# INVISIBLE PROTECTION

## SENSORS FOR THE PROTECTION AND MOVEMENT OF PEOPLE AND VEHICLES

PEPPERL+FUCHS

# NON-CONTACT DETECTION USING SENSORS FOR PROTECTION ON A


*In all situations, Pepperl+Fuchs sensors offer non-contact safety that does not deviate from the task at hand. After all, there are definitely more pleasant contacts in life than with an automatic door.*

# UTOMATED PEDESTRIAN AND VEHICLE ACCESSES

It is hard to imagine modern everyday life without escalators, automatic pedestrian doors, industrial doors and elevators. They open automatically, detect obstacles, and react to approaching people and objects. Invisible systems protect us throughout day-to-day life. Pepperl+Fuchs' sensors are indispensable to the function and reliability of these systems.

## INVISIBLE PROTECTION

Pepperl+Fuchs sensors ensure the secure operation of automatic pedestrian doors, industrial doors, escalators, and elevators. Applications include: activation, protection and monitoring of automatic doors, turnstiles, industrial doors, commercial and industrial gates start-up controls for escalators and safeguarding systems for the closing edges of elevator doors.

Sensor systems can be aligned optimally to meet the broadest range of requirements. Conditions for automatic doors in retail centers and shopping malls are quite different to those in hospitals or nursing homes. Different criteria define sensor technology on industrial doors or warehouse entries where there is a combination of vehicular and pedestrian traffic. On escape and emergency routes and with fire doors, however, safety regulations and maximum reliability take priority.

Here, safety is the most important aspect. Pepperl+Fuchs sensors are always developed to the most recent DIN safety standards and EN ISO/IEC norms. We also actively contribute to the committees that write these standards. In addition to personal protection, the relevant EMC guidelines are also taken into consideration so that with increasing use in modern building technology, electronic devices do not interfere with each other.

Our sensors install seamlessly and discretely for worry-free, automated operation.

**Trust in INVISIBLE PROTECTION. When it has to work, you can rely on Pepperl+Fuchs' sensors**

# PEPPERL+FUCHS – YOUR EXPERT PARTNER

Pepperl+Fuchs has one of the largest and most extensive ranges of industrial sensors that covers a broad spectrum of applications.
With distribution and manufacturing sites at all major points on the globe, Pepperl+Fuchs supplies all regional markets and enables Plug-and-Play sensor installation on-site.
Over 4,000 employees develop, produce and distribute products for automation in more than 30 countries and ensure that these continue to meet and exceed the constantly increasing market requirements.

PEPPERL+FUCHS

An important field for sensors outside of industrial automation is automating doors, industrial gates, industrial gate systems and elevators . Automatic door systems rely on robust sensor systems to keep them working and keep them safe. From photoelectric sensors that can detect direction and differentiate between people and vehicles, light grids that monitor elevator doors and microwave motion detectors for sliding or swinging doors, to sensors that provide absolute positioning and protection against pinch points and collisions, Pepperl+Fuchs has a sensor to suit your needs. In fact, we have the largest and most diverse selection of sensor systems in the world.

Pepperl+Fuchs offers a range of innovative and marketable sensing technologies that are tailored to these applications. We've been supplying sensors to the door and elevator industry for over 25 years.

- **We provide comprehensive advice.**
- **We always come to your site.**
- **We find a solution for your application.**
- **We provide a customized solution to meet your needs.**
- **Your satisfaction is our aim!**

