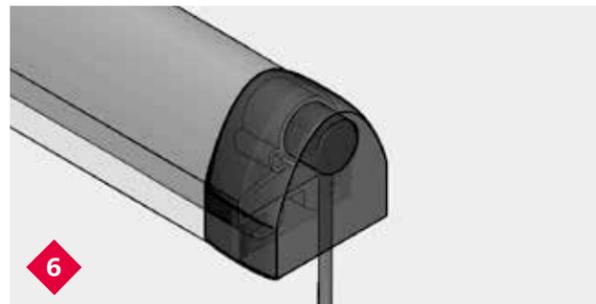
Make cuts in the webs to the outer contour and at the seams to the switching chamber and tear off the cut webs.



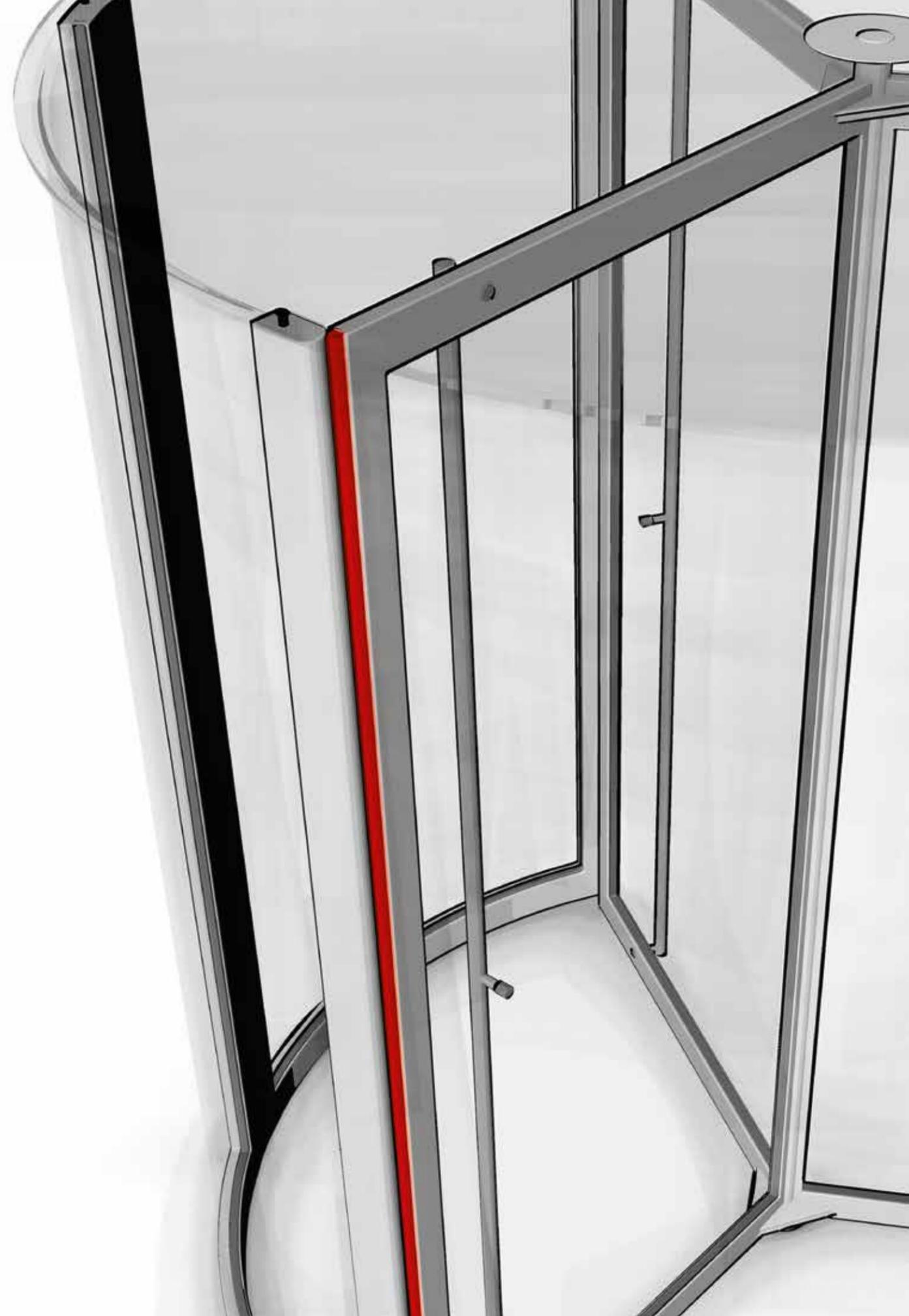
Place the vice-grip wrench on the lug and squeeze hard as far as possible.



