MAYSER®

Innovative by tradition.

Aviation

Mayser makes ground handling safe.

Mayser makes ground handling safe.

The standards of the International Air Transport Association (IATA) for operational safety are stringent. Accidents during loading and unloading, parking, towing or servicing not only impair safety, but also result in high costs. That is why Mayser Safety Technology has a focus on ground handling vehicles and offers solutions for preventing accidents as well as support for drivers and service personnel.

Mayser has the right sensor solution for compliance with IATA regulations, in addition to many years of industry-wide experience. As a partner of the automotive industry Mayser cooperates with numerous well-known OEMs and also equips buses and rail vehicles, as well as AGV systems with reliable sensor technology. Sensors are also installed as standard equipment in ground support equipment (GSE) vehicles.

Pressure-sensitive and non-touch safety components are used:

- Ultrasonic sensors
- Safety bumpers
- Safety shoes
- Safety edges · Miniature safety edges · Sensor profiles

Our in-house development department creates custom-tailored solutions. The components of the safety systems can be used separately or in combination. In addition, retrofitting is no problem. Mayser is known for its high-quality products and sets new standards.

Table of contents

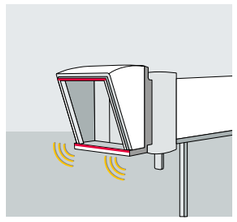
1 Areas of application

Our protection systems are used wherever moving objects pose a hazard that can result in human injury and material damage.

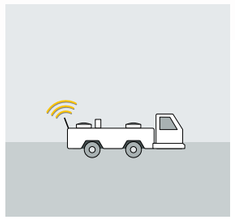
Pressure-sensitive and non-touch safety components from Mayser can be adapted to different zones; they detect and stop dangerous movements, reduce speeds and prevent damage in the event of contact.

- Proximity sensors between ground support equipment (GSE) and the aircraft
- Collision protection between objects and the aircraft
- Level control of platforms

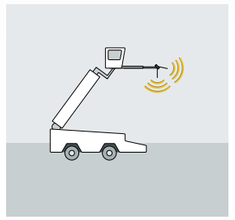
Our safety sensors can be used on all GSE vehicles.



Passenger bridges

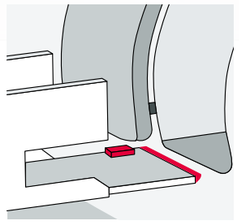


Toilet / water service vehicles



De-icer vehicles

Stairway vehicles



Level control

2 Our solutions

Mayser solutions can be used to fulfil all IATA requirements

Ultrasonic sensors

The ultrasonic industrial sensor USi® and Ultrasonic safety feature non-touch object detection for all materials, as well as distance measurement.

Safety bumpers

These pressure-sensitive sensors provide soft impact protection with long overtravel distances. They are used for example in lift and stairway vehicles.

Safety shoes

The safety shoe is designed for the level control of passenger boarding bridges, catering lift platforms and maintenance platforms, and prevents damage to aircraft doors.

Safety edges, miniature safety edges & sensor profiles

Safety edges send signals where low forces are applied. This ensures the safety of people and objects at shearing and pinching edges.

3 Ultrasonic sensors

Environment, distance and area monitoring via ultrasound is the ideal solution for non-touch detection of persons and objects. If an object is detected within the monitored area, a movement (from GSE units or ground servicing vehicles) can be slowed down or stopped. Even the smallest objects are reliably detected across the entire distance, regardless of material, form, transparency and colour.

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 colour
- ✓ Insensitive to contamination, extraneous sound, air flows and moisture, and thus suitable for ambient surveillance, collision protection or access control
- ✓ Detection without blind zone in an elliptical sound field (+/-17°, +/-5°) up to a distance of 2.50 meters
- ✓ 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

i Currently ultrasonic safety is the only ultrasonic sensor system that is certified in accordance with EN ISO 13849-1, Category 3 PL d.

Technical data

	Ultrasonic safety	**Industrial ultrasonic sensor USi®**
		
Measuring principle	Ultrasonic pulse echo method	Ultrasonic pulse echo method
Sensor	Enclosure 27 x 13 x 21 mm	Cable 1500 mm
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	
IEC 60529: Degree of protection Evaluation unit Sensor	 IP65 IP69K	 IP65 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)
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
OSSD outputs as **safe outputs**	2 OSSDs 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 OUT per connected ultrasonic transducer results in 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

4 Safety bumpers

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

The soft foam body prevents damage to objects with short and long stopping distances. Safety bumpers are used in the aviation industry to protect sensitive components made of pressure-sensitive materials in aircraft that could come into contact with GSE units.