**Trust in INVISIBLE PROTECTION.**
**When it has to work, you can rely on Pepperl+Fuchs' sensors.**

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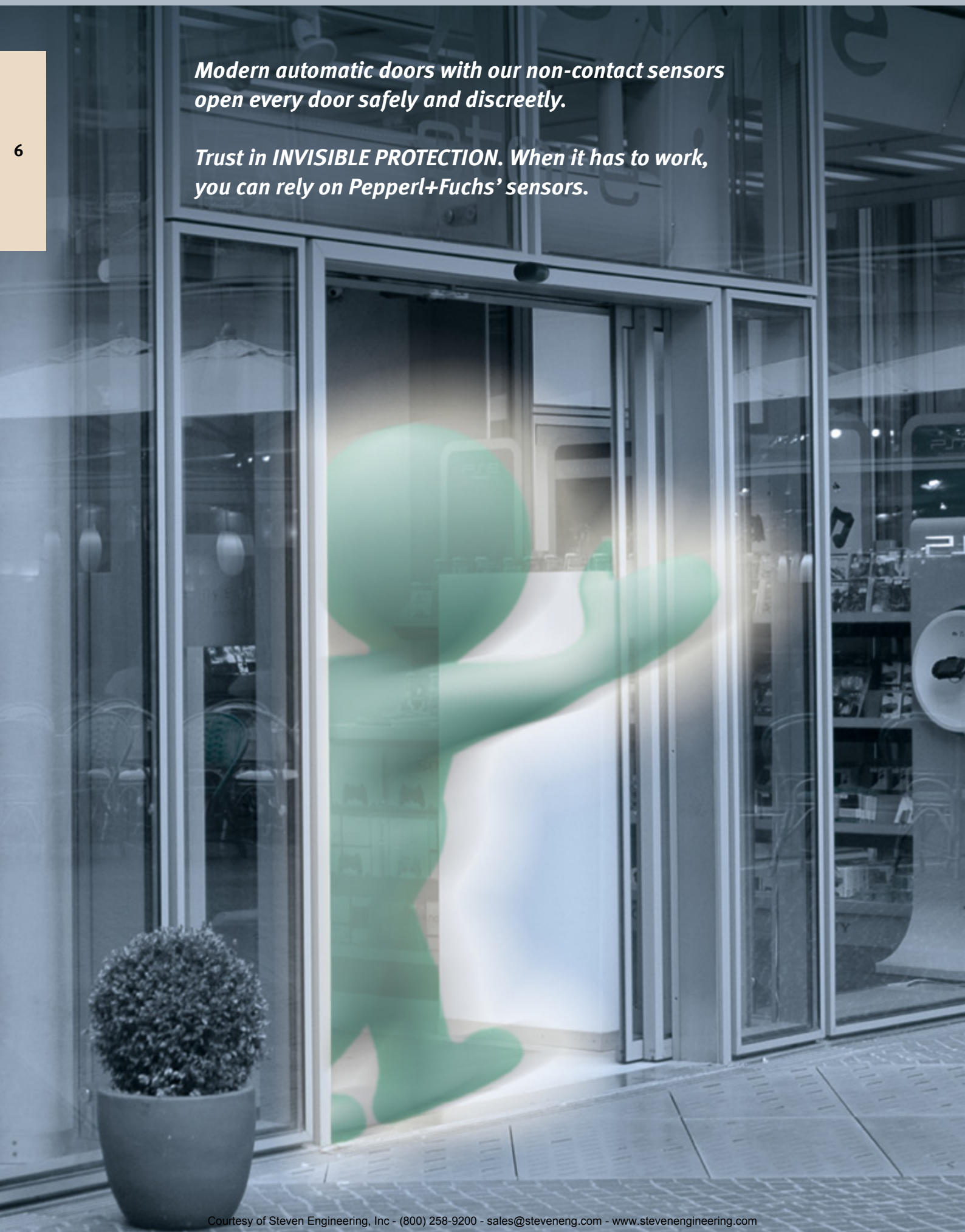
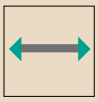


***Modern automatic doors with our non-contact sensors open every door safely and discreetly.***

***Trust in INVISIBLE PROTECTION. When it has to work, you can rely on Pepperl+Fuchs' sensors.***

When classifying sensor functionality we differentiate between the following door types:

**SLIDING DOORS**



**SWINGING DOORS**

**REVOLVING DOORS**

**TURNSTILES**

## CONVENIENT AND SECURE OPERATION OF AUTOMATIC DOORS

Convenience, as it relates to an automatic door, means that it opens independently, at the right time, every time. This falls under the responsibility of door activation sensors. They detect when someone approaches and activate the door-opening mechanism. Our motion sensors are equipped with adjustable detection areas and functions such as direction detection and cross-traffic suppression. This clearly enhances the functionality of automatic doors, preventing unnecessary opening and closing, increasing the service life of the door mechanism, and saving costs on heating and air conditioning. Our sensors are robust, tamperproof, immune to rain, vibration, and reflection, and simple to operate.

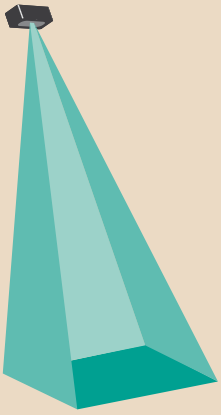
Safety is an essential concern for all forms of automation. When the automatic doors open and close, it is imperative that they do not hit anybody and cause injuries. Securing and monitoring closing door edges is a top priority. Sensors prevent the door from closing if people or animals stop in the area around the door. An automatic teach-in function continually adjusts the sensors to the ever-changing conditions of their surroundings and guarantees fault-free protection.

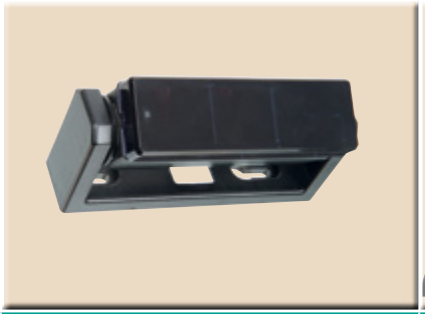
Optimum collision protection is particularly important with swinging and revolving doors. Here it is essential that people are detected when the doors are opened so the door can remain open if necessary. In addition to high-performance and more reliable detection, these sensors are particularly flexible and easy to operate. The detection characteristics can be individually aligned and continuously adjusted.
In addition to stationary operation, they also operate when in motion, providing the option of being mounted on revolving or swinging doors.

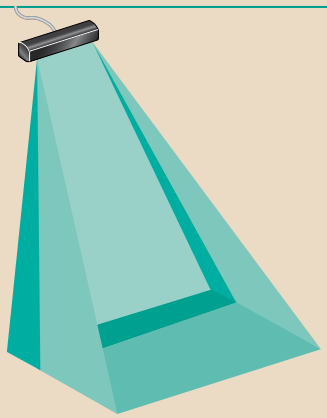
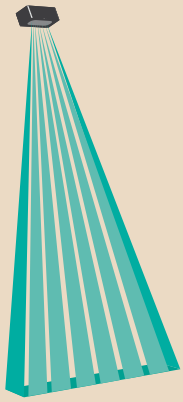
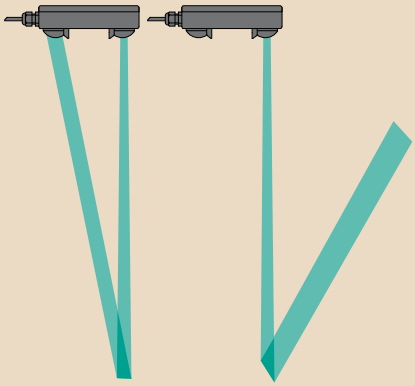
With certification in accordance with DIN 18650 as category 2 testable, non-contact safety equipment (NCSE), Pepperl+Fuchs equipment offers maximum safety.

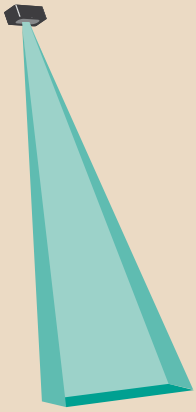
The product portfolio also includes sensors that fulfill the special requirements of public transit systems. They are certified and approved in accordance with rail standard EN 50155 or have E1 approval.

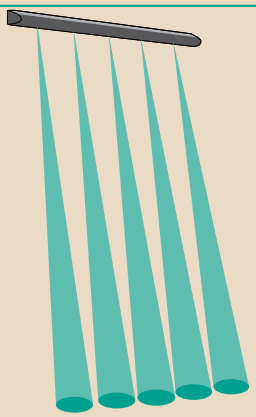

| | |
|---|---|
| **Series** | **RADEC** |
| **Functioning principle** | Radar sensors |
| **Description** | Standard microwave motion sensor with basic functionality |
| **Function** | Opening |
| **Application** |  |
| **Detection area** |  |
| **Technical specifications** | ■ **Reliable movement detection of people and vehicles**<br>■ **Adjustable sensitivity**<br>■ **Modifiable detection area**<br>■ **Direction monitoring**<br>■ **Cross-traffic suppression**<br>■ **Wall and ceiling mount** |
| **Detection area** | 4.5 m x 2 m/2 m x 4.5 m |
| **Installation height** | Max. 4 m |
| **Operating voltage** | 12 to 36 V DC/12 to 38 V AC |
| **Switching output** | Relay |
| **Operating temperature** | -20 °C to 60 °C |
| **Connection** | Connector strip with 2.5 m connecting cable |
| **Dimensions** | 101 mm x 60 mm x 59 mm |
| **Versions** | ■ Mono (no direction detection)<br>■ Stereo with direction detection)<br>■ Black housing<br>■ Silver housing<br>■ White housing |

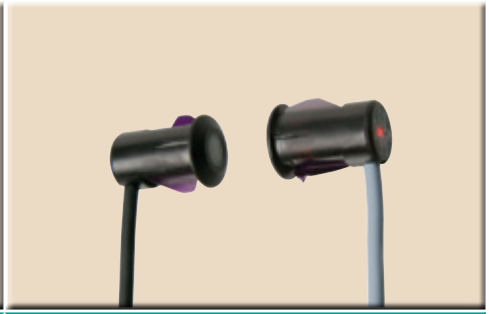
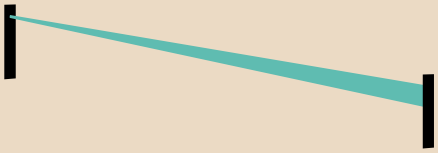
| | RMS | RMS-FRW | PIR20 |
|---|---|---|---|
| |  |  |  |
| | Radar sensors | Radar sensors | Passive infrared scanners |
| | Premium microwave motion sensor with additional intelligent functions | Premium microwave motion sensors with integrated self-monitoring for escape and exit routes<br>SIL IEC61508 TÜV Baumuster geprüft | Presence sensors based on infrared thermal radiation for detecting people |
| | Opening | Opening | Opening |
| |  |  |  |
| |  |  |  |
| | ■ **Reliable movement detection of people and vehicles**<br>■ **Easily programmable with DIP switch and 16 basic pre-programmed settings**<br>■ **Direction monitoring**<br>■ **Cross-traffic suppression**<br>■ **Turtle mode** | ■ **Reliable movement detection for emergency and escape routes**<br>■ **Self-monitoring**<br>■ **Approved in accordance with AutSchR**<br>■ **Remote controllable**<br>■ **Direction monitoring**<br>■ **Cross-traffic suppression**<br>■ **Turtle mode** | ■ **Detect people by their thermal emission +/- 0.5 °C**<br>■ **Operates only in the event of motion**<br>■ **Compact design**<br>■ **Precise and continuous adjustment of the detection field through aperture and zoom function**<br>■ **Suitable for flush-mounting** |
| | 4.5 m x 2 m/2.5 m x 3 m/4 m x 2 m | 2.5 m x 3.5 m | 1.8 m x 2.6 m |
| | Max. 4 m | Max. 3 m | Max. 5 m |
| | 12 to 36 V DC/12 to 38 V AC | 12 to 36 V DC | 12 to 30 V DC/12 to 24 V DC |
| | Relay | Relay/voltage/frequency | Relay |
| | -20 °C to 60 °C | -20 °C to 60 °C | -20 °C to 60 °C |
| | Connector strip with 5 m connecting cable | Connector strip with 3 m connecting cable | Screw terminals |
| | 123 mm x 65 mm x 57 mm | 123 mm x 65 mm x 57 mm | 56 mm x 23 mm x 45 mm |
| | ■ Mono (no direction detection)<br>■ Stereo (with direction detection)<br>■ Extra wide detection area<br>■ Remote controllable<br>■ FCC approval for North America<br>■ Black housing<br>■ White housing<br>■ Silver housing | | ■ Black housing<br>■ White housing |



| Series | FLT-D | PROSCAN | LT2 · LTK2 |
|---|---|---|---|
| Functional principle | Active infrared area scanners | Active infrared scanners | Active infrared scanners |
| Description | Combination sensor for opening and protection | Multi-beam sensor with self-learn function for monitoring | Precision sensor for very long detection range |
| Function | Area sensors with two detection fields | Protection | Protection |
| Application |  |  |  |
| Detection area |  |  |  |
| Technical specifications | ■ **Continuous area detection with 20 programmable detection fields**<br>■ **Teach-in mode**<br>■ **Configuration of field sizes, teach-in mode, sensitivity, switch type and master/slave operation**<br>■ **Test item detection in accordance with EN 12650** | ■ **Fan-shaped detection field with max. of 12 beams**<br>■ **Adjustable for different door widths**<br>■ **Single teach-in phase**<br>■ **Automatic configuration to changing floors/surroundings**<br>■ **Increased sensitivity midspan** | ■ **Choice of operating modes: Background suppression ignored objects/ Background evaluation uses the background as reference for detecting difficult targets**<br>■ **Adjustable detection range and timer functions** |
| Detection area | 2.2 m x 1.5 m (full field) | 2.3 m x 80 mm (full field) | Diameter of the light spot 50 mm at 2 m and 150 mm at 6 m |
| Installation height | Max. 2.2 m | Max. 2.5 m | Max. 2.5 m or 6 m |
| Operating voltage | 12 to 30 V DC/12 to 30 V AC | 12 to 38 V DC or 12 to 38 V DC/12 to 28 V AC | LT2: 15 to 35 V DC<br>LTK2: 11 to 48 V DC/12 to 24 V AC |
| Switching output | Relay | 1 PNP or relay | LT2: 2 PNP or 1 NPN/1 PNP<br>LTK2: Relay |
| Operating temperature | -20 °C to 60 °C | -20 °C to 60 °C | -20 °C to 60 °C |
| Connection | Terminal block | Fixed cable | M12 quick disconnector fixed cable |
| Dimensions | 250 mm x 60 mm x 45 mm | 102 mm x 45 mm x 32 mm | 150 mm x 64 mm x 49 mm |
| Versions | | ■ Test input<br>■ PNP output<br>■ NPN output<br>■ Operating voltage DC<br>■ Operating voltage AC/DC<br>■ Adjustable time between teach cycles | ■ Test input<br>■ Two-channel version with two independent detection areas<br>■ Installation height 2.5 m<br>■ Installation height 6 m<br>■ Operating voltage DC with NPN output<br>■ Operating voltage DC with PNP output<br>■ Operating voltage AC/DC with relay output<br>■ Quick disconnect<br>■ Fixed cable connection |

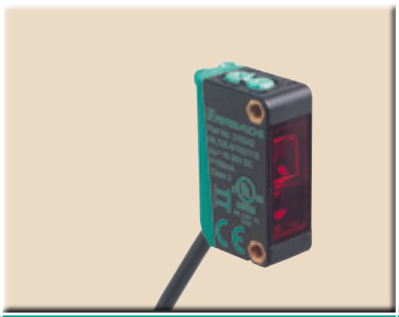
| | FLT-8 | AIR20 | AIR30 |
|---|---|---|---|
| | Active infrared area scanners | Active infrared scanners | Active infrared scanners |
| | Area scanners with long detection range for detecting people and objects | Single-beam diffuse mode sensor for securing closing edges or as an opening impulse sensor | Single-beam diffuse mode sensor with precise light beam for monitoring main and secondary closing edges |
| | Protection | Opening and protection | Protection |
| |  |  |  |
| |  |  |  |
| | ■ **3 or 4 beams in a housing form the sensing field**<br>■ **500 mm x 500 mm maximum detection range**<br>■ **Various operating modes: Background suppression ignores objects beyond a selected area/background evaluation uses background as reference to detect difficult objects** | ■ **Fine, precise light beam with long sensing range**<br>■ **Background suppression**<br>■ **Compact design**<br>■ **Immune to ambient lighting**<br>■ **Suitable for moving or stationary mounting** | ■ **Accurate beam direction with the very small light spot diameter**<br>■ **Various operating modes: Background suppression ignores objects beyond a selected area/ background evaluation uses background as reference to detect difficult objects**<br>■ **Adjustable detection range** |
| | 500 mm x 500 mm or 50 mm x 500 mm or 300 mm x 500 mm | Diameter of the light spot 60 mm at 1.3 m | Diameter of the light spot 50 mm at 2 m |
| | Max. 2.8 m | Max. 2.2 m | Max. 2.5 m |
| | 15 to 48 V DC or 15 to 48 V AC/DC | 12 to 30 V DC/ 18 to 28 V AC | 10 to 30 V DC or 10 to 48 V DC/11 to 38 V AC |
| | 2 PNP or 1NPN/1PNP or relay | Relay | 1 PNP or relay |
| | -20 °C to 60 °C | -20 °C to 60 °C | -20 °C to 60 °C |
| | M16 quick disconnect or fixed cable | Terminal block | Fixed cable |
| | 150 mm x 64 mm x 52 mm | 68 mm x 25 mm x 49 mm | 102 mm x 45 mm x 32 mm |
| | ■ Background suppression (-H)<br>■ Background evaluation (-HW)<br>■ Counter function and direction detection (CLS)<br>■ Operating voltage DC with NPN/PNP output<br>■ Operating voltage DC with 2 PNP outputs<br>■ Operating voltage AC/DC with relay output<br>■ Light-on or dark-on switching<br>■ Quick disconnect or fixed cable connection | | ■ Background suppression (-H)<br>■ Background evaluation (-HW)<br>■ Operating voltage DC with 1 PNP output<br>■ Operating voltage AC/DC with relay output<br>■ Light-on<br>■ Light-on/dark-on selectable<br>■ Test input<br>■ Flush-mounted version |

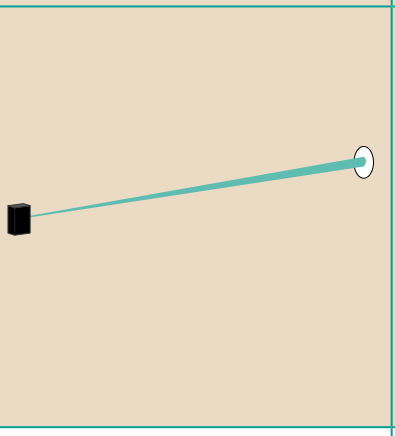
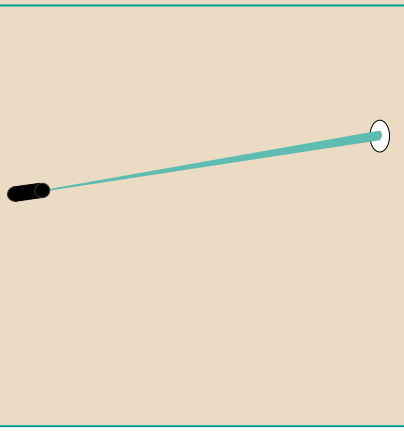
| Series | TOPSCAN | TOPSCAN-S |
|---|---|---|
| Functional principle | Active infrared scanners | Active infrared scanners |
| Description | Mobile single and multi-beam light curtain for individual protection | Mobile single and multi-beam light curtain for TÜV certification<br>Zertifiziert nach DIN 18650 In accordance with<br>TÜV Baumuster geprüft |
| Function | Protection | Protection |
| Application |  |  |
| Detection area |  |  |
| Technical specifications | ■ **Configurable with 1, 2 or 3 sensor modules (beams)**<br>■ **Various profile lengths from 330 mm to 1,350 mm**<br>■ **Each beam can be adjusted individually**<br>■ **Switchable background suppression and evaluation**<br>■ **Adjustable closing edge direction**<br>■ **Test input** | ■ **Configurable with 1 to 6 sensor modules (beams) and a broad range of profile lengths**<br>■ **Category 2, tested and certified to DIN 18650**<br>■ **Modular structure with master/slave modules**<br>■ **Each beam can be adjusted individually**<br>■ **Profile lengths from 310 mm to 1,400 mm**<br>■ **Emitter can be adjusted for left or right edge**<br>■ **Test specimen recognition across the complete door width** |
| Detection area | Per beam 75 mm x 75 mm at 2 m | Per beam 75 mm x 75 mm at 2 m |
| Installation height | Max. 2.5 m | Max. 2.5 m |
| Operating voltage | 17 to 30 V DC | 24 V DC |
| Switching output | Relay | Relay |
| Operating temperature | -20 °C to 60 °C | -10 °C to 50 °C |
| Connection | Screw terminals | Screw terminals |
| Dimensions | Profile length x 42 mm x 37 mm | Profile length x 42 mm x 37 mm |
| Versions | ■ 1-beam<br>■ 2-beam<br>■ 3-beam<br>■ Different profile lengths for different door widths | ■ 1-beam<br>■ 2-beam<br>■ 3-beam<br>■ 4-beam<br>■ 6-beam<br>■ Different profile lengths for different door widths |

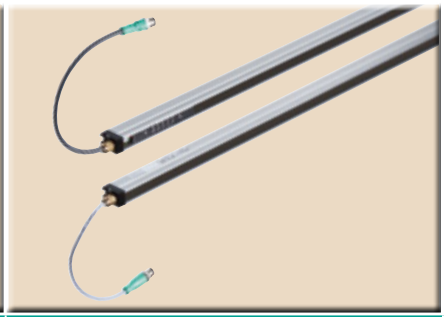
| | ML29 · ML30 | BB10 |
|---|---|---|
| |  |  |
| | Thru-beam sensors | Thru-beam sensors |
| | Miniature bar photoelectric sensor, ideal for installation in door profile or frame | Miniature phototoelectric Plug-In sensor photoelectric sensor, ideal for installation in doors and turnstiles |
| | Protection | Protection |
| |  |  |
| |  |  |
| | ■ **Very slender miniature model**<br>■ **Infrared light**<br>■ **Integral circuit with no external control interface unit**<br>■ **Test input**<br>■ **Easy installation – Plug and Play** | ■ **Very compact model**<br>■ **Infrared light**<br>■ **Integral circuit with no external control interface unit**<br>■ **Narrow opening angle suitable for mounting in pairs**<br>■ **Plug-in housing for 13 mm hole** |
| | | Diameter of the light spot 250 mm at 1 m or 1,300 mm at 6 m |
| | Sensing range max. 6 m or max. 8.5 m | Sensing range max. 4 m or 8 m |
| | 11 to 30 V DC | 10 to 30 V DC |
| | 1 NPN or 1 PNP | 1 NPN or 1 PNP |
| | -20 °C to 60 °C | -40 °C to 60 °C |
| | Fixed cable or M8 quick disconnect | Fixed cable |
| | 11.6 mm x 85.2 mm x 9.2 mm | 22 mm x 12.5 mm x 12.5 mm |
| | ■ Sensing range 6 m<br>■ Sensing range 8.5 m<br>■ PNP output<br>■ NPN output<br>■ Light-on<br>■ Dark-on<br>■ Quick disconnect<br>■ Fixed cable connection<br>■ Dual-beam version (master/slave)<br>■ 1 or 2 mounting holes | ■ Sensing range 4 m<br>■ Sensing range 8 m<br>■ PNP output<br>■ NPN output<br>■ Light-on<br>■ Dark-on<br>■ Test input<br>■ Frequencies F1, F2 or F3 |

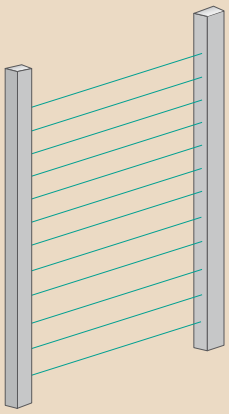
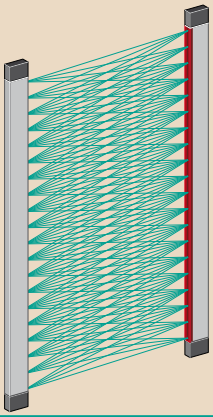
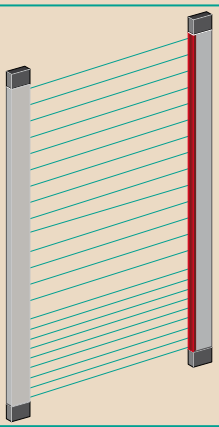
## INDUCTIVE SENSORS

**Our range of inductive sensors for automatic doors and turnstiles can be found on pages 46/47.**



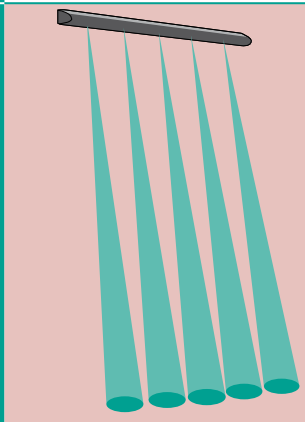
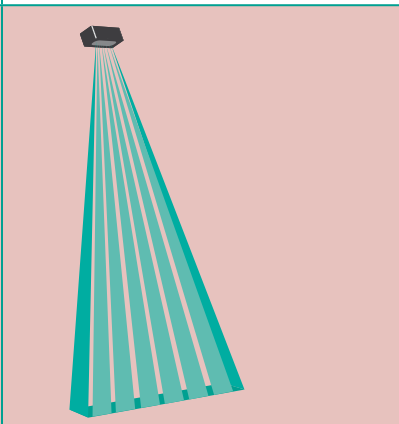
| Series | ML100-6/ML100-55 | GLV18-6/GLK18-6 |
|---|---|---|
| Functional principle | Retroreflective sensor | Retroreflective sensor |
| Description | Single-beam miniature photoelectric sensor with long detection range for detecting people and objects | Single-beam M18 cylindrical sensor for detecting people, objects, and vehicles |
| Function | Monitoring | Monitoring |
| Application |  |  |
| Detection area |  |  |
| Technical specifications | ■ **Miniature design**<br>■ **All-metal thread mounting**<br>■ **Infrared light**<br>■ **Light-ON/dark-ON switch**<br>■ **Sensitivity adjuster**<br>■ **Works reliably on reflector** | ■ **Short M18 plastic housing**<br>■ **Red light**<br>■ **Fine, sharp light spot**<br>■ **Light-on/dark-on switching**<br>■ **Works reliably on reflector** |
| Detection area | Diameter of the light spot: 500 mm at 7 m | Diameter of the light spot: 250 mm at 6.5 m |
| Installation height | Sensing range: max. 7 m / max. 9 m | Sensing range: 6.5 m or 8 m |
| Operating voltage | 10 to 30 V DC | GLV18: 10 to 30 V DC<br>GLK18: 20 to 250 V AC/DC |
| Switching output | 1 PNP or 1 NPN | GLV18: 2 PNP or 1 PNP<br>GLK18: N-channel MOSFET |
| Operating temperature | -30 °C to 60 °C | -20 °C to 60 °C |
| Connection | Fixed cable | Fixed cable or M8 quick disconnect |
| Dimensions | 11 mm x 31 mm x 20 mm | M18 x 44 mm or M18 x 60 mm |
| Versions | ■ Version without polarisation filter (-6)<br>■ Version with polarisation filter (-55) | ■ Front lens orientation with 8 m sensing range<br>■ Side lens orientation (-S) with 6.5 m sensing range<br>■ Operating voltage DC with PNP output<br>■ Operating voltage DC with 2 PNP outputs<br>■ Operating voltage AC/DC with MOSFET output<br>■ Quick disconnect<br>■ Fixed cable connection |

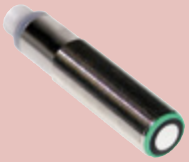


| | LGS100 | AL2109 | AL20/40 |
|---|---|---|---|
| | Thru-beam light grids | Thru-beam light grids | Thru-beam light grids |
| | Light grid for monitoring large areas | Light grid with fine resolution for detecting people and objects | Light grid with long sensing range for detecting people and objects |
| | Monitoring | Monitoring | Monitoring |
| |  |  |  |
| |  |  |  |
| | ■ **Integrated controller**<br>■ **Beam gap 100 mm**<br>■ **Various field heights from 100 mm to 3 m**<br>■ **Super-fast object detection**<br>■ **Infrared light**<br>■ **Test input**<br>■ **Configuration via touch field without software** | ■ **Conformity to EN 81-70 and EN 12015/16**<br>■ **Integrated controller**<br>■ **Infrared light**<br>■ **Extremely dense monitoring field with 135 beams and up to 7 times crossover**<br>■ **Object detection up to 'zero distance'**<br>■ **Automatic adjustment of beam configuration**<br>■ **Blanking of defective beams**<br>■ **Insensitive to reflection and ambient light** | ■ **Integrated controller**<br>■ **Infrared light**<br>■ **Dense sensor field enables detection of small objects**<br>■ **Automatic adjustment of beam configuration for maximum resolution**<br>■ **Operation and status LEDs**<br>■ **Insensitive to reflection and ambient light** |
| | Field height max. 3 m | Field height 1.8 m | Field height 1.65 m |
| | Sensing range: max. 6 m or 8 m | Sensing range: max. 3.5 m | Sensing range: max. 5.6 m |
| | 18 to 30 V DC | 11 to 30 V DC | 12 to 30 V DC |
| | 1 push-pull output for detection field and 3 push-pull outputs for height control | 1 PNP/NPN | 1 PNP/1 NPN |
| | -10 °C to 60 °C (optionally to - 30 °C) | -10 °C to 55 °C | -10 °C to 60 °C |
| | Fixed cable with M12 quick disconnect (pigtail) | Fixed cable or M8 quick disconnect | Fixed cable or M12 pigtail |
| | 20 mm x 30.5 mm x field height + 159 mm | 9 mm x 34 mm x 2 m | Profile width x 30 mm x 2 m |
| | ■ Sensing range 6 m<br>■ Sensing range 8 m<br>■ Field heights of 100 mm to 3 m<br>■ Low temperature version to -30 °C | ■ Quick disconnect<br>■ Fixed cable connection<br>■ Version with ATEX approval for zone 2 and 22 (TÜV 08 ATEX 554855 X) | ■ Profile width 12 mm (ALXX12)<br>■ Profile width 16 mm (ALXX16)<br>■ Beam gap 20 to 44 mm (AL20XX)<br>■ Beam gap 40 to 88 mm (AL40XX)<br>■ Pigtail connector<br>■ Fixed cable connection |

# SENSORS FOR DOORS IN PUBLIC TRANSIT




| Series | TOPSCAN | PROSCAN-T |
|---|---|---|
| Functional principle | Active infrared scanners | Active infrared scanners |
| Description | Single- and multi-beam light curtain to protect against collision | Multi-beam sensor with self-learn function for monitoring large areas with E1 approval |
| Function | Protection | Protection |
| Detection area |  |  |
| Technical specifications | ■ **Configurable with up to 5 sensor modules (beams)**<br>■ **Each beam can be adjusted individually**<br>■ **Switchable background suppression and evaluation**<br>■ **Test input** | ■ **Fan-shaped detection field with 12 beams**<br>■ **Dynamic closing edge monitoring over the entire width of the door**<br>■ **Adjustable for different door widths**<br>■ **Single teach-in phase**<br>■ **Automatic adjustment to surroundings and weather** |
| Detection area | Per beam 75 mm x 75 mm at 2 m | 2.3 m x 80 mm (full field) |
| Installation height | Max. 2.5 m | Max. 2.5 m |
| Operating voltage | 17 to 30 V DC | 12 to 38 V DC |
| Switching output | Relay | 1 PNP |
| Operating temperature | -20 °C to 60 °C | -20 °C to 60 °C |
| Connection | