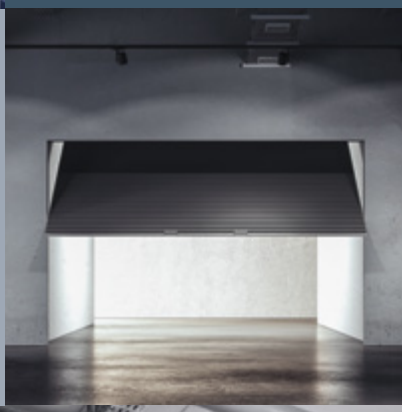
Product Overview for Entrance Automation



senso|tek®
Intelligent Sensor Solutions

PEPPERL+FUCHS

Find Your Perfect Device in Just a Few Clicks

Go online. Enter your requirements. Choose a sensor. The right solution for your application is just a few clicks away. If you have any questions, our experts will be happy to take your call.

Online Search in the Sensotek Webshop

Enter the series name in the search box in the webshop and you will be immediately taken to your product selection. The series name can be found in this brochure in the technical data extract.

Or you can browse through the product families and groups in our product world, where product selectors help you select the right device.

www.sensotek.com

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Industry-Specific Sensor Solutions for Increased Safety and Convenience

Escalators, automatic doors, gates, and elevators are an integral part of our daily lives. Powerful sensors are vital to their functionality and safety. With sophisticated technologies, extensive application expertise, and a high standard of quality, Pepperl+Fuchs and Sensotek offer the ideal sensor solution for each of these special application areas from a single source.

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PEPPERL+FUCHS

Pepperl+Fuchs and Sensotek— Partners in Entrance Automation

With a comprehensive portfolio as diverse as the field of entrance automation, sensors from Pepperl+Fuchs and Sensotek are suitable for a wide range of applications. From automatic doors and industrial gates to highly sensitive safety areas, different functional principles and future-oriented technologies make sure all applications can be implemented efficiently, reliably, and safely.

Pepperl+Fuchs

As a leader in industrial sensor technology and a pioneer in electrical explosion protection, Pepperl+Fuchs has been developing components and solutions for over 70 years. To achieve this, we work closely with our customers in a spirit of partnership, sharing not only our passion for the subject, but also our in-depth expertise and many years of experience.

When it comes to the safety and functionality of automatic door, gate, and barrier systems, reliable sensor technology from Pepperl+Fuchs is absolutely essential. Virtually no other supplier has as much technical experience and product diversity.

Sensotek

Within the Pepperl+Fuchs Group, Sensotek GmbH is a specialist in the field of entrance automation and covers both sales and service for sensory detection and monitoring systems. By maintaining close contact with the customer, Sensotek develops a true understanding of their needs and wishes and can use that knowledge as a basis for developing innovative sensor solutions for a wide range of applications in the door, gate, elevator, and traffic sectors.

A clear focus on this specific market segment also allows Sensotek to react flexibly to changing requirements. In addition to Sensotek's own products, their broad product offerings also include adaptations of existing sensors from the Pepperl+Fuchs Group.

Automatic Doors and Access Systems

Convenient and Safe Operation

Automatic doors and access systems open and close whenever passersby want to use entrances or exits. Automatic doors are equipped with intelligent sensor technology to ensure the safety of people at all times when opening and closing. They also offer some environmental advantages, because building owners can save on heating or air-conditioning costs, depending on the season.

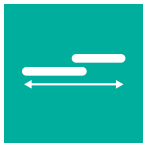
Swing Doors

Swing doors are most commonly used in entrance automation. They have a movable door panel, which is attached to the doorframe by two or more hinges. When opened, the swing door rotates on the hinges.

Revolving Doors

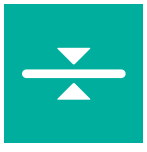
Modern revolving doors provide climatic separation, protect against cold and damp, and offer employees, delivery personnel, and visitors free access to the building. Automatic revolving doors detect a person, causing the door leaves to rotate at a constant speed. If the person stops, the door will then brake automatically.

Sliding Doors



Unlike conventional doors, a sliding door requires no rotational movement to open or close. Instead, the door opens automatically using a horizontal movement when a person moves toward it. If a person remains standing in the closing area, the door will not close.

Access Systems



Access systems are often found in the form of turnstiles in the entrance area of stations, museums, swimming pools, and airports. They are available in different versions depending on the application, safety requirements, and amount of foot traffic.

More information can be found at
www.sensotek.com/en/market-segments/automatic-doors

Opening—Radar

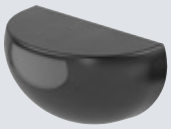
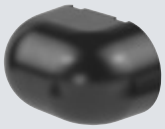
Reliable Detection of People and Vehicles

RMS-D-RC, RaDec-D, and RADAR RC

Sensors with integrated radar technology are used to detect moving objects. This makes them an ideal solution for generating opening pulses in doors and gates. There are two different radar sensors suitable for this: a compact opening pulse sensor from the **RMS-D-RC** series and a radar motion sensor from the **RaDec** series.

The **RMS-D-RC** features various configuration options, such as a slow-motion function for detecting extremely slow movements. Settings for direction recognition and cross-traffic suppression enable optimal adaptation to the detection task. An additional Radar-RC remote control enables convenient and precise programming of the radar motion detector for higher installation locations.

The **RaDec** radar motion sensor combines all the essential basic requirements in one compact device. In addition to convenient installation and operation, the configuration options of the device offer a high level of functionality for reliable motion detection of people or shopping carts.

Excerpt from Technical Data	RMS-D-RC	RaDec-D
		
Detection area	2 m × 4.5 m at installation height of 2.2 m and 30° inclination angle	2 m × 4.5 m at installation height of 2.2 m and 30° inclination angle
Installation height	Max. 4,000 mm	Max. 4,000 mm
Operating voltage	12 V AC ... 28 V AC, 12 V DC ... 36 V DC	12 V AC ... 28 V AC, 12 V DC ... 36 V DC
Switching type	Active/passive	Active/passive
Operating temperature	–20°C … 60°C (–4°F … 140°F)	–20°C … 60°C (–4°F … 140°F)
Dimensions	123 mm × 65 mm × 57 mm	101 mm × 60 mm × 59 mm

Swing doors

Revolving doors

Sliding doors

Highlights

RMS-D-RC

- Various configuration options for the functions
- Slow-motion function for detecting extremely slow movements
- Suitable for direction recognition and cross-traffic suppression
- Additional remote control available for programming from the ground

RaDec-D

- Cost-effective opening pulse sensor for standard applications
- Define and adjust the detection area by repositioning the antenna
- Optional inclined detection area
- Optional adjustable cross-traffic suppression for narrow shopping streets or pedestrian routes

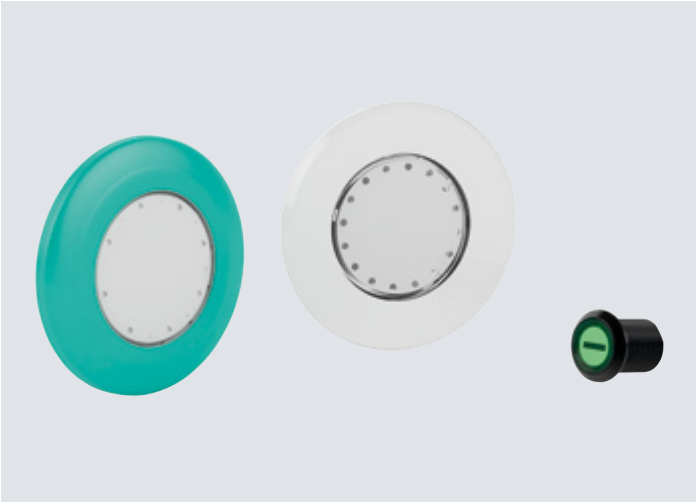
Comprehensive Functionality for a Wide Range of Requirement Profiles

With an intelligent range of functions, radar detectors from the RMS-D-RC series flexibly meet the most diverse requirement profiles. Cross-traffic suppression is especially well suited for use in narrow shopping streets and shopping arcades, where passersby are ignored and only those who move toward the door are detected. The direction recognition function triggers the opening pulse based on the direction of movement. The sensor can be set up to detect only movements coming toward or moving away from the sensor.

Slow-motion mode is an especially convenient solution that has proven useful in retirement homes and hospitals. Slower movements are reliably detected when the door is open or closed. When the door is open, it will remain open even if the person is moving through slowly. When closed, the door will open even if the speed of the approaching person would normally be too slow for detection by standard motion sensors.

Opening Pulse Sensor—Capacitive

Durable Opening Pulse Sensors



KTTA Capacitive Switches

Capacitive switches in the KTTA series are used as door-opening pulse sensors in building technology. These switches are actuated without force or pressure, and 16 integrated LEDs light up when actuated. The switch can be used with all programmable logic controllers due to the two push-pull outputs. The flat housing design, which is made of plastic or glass, features IP69K protection and is especially resistant to environmental influences, chemical solvents, and vandalism. Unlike mechanical switches, capacitive switches are completely maintenance-free and have an impressively long service life.

Excerpt from Technical Data	KTTA	M²2
		
Operating voltage	16.8 V DC ... 32 V DC	12 V DC ... 24 V DC
Dynamic output pulse	300 ms	300 ms
Operating temperature	–30°C ... +80°C	–30°C ... +80°C
Switching outputs	PNP/NPN or PNP	PNP
Degree of protection	IP69K	IP69K

Highlights

- Highly responsive
- Extremely durable compared to mechanical switches
- Vandalism-proof and extremely resistant to environmental influences
- Available in plastic and glass versions to meet high requirements for hygiene and design
- IP69K protection for all environmental conditions

Swing doors

Authentication and Opening—RFID

Secure Access Control with Maintenance-Free Technology

RFID Read Head and Tag

An RFID system consists of a reader and a tag, which are available in various designs including key rings, credit cards, and adhesive labels. Tags are often used for authentication purposes; people can gain access by holding a tag with relevant access rights in front of the RFID reader. The reader then processes the information stored on the tag and detects whether the person is authorized. Passive RFID tags are maintenance-free. Power is supplied via the field that is generated by the reader. Interface units allow an RFID system to communicate with a programmable logic controller (PLC) or other IT systems.

Excerpt from Technical Data	IQT1-FP-R4-V1 Reader	IQC22-C1 Tag
		
Operating frequency	13.56 MHz	13.56 MHz
Operating distance	0 mm … 130 mm	–
Interface	RS485	–
Connection	M12 × 1 connector	–
Degree of protection	IP67	IP67
Memory	–	2 kBit
UID	–	64–bit read-only code
Design	–	ISO check card

Highlights

- Identification and authentication of people for restricted areas
- Contactless use of tags for quick, maintenance-free access control
- Complete system solutions for various applications


Swing doors

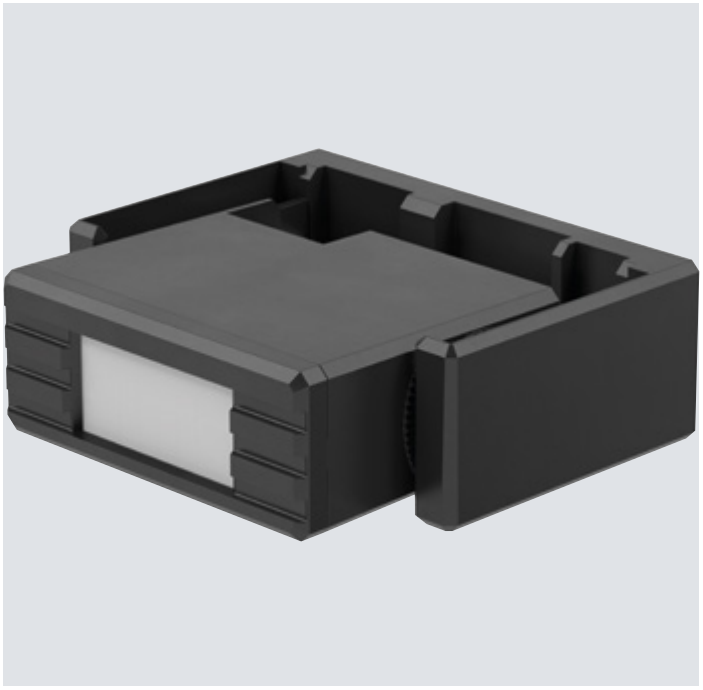

Revolving doors


Sliding doors


Access systems

Opening—Passive Infrared Sensor

Small Infrared Sensor for Confined Spaces



PIR

As one of the smallest sensors for human-presence detection, the PIR passive infrared sensor is used as an opening pulse sensor for automatic doors. Instead of an emitter element, it has a receiver element that reacts to heat radiation emitted from the human body in the form of infrared light. The sensor detects movement as soon as the temperature differential between an object and its environment is greater than ± 0.5°C. The sensing range can be precisely adjusted using the zoom setting and lens masks. The compact housing design means that the sensor can be installed in virtually all door situations. This ensures comprehensive monitoring for doors that close automatically.

Excerpt from Technical Data	PIR20/31 bw
Detection area	Max. 1,800 mm × 2,600 mm at an installation height of 2,500 mm
Operating voltage	12 V AC ... 24 V AC, 12 V DC ... 30 V DC
Effective detection range	Max. 12 m
Function indicator	Red LED: illuminates upon detection
Signal output	Relay, 1 changeover contact

Highlights

- One of the smallest passive infrared sensors for human-presence detection
- Sensitive receiver element reacts to human body heat
- Precise and continuous field adjustment for monitoring of the entire area
- Only functions with movement

Swing doors

Revolving doors

Opening and Security—Active Infrared Sensor

Precisely Adjustable Light Beam for Accurately Monitoring Closing Edges

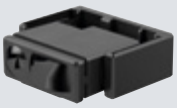
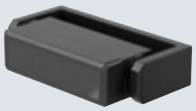
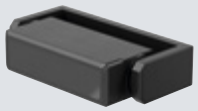
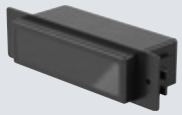
AIR

Active infrared sensors detect people and objects using short-wave infrared light according to the triangulation principle. Active infrared sensors in the **AIR20** series are especially well suited for monitoring closing edges or for use as opening pulse sensors. In addition, the exceptionally small dimensions allow for installation in almost all doors.

Single-beam active infrared sensors from the **AIR30** series feature excellent optical properties for monitoring the closing edges of various door systems such as swing doors and revolving doors. The finely bundled light beam can be precisely aligned to the area to be detected.

Highlights

- For monitoring leading edges and hinge edges, e.g., on swing doors and revolving doors
- Accurate beam alignment using a finely bundled light beam
- Various housing and mounting versions

Excerpt from Technical Data	AIR20-8-H-2200*	AIR30-8-H-2500*	AIR30-8-HW-2500*	AIR30-8-HW-2500*	AIR30/32-UP
					
Operating voltage	18 V AC … 28 V AC, 12 V DC … 30 V DC	11 V AC … 36 V AC, 10 V DC … 48 V DC	11 V AC … 36 V AC, 10 V DC … 48 V DC	11 V AC … 36 V AC, 10 V DC … 48 V DC	10 V DC … 30 V DC
Scanning range	Min.: 200 … 1,300 mm Max.: 200 … 2,200 mm	Min.: 55 … 1,000 mm Max.: 550 … 2,500 mm	Min.: 100 … 1,000 mm Max.: 100 … 2,500 mm	Min.: 100 … 1,000 mm Max.: 100 … 2,500 mm	Min.: 0 … 1,870 mm, default
Operating mode	Background suppression	Background suppression	Background evaluation	Background evaluation	Background evaluation
Function indicator	Red LED: illuminates when the output is active	Red LED: illuminates when the output is active	Red LED: illuminates when the output is active	Red LED: illuminates when the output is active	Red LED: illuminates when the output is active
Signal output	Relay, 1 changeover contact	Relay, 1 normally open	Relay, 1 normally open	Relay, 1 normally open	1 PNP output, short-circuit proof, protected against reverse polarity, open collector

Swing doors

Revolving doors

Sliding doors

Security—Active Infrared Sensor

Reliable Sensor Solution Certified According to SIL 2/PL d

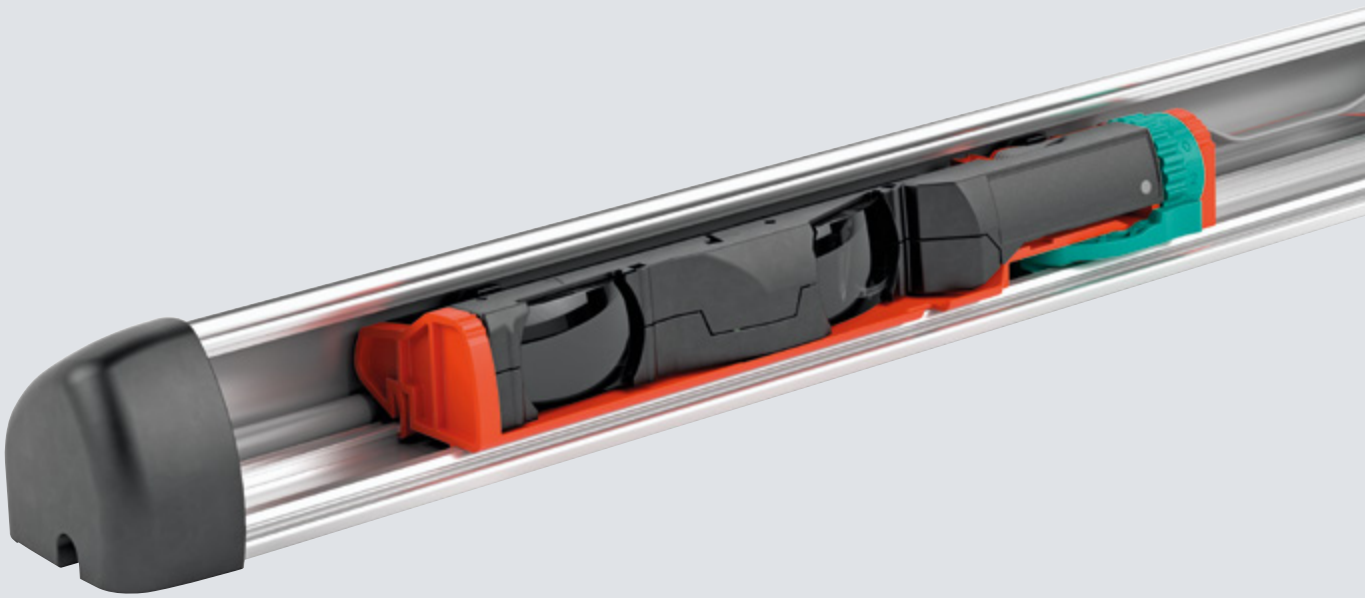
DoorScan® is a presence sensor that monitors the areas in front of and behind swing doors to protect people and objects from colliding with the door. The universal system ensures reliable detection and protection in every situation.

Standard-Compliant Door Protection

Intelligent wall suppression allows DoorScan® to provide complete protection up to the wall without sensor shutoff. Even environmental influences such as reflective walls, grating, and shiny stone panels do not affect its function in any way.

Teach buttons enable quick, user-friendly commissioning. The snap-in mechanism means the modules can be mounted in the sensor rail without any tools.

The sensor solution is certified according to DIN 18650/ EN 16005 and also has SIL 2 functional safety and PL d Machinery Directive approvals. The solution is available in two versions for door widths up to 1,200 m and 1,600 m.

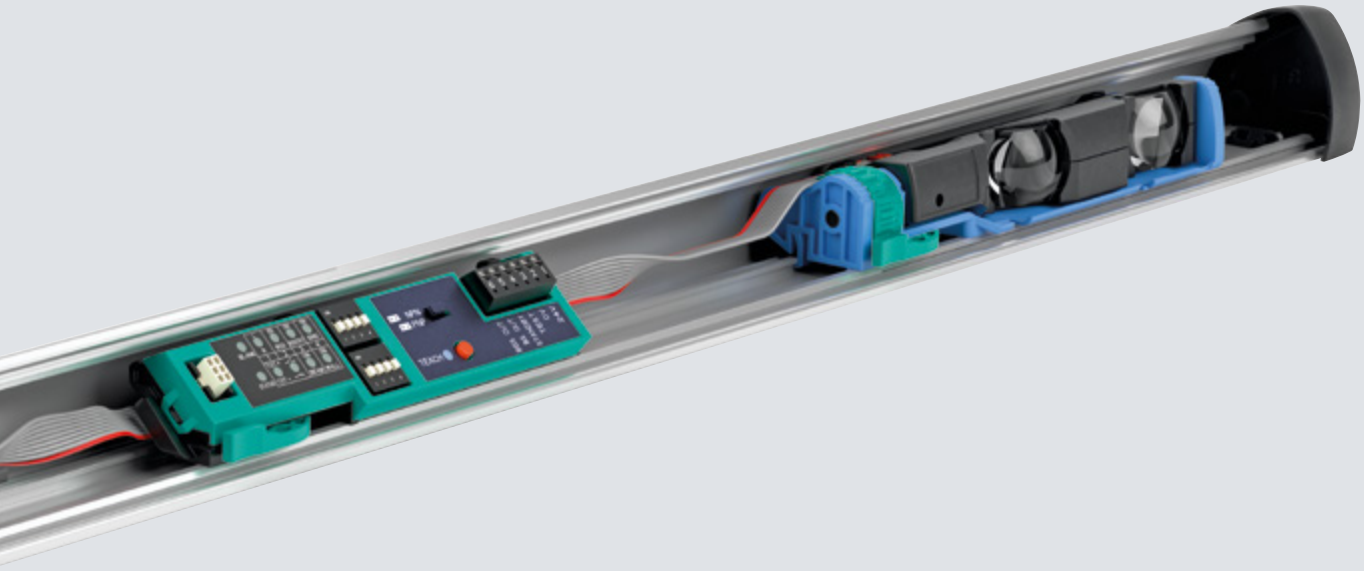


Excerpt from Technical Data	DoorScan-DS-2P-1200	DoorScan-OS-1P-1200
		
Operating voltage	24 V DC ±20%	24 V DC ±20%
Signal output	Switchable NPN or PNP, short-circuit proof	Switchable NPN or PNP, short-circuit proof
Scanning range	Min.: 0 mm … 1,500 mm Max.: 0 mm … 3,500 mm	Min.: 0 mm … 1,500 mm Max.: 0 mm … 3,500 mm
Operating mode	Background evaluation	Background evaluation
Response time	≤ 52 ms ≤ 200 ms in boost mode	≤ 52 ms ≤ 200 ms in boost mode

Accessories	
DoorScan Weather Cap L1200 **DoorScan Weather Cap L1600**	Weather-protective cover
DoorScan Transfer Loop **DoorScan Connection Cable p** **DoorScan Cable BE/BGS**	Connection cable
DoorScan-R **DoorScan-T** **DoorScan-I** **DoorScan Relay Module**	Additional sensor modules for individual configuration
DoorScan End Caps	End cap sets
DoorScan Profile L3000 5 pcs **DoorScan Cover L3000 5 pcs**	Sensor profiles
DoorScan Adapter **DoorScan Cable Adapter**	Adapter modules for individual configuration

Swing doors

Revolving doors



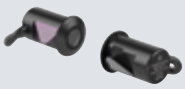
Security—Thru-Beam Sensors

Economical Solution with Outstanding Performance

BB10 and Y-Splitter

The single-beam miniature thru-beam sensors in the **BB10** series are especially easy to install in frames or profiles in doors and turnstiles. The plug-in housing simply snaps into a 13-mm bore without any tools. The small opening angle means there is no cross-talk when the especially powerful sensors are mounted in pairs. BB10 thru-beam sensors have a completely encapsulated sensor housing and are suitable for use in extremely cold regions with temperatures as low as –40 °C and in areas with large temperature fluctuations.

Additional **Y-splitters** are the ideal expansion solution for thru-beam sensors in barrier systems. They allow the logical AND operation of two digital sensor signals, which reduces installation costs and facilitates troubleshooting.

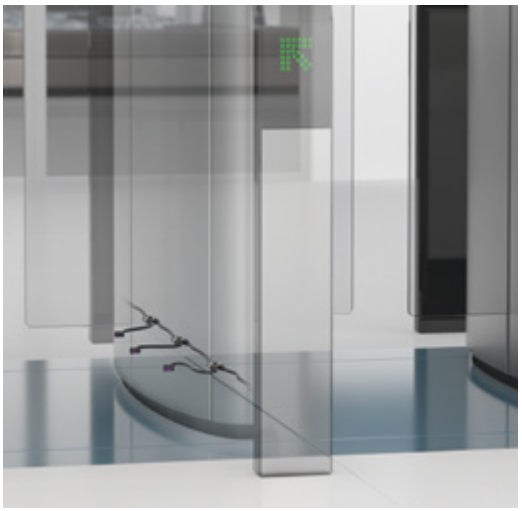
Excerpt from Technical Data	BB10	Y-Splitter
		
Effective detection range	0 m … 3 m	–
Operating voltage	10 V DC … 30 V DC	30 V AC/DC
Switching type	Light-on	–
Signal output	1 PNP output, short-circuit proof, protected against reverse polarity, open collector	–
Response time	5 ms	–

Highlights

- Mounting in pairs without the need to adjust the opening angle
- Narrow opening angle improves results in mass installation
- Suitable for use in harsh environments down to –40 °C

Plug-and-Play Solution for Complex Detection Applications

Installation in turnstiles requires several BB10 sensor pairs situated in various horizontal and vertical arrangements. The integrated systems are used for detecting and counting people, identifying baggage, and other detection tasks. Using thru-beam sensors from the BB10 series in combination with the Y-splitter enables various complex detection requirements to be met with comparatively little effort. The user-friendly installation as well as the plug-and-play connection of the Y-splitter enable simple construction of complicated detection geometries.



Security—Thru-Beam Sensors

Narrow Bar Sensors with a Wide Operating Angle

ML29 and ML30

Using adhesive strips or screws, the ML29 and ML30 series narrow miniature thru-beam sensors can be integrated into frames or door profiles, where they can quickly and reliably detect people and objects up to 6 meters away. A wide opening angle allows for easy alignment. Multiple light barriers can be mounted in a cross formation to offer multi-beam protection.

Excerpt from Technical Data	ML29	ML30
Effective detection range	0 m … 6 m	0 m … 6 m
Operating voltage	11 V DC … 30 V DC	10 V DC … 32 V DC
Switching type	Light-on/dark-on switching	Light-on
Signal output	PNP or NPN output, short-circuit proof, protected against reverse polarity, open collector	1 NPN output, short-circuit proof, protected against reverse polarity, open collector
Connection type	Plastic connector diameter 6.5 mm; 4-pin or fixed cable	6 m fixed cable

Highlights

- Single-beam monitoring with extremely narrow bar sensor
- Integrated circuit and IP65 or IP67 protection
- Testing for safe operation of door systems
- Ideal for installation in door profiles or frames for door locking and access control
- Cross mounting of multiple light barriers for multi-beam protection

Sliding doors

Security—Active Infrared Sensor

Especially Robust Diffuse Mode Sensors with a Large Sensing Range

LTK2

The LTK2 series of diffuse mode sensors are used in situations where people, objects, or vehicles have to be detected in a precisely defined area, such as monitoring the closing edges of industrial gates or automatic doors. They are especially robust and resistant to mechanical stress and have a very wide sensing range of up to 6 meters, which can be adjusted individually.

Excerpt from Technical Data	LTK2-8-HS-6000/31/115
Scanning range max.	0 mm ... 6,000 mm for background evaluation, 200 mm ... 6,000 mm for background suppression
Operating voltage	12 V AC ... 24 V AC, 11 V DC ... 48 V DC
Signal output	Relay, 1 changeover contact
Operating mode	Able to switch between background suppression/ background evaluation
Connection	5 m fixed cable

Highlights

- Detection of people and objects in precisely defined area
- Extremely robust and resistant to mechanical stresses
- Very large, individually adjustable sensing range up to 6 m
- Selectable operating mode: background suppression or background evaluation

Revolving doors

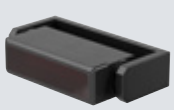
Security—Active Infrared Sensor

Fault-Free Operation in Demanding Environments

FLT8 and ProScan

The **FLT8** active infrared sensor detects people or objects within a defined detection field—regardless of their motion state and background.

As a compact energy scanner, the **ProScan** operates with its own infrared light source, which it uses to create a fan-shaped detection field. The beam intensifies toward the middle of the fan, so the area around the closing edges is monitored almost seamlessly. The detection area of the device can be individually adapted to the respective door width. The sensor automatically learns the contrast of the ground and detects changes caused by the presence of people or objects. High insensitivity to ambient light and long-term drift compensation guarantee long-term, error-free operation even in the event of contamination, rain, or snow.

Excerpt from Technical Data	ProScan/38a	FLT-8-HW-2800-50/25/31
		
Detection field	Full field: 2,300 mm × 80 mm	50 mm × 500 mm at 2,000 mm sensing range
Installation height	1,000 mm … 2,500 mm	Max. 2,800 mm
Operating voltage	12 V AC … 28 V AC, 12 V DC … 38 V DC	15 V AC/DC … 48 V AC/DC
Signal output	Relay, 1 changeover contact	Relay, 1 changeover contact
Degree of protection	IP52	IP65

Highlights

- Area scanner with large sensing range for the detection of people and objects
- Background referencing for reliable detection of objects that are difficult to detect

Revolving doors

Sliding doors

Security—Active Infrared Sensor

Reliable Presence Monitoring, Even in Difficult Conditions

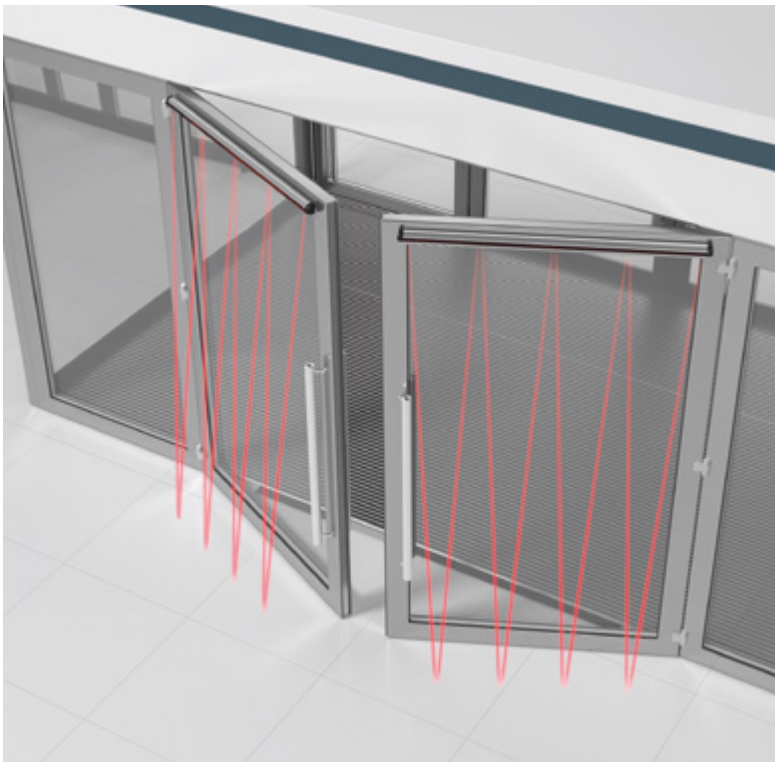
TopScan-S

The TopScan-S presence sensor uses an active infrared method with background evaluation and is used on automatic swing doors. It can be used in static mode, but is also suitable for moving installations. The integrated background evaluation ensures reliable operation even on irregular floor surfaces. Up to seven individually adjustable beams guarantee test body detection over the entire door width.

Highlights

- Can be configured for different door-leaf widths
- Category 2, tested and certified according to DIN 18650/EN 16005
- Modular design with primary and seconday sensors
- Individually adjustable beams

Excerpt from Technical Data	TopScan-S-M/L900
Scanning range	Min.: 0 mm … 1,500 mm Max.: 0 mm … 2,500 mm
Operating mode	Background evaluation
Operating voltage	24 V DC ±20%
Switching output	Relay, 1 changeover contact



Swing doors

Revolving doors

Flexibly Adjustable Combined Sensor with Automatic Teach-In Function

MotionScan

The MotionScan two-in-one sensor is able to cope with a high volume of people while reliably detecting and protecting each individual person. The 4 m by 4 m radar detection field detects approaching people early so that the door can be opened in time. At the same time, the large, flexibly adjustable infrared protection field provides the best possible protection to prevent people from colliding with the doors. The automatic teach-in function and a multicolored LED make the combination sensor especially user-friendly and simplify installation. MotionScan-P is equipped with a frequency output for emergency exit and escape route doors.

Excerpt from Technical Data	MotionScan	MotionScan-P
Installation height	2 m … 3.20 m	Max. 3,200 m
Operating voltage	12 V AC/DC … 24 V AC/DC ±10%	12 V AC … 24 V AC, 12 V DC … 24 V DC, ±10%, 50–60 Hz
Functional safety	PL d Cat. 2	PL d Cat. 2
Temperature range	–20°C … 60°C	–20°C … 60°C (–4°F … 140°F)
Degree of protection	IP54	IP54

Highlights

- Doors open promptly to provide unrestricted passage thanks to the 4 m by 4 m radar detection field
- Outstanding safety due to the large, flexibly adjustable infrared protection field
- Reliable functionality with a wide range of floor coverings
- Automatic teach-in function and multicolored LED make it easy to install and operate

Sliding doors

Impressive Functional Safety, Even with A High Volume of People

The MotionScan high-performance radar module is used as a pulse generator for opening automatic sliding doors. Within the large radar detection field of up to 4 m by 4 m, approaching people are quickly and reliably detected. This ensures unrestricted passage, even for large numbers of people at all times.

In order to avoid the dangers caused by closing movements, the active infrared sensor integrated in MotionScan ensures reliable protection of the leading edge. A total of three infrared beam units form the flexibly adjustable protection field, which starts up to 1.10 m in front of the door, allowing people to pass through safely. Whether high-gloss marble, stone tiles, or gratings—MotionScan provides total functional safety on all types of floor surfaces. The protection and detection fields, integrated direction recognition, and installation height of up to 3.2 m can all be adjusted, which allows the combined sensor to be flexibly used for a range of applications. The automatic teach-in function and installation instructions integrated in the sensor make assembly and commissioning quick and easy. The operating state is simply and clearly displayed via a multicolored LED.

Miniature Sensors for Installation in Confined Spaces

ML100 and GLV18-6

The **ML100** miniature retroreflective sensor impresses with its especially small housing design for use in confined spaces, as well as a functional display concept that indicates different operating states. The alignment and commissioning of the sensor is especially simple and user-friendly. This is made possible by the integrated PowerBeam LED with a light spot size that can be adjusted to the appropriate application. The ML100 series is especially suitable for applications requiring large detection ranges.

The robust and reliable **GLV18-6** product family is ideal for installation in gate frames and profiles. The retroreflective sensor is delivered with a mounting set and optimized potentiometer design that enables quick assembly and easy configuration.

Excerpt from Technical Data	ML100-6-IR/ 103/115	ML100-55/ 103/115	GLV18-6/ 115/120
			
Effective detection range	0 m … 5 m	0 m … 5 m	0 m … 6.5 m
Range limit	7 m	7 m	8 m
Operating voltage	10 V DC … 30 V DC	10 V DC … 30 V DC	10 V DC … 30 V DC
Signal output	1 PNP output, short-circuit proof, protected against reverse polarity, open collector	1 PNP output, short-circuit proof, protected against reverse polarity, open collector	2 PNP, complementary, short-circuit proof, open collectors
Connection	2 m fixed cable	2 m fixed cable	2 m fixed cable

Highlights

ML100
- Miniature design for installation in confined spaces
- Light-on/dark-on changeover switch
- Simple alignment and commissioning with ultrabright emitter LED with individually adjustable light spot

GLV18-6
- Short, sturdy plastic M18 housing
- Ideal for installation in gate frames or profiles
- Narrow, precise light spot

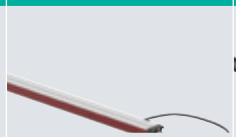
Monitoring—Thru-Beam Light Grid

Reliable Detection of People and Objects

LGS100 and AL3609.4

LGS100 series automation light grids with IO-Link interface are available with various beam spacings and field heights. The lightweight systems can be easily integrated into the environment and reliably detect people and objects.

The high-resolution **AL3609.4** elevator light grid is suitable for monitoring the closing edge with up to 174 beams. The beams are crossed so that even small objects can be easily detected. Objects can even be detected down to zero distance. The sensors are resistant to reflections and extraneous light and are supplied ready for connection with integrated electronics for level measurement.

Excerpt from Technical Data	LGS100	AL3609.4
		
Operating voltage	18 V DC ... 30 V DC	15 V DC ... 30 V DC
Effective detection range	Default: 0.3 m … 6 m	0 m … 4 m
Field height	Max. 3,000 mm	1,645 mm
Switching type	Default setting: dark-on, can be switched to light-on	Light-on/dark-on switching, programmable
Connection	Emitter: 200 mm connection cable with M12 × 1 plug, 4-pin Receiver: 200 mm connection cable with M12 × 1 plug, 8-pin	5-pin or 7-pin DIN plug and 2.5 m fixed cable

Highlights

- Light grid with integrated signal evaluation
- Reliable detection of people and objects
- Simple mounting and commissioning

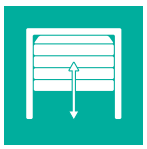
Access systems

Industrial Gates

Effective and Safe Operation

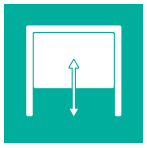
Highly functional indoor and outdoor automatic gates are an important means of optimizing complex operating procedures and critical logistics processes. Our sensor systems are tailored to the requirements of the respective field and all offer a high level of safety and convenience.

Sectional Doors



A sectional door is used for closing off halls or as a garage door. The door leaf is divided horizontally into several individual elements, or sections, and closes from top to bottom. Since sectional doors do not require a swivel area when opening and closing, the space is fully usable on the outside.

High-Speed Doors

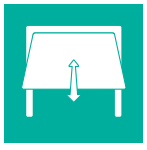


High-speed doors are a technical development of the sectional door and are predominantly used in the commercial and industrial sectors. The differences lie mainly in the design, which is geared to high running speeds and a large number of load changes.

Swing Gates

Swing gates open outward, meaning the entire internal surface can be utilized optimally. The gates can have one, two, or multiple leaves. Just like standard swing doors, the large leaves rotate around the lateral rotational axis, but in larger dimensions.

Tilt Doors



Tilt doors are one of the main types of garage door. They have a steel frame that swings outward when opened using a lever arm construction. The door wing of the up-and-over door consists of a single-wing, galvanized-steel sheet element, which usually features embossed stripes.

Sliding Gates

A sliding gate is a gate that is opened by sliding horizontally. Sliding gates that run along the floor move on a roller. This type of door is always used where the entrance area is especially wide and the installation of large, heavy leaves is difficult.

More information can be found at
www.sensotek.com/en/market-segments/industrial-gates

Innovative Vehicle Detection with Diagnostics Tool and App

LC20 with Diagnostics Tool

From scooters to trucks and trailers, the LC20 loop detector reliably detects a wide range of vehicle combinations using an induction loop installed in the ground. Even complex, multilane access-control systems can be installed quickly and easily due to automatic frequency selection. For applications in sensitive areas, the power-fail memory function ensures smooth operation. In the event of power failure, the sensor seamlessly detects the stored parameters as soon as the power supply is restored.

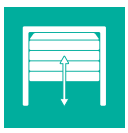
The diagnostic tool and the associated app are the ideal supplement to make documentation, fault repair, and commissioning of the loop detector especially easy. In addition to detailed fault diagnostics, the app also displays short-term changes and trends. This means users can get all the important information easily at a glance.

Excerpt from Technical Data	LC20-1-RB 12-24 V AC/DC	LC20-2-RB 12-24 V AC/DC	LC20-1-DR 230VAC	LC20-2-DR 230VAC
				
Number of channels	1	2	1	2
Operating voltage	12 V AC/DC … 24 V AC/DC	12 V AC/DC … 24 V AC/DC	230 V AC	230 V AC
Version with direction recognition	No	Yes	No	Yes
Connection	Plug–in base; 11-pin terminal connection	Plug–in base; 11-pin terminal connection	11-pin terminal connection	11-pin terminal connection
Operating temperature	–40°C … 70°C	–40°C … 70°C	–40°C … 70°C	–40°C … 70°C

Highlights

- Reliable detection of all vehicle combinations
- Diagnostics tool and diagnostics app: intuitive operation and simplified commissioning
- Automatic frequency selection and sensitivity adjustment allow for simplified commissioning, even under unfavorable conditions.

Swing gates



Sectional doors

High-speed doors

Opening and Authentication

Premium Technology in a Compact Housing Design

RFID

RFID-based access controls are used in a variety of areas. Examples include commercial parking space management, access to company premises, or controlled entry into gated communities where access is only permitted for authorized vehicles. When a vehicle with a built-in RFID tag approaches a gate with an RFID read/write head, the read/write head reads out the data from the tag and—if the tag has the relevant access rights—triggers the opening mechanism. This means that in access-controlled areas, access can be easily monitored and logged, and unauthorized access can be prevented.

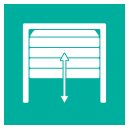
The compact design with integrated antenna allows optimal use of the RFID readers even in confined spaces. Pepperl+Fuchs offers RFID tags in a wide variety of designs that covers all areas of application.

Excerpt from Technical Data	IUH-F192-V1-FR1 Reader	IUT-F190-R4-V1-FR1-01 Reader
		
Operating frequency	865 MHz … 868 MHz	865 MHz … 868 MHz
Operating distance	Typ. 4 m	Typ. 2 m
Interface	RS232, RS485 via control interface	RS485
Degree of protection	IP67	IP67
Application	Long–range reader for connection to IC–KP2–1HRX–2V1 control interface	Small, compact unit including control interface

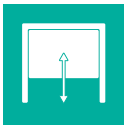
Highlights

- High level of flexibility for large detection ranges
- The UHF systems (865–928 MHz) from Pepperl+Fuchs are the perfect choice for all long-distance applications requiring large detection ranges of up to 6 meters
- Versions for connecting to control interfaces or compact versions with integrated control interface
- IDENTControl control interfaces have a robust, EMC-stable metal housing and support all standard RFID frequencies

Swing gates

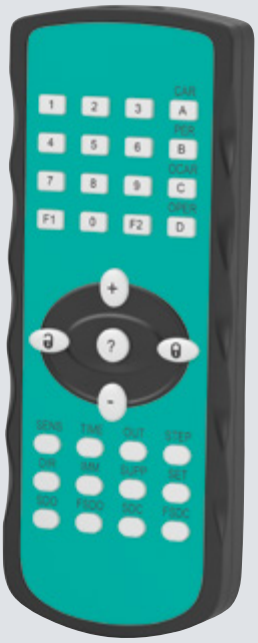


Sectional doors



High-speed doors

Opening
Robust Radar Motion Sensor with IP67



With IP67 protection, the RAVE radar motion sensor is the ideal gate opener for demanding automation tasks in especially harsh environments like rain, snow, vibrations, extraneous light, or temperature changes. The targeted door opening ensures optimized and efficient operating procedures at all times.

RAVE and RADAR RC

The RAVE radar motion sensor impresses with its extremely robust housing that features IP67 protection. This protection offers the opening pulse emitter a high level of immunity against any external environmental influences and thus guarantees impressive availability and safety in the application. Targeted gate opening enables differentiated detection of people and vehicles using two relays. This allows for regulated transport routes, energy savings, and optimized processes.

The installation concept of the RAVE radar motion detector consists of a bracket for easy mounting of the device and a detent for quick adjustment of the detection angle. Individual settings can be easily adjusted using the integrated push buttons or the radar RC remote control.

Highlights

RAVE

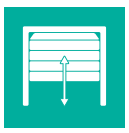
- Differentiated detection of people and vehicles, each with one output relay
- Cross-traffic suppression and rotation direction monitoring
- Simplified adjustment options via remote control or integrated push buttons
- 360° installation—can be easily mounted on the wall and ceiling. Housing and bracket can be used flexibly.