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

The design, form and surface of safety bumpers can be adapted to the different areas of application.

Your benefits

- High-quality materials and craftsmanship
- Custom solutions
- All RAL colours possible
- Virtually 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

5 Safety shoes

The safety shoe is designed for level control in mobile ground handling platforms. Sinking of the aircraft during loading exerts force on the safety shoe. This causes a signal to be sent to the lift platform control system, which then lowers the platform until the level is compensated. The especially rugged construction makes the safety shoe ideal for use in harsh environments.

Technical data

Applied standard	ISO 13856-3
Actuation force	
Test stamp Ø 80mm	< 150 N
Effective actuation angle	90°
Actuation distance	< 5 mm
Overtravel distance	15 mm
ISO 13856: Reset function	none
ISO 13849-1: 2016	up to Category 3 PL d is possible
$MTTF_0$ (sensor)	381 a
B_{10D} (sensor)	2×10^6
Sensor size (W x H x D)	300 x 69 x 104 mm
with handle	450 x 99 x 104 mm
Weight	1.1 kg
IEC 60529: Degree of protection	IP67 with screwed plug connector
Operating temperature	–20 to +45 °C
Storage temperature	–20 to +45 °C
EN 60947 -5-1: Utilisation category	AC 15: 230 V / 1.5 A DC 13: 60 V / 0.5 A
Switching voltage (max.)	AC 230 V DC 60 V
Switching current (max.)	1.5 A 0.5 A
Constant current (max.)	8 A 8 A

Your benefits

- Robust construction
- Maintenance-free
- ISO 13849-1, Category 3 PL d can be achieved
- Reliable operation
- Flexible use in different vehicles

6 Safety edges · Miniature safety edges · Sensor profiles

Safety edges are sensors that provide anti-pinch protection at pinching and shearing edges.
If the safety edge encounters an obstacle, a signal is triggered that makes it possible to immediately stop the dangerous movement.

We offer complete in-house services from development to design all the way to series delivery.

Your benefits

- Diverse profile geometries
- Maintenance-free
- Custom-tailored solutions possible
- Optimal solution for different installation heights
- High degree of protection (IP67)
- Pre-assembly or DIY installation possible

Technical data

	Safety edge	Miniature safety edge / anti-pinch sensor	Sensor profile
Operating principle	Pressure-sensitive Non-touch	Pressure-sensitive	Pressure-sensitive
	NC contact and NO contact principle	NO contact principle	NO contact principle
Overall height	20 – 137 mm	4 – 16 mm	20 – 70 mm
Actuation angle	up to ±45°	up to ±45°	up to ±50 °
DIY solution		•	•
Applied standards	EN 12978 ISO 13849-1 ISO 13856-2	ISO 13849-1 ISO 13856-2	EN 12978 ISO 13856-2 ISO 13849-1
Degree of protection	IP67	IP67	IP67
Operating temperature	min. – 20 °C max. + 55 °C	min. – 25 °C max. + 80 °C	min. – 25 °C max. + 55 °C
Actuating distance	8 – 17 mm	≤ 1.0 mm	6 – 8 mm
Rubber envelope profile	EPDM NBR CR	TPE	TPE
Custom adaptation	Bending radii Angled geometries Active ends		

MAYSER®

Innovative by tradition.

www.mayser.com

Mayser GmbH & Co. KG
Bismarckstrasse 2
88161 Lindenberg
GERMANY

Phone: +49 8381 507-0
info.lindenberg@mayser.com

Mayser GmbH & Co. KG
Oerlinger Strasse 1–3
89073 Ulm
GERMANY

Phone: +49 731 2061-0
info.ulm@mayser.com

Mayser USA, Inc.
6200 Schooner Drive
48111 Belleville /
Michigan
USA

Phone: +1 734 858-1290
usa@mayser.com

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

Phone: +33 1 6077-3637
france@mayser.com

Mayser Slovakia s.r.o.
Gemerska 564
04951 Brzotin
SLOVAKIA

Phone: +421 58-7884870
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
P.R. OF CHINA

china@mayser.com

Foam Technology & Moulding **Safety Technology** **Headwear**

EN_V03_201901