Place the lug clamp on the switching chamber.



Install the end cap and the aluminum rail.



## 4 Safety edges

Safety edges are sensors that provide anti-pinch protection at pinching and shearing edges.

If the safety edge encounters an obstacle, a signal is sent that immediately stops the dangerous movement.

### Your benefits

- ✓ Diverse profile geometries
- ✓ Maintenance-free
- ✓ Customer-specific solutions possible
- ✓ Optimal solution for different installation heights
- ✓ High degree of protection (IP67)
- ✓ For systems up to Cat 3 PL d



### Technical data

	Safety edge
Operating principle	Pressure-sensitive Non-touch  NC contact and NO contact principle
Overall height	20 – 137 mm
Actuation angle	up to $\pm 45^\circ$
Applied standards	EN 12978 ISO 13849-1 ISO 13856-2
Degree of protection	IP67
Operating temperature	min. $-20^\circ\text{C}$ max. $+55^\circ\text{C}$
Actuating distance	8 – 17 mm
Rubber envelope profile	EPDM NBR CR
Custom adaptation	Bending radii Angled geometries Active ends

## 5 Miniature safety edges

We specially developed our miniature safety edges (EKS) for applications where short response times are required and only low installation heights are possible.

A classic example is their use as anti-pinch sensors on the shearing and pinching edges of automatic windows and doors in automobiles. However, our miniature safety edges are also ideal as anti-pinch sensors on machine construction, automated furniture, and modern medical devices.

### Your benefits

- ✓ Short response times
- ✓ Maintenance-free
- ✓ Customer-specific solutions possible
- ✓ Wide range of profile geometries
- ✓ High degree of protection (IP67)
- ✓ Full-service customer support: we provide in-house new development, prototype construction and testing and supply ready-for-production solutions
- ✓ Pre-assembly or DIY installation possible
- ✓ Compliant according to UL 325

### Technical data

	Miniature safety edge / anti-pinch sensor
Operating principle	Pressure-sensitive N/O switch principle
Overall height	4 – 16 mm
Actuation angle	up to $\pm 45^\circ$
DIY solution	•
Applied standards	ISO 13849-1 ISO 13856-2
6,75 mm	IP67
Operating temperature	min. $-25^\circ\text{C}$ max. $+80^\circ\text{C}$
Actuating distance	$\leq 1.0$ mm
Rubber envelope profile	TPE

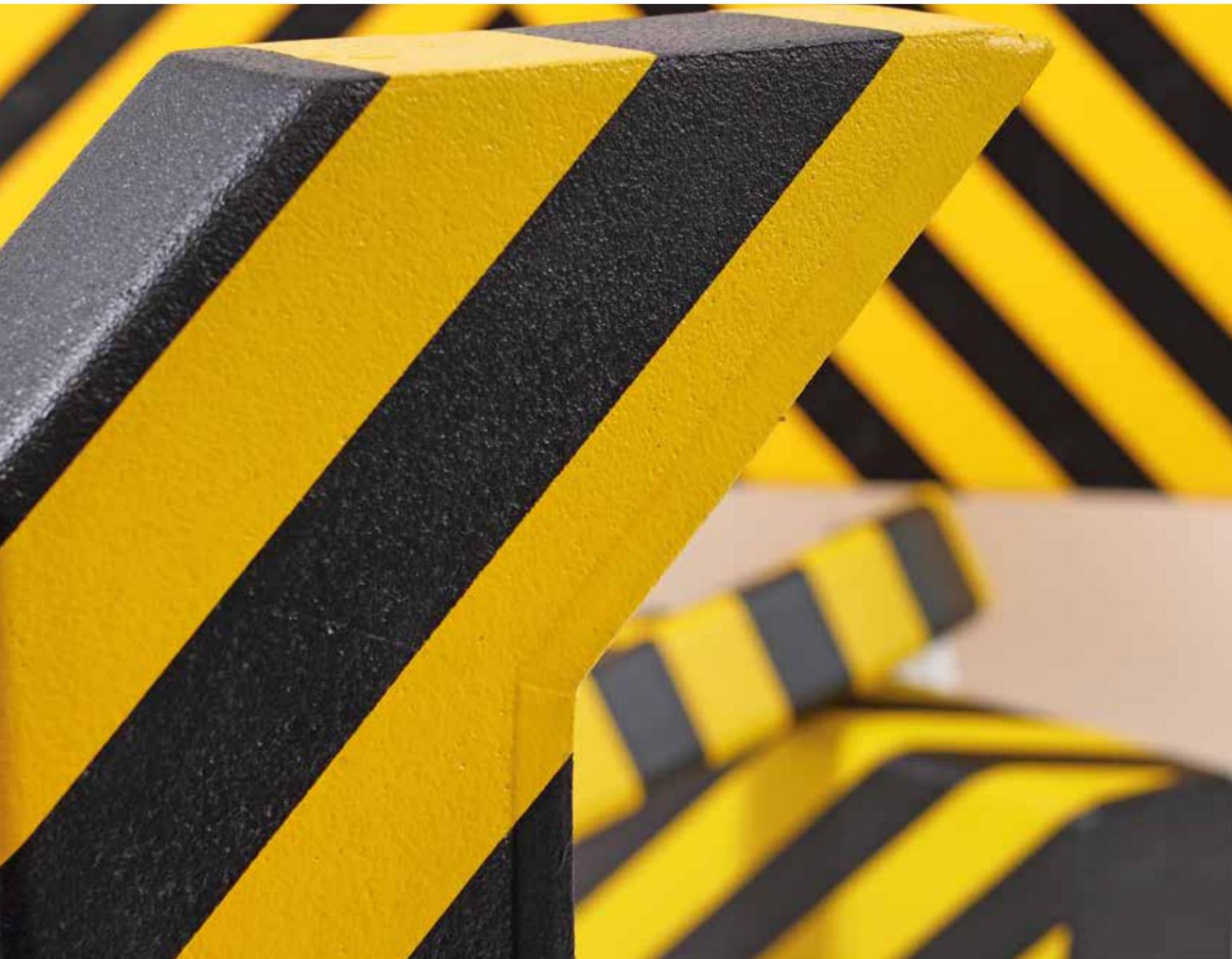


## 6 Safety bumpers

Safety bumpers protect people against machine components with long over travel distances, for instance in machining centers, AGVs, measuring machines and lifting platforms.

Safety bumpers thus expand the range in the collision protection system field.

Typical applications are protection in mechanical engineering, stage technology, medical technology and on large, heavy gates. Safety bumpers provide collision protection on automated guided vehicle systems (AGVS).



### Technical data

Operating principle	Pressure-sensitive (NC contact or NO contact principle)
Max. depth	
Standard version	400 mm
Bumpers based on drawings	1200 mm
Areas to be protected	Pinching and shearing edges Collision protection
Applied standards	ISO 13856-3 ISO 13849-1
Degree of protection	IP54 (up to IP 65 possible)
Operating temperature	-20 °C to +55 °C
Surfaces	PUR skin Polyester coverings Resistant against sparks during welding Synthetic leather
Chemical resistance (depending on the surface)	Diluted acids Alkaline solutions Cleaning products Lubricants Alcohol Disinfectants Bodily fluids Oils
Customer-specific adjustment options	Form Design Layout

### Your benefits

- ✓ High-quality materials and processing
- ✓ Customer-specific solutions
- ✓ All RAL colors possible
- ✓ Nearly all geometries possible
- ✓ Maintenance-free
- ✓ Safety bumpers adjust to various applications with their design, form and surface, regardless of external influences like weather or chemicals
- ✓ Optional fire resistance

## 7 Safety mats

Safety mats serve to detect a presence in dangerous movement areas, for instance on machines or in collaboratively used space with cobot applications.

The presence of humans or objects in the protected area slows or stops the movement of the machine or the robot.

### Technical data

	SM 15	SM 11	SM 8	TS
<b>General data</b>				
Height	15	11	8	11
Covering	GM1 GM4 GM5	2 component coating structured surface	rubber surface topping with molded ramp edge	rubber surface topping (+ molded logo)
Colors	black, green, yellow	black	black	black
<b>Functional data</b>				
Chemical resistance	+++	++	+	+
Degree of protection	IP65	IP65	IP65	IP65
Forms	variable	variable	standard sizes, rectangular	standard sizes, rectangular
Maximum size (single mat)	1.5 m <sup>2</sup>	1.5 m <sup>2</sup>	1.5 m <sup>2</sup>	1.6 m <sup>2</sup>
Structure of ramps	miter cut according to drawing	standard with corner joints, no drawing	molded profile	standard with corner joints, no drawing
Safety mat system	max. 10 per control unit	max. 10 per control unit	max. 10 per control unit	max. 10 per control unit
Applied standards	ISO 13856-1 ISO 13849-1	ISO 13856-1 ISO 13849-1	ISO 13856-1 ISO 13849-1	ISO 13856-1 ISO 13849-1
Operating principle	NO	NO	NO	NO
Terminal resistance	•	•	•	•
4 conductor connection	•	•	•	•
Slip protection	R9	R9	R9	R9
Special version	•	•		



### Your benefits

- ✓ Maintenance-free
- ✓ Robust construction
- ✓ Resistant to environmental influences and normal chemical influences
- ✓ Reliable functionality in dirty environmental conditions

[www.mayser.com](http://www.mayser.com)

**Mayser USA, Inc.**

6200 Schooner Drive  
Belleville, Michigan 48111  
USA

Phone: +1 734 858-1290  
[usa@mayser.com](mailto:usa@mayser.com)

**Mayser GmbH & Co. KG**

Bismarckstraße 2  
88161 Lindenberg  
GERMANY

Phone: +49 8381 507-0  
[info.lindenberg@mayser.com](mailto:info.lindenberg@mayser.com)

**Mayser France**

Les Aunettes  
12M Bd. Louise Michel  
91030 Evry Cedex  
FRANCE

Phone: +33 1 6077-3637  
[france@mayser.com](mailto:france@mayser.com)

**Mayser GmbH & Co. KG**

Örlinger Straße 1-3  
89073 Ulm  
GERMANY

Phone: +49 731 2061-0  
[info.ulm@mayser.com](mailto:info.ulm@mayser.com)

**Mayser Slovakia s.r.o.**

Gemerska 564  
04951 Brzotin  
SLOVAKIA

Phone: +421 58-7884870  
[roznava@mayser.com](mailto:roznava@mayser.com)

**Mayser Kunshan Co., Ltd.**

梅斯安全部件（昆山）有限公司  
No. 329, Jujin Road, Zhangpu Township,  
215321 Kunshan  
CHINA

[china@mayser.com](mailto:china@mayser.com)