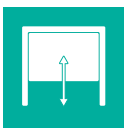
Radar RC Remote Control

- Simple operation of radar opening pulse sensors
- Practical design
- Convenient and precise adjustment of sensors with tall mounting heights of up to 7 meters
- Unidirectional operation

Excerpt from Technical Data	RAVE	Radar RC Remote Control
Sensing range	10 m × 7 m at installation height of 7 m and 45° inclination angle	–
Detection field angle	–90° ... +90° in 15° increments	–
Operating voltage	12 V AC ... 28 V AC, 12 V DC ... 36 V DC	Battery: 2× AAA/LR03 micro cells included
Installation height	Max. 7 m	–
Degree of protection	IP67	–

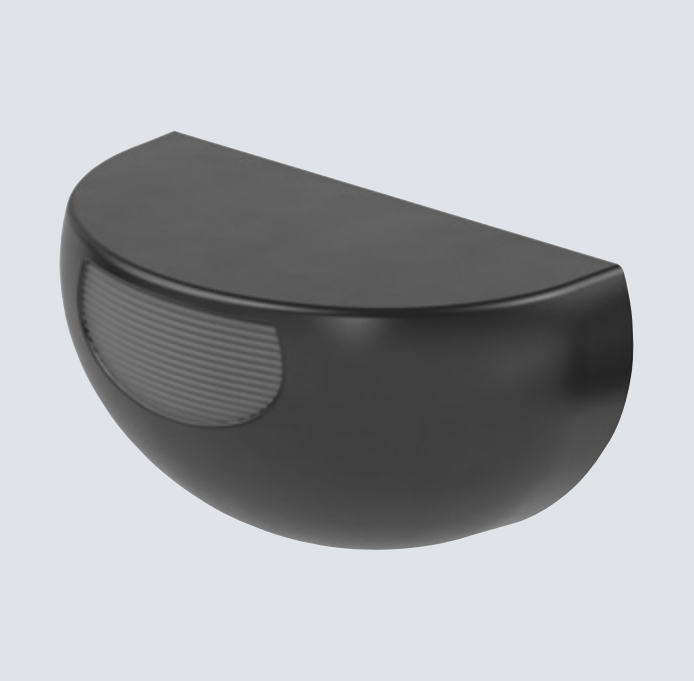

Swing gates


Sectional doors


High-speed doors

Opening

Reliable Control with a Long Detection Range



RMS-G Radar Sensor

The RMS-G-RC radar sensor enables reliable and flexible control of opening and closing operations on industrial gates and automatic doors up to a height of 7 m. The sensor uses two separate relay contact outputs to evaluate the movements of people and vehicles in different ways. It can therefore be configured so that the industrial gate only opens when a vehicle approaches it, while passing pedestrians are ignored.

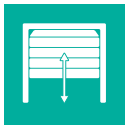
Various convenient settings such as direction recognition, sensitivity, and cross-traffic suppression can be adjusted both on the sensor and conveniently via remote control. A weather protection accessory for outdoor mounting rounds out the range of services.

Excerpt from Technical Data	RMS-G-RC
Sensing range	2,000 mm × 4,500 mm at an installation height of 2,200 mm
Detection speed	Min. 0.1 m/s
Operating voltage	12 V AC ... 28 V AC, 12 V DC ... 36 V DC
Signal output	Relay, 1 NO/NC
Installation height	Max. 4 m

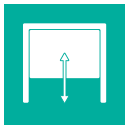
Highlights

- Premium radar motion sensor with intelligent additional functions
- Reliable motion detection of people and vehicles
- Direction recognition and cross-traffic suppression
- Easy adjustment of the detection field
- Version for programming with remote control

Swing gates



Sectional doors



High-speed doors

Distance Measurement
Reliable Gate Monitoring

R2000 Detection

The R2000 Detection offers precise measurement to the nearest millimeter, reliable monitoring, and guaranteed process reliability. With the best angular resolution of switching scanners of up to 0.071° and a measuring angle of 360°, the 2-D LiDAR sensor easily detects even the smallest objects in hazardous areas. Users can benefit from quick and easy commissioning. Intuitive software allows up to four freely definable fields of view to be adapted to the respective application in just a few steps—even for gate monitoring.

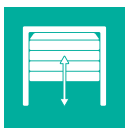
Since the highest point of a forklift can vary depending on the load, the R2000 Detection is mounted on the side of the gateway with the scanning layer just below the maximum clearance height. If a forklift passes the gate with the lift extended too high, the laser scanner detects this at an early stage and triggers an alarm.

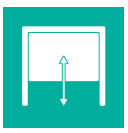
Highlights

- Detection of objects as small as 1 mm
- All-around visibility with 360° measuring angle
- Freely programmable fields of view
- Highly stable scanning layers
- Simple operation and quick commissioning

Excerpt from Technical Data	OBD10M-R2000*	OBD30M-R2000*
Measuring range	0.2 m ... 3 m (bw 10%) 0.2 m ... 10 m (wb 90%) 0.3 m ... 30 m (reflector)	0.1 m ... 10 m (bw 10%) 0.1 m ... 30 m (wb 90%) 0.1 m ... 30 m (reflector)
Laser class	1	1
Operating voltage	10 V DC ... 30 V DC	10 V DC ... 30 V DC
Object size	> 1 mm	> 1 mm
Degree of protection	IP65	IP65


Swing gates


Sectional doors


High-speed doors

Distance Measurement

Reliable Results with Impressive Flexibility

R2100

The R2100 shows its strengths to the fullest when complex tasks have to be solved under mechanically demanding loads. Since the 2-D LiDAR sensor works without moving parts such as bearings and motors, it can provide reliable measurement results even on moving or vibrating gate segments. When controlling the opening height of roller shutters, for example, the scanner determines the exact height of the approaching vehicle and only opens the shutter as much as necessary.

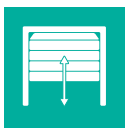
This offers users a considerable savings potential, because less heat energy escapes from the building. The R2100 thus makes a valuable contribution to increasing energy efficiency and conserving resources.

Excerpt from Technical Data	OMD8000-R2100-B16-2V15	OMD8000-R2100-R2-2V15
Measuring range	0.2 m ... 8 m	0.2 m ... 2 m (bw 6%) 0.2 m ... 8 m (wb 90%)
Light type	Infrared LEDs, modulated light, 850 nm	Infrared, modulated light, 850 nm
Scanning angle	88°	88°
Operating voltage	10 V DC ... 30 V DC	10 V DC ... 30 V DC
Degree of protection	IP67	IP67

Highlights

- Long service life due to measurement using LEDs
- 2-D measurement using 11 individual beams
- Large light spots tolerate different surface properties
- Reduced energy consumption for greater cost efficiency
- Eye-safe LED measuring system

Swing gates

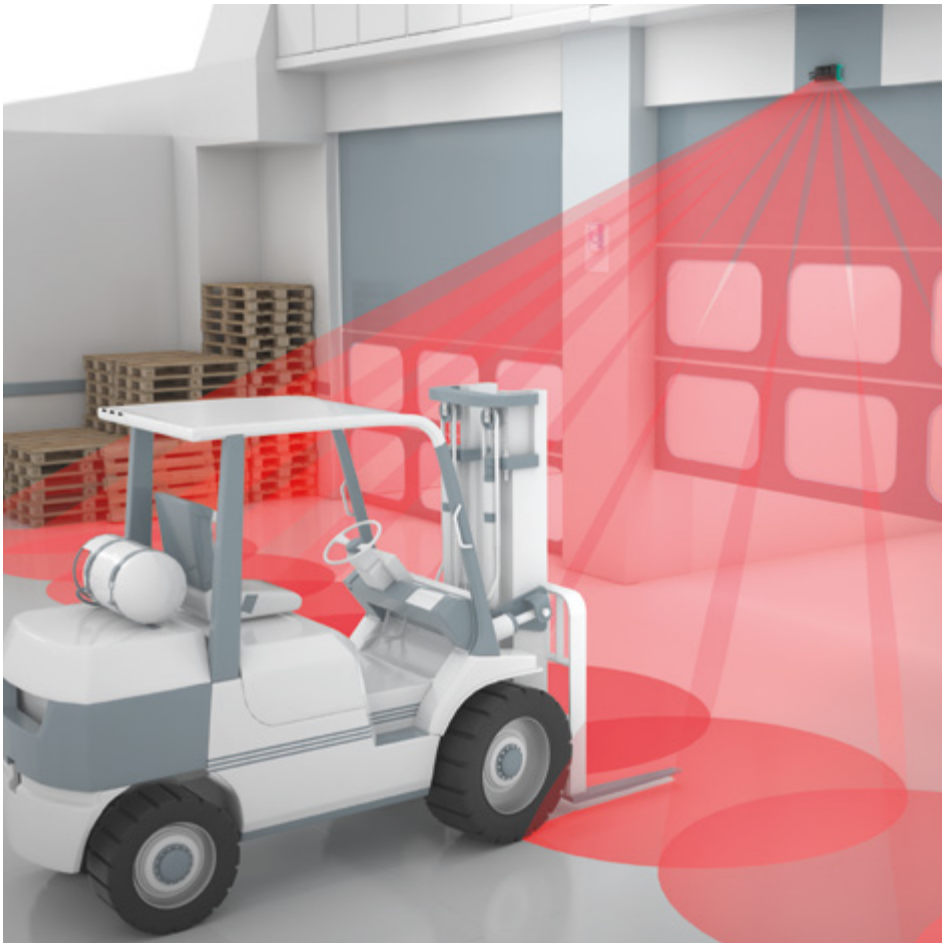


Sectional doors

High-speed doors

Sophisticated Technology for Demanding Applications

In addition to controlling the opening height of roller shutters, the R2100 is used as an opening pulse sensor on industrial doors. Here, the multi-ray LED Scanner monitors the presence of objects, people, or vehicles in front of the gate—regardless of their heat radiation and movement. When an object is detected, the gate control performs the opening operation. The robust sensor design guarantees reliable measurement results at all times.



Outstanding Safety with a Long Detection Range

SLCT Multi-Beam Safety Light Barriers

The SLCT series multi-beam safety light barriers offer the highest standards of quality and reliability for the protection of people and machines. They generate a two-dimensional protection field that transports infrared light beams from the emitter to the receiver. The distance of the individual light beams determines the minimum obstacle size, which is reliably detected over the entire protection field area.

Different resolutions and protection field heights from 100 mm up to 2,400 mm guarantee the best possible protection for fingers, hands, and people. In addition, users have more flexibility for various applications.

Excerpt from Technical Data	SLCT60-/35	SLCT90-/35
Resolution	60 mm	90 mm
Detection range	5 m ... 20 m	5 m ... 20 m
Protection field height	Max. 2,400 mm	Max. 2,400 mm
Operating voltage	24 V DC (–20%, +30%); power supply with safe isolation: 24 V DC	24 V DC (–20%, +30%); power supply with safe isolation: 24 V DC
Output circuit	PNP	PNP
Connection	Emitter: M12 × 1 connector plug, 4-pin Receiver: M12 × 1 connector plug, 8-pin	Emitter: M12 × 1 connector plug, 4-pin Receiver: M12 × 1 connector plug, 8-pin

Highlights

- Slim design and snap-on mounting bracket
- Long detection range of up to 20 m
- IP67 protection
- Temperature range from –35°C to +60°C
- TÜV-tested, self-testing, SIL 1 according to IEC 61508/IEC 61496-1 (type 2)

Swing gates

Security

Simple Commissioning without Wiring

BLS25 Thru-Beam Sensor

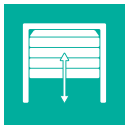
The BLS25 thru-beam sensor is suitable for protecting sliding gates and industrial gates, and for detecting the presence of people at automatic gates and barriers. The emitter is powered by just two AA/LR03 1.5 V batteries, which eliminates the need for overhead wiring. Commissioning is extremely simple. An adjustable optic allows the single-beam sensor to be flexibly aligned on uneven mounting surfaces. The infrared orientation is continuously adjustable both horizontally (-90°/+90°) and vertically (-5°/+5°).

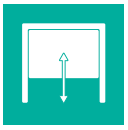
Excerpt from Technical Data	BLS25
Effective detection range	0 m … 15/30 m, adjustable
Operating voltage	12 V AC/DC … 24 V AC/DC Emitter: 2 × 1.5 V AA/LR03
Signal output	Relay
Light emitter	IRED
Temperature range	–20°C … 60°C

Highlights

- No cabling on the emitter at the gate
- Long detection range of up to 30 m
- High degree of immunity to extraneous light
- Especially flexible due to the adjustable optic


Swing gates


Sectional doors


High-speed doors


Tilt doors

Optimized for the Protection of Doors and Gates in Outdoor Areas

TLS-10 Gate Sensor

With outstanding immunity to extraneous light and IP67 protection, the TLS-10 gate sensors are the ideal solution for reliable detection both inside and outside. This includes the protection of industrial gates and the detection of people and vehicles at automatic doors and gates.

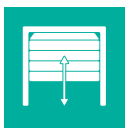
The robust plastic housing means that the thru-beam sensors are perfectly protected against mechanical influences and adverse environmental conditions such as rain and moisture. Plus, the devices can be installed in all types of doorframes.

Excerpt from Technical Data	TLS-10
Effective detection range	0 m ... 8 m
Operating voltage	10 V DC ... 30 V DC
Signal output	PNP
Connection	40 mm fixed cable
Degree of protection	IP67

Highlights

- For indoor and outdoor applications
- Integrated analyzer and test input
- High protection and immunity to extraneous light
- Narrow opening angle


Swing gates

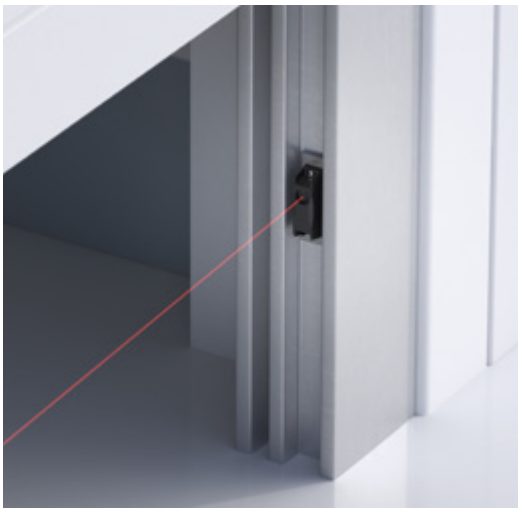

Sectional doors

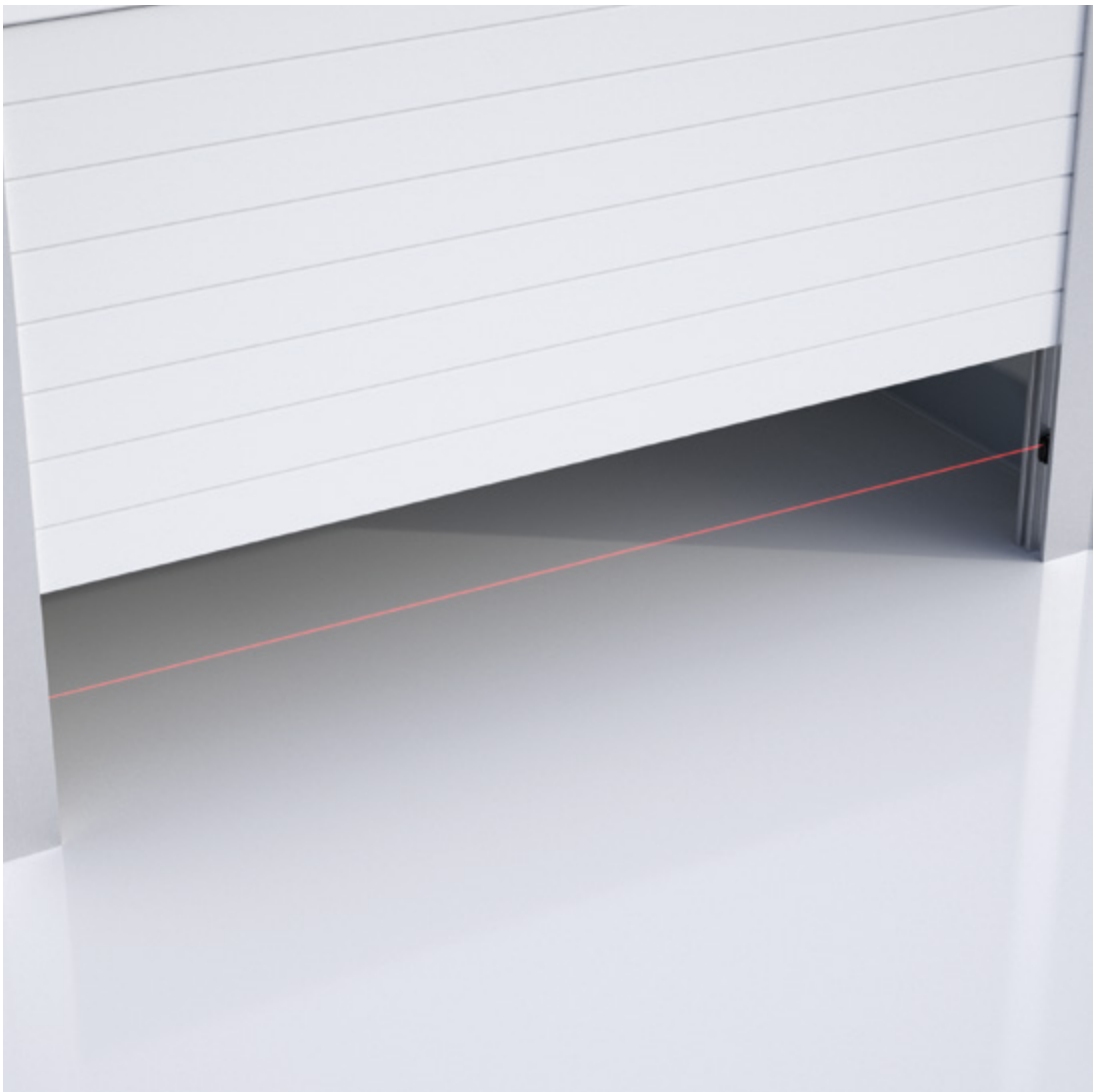

High-speed doors


Tilt doors

Handles A Wide Range of Protection Tasks with Ease

The TLS-10 has been specially developed for applications on gates and turnstiles. The plug-in housing requires little installation space and does not require a mounting bracket. The integrated control interface and switching unit mean no additional electronics are required. A test input enables a wide range of protection tasks to be integrated easily and in line with the standards. They can be combined with tactile edges from Sensotek to offer users optimal closing edge protection.





Impressive Reliability in Near-Range Applications

RL80 and RL81

Retroreflective sensors from the RL80 and RL81 series are characterized by their extreme detection reliability on reflective surfaces in the near range. These features offer reliable detection of vehicles or people passing in the immediate vicinity of the sensor. This eliminates switching faults and unintentional opening of gates and barriers. Both series are suitable for indoor or outdoor use.

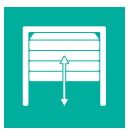
The RL80 series offers a sophisticated sensor design for side and front mounting on metal or concrete columns. This results in a highly flexible adjustment functionality with a mechanical rotation adjustment of 360° horizontally and ±2° vertically.

Excerpt from Technical Data	RL80	RL81
		
Effective detection range	0 m … 12 m	0 m … 12 m on REF–H88x50 reflector
Operating voltage	12 V AC/DC … 24 V AC/DC	12 V AC/DC … 24 V AC/DC
Signal output	Relay	Relay
Temperature range	–30°C … 60°C	–30°C … 60°C
Degree of protection	IP65	IP65

Highlights

- Detection reliability in the near range even on reflective surfaces
- Long-term sealing due to the high IP65 protection
- Side and front mounting on metal or concrete columns

Swing gates



Sectional doors

High-speed doors

Tilt doors

Security

Proven Technology in a Compact Housing

R300 Diffuse Mode Sensor

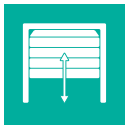
The versatile R300 product range is based on the proven pulse ranging technology (PRT) and guarantees total reliability in object detection and immunity to extraneous light and cross-talk. Equipped with an eye-safe red light as standard, the alignment of the devices is especially easy even in large working areas. The compact sensor series with large sensing and detection range has a simple operating concept.

Excerpt from Technical Data	R300
Sensing range	Max. 8 m on white background (2 m on black)
Operating voltage	10 V DC ... 30 V DC
Output	2 push-pull outputs, complementary
Connection	M12 connector plug, 4-pin (V1)
Light type	Red light, laser class 1M

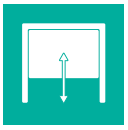
Highlights

- Large sensing ranges and minimum BW difference
- Fully reliable background suppression
- Multiple switching points and operating modes in one device
- Size of light spot corresponds to the standard sensors

Swing gates

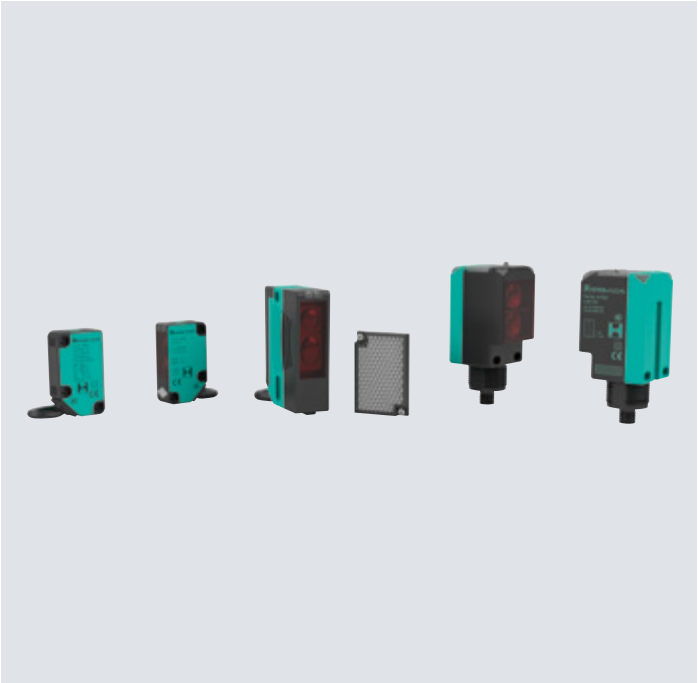


Sectional doors



High-speed doors

Three Robust Series for Outdoor Use



29 Series

Long detection ranges, insensitivity to ambient light, and IP67 protection all enable the thru-beam and retroreflective sensors from the 29 series to reliably carry out monitoring tasks even in harsh environments. Several mounting options simplify installation in various applications.

31 Series

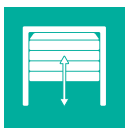
Thru-beam and retroreflective sensors from series 31 are the perfect solution for the safe detection of people, objects, and vehicles in applications requiring space-saving installation. A low housing depth and matching accessories, including reflector and fixed cable, mean that installation is easy by hand.

61 Series

The thru-beam and retroreflective sensors in series 61 have an especially robust and waterproof housing designed for a very high temperature range. Adjustable timer functions and operating modes and the individual adjustment of sensitivity and sensing ranges offer users greater flexibility for their tasks.

Excerpt from Technical Data	RLK29	LA29/LK29	RLK31	LA31/LK31	RLK61	LA61/LK61
						
Effective detection range	0 m … 12 m	0 m … 65 m	0 m … 9 m	0 m … 30 m	0 m … 18 m	0 m … 60 m
Switching type	Light-on	Light-on/dark-on switching, switchable	Light-on	Light-on	Light-on/dark-on switching, switchable	Light-on/dark-on switching, switchable
Operating voltage	24 V AC/DC … 230 V AC/DC	12 V AC/DC … 240 V AC/DC	24 V AC … 240 V AC 12 V DC … 240 V DC	24 V AC … 240 V AC 12 V DC … 240 V DC	24 V AC … 240 V AC 12 V DC … 240 V DC	24 V AC … 240 V AC 12 V DC … 240 V DC
Signal output	Relay, 1 changeover contact	Relay, 1 changeover contact	Relay, 1 changeover contact	Relay, 1 changeover contact	1 SPDT	1 SPDT
Connection	Terminal compartment	Terminal compartment	2 m fixed cable	2 m fixed cable	2 m fixed cable	7/8"–16 UN connector plug


Swing gates


Sectional doors


High-speed doors


Tilt doors

Security

Four Series for Easy Installation

28 Series

Numerous product features including a timer function, light/dark switch, individual sensitivity adjustments and ultra-bright LEDs as alignment aids make operation of the 28 series incredibly simple. The waterproof plastic housing with IP67 protection and scratch-resistant lens cover make the thru-beam and retroreflective sensors especially robust.

ML17 Series

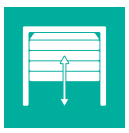
A miniature design makes thru-beam and retroreflective sensors from the ML17 series ideal for applications requiring absolute precision in the smallest possible space. In addition to a wide range of connection and mounting options, the standard mounting variation uses M4 screws on the M18 threaded insert. A quick-release clamping device simplifies the mounting process.

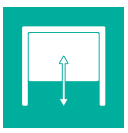
GLV18 and GD18/GV18 Series

The GLV18 and GD18/GV18 photoelectronic sensors offer an impressively large detection range, four LEDs for 360° visibility, and the detection of clear, reflective, or dark objects. The included mounting set and the optimized potentiometer design ensure quick assembly and easy configuration.

Excerpt from Technical Data	RLK28	ML17	GLV18	GD18/GV18
				
Effective detection range	0 m … 17 m	0 m … 3.5 m	0 m … 4 m	0 m … 20 m
Operating voltage	12 V AC/DC … 240 V AC/DC	10 V DC … 30 V DC	10 V DC … 30 V DC	10 V DC … 30 V DC
Switching type	Light-on/dark-on switching, switchable	Light-on/dark-on switching	Light-on/dark-on switching	Light-on/dark-on switching
Signal output	Relay, 1 changeover contact	2 push-pull outputs, short-circuit proof, reverse polarity protected, surge protector	2 PNP, complementary, short-circuit proof, open collectors	2 PNP, complementary, short-circuit proof, open collectors
Connection	Terminal compartment	2 m fixed cable	2 m fixed cable	2 m fixed cable


Swing gates


Sectional doors


High-speed doors


Tilt doors

Extremely Robust and Durable

LT2 and LTK2

Diffuse mode sensors from the LT2 and LTK2 series are the perfect choice for detecting people, objects, or vehicles in a clearly defined area. The sensors are extremely robust and resistant to mechanical stress, and operation is not influenced by the properties of the ground surface.

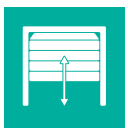
In background suppression mode, objects outside the sensing range are ignored. In background evaluation mode, the background surface is used as the reference surface. Even mirrored or highly reflective objects can be reliably detected.

Highlights

- Precision sensor for long sensing ranges up to 6 m
- Mechanically adjustable sensing range
- Adjustable timer functions
- Available in DC or AC versions

Excerpt from Technical Data	LT2-8-HS-6000/47/115	LT2-8-HS-6000/47/105	LTK2-8-HS-6000/31/115	LTK2-8-HS-6000/31/105
Scanning range max.	0 mm ... 6,000 mm for background evaluation, 200 mm ... 600 mm for background suppression	0 mm ... 6,000 mm for background evaluation, 200 mm ... 6000 mm for background suppression	0 mm ... 6,000 mm for background evaluation, 200 mm ... 6000 mm for background suppression	0 mm ... 6,000 mm for background evaluation, 200 mm ... 6000 mm for background suppression
Operating mode	Able to switch between background suppression/ background evaluation	Programmable light-on/ dark-on switching	Able to switch between background suppression/ background evaluation	Able to switch between background suppression/ background evaluation
Operating voltage	15 V DC ... 35 V DC	15 V DC ... 35 V DC	12 V AC ... 24 V AC, 11 V DC ... 48 V DC	12 V AC ... 24 V AC, 11 V DC ... 48 V DC
Signal output	2 PNP, complementary, short-circuit proof, open collectors	2 PNP, complementary, short-circuit proof, open collectors	Relay, 1 changeover contact	Relay, 1 changeover contact
Connection	5 m fixed cable	M12 plastic connector, 5-pin, without cable	5 m fixed cable	M12 plastic connector, 5-pin, without cable

Swing gates



Sectional doors

High-speed doors

Security

Proven Safety Components for Total Protection

Tactile Edges

Safety contact edges are used to secure closing edges on gates and provide complete protection for people and objects. A safety system consists of an external safety control unit and a freely configurable, pressure-sensitive rubber profile.

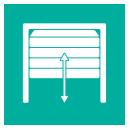
If the profile is deformed by external pressure, its cross section is reduced and the switching device responds. This allows protection up to performance level e, category 4 according to EN ISO 13849 to be implemented, and the highest safety standards can be met.

Excerpt from Technical Data	SE 35.55 End Edge	SE 35.55 Li Serial Edge
Actuating force	46.8 N	46.8 N
Pretravel	3.8 mm	3.8 mm
Overtravel to 400 N	31.4 mm	31.4 mm
Outer shell	TPE	TPE
Mounting profile	Aluminum	Aluminum

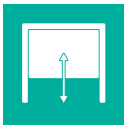
Highlights

- Preconfigured or freely adjustable
- Millimeter-precise customization
- Large overtravel
- Quick switching
- Protection up to performance level e, category 4 according to EN ISO 13849

Swing gates



Sectional doors



High-speed doors

End-Position Switch-Off

Safe Switching with Proven Technology

SJ15 and SJ30

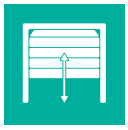
Inductive proximity sensors are a wear-free solution for the safe, noncontact detection of metallic objects. Slot sensors in the SJ15 and SJ30 series are an especially popular solution for end-position shut-off on gates. If a metallic object enters the measuring field of two opposite coils, this is detected and triggers a switching signal. An easy-to-attach metal bracket acts as an actuator element. The inductive slot sensors are available as a type-tested safety component.

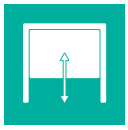
Excerpt from Technical Data	SJ15	SJ30
		
Slot width	15 mm	30 mm
Immersion depth (side)	17 mm ... 20 mm	27 mm ... 31 mm
Operating voltage	10 V DC ... 30 V DC	10 V DC ... 30 V DC
Connection type	PVC cable, 2 m	PVC cable, 2 m
Degree of protection	IP67	IP67

Highlights

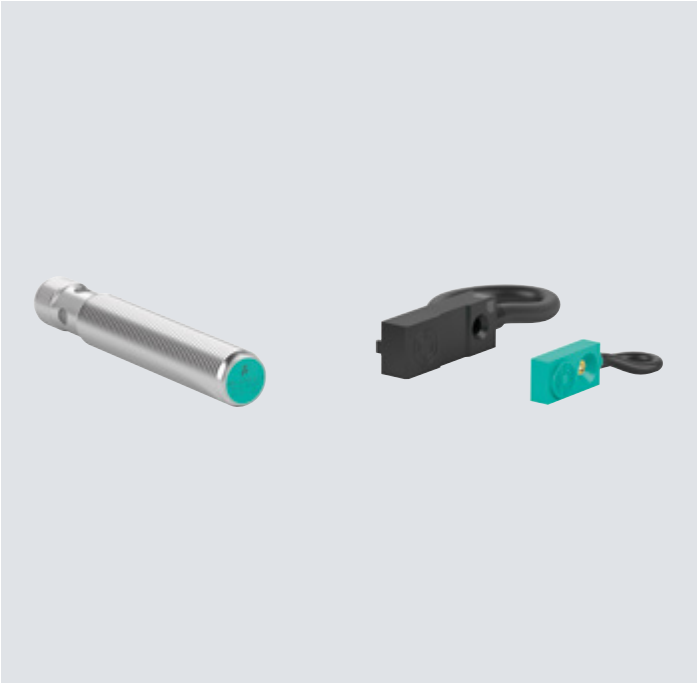
- Compact dimensions for a wide range of applications
- Meet the functional safety criteria (SIL 2/SIL 3) according to IEC 61508
- LED for visual verification of the functionality


Swing gates


Sectional doors


High-speed doors

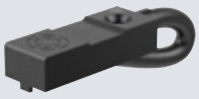
End-Position Monitoring
Wear-Free and Easy Operation



F29, F79, and 12GM30

Whether round, slotted, or cubic, flush or nonflush—proximity sensors in the F29, F79, and 12GM30 series fulfill all your sensing needs. For reliable end-position monitoring on gates and barriers, transmitting a clear signal to the gate or barrier control unit is as simple as attaching a metal bracket or a switching target.

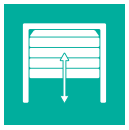
With all standard output signals, a large variety of designs, and worldwide approvals, the inductive sensors not only meet the highest quality standards, but also offer a high degree of flexibility for different applications.

Excerpt from Technical Data	F29	F79	12GM30
			
Sensing range	Flush 2 mm	Flush 1.5 mm	Flush 4 mm
Output type	4–wire	3–wire	3–wire
Operating voltage	4.75 V DC ... 30 V DC	5 V DC ... 30 V DC	10 V … 30 V
Connection type	PVC cable, 2 m	PVC stranded wires, 500 mm	PVC cable, 2 m
Degree of protection	IP67	IP67	IP67

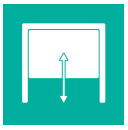
Highlights

- The highest standards of quality in sensor production guarantee reliability and process safety for your application
- The best sensory solution for every application with our complete portfolio
- Highest levels of robustness and durability even in harsh industrial environments

Swing gates



Sectional doors



High-speed doors

Elevators

Noncontact Detection in All Ambient Conditions

Our sensor technology for elevator applications handles key tasks such as continuous monitoring of access to cabs and reliable and precise positioning. The components used for monitoring can be found wherever movements pose a potential risk to people—such as the closing of doors. Smooth, comfortable operation also requires precise alignment of the cabs to the floor level of the landing, gentle braking, and jolt-free movement. This is ensured by a number of additional sensors, including photoelectric slot sensors, rotary encoders, special slot-shaped initiators, high-precision distance sensors, and millimeter-precise positioning systems.

Passenger Elevators

These elevators are primarily used to transport people, but are also suitable for transporting loads. They are the most commonly used elevator type in Germany—including glass and panoramic elevators.

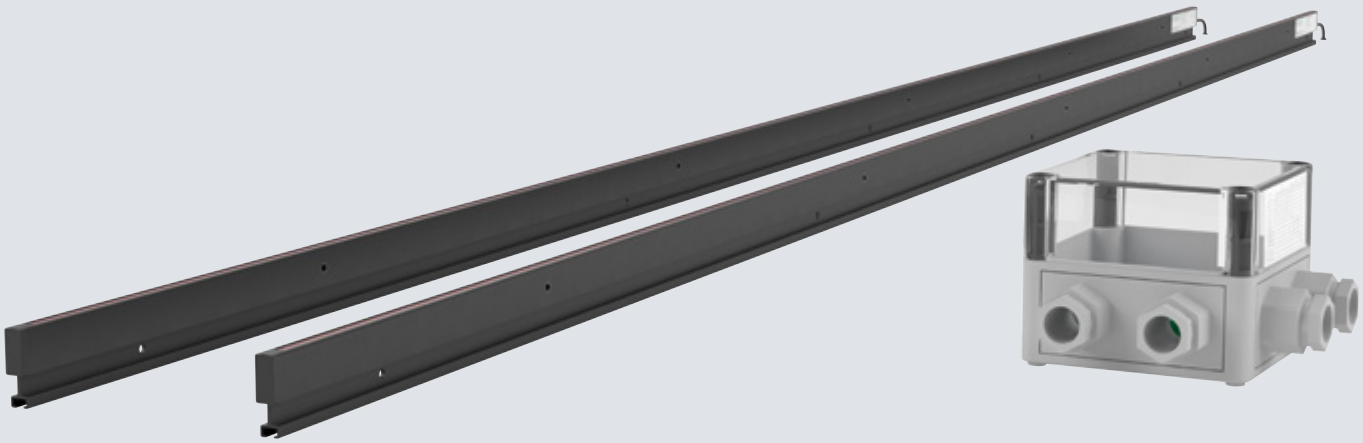
Freight Elevators

Freight elevators are only intended for the carriage of goods, but people can easily enter the elevator cab and operate the elevator using a control system inside the elevator. This type of elevator places increased demands on the functionality, robustness, and resistance of the system, and also has higher requirements for the load capacity, drive type, dimensions of the elevator cab, and the landing doors.

More information can be found at
www.sensotek.com/en/market-segments/elevators

Monitoring—Thru-Beam Light Grid

Continuous Monitoring of Entrances



The AL3609.4 light grid is used in applications requiring safe and continuous monitoring in accordance with the EN 81-20 standard. Typical applications include monitoring elevator doors, access systems, and entrance areas, and reliable access controls.

Flat Light Grid with Fine Resolution for Monitoring the Closing Edge

In addition to a freely configurable, potential-free signal output, the AL3609.4 light grid has a separate diagnostic output for function monitoring and a dynamic beam crossover with up to 174 active beams. The 9.4 mm narrow light grid is insensitive to sunlight and allows object detection to a distance of zero millimeters. The electronics for level measurement and the power supply are fully integrated in the emitter and receiver elements, so no external devices are required for operation.

If necessary, the accessory supply module PS1/31 can be used to provide a stable and high-performance current source. This also features a potential-free relay contact for switching higher output power. Timer functions can be adjusted to the switching signal. The light grid profile can be flexibly mounted, meaning that both rear and side mounting are possible. The system complies with the latest standards according to EN 81-20.

Highlights

- Ready for connection with integrated electronics for level measurement
- Object detection down to zero distance
- Automatic beam crossover for finer resolution of the field of view
- Diagnostic output reports the occurrence of minor faults during operation
- Resistant to reflections and extraneous light such as sunlight
- Ideal for new elevators and retrofitting existing elevator systems

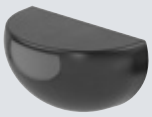
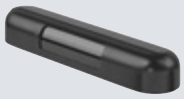
Excerpt from Technical Data	AL3609.4	PS1/31
Function indicator	Yellow/red LED	Yellow/green LED
Operating voltage	15 V DC ... 30 V DC	115/230 V AC
Degree of protection	IP54	IP55
Switching type	Light-on/dark-on switching, programmable	Light-on/dark-on switching, programmable
Signal output	Potential–free changeover contact, programmable semiconductor switching behavior	Potential–free changeover contact

Radar Technology as a Flexible Solution for Elevator Construction

MotionScan and RMS-D-RC

The **MotionScan** combined sensor uses a radar function to provide the pulse for opening automatic sliding doors and an energetic diffuse mode sensor to secure the leading edge. The radar and active infrared field can be precisely adjusted to ensure reliable detection of static and dynamic objects. MotionScan can be used regardless of the floor covering and mounted up to a maximum height of 3.2 m. Users can choose between one large protection field or two smaller protection fields, ensuring the requirements of the EN 16005 standard are always met.

The compact opening pulse sensor with **RMS-D-RC** radar technology can be controlled remotely and allows the automated calling of the elevator cab. It impresses with reliable motion detection in the form of direction recognition and cross-traffic suppression.

Excerpt from Technical Data	RMS-D-RC	MotionScan
		
Installation height	Max. 4,000 mm	Max. 3,200 mm
Operating voltage	12 V AC … 28 V AC, 12 V DC … 36 V DC	12 V AC … 24 V AC, 12 V DC … 24 V DC, ±10%
Degree of protection	IP54	IP54 (when mounted)
Detection field angle	Horizontal: –30° … +30° Vertical: 0° … 90°	–8° … +4°
Signal output	Potential–free relay contact, NO/NC	Relay contact (radar module), optocoupler (active infrared module)

Highlights

- The size of the detection field and the detection range can be precisely adjusted
- Suitable for wall and ceiling mounting
- International approval
- Various configuration options for the functions

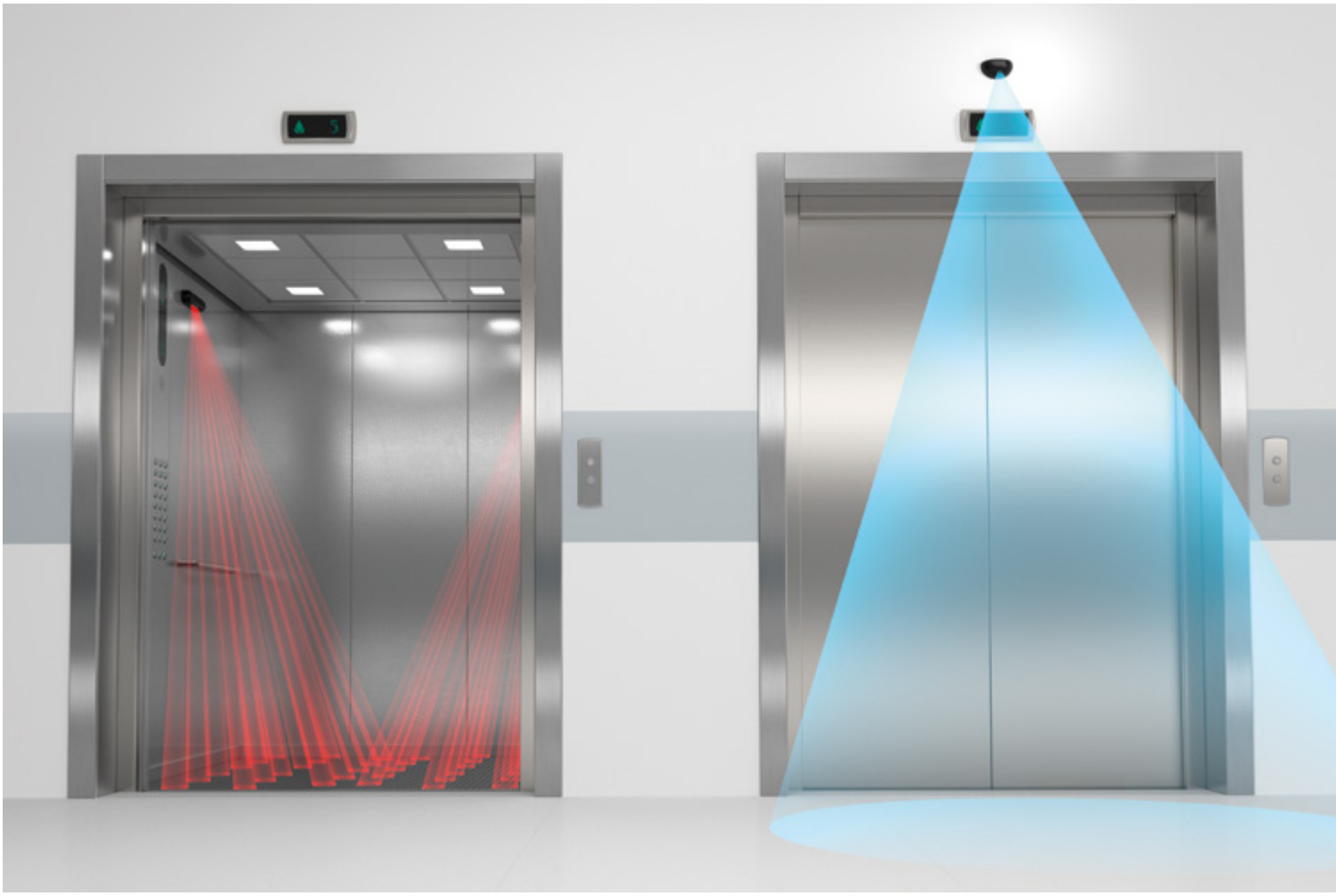
Shorter Waiting Times and Optimal Utilization

Combined sensors from the MotionScan series are used to determine whether the cab is occupied. The sensor is mounted just below the ceiling, centrally on the interior side wall of the elevator cab. In especially large cabs, a sensor is mounted on the left and right sides for detection in the entire space. The alignment is directed downward into the interior of the cab, so that the objects close to the ground can be detected. This ensures continuous monitoring of the entire interior of the elevator cab. Empty cabs can be identified more quickly, so that they can be prioritized when making cabs available. This reduces waiting times and ensures optimal utilization.

Restrictions on access to certain floors can be set to prevent unmonitored movement of the elevator between different security areas.

Automatic Elevator Calling

The RMS-D-RC opening pulse sensor is used to monitor the entrance area in front of the lift, so that approaching people are detected automatically. The sensor is mounted above the elevator door and aligned with the area in front of the door. The detection area is the access area for the elevator cab. As soon as the sensor detects people approaching, the elevator is called automatically and the call button does not need to be pressed.



Radar sensors in action: MotionScan (left) and RMS-D-RC (right)

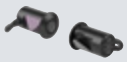
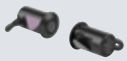
Security—Thru-Beam and Retroreflective Sensors

Sophisticated Door and Closing Edge Protection

BB10 and 91 Series

The especially small **BB10** miniature thru-beam sensor is ideal for door security and access control. The sophisticated plug-in housing can be mounted on the doorframe without tools using an integrated snap-on mounting bracket. The small opening angle enables the sensors to be mounted in pairs with no cross-talk. Since evaluation is already integrated in the sensor, an external switching device is not required.

The retroreflective sensors from the **91 series** are used for single-beam closing edge protection. The especially narrow and robust plastic housing is ideally suited for small gaps. They are available in visible red light or infrared light versions and offer a variety of mounting options.

Excerpt from Technical Data	BB10-P/25/33/ 76b/103/115-7m	BB10-P-F2/25/33/ 35/102/115-7m	RL91-6-IR/ 25/38a/115	RL91-6-IR/ 25/49/115
				
Effective detection range	0 m ... 6 m	0 m ... 3 m	0 m ... 6 m	0 m ... 6 m
Signal output	1 PNP output, short-circuit proof, protected against reverse polarity, open collector	1 NPN output, short-circuit proof, protected against reverse polarity, open collector	Low–voltage relay, 1 changeover contact	1 NPN, 1 PNP DC, short-circuit proof, reverse polarity protected
Operating voltage	10 ... 30 V DC	10 ... 30 V DC	18 ... 28 V AC, 12 ... 30 V DC	12 ... 30 V DC
Switching type	Light-on	Light-on	Light-on	Light-on
Connection	7 m fixed cable	7 m fixed cable	5 m fixed cable	5 m fixed cable

Highlights

BB10

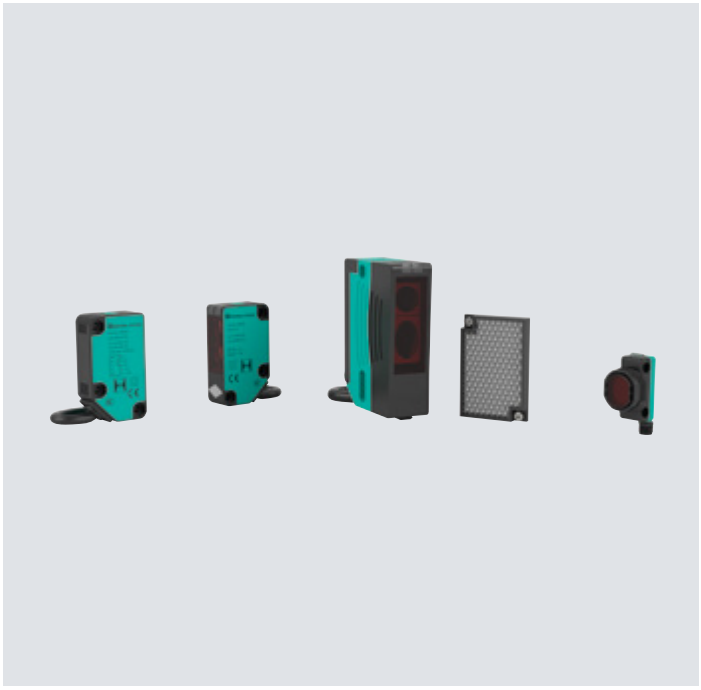
- Various frequencies for preventing cross-talk
- The narrow opening angle of the light emitter allows for mounting in pairs
- No external switching device required due to the integrated evaluation

91 Series

- Robust, especially narrow plastic housing
- Versions with visible red light or infrared light
- Different mounting options

Security—Thru-Beam and Retroreflective Sensors

Robust Light Barriers for Use Outdoors



29, 31, and ML17 Series

The basic sensors in the **29 and 31 series** are available as thru-beam or retroreflective sensors. They can be mounted on the elevator cab door and reliably detect people, objects, and even vehicles. The robust, waterproof housing with IP67 protection makes the two series the ideal solutions for outdoor applications. Both light barriers are insensitive to extraneous light and are especially resistant to interference in the private-mobile-radio and mobile-phone range.

The **ML17** compact retroreflective sensor features numerous connection and mounting options for a wide range of automation tasks. The universal housing is suitable for front mounting using an M18 thread and has additional through holes for side mounting. The integrated LEDs are clearly visible regardless of the installation situation.

Excerpt from Technical Data	TLA29/LK29-Z-F1/31/116-SET	RLK31-54/25/31/115-SET	LA31/LK31/25/31/115-SET	ML17-54/115/136
				
Effective detection range	0 … 65 m	0 … 9 m	0 … 30 m	0 … 3.5 m
Signal output	Relay, 1 changeover contact	Relay, 1 changeover contact	Relay, 1 changeover contact	2 push-pull outputs, short-circuit proof, reverse polarity protected, surge protector
Operating voltage	12 … 240 V AC/DC	24 … 240 V AC, 12 … 240 V DC	24 … 240 V AC, 12 … 240 V DC	10 … 30 V DC (Class 2)
Switching type	Light-on/dark-on switching, switchable	Light-on	Light-on	Light-on/dark-on switching
Connection	Terminal compartment	2 m fixed cable	Emitter and receiver each with 2 m fixed cable	2 m fixed cable

Highlights

29 and 31 Series

- Robust and waterproof housing
- High IP67 protection for outdoor applications
- Immune to extraneous light

ML17

- Miniature design
- LEDs clearly visible from all sides
- Time-saving assembly with quick-release mechanism

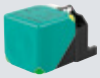
Passenger elevators

Positioning—Inductive Sensors and Photoelectric Slot Sensors

Precise End-Position Monitoring

GL-ES-IR, SJ15, SJ30, and VariKont-L Series

Various sensors with different operating principles can be used to ensure the exact positioning of the elevator car or for reliable end-position monitoring of the elevator cab door. The GL-ES-IR photoelectric slot sensor works with an infrared light source and is especially robust and unaffected by environmental influences and extraneous light. However, SJ15 and SJ30 series sensors use an inductive electrical field, which is integrated in the form of a slot-shaped housing design. The VariKont-L inductive sensor uses an electromagnetic field to detect metallic objects.

Excerpt from Technical Data	GL-ES-IR	SJ15	SJ30	VariKont-L
				
Fork width/slot width/ sensing range	24 mm	15 mm	30 mm	20 mm
Operating voltage	10 V DC … 30 V DC	10 V DC … 30 V DC	10 V DC … 30 V DC	10 V DC … 30 V DC
Switching type	Light-on/dark-on switching	PNP, normally-open	PNP, complementary	PNP/NPN NO/NC
Connection	2 m fixed cable	PVC cable, 2 m	PVC cable, 2 m	M12 connector

Highlights

- High switch point accuracy for precise positioning of the elevator cab at the stop on a floor
- Quick assembly by adjustment of the optical axes at the factory and limitation to a single connection (GL-ES-IR)
- Protection against vandalism through use of an invisible infrared light source (GL-ES-IR)

Positioning—Incident Light Positioning System

Reliable Absolute Positioning According to SIL 3/PL e

safePXV and safePGV

The safePXV positioning system allows for reliable absolute positioning in accordance with SIL 3/PL e using a single sensor. The system's innovative technology is impressive, and so is the extremely simple installation. The corresponding code tape is supplied in the appropriate length and is simply stuck on, so that the read head only has to be roughly aligned with it. Parameterization can be performed directly via the safety control using a PROFINET GSDML file. This sophisticated system uses the absolute position data to ensure that the elevator cab is positioned precisely in the elevator shaft.

Excerpt from Technical Data	safePXV	safePGV
Traversing speed	≤ 8 m/s	≤ 8 m/s
Depth of focus	±40 mm	±30 mm
Field of view	Typ. 60 mm × 35 mm	Typ. 120 mm × 80 mm
Operating voltage	20 V DC … 30 V DC, PELV	20 V DC … 30 V DC, PELV
Interface protocol	PROFINET IO Real–Time (RT) Conformance Class B	PROFINET IO Real–Time (RT) Conformance Class B

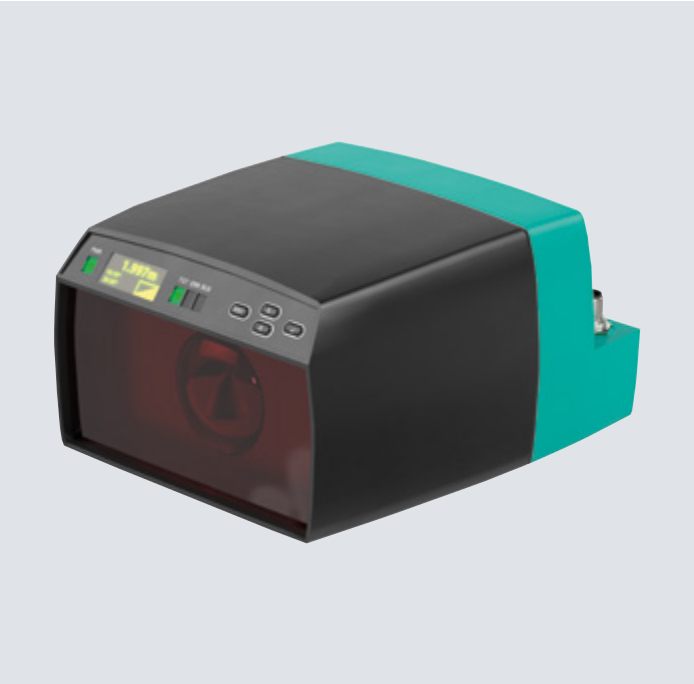
Highlights

- Highly reliable absolute positioning according to SIL 3/PL e due to the unique combination of 2-D camera and DataMatrix code tape
- Noncontact positioning up to 100,000 m
- Total reliability even in case of contamination or destruction, made possible through multiple code redundancy

Passenger elevators

Positioning—Distance Measurement Device

Highly Precise Distance Measurement, Regardless of the Measuring Environment



VDM100

The VDM100 distance sensor is especially easy to operate, with high measuring rates as a result of the integrated Pulse Ranging Technology. Measured values can be transferred via various interfaces. When measuring on reflectors, ranges of up to 300 m are achieved with a repeat accuracy of ±0.5 mm over the entire measuring range. The device uses an eye-safe Class 1 laser while measuring.

Highlights

- Especially quick, continuous measurement value recording for increased productivity
- Long detection ranges, regardless of the measuring environment, offer flexible application options
- Easy integration into different environments via various interfaces

Excerpt from Technical Data	VDM100
Measuring range	0.3 m ... 50 m 0.3 m ... 150 m 0.3 m ... 300 m
Resolution	0.1 mm, adjustable
Operating voltage	18 V DC ... 30 V DC
Interface type	PROFIBUS DP, SSI, RS–422, EtherNet/IP, INTERBUS
Input/output type	2 PNP inputs/outputs, independently configurable, short-circuit proof, protected against reverse polarity

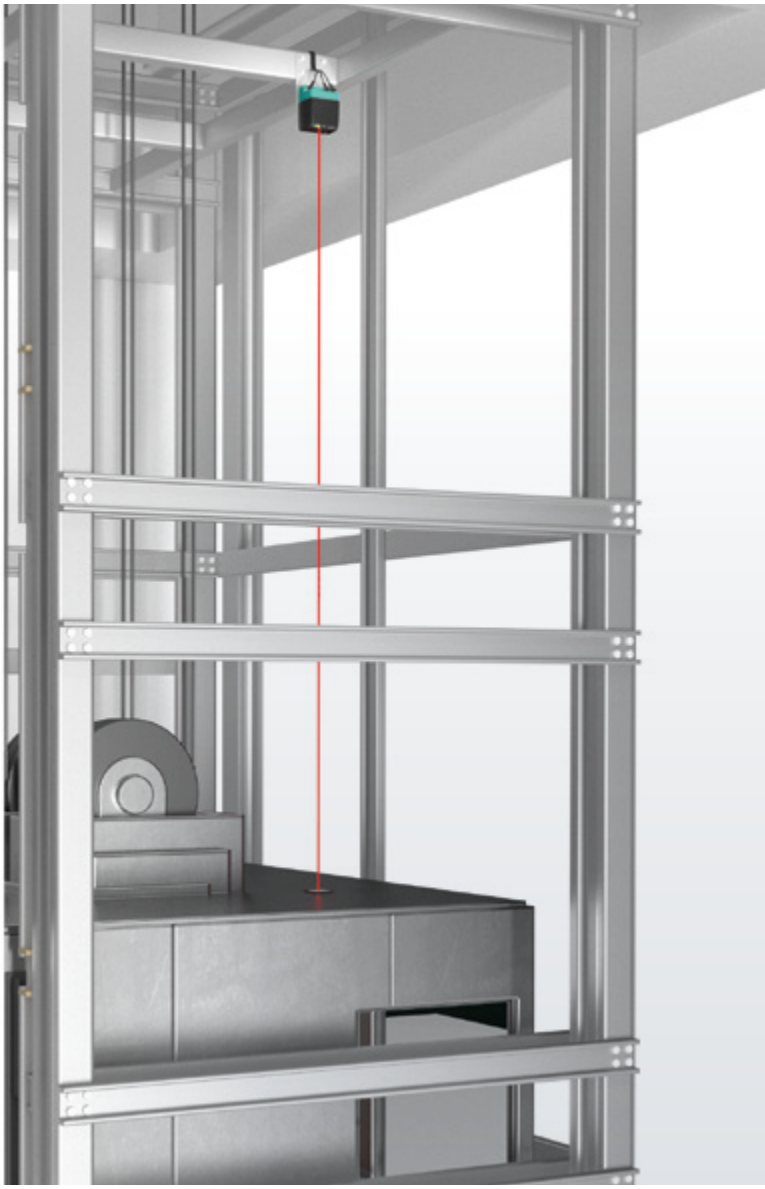
Pulse Ranging Technology (PRT)—Precise Positioning over Large Distances

Distance sensors with PRT offer short reaction times and highly precise measurement results for a wide range of object types and ambient conditions. Benefit from the most precise industry-standard methods for distance measurement!

More information is available at:
www.pepperl-fuchs.com/fa-prt

Precise Alignment of the Cab Position

To determine the exact position of the cab in the elevator shaft, the VDM100 distance sensor is attached directly to the shaft head at the upper end of the elevator shaft. The sensor optics are aligned downward to a reflector that is mounted on the outside of the elevator cab. This setup allows operators to determine the position of the elevator cab in the shaft, as well as the position of the individual stops. Alignment to the height of the floor is also configured, so that there is no difference in height between the cab and the anteroom.



Positioning—Rotary Encoder

Elevator Positioning and Drive Control

Incremental and Absolute Rotary Encoders

The exact positioning of the elevator cab is an essential component of safe and efficient passenger and cargo transport. Incremental rotary encoders monitor the speed of the elevator cab, while absolute rotary encoders are used to determine the exact position of the elevator cab and doors. The comprehensive portfolio of rotary encoders is suitable for other applications such as monitoring the rotation speed of the elevator drive or controlling the speed limiter.

Highlights

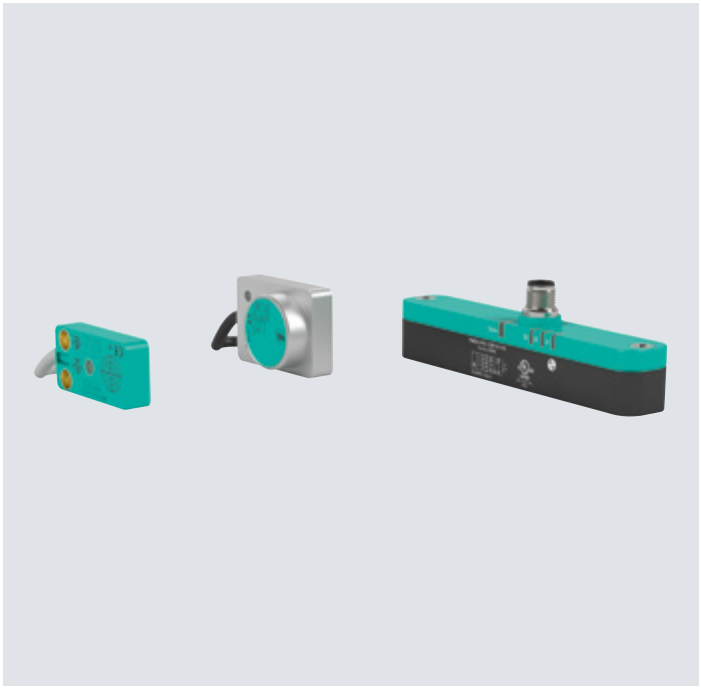
- Compact housing, tangential cable outlet (TVI40/TSI40/THI40)
- Especially robust design and BlueBeam technology for outstanding precision (ENI58IL)
- Hollow shaft up to Ø 45 mm, very high resolution and accuracy (RHI90)
- Wear-free, magnetic scanning principle, various interfaces (ENA36IL/ENA58IL)

Excerpt from Technical Data	TSI40N	ENI58IL	RHI90	ENA36IL/ENA58IL
				
Function principle	Incremental	Incremental	Incremental	Absolute
Housing design	Ø 40 mm	Ø 58 mm	Ø 90 mm	Ø 36 mm/Ø 58 mm
Shaft type	Solid shaft, recessed hollow shaft, hollow shaft	Solid shaft, recessed hollow shaft, hollow shaft	Hollow shaft	Solid shaft, recessed hollow shaft
Connection type	Cable, fixed cable with connector plug	Cable, fixed cable with connector plug, connector plug	Cable, connector plug	Cable, connector plug
Electrical interface	Push-pull	Push-pull, RS422, universal current driver	Push-pull, RS422, sine-cosine	Analog, CANopen, J1939, SSI, ProfiNET, Profibus, EtherCAT
Resolution	Up to 1,024 pulses	Up to 5,000 pulses	Up to 50,000 pulses	Singleturn: 65,536 (16 bit) Multiturn: 65,536 (16 bit)

Passenger elevators

Positioning—Inductive Proximity Sensors

Comprehensive Portfolio Perfect for Every Application

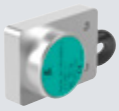


F33, F148, and PMIF90

As the inventor of the proximity sensor, Pepperl+Fuchs continues to set the standard in terms of quality and product diversity—including in the field of inductive proximity sensors, which are used for accurately positioning elevator cabs on the individual floors.

Inductive sensors **F33** and **F148** in an especially flat and robust housing can be flush mounted in metallic frame structures or small recesses. From there, they reliably detect the end position of the cab door.

The **PMIF90** inductive positioning system combines the measuring and switching function in one device. As a sensor for complex applications, it is used to measure the distance between two targets.

Excerpt from Technical Data	F33	F148P10	PMI
			
Sensing range/object distance	Flush 8 mm	Flush 15 mm	0.5 mm … 3 mm
Switching element function	PNP/NPN NO/NC	PNP/NPN NO/NC	Analog, current, and voltage output
Operating voltage	10 V … 60 V DC	10 V … 60 V DC	18 V ... 30 V DC
Degree of protection	IP67	IP67/69	IP67
Connection type	PVC cable, 2 m	PUR cable, 2 m	M12 × 1, 4-pin

Highlights

- Extremely robust metal housing and resistant to dust/dirt and mechanical loads
- High resolution provides accurate measurement results
- Noncontact, maintenance-free, and contamination-resistant technology
- High switching frequencies and very long service life
- Simple commissioning and minimal downtimes

Escalators

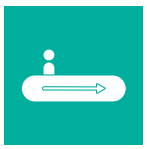
Making Public Transportation More Efficient and Reliable

Escalators automate our daily lives and are an integral part of the urban environment. They transport millions of people every day and ensure a smooth flow of traffic in a variety of public places, such as airports, train stations, convention centers, and department stores.

Escalators

An escalator is a power-operated system with continuous step bands. It is used to transport people between areas that are usually located on different levels. This means that they operate both upward and downward. Standard photoelectric sensors or motion detectors from Pepperl+Fuchs modernize this operation through automated breaks in use to protect materials and reduce energy costs.

Travelators



Travelators are special type of escalator. They are characterized by the fact that the circumferential bands have no steps and thus run completely flat. The bands can consist of pallets or belts. They transport people between areas, which are usually at the same height.

More information can be found at
www.sensotek.com/en/market-segments/escalators

Extremely Easy to Use in a Miniature Design

ML100

Retroreflective sensors in the ML100 series are characterized by their miniature housing with integrated solid-metal threaded bushings. The compact housing design makes the photoelectric sensors especially well suited for use in extremely restricted spaces, such as in escalators. Here, they monitor whether people mount the escalators or even move against the direction of travel. In both cases, the sensor sends an “occupied” message before the system is activated.

The miniature photoelectric sensors are extremely easy to use. Users can ascertain the operating states at any time via a clear and functional display. A clearly visible emitter LED facilitates alignment and commissioning of the device.

Excerpt from Technical Data	ML100
Effective detection range	0 m … 5 m
Operating voltage	10 V DC … 30 V DC
Switching type	Light-on/dark-on changeover switch; delivery state: light-on switching
Degree of protection	IP67
Signal output	1 PNP output, short-circuit proof, protected against reverse polarity, open collector

Highlights

- Clearly visible LEDs for power on, switch state, and operating reserve
- Solid-metal threaded bushing
- Very bright, highly visible light spot
- Immune to extraneous light

Escalators

Travelators

Activation

For Installation Positions Directly above Entrance Areas

DoorScan

DoorScan combines impressive safety levels with high flexibility and a space-saving installation concept. Mounted directly above the access area for escalators, the active multi-beam infrared sensor reliably detects people at all times. Mirrored walls, dark mats, or shiny floor coverings are not an issue. When unlocked, the modules of the DoorScan can be moved freely in the sensor rail. The detection field is enlarged or reduced for a variety of different applications depending on the distances between the emitter and receiver modules.

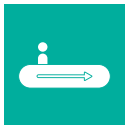
The convenient snap-in mechanism allows modules to be mounted quickly and without any tools, and the system is commissioned by simply using the teach function.

Excerpt from Technical Data	DoorScan-OS-1P-1200
Sensing range	1,000 mm at an installation height of 2100 mm
Operating voltage	24 V DC ±20%
Installation height	Max. 3,500 mm
Switching type	Light-on
Signal output	1 switchable NPN or PNP output, short-circuit proof

Highlights

- Precise control of escalators and travelators
- No mechanical intervention in the existing system
- Ideal for retrofit automation

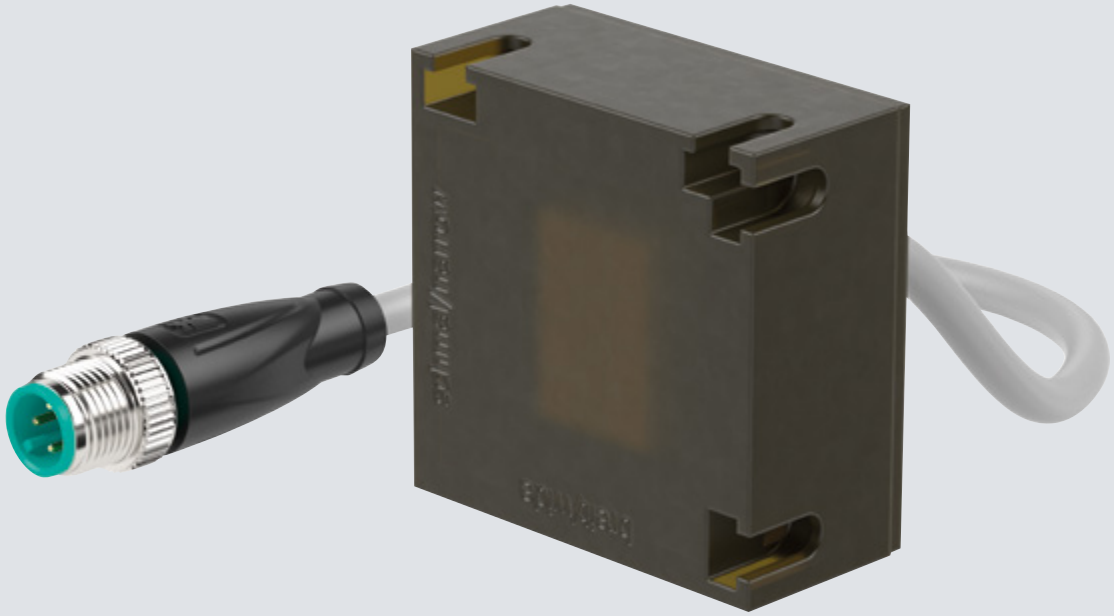
Escalators



Travelators

Activation

Efficient and on Demand



Radar pulse generators with a selectable detection field are the ideal solution for on-demand activation of escalators in conjunction with reliable monitoring of the passenger load. Efficiency and convenience go hand in hand during everyday use of the escalator.

Predictive Maintenance Due to Useful Additional Information

The radar pulse generator is built according to the latest standards and detects people and objects as they approach the escalator. This means that the rolling mechanism is only activated when required, resulting in reduced wear and increased energy efficiency. The passenger load is recorded by counting the operating hours and the weight. This additional data means that maintenance intervals and service operations can be planned based on usage.

The radar pulse generator also allows the user to track the passenger volume relative to the time of day and the direction of movement.

Highlights

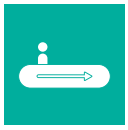
- Reliable detection of moving objects (counting accuracy ≥ 80 %)
- Direction recognition and cross-traffic suppression
- Compact design
- Tamperproof
- Easy adjustment of the detection field
- Detection range adjustment: between 1.5 meters and 2.5 meters

Safe Escalator Use

The radar pulse generator detects people or objects in the access area of the escalator and thus ensures that the escalator starts up in a timely manner. The device can be installed in both the upper and lower access areas and is only required on one side of the access zone. This means that technicians will benefit from greater flexibility during installation and significantly reduced workload. When the sensor is installed in the escalator paneling, it is not visible to passersby. This effectively prevents tampering and vandalism.

Excerpt from Technical Data	ESC-MS-2.0
Sensing range	Can be electrically switched between 1.5 m and 6.0 m (for narrow field alignment/relative to the sensor axis)
Operating frequency	24.15 GHz … 24.25 GHz K band
Operating voltage	12 V DC … 30 V DC
Switching voltage	24 V DC
Switching type	Push-pull

Escalators



Travelators

Barriers

Smooth and Safe Entry to Barrier Systems

Barrier systems are used to provide optimal protection in restricted areas and ensure efficient control. They allow authorized vehicles to enter and exit private areas and allow controlled entry and exit to underground parking garages, company premises, public authorities, and to private parking lots.

Barrier Sensors—The Requirements

Whether people, motorcycles, cars, vans, or vehicles with trailers—a high-performance sensor system with high detection reliability is crucial for fault-free operation on barrier systems. Specialized sensors and systems serve as opening pulse sensors and ensure reliable monitoring of the closing areas.

Barrier Sensors—The Perfect Solution

The wide range of products from Pepperl+Fuchs and Sensotek make it possible to fulfill numerous requirements in different environments. Loop detectors, radar detectors, and RFID systems are used for opening the barrier, while tactile edges and photoelectric sensors provide protection against accidental collision with the barrier arm.

More information can be found at
www.sensotek.com/en/market-segments/barriers

End-Position Monitoring

Noncontact Detection in All Ambient Conditions

NBB8 Inductive Sensor

As an industry pioneer and one of the world market leaders for inductive sensors, Pepperl+Fuchs continues to set standards in terms of quality and performance. Inductive proximity sensors are used in applications requiring reliable, noncontact detection of metallic objects. The NBB8 sensor achieves this by detecting the position of the barrier arm and thus offers the simplest and most economical technical solution for end-position monitoring.

Excerpt from Technical Data	NBB8-18GM50-E2	NBB8-18GM50-E2-5M
Sensing range	Up to 8 m	Up to 8 mm
Operating voltage	10 V DC ... 30 V DC	10 V DC ... 30 V DC
Design	M18	M18
Connection	2 m fixed cable	5 m fixed cable
Degree of protection	IP67	IP67

Highlights

- M18 thread for easy mounting
- 8 mm sensing range for reliable detection
- Protection up to IP69 for use in all conditions

Opening
Noncontact Detection in All Ambient Conditions

VDM28 Distance Sensor

The VDM28 distance sensor is a true all-around solution for numerous measuring and monitoring tasks. The sensor is used both as a measuring system with analog output signal and as a switch with binary output signals. Plus, in combination with a reflector, the VDM28 can cover large distances of up to 50 meters without any problems.

Pulse Ranging Technology (PRT) is the most precise method for measuring distances in industrial applications, and forms the basis for reliable detection of objects such as vehicles and people. Intensive light pulses with a high sampling rate ensure interference-free measurement results.

Excerpt from Technical Data	VDM28
Detection range	Up to 8 m
Operating voltage	10 V DC ... 30 V DC
Output	Push-pull
Connection	M12 plug
Degree of protection	IP67

Highlights

- Wide range of applications due to the availability of switching and measuring sensors—also with IO-Link
- Reliable detection due to high level of immunity and resistance to environmental influences
- High repeat accuracy, unaffected by surfaces
- Precise detection due to the small light spot diameter

Opening
Multiple Switch Points for Flexible Sensor Use

R300 Distance Sensor

Distance measurement is one of the basics of sensor technology. Distance sensors from the R300 series go beyond the limits of standard sensors, offering a superior detection performance and making them an ideal solution. The entire range of devices is based on the innovative Pulse Ranging Technology (PRT), and makes the phase correlation principle or similar chip-based processes obsolete.

A precise switch point and minimal black-white difference ensure fully reliable object detection. Significantly larger sensing ranges guarantee an especially wide range of applications.

Excerpt from Technical Data	R300
Detection range	Up to 8 m
Operating voltage	10 V DC ... 30 V DC
Output	Push-pull
Connection	M12 plug
Degree of protection	IP67

Highlights

- Optical immunity for excellent reliability during use
- Multiple switch points in one device for flexible use of the sensor
- Application-oriented user interface for simple sensor operation
- Visible red light for easy alignment
- Simple teach-in of the switch point with quick twist function

PRT for Reliable Vehicle Detection

Distance sensors with PRT technology ensure reliable detection of motorcycles or bicycles, and vehicles with high ground clearance. They function similar to a light grid and precisely measure the distance to the target object. Vehicles can therefore be easily located at defined positions. If the distance sensor is mounted on the underside of the barrier arm, it can prevent the closing operation while a vehicle is underneath it. If the sensor is positioned in front of the ticket dispenser, it can trigger the dispensing of the parking ticket. This also applies to the opening of the exit barrier.

Security

Robust and Resistant

The IP65 housing and the hardened plastic lens make the LTK2 extremely robust and highly resistant to mechanical loads.

Extremely Robust and Resistant to Mechanical Loads

The active infrared sensor from Pepperl+Fuchs can be used as an opening pulse sensor for monitoring barrier systems and providing precise detection of people, objects, and vehicles. Users can choose between two operating modes that are suitable for their application. In background suppression mode, objects outside the sensing range are ignored, and in background evaluation mode, the background is used as the reference surface. The active infrared sensor reliably detects even mirrored and highly reflective black surfaces on vehicles. For vehicle protection, adjustable timer functions and light-on/dark-on switching facilitate adjustment and control in the respective application area. The adjustable sensing range up to 6,000 mm enables operation without reflectors or with a passive column on the opposite side.

Excerpt from Technical Data	LTK2
Detection range	Up to 6 m
Operating mode	Background suppression/background evaluation
Operating voltage	11 V AC ... 48 V AC, 12 V DC ... 24 V DC
Output	Relay (changeover contact)
Degree of protection	IP67

Barriers

Robust and Resistant

61 Series

With five different operating modes and IP67 protection, the 61 series offers an especially versatile and robust product line. The AC/DC models provide a relay output of up to 3 A, while the DC modules are equipped with a push-pull output. All versions come with an integrated multifunction timer, sensitivity adjustment, and light-on/dark-on switch as standard. The sensors therefore always function reliably with no influence from extraneous light and cross-talk. Sophisticated features ensure simple, quick installation. The devices can thus be mounted with both thru-holes and M30x1.5 threads. Sensors with cable output feature a 1/2"-14 NPT female thread for mounting a flexible protective tube.

Excerpt from Technical Data	RLK61	LA61/LK61
		
Detection range	0 m ... 18 m	0 m ... 60 m
Operating voltage	24 V AC ... 240 V AC, 12 V DC ... 240 V DC	24 V AC ... 240 V AC, 12 V DC ... 240 V DC
Output	Relay	Relay
Connection	Fixed cable	Fixed cable
Degree of protection	IP67	IP67

Highlights

- Especially robust and waterproof housing with a wide range of mounting options
- Economical series for standard applications in special, compact housing design
- Cubic housing design with M30 thread offers a wide range of mounting options
- LEDs are clearly visible from all sides
- Programmable timer functions
- Universal-voltage version and relay contact output

Security

Robust Basic Technology and Large Detection Ranges

29 and 31 Series

Series 29 and 31 retroreflective sensors and diffuse mode sensors are used where standard applications on barrier systems have to be implemented economically and reliably. The ultrasonic-welded plastic housing provides a high level of protection, making them ideal for applications outdoors and on boundaries. The compact universal-voltage sensors can be operated with any DC and AC voltages between 24 V and 240 V. Numerous additional product features simplify installation, connection, and commissioning.

Highlights

- Robust and waterproof housing for outdoor applications
- Long detection range
- Simple mounting and commissioning
- Extremely easy to use
- Immune to extraneous light

Excerpt from Technical Data	RLK29	LA29/LK29	RLK31	LA31/LK31
				
Operating mode	Retroreflective sensor	Thru–beam sensor	Retroreflective sensor	Thru–beam sensor
Detection range	0 m ... 12 m	0 m ... 65 m	0 m ... 9 m	0 m ... 30 m
Operating voltage	24 V AC/DC ... 230 V AC/DC	24 V AC ... 240 V AC, 12 V DC ... 240 V DC	24 V AC ... 240 V AC, 12 V DC ... 240 V DC	24 V AC ... 240 V AC, 12 V DC ... 240 V DC
Output	Relay	Relay	Relay, 1 changeover contact	Relay, 1 changeover contact
Connection	Terminal compartment	Terminal compartment	2 m fixed cable	2 m fixed cable
Degree of protection	IP67	IP67	IP67	IP67

Barriers

Reliable Vehicle Detection with Rapid Diagnosis in Real Time

LC20 Loop Detector

In modern barrier systems, reliable detection of a wide range of vehicle combinations and quick diagnosis of data in real time are essential. The robust LC20 from Pepperl+Fuchs is characterized by these and other intelligent features. Combined with induction loops laid in the ground, the loop detector forms a universal sensor system for reliable vehicle detection. Commissioning is quick and easy—automatic frequency selection means it is even possible to install multilane access-control systems. The area around the detector is automatically checked and the optimal operating frequency is selected. This allows users to benefit from minimized setup times and operating costs.

The LC20 is ideal for applications where vehicles can be damaged. Power fail memory guarantees functional reliability even in the event of power failure: the fail-safe functionality prevents vehicles from being locked in, while the fail-secure functionality prevents unauthorized access.

Excerpt from Technical Data	LC20-1-RB 12-24 V AC/DC	LC20-2-DR 230 V AC
		
Number of channels	1	2
Operating voltage	12 V AC/DC ... 24 V AC/DC	230 V AC
Version with direction recognition	No	Yes
Connection	Plug–in base, 11-pin terminal connection	11-pin terminal connection
Operating temperature	–40°C ... 70°C	–40°C ... 70°C

Highlights

- Direction recognition via a two-channel loop detector
- Diagnostics tool and diagnostics app: intuitive operation and simplified commissioning using a visual display via smartphone
- Communication via smartphone using the free app from the iOS or Android store
- Reliable operation due to Power Fail Memory and definition of specific behavior to be applied in the event of a power failure

Efficient Control of Barrier Systems

The LC20 loop detector detects the presence of vehicles in areas where the induction loop is installed in the ground. Different application scenarios can be applied, depending on where exactly the induction loops are positioned. If it is located beneath the barrier arm, the closing operation can be prevented while a vehicle is underneath it. If the induction loop is located in front of the ticket dispenser, the dispensing of the parking ticket can be triggered. This approach could also be utilized for the exit. The additional direction recognition means that the evaluation of vehicle counts is not limited.

People Counting
Accurate Visitor Records

Sensors are often used for customer counting and visitor frequency measurement in stores, at events, and at trade fairs. Accurate visitor tracking helps store owners and event managers allocate capacity based on actual demand, which increases efficiency and reduces costs.

Optimize Capacities and Make Success Measurable

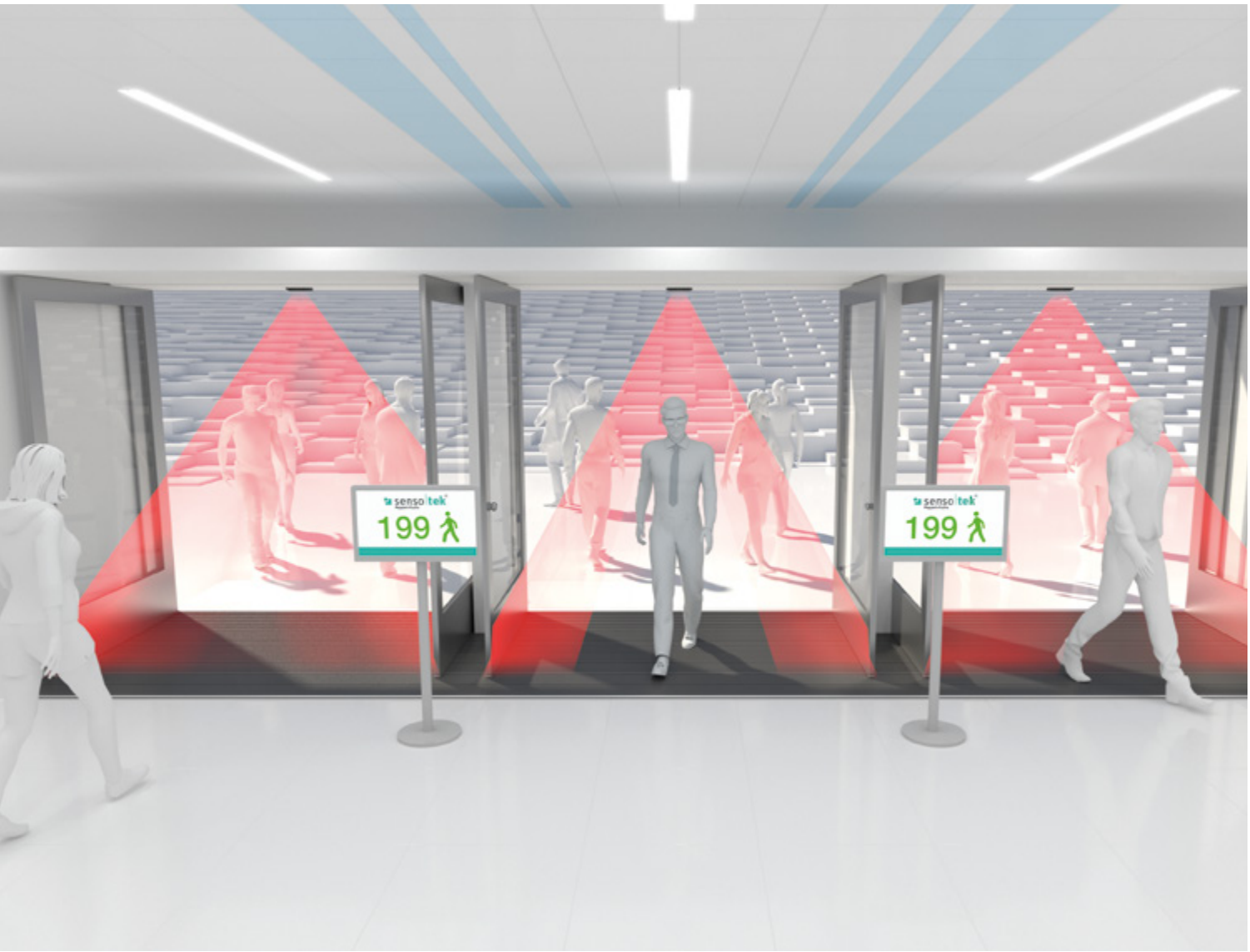
Customer counting can be valuable to companies in many ways: Store opening times and staff deployment planning can be adjusted based on customer behavior and the number of visitors. This enables the customer-consultant relationship to be optimized and can improve employee and customer satisfaction.

The same applies to trade fair and event managers who use people counting as an indicator of success. Precise measurement of visitor frequency helps to better evaluate and compare events at multiple locations.

Accurate visitor recording at a given time can even be useful for ensuring compliance with fire protection regulations. This applies, for example, to (large) events with strict fire protection requirements, where the maximum number of visitors must not be exceeded.

More information can be found at
www.sensotek.com/en/market-segments/people-counting

People Counting
Smart Solutions for Admission Control



Easily Implement Regulatory Requirements

Many businesses—retail outlets, beverage stores, footwear stores, or DIY stores—are legally required to consistently monitor the number of people present on the premises at any one time. The Smart Entrance Manager has been specially developed for this task. Available on the market for the first time as a modular system, the solution allows digital access control for precise people counting. This task can be difficult or inefficient for humans to complete and often involves high personnel costs; the digital solution based on time-of-flight technology (TOF) delivers an accuracy of more than 99%. The Smart Entrance Manager counts people who pass through with directional evaluation and can be configured for basic people counting with evaluation at either one entrance and exit door or at multiple entrances and exits, for more complex access-control scenarios.

Easy Installation and Adjustments On-Site

The individual functional components of digital admission control are connected to each other simply via an Ethernet cable. The interface developed by Sensotek disables the activation sensors for opening the exterior access door as soon as the specified number of visitors is reached—without any intervention in the door control system. The fully autonomous system means no additional people can enter the store, but it is still possible to exit safely.

The user can access the settings via the 5" color touch panel on the control unit by touching and entering the PIN. The maximum number of people allowed is defined here. A green or red traffic light on the touch panel indicates whether or not people can enter the building.

Highlights

- Complete kit and easy installation
- Compatible with virtually any existing door control system
- Simple adjustment of the maximum number of people via the touch panel
- Regulatory requirements can easily be implemented visually
- Can be combined with multiple inputs and outputs
- Direction recognition allows precise counting
- 3-D TOF sensor provides a counting accuracy of over 99%
- When connected to the door controller, the doors will not open inward until the current number of visitors falls below the maximum number of people allowed

Basic Kit (DPZ-BK)	Classic Kit (DPZ-CK)	Premium Kit (DPZ-PK)
Radar sensor with counting function	3–D TOF sensor	
Optional interface module (optional for combination with door control)		
Control interface with 5" touch panel		
–	–	Mini PC with 32" screen

People counting

Security

Safely One Step Ahead

For sensitive and highly protected areas such as banks and airports, it is becoming increasingly important to ensure an efficient flow of people with no lines and reliable access control. The protection of visitors is a top priority.

Sensor Solutions for Enhanced Safety

The interaction of proven technologies and reliable sensor solutions guarantees optimum safety for these sensitive areas. In addition to separation systems and sensors for direction recognition, the authentication of people by means of biometric identification rounds off our range of services.

More information can be found at
www.sensotek.com/en/market-segments/security

Direction Recognition

Reliable Detection of People Moving in the Wrong Direction

Airport operators are faced with the dual challenges of meeting increasing security requirements while also maximizing the daily flow of people through the terminals. Access controls and ID checks in particular have to be carried out quickly and easily for passengers, visitors, and employees.

Robust DIR CHECK Sensor System

Strict safety regulations are in place to ensure that passengers have a smooth transition from the sky to the ground. The robust DIR CHECK sensor system has the perfect features for these sensitive applications. Equipped with reliable time-of-flight technology, it detects the direction of movement of people and objects in 3-D and issues an alarm signal as soon as an object is moving in the opposite direction—from the secure area to the unsecured area. The flexible installation height of 2,000 mm to 2,400 mm and a passage width of up to 1,400 mm allow the sensor housing to be easily integrated into existing systems.

Highlights

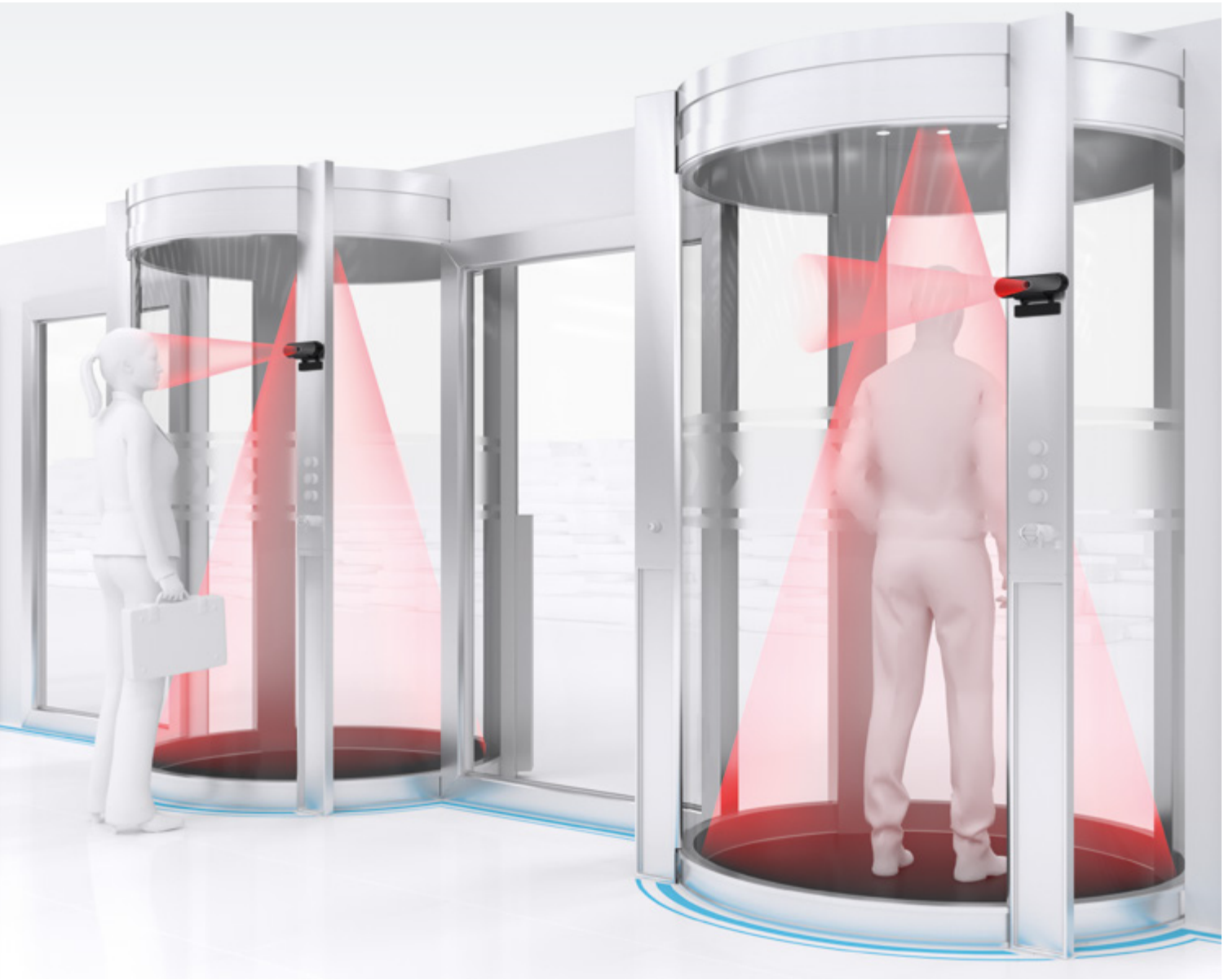
- 3-D TOF sensor for direction recognition on turnstiles
- Data processing takes place within the sensor
- Evaluation of people based on height profile and shape
- Installation height from 2,000 mm to 2,400 mm and passage width up to 1,400 mm

Excerpt from Technical Data	DIR Check
Operating voltage	24 V DC ±10%
Current consumption (24 V)	< 100 mA
Signal output	Semiconductor and relay
Signal input	2 × PNP
Connection	Removable screw terminals, 4-pin and 5-pin

Security

Separation

Securing Sensitive Access Areas



Enhanced Security and Control with Individual Entry

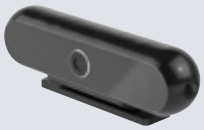
Separation systems ensure that people enter premises or buildings and certain areas or zones individually and in a controlled manner. Due to the different characteristics of the target “human” and the associated variety of parameters to be evaluated, the application places high requirements on the sensor technology. With the help of stored algorithms, individuals can pass through easily, regardless of their height and stature. In combination with the ALL-IN-ONE Tube biometric recognition technology, sensitive access areas can be protected by means of a verification process. Misplaced access cards and forgotten or shared passwords are a thing of the past.

ONLY ONE Separation System

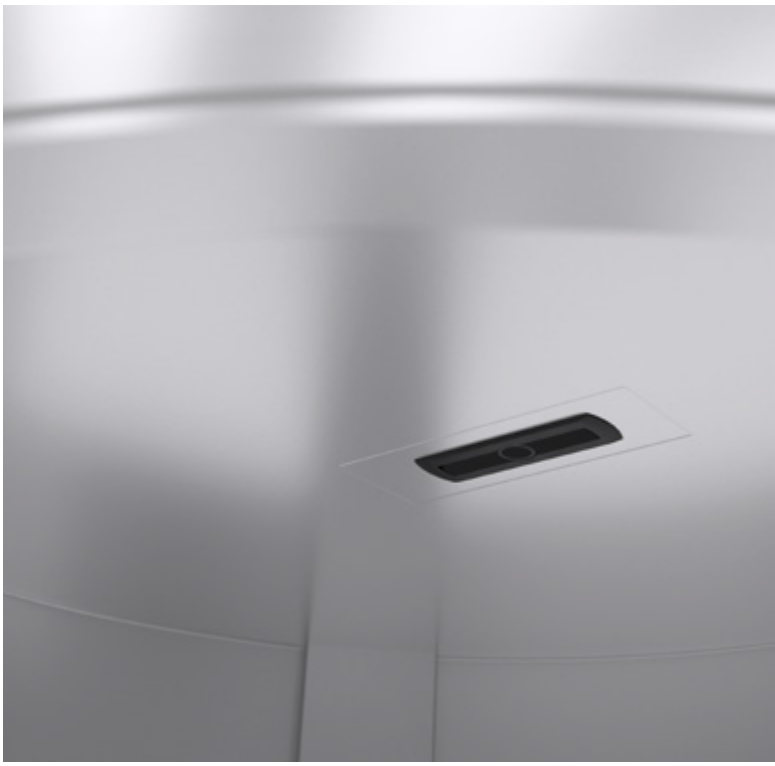
Once the authorized person has been clearly identified by the ALL-IN-ONE Tube, the ONLY ONE separation system makes sure that only that person enters. The sensor uses a matrix of over 500 measuring points to precisely detect the distance to the object in 3-D. Using time-of-flight technology (TOF), the system evaluates real distance information and reliably distinguishes between moving parts and people based on their shape and movement. This allows access to be easily granted to individual, authorized people.

Highlights

- Independent of environmental influences
- Detection of piggybacking and tailgating
- Tamper detection
- Easy combination of ONLY ONE and authentication solutions

Excerpt from Technical Data	ALL-IN-ONE TUBE
	
CPU	2 GHz Hexa Core ARM CPU
Memory	2G/4G
Communication	Wi–Fi, Ethernet, RS–485, USB 2.0
Encryption	AES256
Connections	18p socket, RJ45, HDMI micro 4p, USB 2.0

Excerpt from Technical Data	Only One
	
Operating voltage	24 V DC ±10%
Current consumption (24 V)	< 100 mA
Signal output	Semiconductor and relay
Signal input	2 × PNP
Connection	Removable screw terminals, 4-pin and 5-pin



Security

Fire Protection Equipment

Safety in Case of Fire

In the event of a fire in a building or plant, fire barriers such as fire doors, gates, and flaps help prevent the spread of fire and smoke through corridors, passageways, and shafts. A reliable automatic closing mechanism is crucial for this.

Certified and Approved

In normal operation, fire doors, gates, and closures are permanently closed. Only in exceptional cases can they remain open in the event of heavy traffic by people or objects. However, in the event of an emergency, an automatic closing mechanism with a safety-monitoring system are essential. Thru-beam sensors and retroreflective sensors from Pepperl+Fuchs, which have been approved in accordance with the FSA inspection report from VdS, offer greater safety and functionality specifically for such applications.

More information can be found at
www.sensotek.com/en/market-segments/fire-protection-sensors

Ignore Smoke, Detect Objects

28 and MLV12 Series

Even if smoke severely impairs the field of view, fire barriers must not close until the closing area is clear of people and objects. It is therefore essential that potential smoke emissions are ignored while objects in the smoke are reliably detected—a technical challenge effortlessly mastered by the thru-beam and retroreflective sensors in series 28 and MLV12.

The certified sensors are available in two different functional versions and connections. The LA28/LK28 series fire protection thru-beam sensors with terminal compartment are especially suitable for applications with long detection ranges. The RLK28 series fire protection retroreflective sensors, featuring a polarizing filter and terminal compartment, and the MLV12 series, which includes a plug connection, are the perfect choice for confined spaces and provide high levels of protection against direct contact.

Excerpt from Technical Data	LA28/LK28	RLK28	MLV12
			
Effective detection range	0 m … 10 m	1 m … 3 m on C110–2 reflector	0 m … 2.1 m (with H60 reflector)
Operating voltage	12 V AC/DC … 240 V AC/DC	12 V AC/DC … 240 V AC/DC	10 V DC … 30 V DC
Switching output	Relay, 1 potential–free changeover contact	Relay, 1 potential–free changeover contact	1 NPN and 1 PNP transistor, DC
Connection	Terminal compartment with spring terminals	Terminal compartment with spring terminals	Plug connection, 5-pin with metal M12 thread
Degree of protection	IP67	IP67	IP67

Highlights

- In the event of a fire, the smoke is ignored, but people or objects are detected reliably
- Immune to extraneous light
- Multiple assignment possible—no cross-talk
- Approval according to FSA inspection report by VdS

Fire doors

Fire gates

Precise Sensor Technology for Emergency Situations

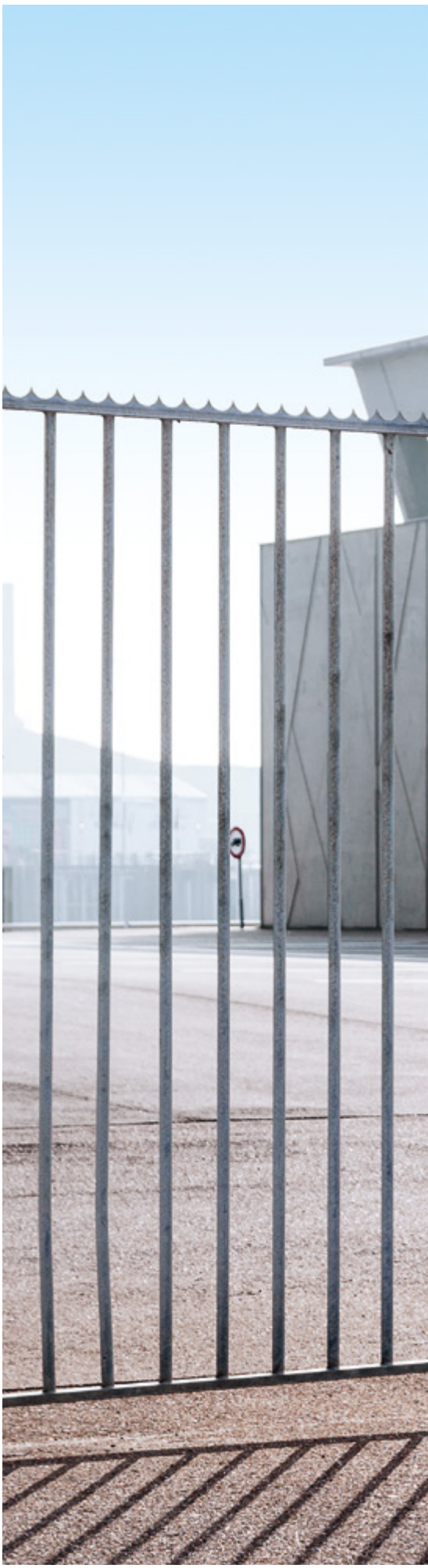
From check-in to baggage claim, automatic conveyor systems ensure that luggage is transported through airports quickly. They pass through necessary openings in fire walls and ceilings, and conveyor-system barriers are used to close them in case of fire.

If a fire starts, these openings have to close automatically and reliably to prevent the flames from spreading uncontrolled to adjacent areas of the building. The RLK28 fire protection retroreflective sensor with polarizing filter has been specially developed for such applications. It detects the slightest presence of smoke, which activates the signal lamp and causes the opening to close.

Perimeter Security

Outdoor and Building Security with Perfectly Matched Sensor Technology

Site security is becoming increasingly important—not only in critical infrastructures such as prisons, airports, or data centers, but also in the industrial and private sectors. Clear, controlled detection of people and objects through coordinated sensor technology is essential for this.



A Wide Range of Products for Individual Solutions

Doors, gates, and service openings are a potential weak point in perimeter security and therefore require especially reliable protection. This can be achieved with different sensor principles and systems. The comprehensive product selection from Pepperl+Fuchs ranges from proven photoelectric sensors and radar sensors to intelligent separation systems based on modern TOF technology.

More information can be found at
www.sensotek.com/en/market-segments/perimeter-security

Security

Individualized Access Control

Like an invisible curtain, TopScan-S monitors the presence of people and objects at automatic doors, gates, and turnstiles. The proven sensor system works reliably at all times, both statically and when moving, thus ensuring enhanced security at entrances and exits.

High Flexibility for Enhanced Security

The TopScan-S active infrared sensor is used wherever reliable overhead detection is required in a specific location, such as on pedestrian entrances to buildings and outdoor facilities. The modular design with primary and secondary sensor allows users to easily configure different door widths from 310 mm to 1,400 mm depending on their requirements.

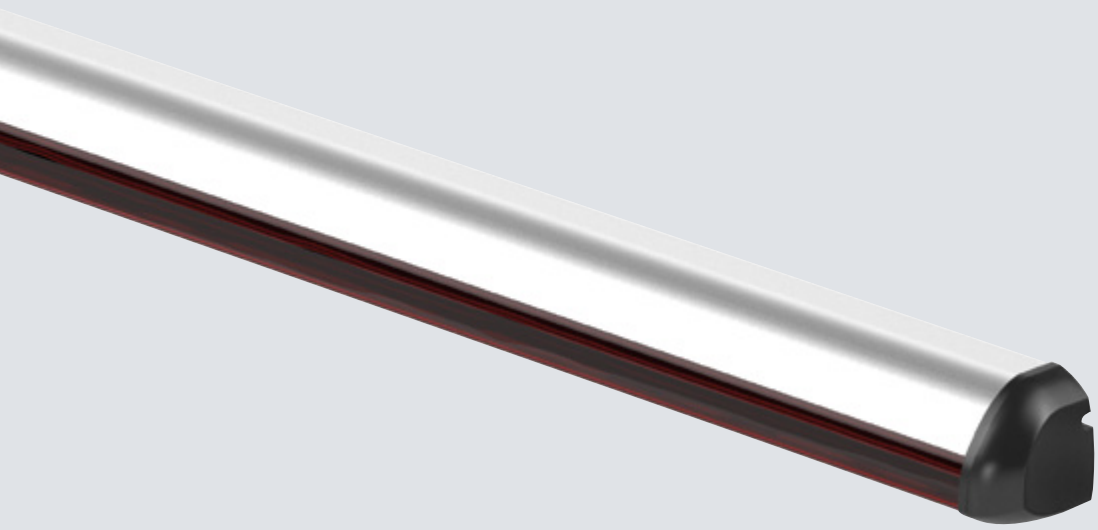
Up to seven individually adjustable beams can be used in one device. This ensures reliable test body detection across the full width of the door. Equipping the sensors with background suppression means that even complex floor coverings do not affect the presence sensor.

Excerpt from Technical Data	TopScan-S
Scanning range	Max. 0 mm ... 2,500 mm
Operating voltage	24 V DC ±20%
Signal output	Relay, 1 changeover contact
Degree of protection	IP52, IP54 optional (with special seal)
Connection	Screw terminals; cable cross section 0.3 mm² to 1.3 mm² (AWG26–16), single–stranded/ multistranded CU

Highlights

- Can be configured with one to six sensor modules (beams) and a wide range of profile lengths
- Modular design with primary and secondary sensor
- Each beam can be adjusted individually
- Profile lengths from 310 mm to 1,400 mm
- Noncontact protective equipment in accordance with DIN 18650/EN 16005

Perimeter security



Extremely Robust and Reliable

LA/LK29 and LTK2

The sensors and light barriers from the LA/LK29 and LTK2 series help keep company premises secure by detecting people, objects, and vehicles. They serve as invisible fencing or as protection against climbing onto roofs, for example.

The reliable thru-beam photoelectric sensors with a high level of protection from the **LA/LK29 series** offer ideal conditions for all monitoring tasks outdoors and along property boundaries. In contrast, diffuse mode sensors from the **LTK2** series with a clearly definable sensing range are characterized by their extremely robust design, which can withstand even high mechanical loads.

Excerpt from Technical Data	LA/LK29	LTK2
		
Operating voltage	12 V AC/DC ... 240 V AC/DC	12 V AC ... 24 V AC, 11 V DC ... 48 V DC
Detection range	0 m ... 65 m	0 m ... 6 m
Signal output	Relay, 1 changeover contact	Relay, 1 changeover contact
Degree of protection	IP67	IP65
Connection	Terminal compartment	5 m fixed cable

Highlights

LA/LK29
- Robust and waterproof housing with a wide range of mounting options
- Very long detection ranges
- Immune to extraneous light
- Especially resistant to interference in the private-mobile-radio and mobile-phone range

LTK2
- Robust and durable
- Adjustable timer functions
- Mechanically adjustable sensing range

Perimeter security

Security

Reliable Detection in Harsh Environmental Conditions

RAVE and DoorScan

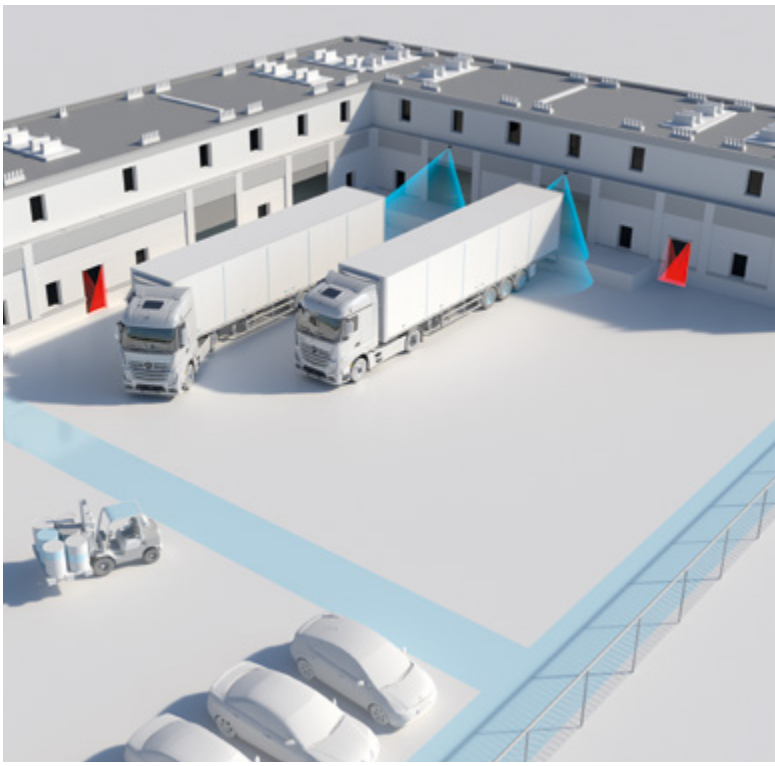
Due to weather-dependent ambient conditions such as rain and snow, the protection of gates and doors in outdoor surveillance requires especially resistant sensor technology—requirements that the RAVE radar sensor and the DoorScan active infrared sensor meet perfectly.

With its robust housing and high protection from the environment, **RAVE** is especially suitable for use in harsh environmental conditions. The sophisticated housing concept allows for time-saving installation, thanks to the convenient wall bracket and locking plate used to adjust the detection field. **DoorScan** operates on the basis of the active-infrared principle and enables individual adaptation of the detection field through freely movable emitter and receiver modules.

Highlights

- Reliable detection even in harsh environmental conditions such as through foliage and rain
- RAVE: high IP67 protection
- DoorScan: adjustment of the detection field provides flexibility

Excerpt from Technical Data	RAVE	DoorScan
		
Sensing range	9,000 mm × 6,500 mm at an installation height of 5 m	1,000 mm at an installation height of 2,100 mm
Operating voltage	12 V AC ... 28 V AC, 12 V DC ... 36 V DC	24 V DC ±20%
Signal output	2 relay outputs	Switchable NPN or PNP, short-circuit proof
Ambient temperature	–30°C ... +60°C (–22°F ... +140°F)	–30°C ... +60°C (–22°F ... +140°F)
Degree of protection	IP67	IP54



Perimeter security

Noncontact Detection with State-of-the-Art LIDAR and TOF Sensors

R2000 and R2100

Pepperl+Fuchs has developed the R2000 and R2100, two specialist sensors for area monitoring based on laser and multi-beam LED technology. Both distance sensors fully play to their strengths in securing entrances and exits, facades, and roofs.

The **R2000** 2-D laser scanner combines large detection ranges with a small light spot for highly precise measurement results. Its seamless 360° all-around view and high scanning frequency make this sensor the ideal solution for demanding applications. The **R2100** multi-ray LED scanner, on the other hand, enables time-of-flight technology to be used for detection tasks involving irregular surfaces. The 2-D surface measurement with 11 large light spots produces reliable and stable results regardless of the environment.

Excerpt from Technical Data	R2000	R2100
		
Measuring range	0.2 m … 3 m (bw 10%) 0.2 m … 10 m (wb 90%) 0.2 m … 30 m (reflector)	0.2 m … 2 m (bw 6%) 0.2 m … 8 m (wb 90%)
Scan rate	10 Hz, 20 Hz, 30 Hz	50 s^{-1} (1 scan = 11 measurements)
Scanning angle	360°	88°
Operating voltage	10 V DC … 30 V DC	10 V DC … 30 V DC
Degree of protection	IP65	IP67

Highlights

- Reliable PRT (Pulse Ranging Technology) measurement process
- Reliable monitoring of clearance heights
- High sampling rates
- High resolution with millimeter precision
- Reliable detection even in challenging environments such as dust and rain

Perimeter security

Security

Effective Access Monitoring with Tactile Perimeter Detection Systems

Tactile Edges

The intelligent and future-proof installation of Sensotek pressure-sensitive safety edges effectively prevents people from climbing over walls or fences and from scaling and accessing roof structures. The Sentir edge SE tactile perimeter detection system is characterized by its ease of use and offers users a high degree of flexibility. The safety edge is cut to the required length from 100 mm to 100 m, with millimeter precision.

Excerpt from Technical Data	SE 35.55 Group
Max. length of multiple contact edges	100 m
Electrical load capacity	24 V/100 mA
Switching angle	2 × 45°
Degree of protection	IP65
Ambient temperature	–25°C … 55°C

Highlights

- Easy mounting
- UV resistant
- High protection
- Millimeter-precise customization

Perimeter security

Public Urban Transport

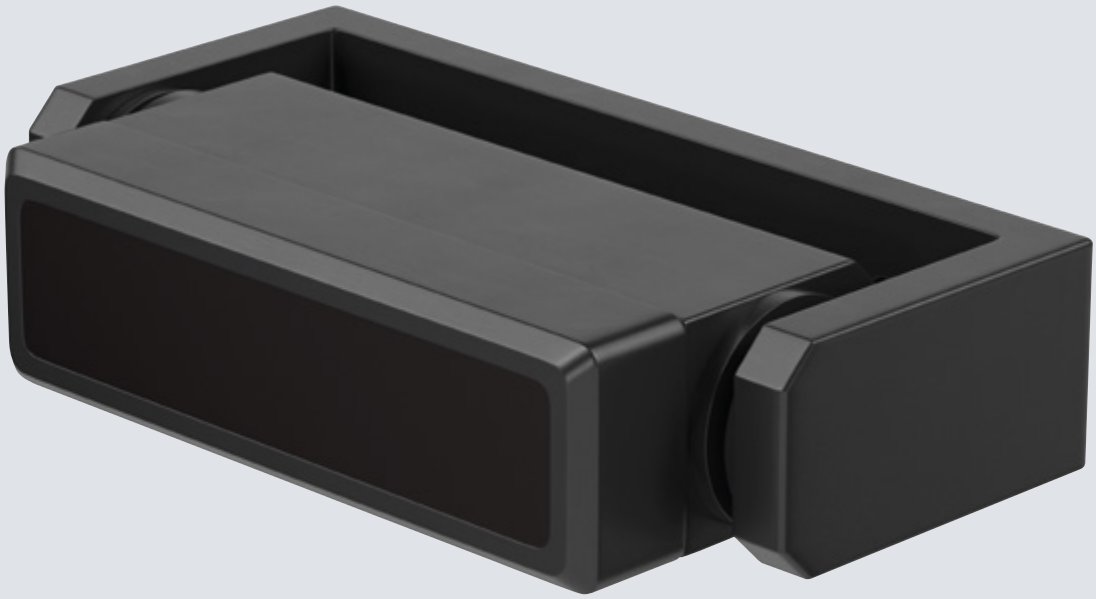
Safe and Convenient Boarding and Disembarking

Public transportation is an indispensable part of our mobility and everyday culture. In Germany alone, thousands of people use public transportation every day. The protection of passengers when boarding and disembarking buses and trains is a top priority. Therefore, the use of sensor technology in public transportation places especially high requirements on safety and functionality. To prevent failures and possible personal injury, we rely on sensor technology that has been specially developed for this area of application.

More information can be found at
www.sensotek.com/en/market-segments/public-urban-transport

Security—Active Infrared Sensor

Convenient Door Monitoring and Detection of the Flow of Passengers



The self-learning infrared sensor, which generates a linear detection field with 12 light beams, is especially suitable for detecting the flow of passengers and for monitoring doors on buses and trains.

Reliable Operation in Wind and Adverse Weather

The sensor can automatically learn any environment and automatically adapt itself to subsequent static changes. For example, it learns the contrast of the ground and detects changes caused by the presence of people or objects. This allows it to be used as an opening pulse sensor.

The 12 beams of the sensor can be adjusted to different door widths. Other notable features include the high level of sensitivity, immunity to external light sources, and long-term drift compensation function of the infrared sensor. This function guarantees reliable long-term use, even in dirty, rainy, or snowy conditions. It is available with E1 approval for use in motor vehicles. The sensor is available in a version that is certified to railway and automotive standards.

Highlights

- Automatic adaptation of the 12 light beams to any environment and door width
- Fault-free operation, even in the event of dirt, rain, or snow
- Version with PNP output, active/inactive switching function, and test input
- Available with E1 approval for application in motor vehicles

Excerpt from Technical Data	PROSCAN-T/32/76a
Detection field	230 mm × 80 mm (full field)
Operating voltage	12 V DC ... 38 V DC
Switching output	1 PNP, short-circuit proof, protected against reverse polarity, open collector
Ambient temperature	–20°C ... +60°C (–4°F ... +140°F)

Buses

Trains

Security—FMCW Radar

For Enhanced Safety During the Start-up Procedure

Traffic AKSS-T Anti-Collision System

All trams have a blind spot directly in front of the tram where the driver can see poorly or not at all. To protect pedestrians at tram stops, Traffic AKSS-T anti-collision system uses radar technology that is traditionally only used in stationary environments. Two sensors at the front detect people in front of the train. The reaction time of the system is less than 200 milliseconds. The driver is warned by an acoustic signal before starting off so that collisions are avoided.

Excerpt from Technical Data	AKSS-T
Operating voltage	12 V DC ... 36 V DC
Microwave module	865 GHz ... 24.25 GHz
Signal output	1× fault relay (NC) 1× warning relay (NO)
Switching voltage	Max. 48 A AC/DC
Switching current	Max. 0.5 A AC, 1 A DC
Degree of protection	IP67

Highlights

- Detection range of up to 4 meters
- Active warning function at speeds below 5 km/h
- The radar sensors have a wide range, ensuring that the entire hazardous area in front of the vehicle is monitored
- Time-saving installation with click-in housing

Trains

Security—Ultrasonic Sensors

Distance Measurement of Automatically Extending Footboards

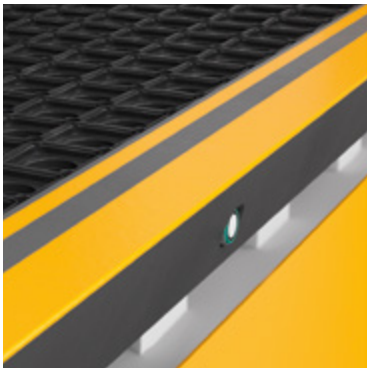
UB500 Series

Ultrasonic sensors use high-frequency sound pulses that are not audible to humans and are the ideal solution for noncontact position detection and distance measurement. They can detect objects made from a variety of materials, regardless of their shape and color, with millimeter precision. This means they are ideally suited to distance measurement on access systems on trams, where they provide reliable protection for automatically extending footboards. The footboard moves close to the platform, while the ultrasonic sensor installed in the footboard measures the distance to the platform.

Highlights

- Compact M18 housing with high IP67 protection
- Object detection with millimeter precision
- Extremely robust, therefore suitable for the toughest conditions

Excerpt from Technical Data	UB500-18GM75*
Sensing range	30 mm … 500 mm, adjustable from 50 mm … 500 mm
Operating voltage	10 V DC … 30 V DC
Signal output	Switching output or analog output can be parameterized
Signal input	Teach-in input, bidirectional synchronization
Operating temperature	–25°C … 70°C



Trains

Security—Active Infrared Sensor and Scanner

Flexibly Adjustable Systems for Monitoring the Closing Edge

TopScan and AIR30

The **TopScan** presence sensor is mounted on the front panel on bus doors. The sensor can be configured for different door widths—each beam can be individually adjusted to the closing edge.

The finely bundled light beam on the **AIR30** active infrared sensor allows for precise beam alignment. The diverse range of housing and mounting options allows the devices to be adjusted to suit a whole host of mounting conditions. The active infrared sensor is used to monitor the leading edge and hinge edge on bus and train doors.

Excerpt from Technical Data	TopScan	AIR30-8-HW-2500-3767/38a/76a
		
Scanning range	Min.: 0 … 1,500 mm for background evaluation, 500 … 1,500 mm for background suppression Max.: 0 … 2,500 mm for background evaluation, 500 … 2,500 mm for background suppression	Min. 100 … 1,000 mm Max. 100 … 2,500 mm
Operating voltage	18 V AC … 28 V AC, 17 V DC … 30 V DC	11 V AC … 36 V AC, 10 V DC … 48 V DC
Signal output	Relay, 1 changeover contact	Relay, 1 normally open
Operating temperature	–20°C … 60°C	–20°C … 60°C
Connection	Screw terminals	5 m fixed cable

Highlights

TopScan

- Can be configured with up to five sensor modules/beams
- Each beam can be adjusted individually
- Capability to switch between background suppression and background evaluation

AIR30

- Narrow, precise light beam with long detection range
- Reliable detection close to the surface
- Background suppression or background evaluation can be selected

Buses Trains

Security—Thru-Beam Sensors

Especially Space-Saving and Economical Door Security

ML29

The narrow ML29 miniature thru-beam sensor can be easily installed in door profiles or frames of rail vehicles and buses to provide door security. The narrow housing is mounted behind a panel on the profile using adhesive strips or a screw. The small opening angle makes it possible to mount in pairs with no risk of cross-talk. The optical face is discreet and invisible to the human eye, thus reducing the likelihood of vandalism. The sensor enables quick and reliable detection at a distance of up to 2 meters.

Excerpt from Technical Data	ML29T-P/32/59/115 100mm
Effective detection range	0 m ... 2.5 m
Operating voltage	10 V DC ... 32 V DC
Switching output	1 PNP output, short-circuit proof, protected against reverse polarity, open collector
Operating temperature	–25°C ... 60°C (–13°F ... +140°F)
Connection	100 mm fixed cable

Highlights

- Very narrow miniature design with infrared light
- Ideal for mounting in profiles or frames
- Integrated circuit and test input
- Easy plug-and-play installation
- Available version certified according to railway standard EN50155

Buses Trains

Security—Active Infrared and Fiber Optic Sensors

Protection and Convenience for Passengers on Trains and Buses

Sensor Range Ensures Safe Boarding and Disembarking

When buses are lowered at bus stops, the system detects the presence of an obstacle (“kneeling” protection). For example, if a person’s foot is trapped, the lowering process stops automatically.

As soon as a person at the stop approaches the bus or train door, it opens without contact. This facilitates entry for people with disabilities, strollers, and passengers with a lot of luggage. As soon as the door closes again, a tactile sensor integrated in the door profile monitors the closing edge and detects any trapped objects, even small items such as dog leashes and purses.

To protect passersby who are in the blind spot when starting off, an AKSS-T static radar sensor system is mounted on the front of the rail vehicle or bus.

Excerpt from Technical Data	TraffiComfort	TraffiContact	TraffiKneeling
Function	Autonomous opening, door monitoring	Pinch protection, pinch protection detection, collision protection	Kneeling protection
Operating voltage	12 V DC … 38 V DC	12 V DC … 38 V DC	12 V DC … 38 V DC
Switching output	PNP transistor, short-circuit proof	PNP transistor, short-circuit proof	PNP transistor, short-circuit proof
Signal input	Teach-in/test	Teach-in/test	Teach-in/test
Operating temperature	25°C … 60°C	25°C … 60°C	25°C … 60°C
Connection	Fixed cable	Plug or fixed cable	Plug or fixed cable

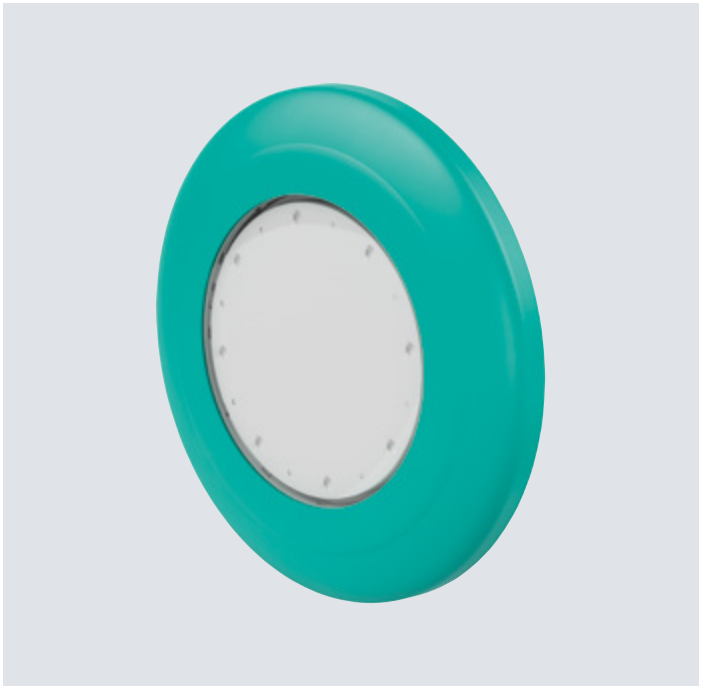
Highlights

- Uniform interfaces
- Flexible mounting options
- Can be used for all electric and compressed-air-powered vehicle-door systems
- Automatic adaptation to changing weather conditions
- Teach-in function to increase reliability
- Available with E1 or rail approval

Buses Trains

Opening—Capacitive Switch

Touch Door Opening with Robust, Maintenance-Free Switches



KTTA

Capacitive sensor systems function as pulse sensors that allow doors to be opened without force or pressure. If the switch is actuated successfully, 16 LEDs light up. The two push-pull outputs mean that the switch can be used with all programmable logic controllers. The IP69K protection enables use in all ambient conditions. With maintenance-free technology, the capacitive switch has an especially long service life compared to mechanical switches. Cover rings in various colors and different pictograms allow adjustment to different, customer-specific application areas.

Highlights

- Maintenance-free technology with an especially long service life
- The flat housing design is extremely resistant to vandalism
- E1 approval for buses

Excerpt from Technical Data	KTTA-E1
Operating voltage	16.8 V DC ... 32 V DC
Dynamic output pulse	300 ms
Operating temperature	–30°C ... 80°C
Degree of protection	IP69K
Switching outputs	PNP

Buses

Trains

Traffic Engineering

Designing Traffic Processes Safely

Increasing urbanization leads to a high utilization of the existing transport infrastructure by motorized vehicles and cyclists. Traffic concepts and traffic control systems are therefore increasingly based on intelligent sensor technology to enable efficient planning for inner-city parking and safer design of traffic flows.

More information can be found at
www.sensotek.com/en/market-segments/traffic-engineering

Reliable Detection of Cyclists

Premium Radar Motion Sensor with Intelligent Detection Modes

Intelligent detection modes allow Sensotek radar motion sensors to reliably distinguish between pedestrians and bicycles, so that the cyclists are detected safely. When mounted on the cycle path, they can be used for counting cyclists and aid in gathering usage statistics. The sensors can be connected to the traffic-light circuit to ensure better traffic flow.

The Bike P-HS radar sensor features intelligent functions that it can use to flexibly meet a wide range of requirements for vehicle detection. By contrast, the CAR-MS sensor is characterized by an extra-wide detection field and long detection range. The radar motion sensor thus offers numerous applications—such as counting vehicles in parking garages or displaying the number of occupied parking spaces.

Excerpt from Technical Data	Bike P-HS	CAR-MS
Sensing range	8,000 mm × 5,000 mm (D × W) at an installation height of 7,000 mm	Approx. 2.9 m × 2.3 m (D × W) with wide field alignment and adjustment of long detection range
Operating voltage	12 V AC ... 28 V AC, 12 V DC ... 36 V DC	12 V DC ... 30 V DC
Switching type	Active/passive	Push-pull output
Signal output	2 relay outputs	0.5 m fixed cable M12 plug, 5-pin
Degree of protection	IP67	IP67

Highlights

- Premium radar motion sensor with intelligent detection modes
- Extra-wide detection field and long detection range
- Suitable for direction recognition

Traffic Engineering

The Perfect Addition: Accessories and Other Components

Perfectly coordinated connectivity and mounting accessories make optimal sensor integration possible. The comprehensive range of accessories from Pepperl+Fuchs offers the components necessary for ready-to-install solutions.

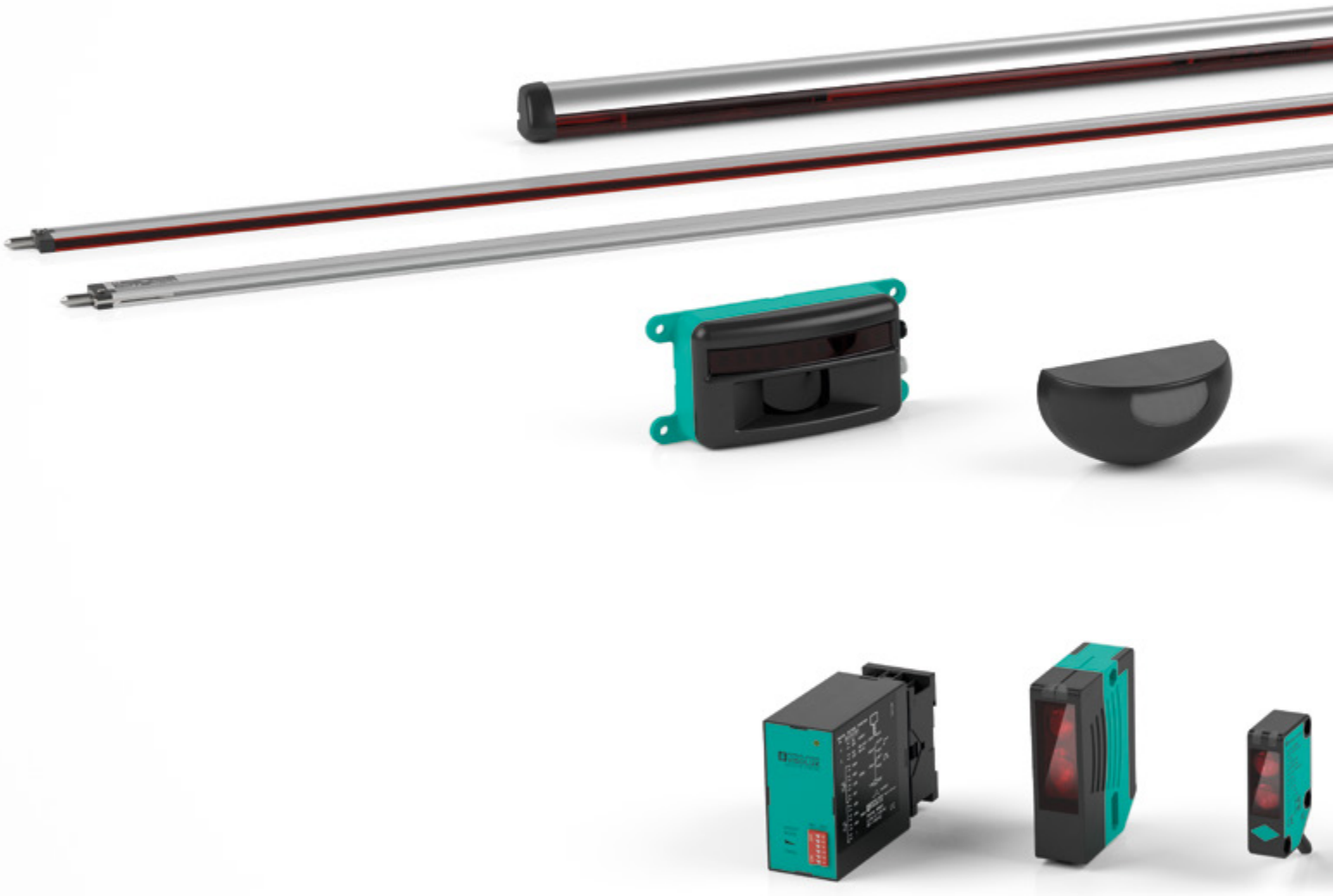
Pepperl+Fuchs Connectivity

- **Sensor-actuator cables**—numerous connection and cable types that can be used worldwide for a tailor-made solution
- **Field-attachable connectors**—a wide range of connectors suitable for a diverse range of applications
- **Junction blocks**—M8 and M12 distributors with a molded master cable for reduced installation costs
- **Sensor-actuator splitters**—for easy merging of two signals at a single slot
- **Receptacles**—signal routing from the switch cabinet directly into the field
- **Data connectors**—for reliable networking between the components of an automation system

Large Selection of Cable Types

Each operating environment has its own requirements. The mechanical and chemical properties of the connection technology used are a crucial aspect in determining the solution. Pepperl+Fuchs offers the exact cable types that you need.

- PVC—solid and economical
- PUR—durable and highly flexible
- PUR U—highly flexible with UL approval
- PUR A—resistant to welding sparks for the automotive industry
- PUR O—rugged for demanding outdoor applications
- PUR-R—highly flexible for demanding robotic applications
- STOOW—designed specifically for the American market
- POC—specifically for the welding industry



Your automation, our passion.

Sensor technology for entrance automation:

- Automatic Doors and Access Systems
- Industrial Gates
- Elevators
- Escalators
- Barriers
- People Counting
- Security
- Fire Protection Equipment
- Perimeter Security
- Public Urban Transport
- Traffic Engineering

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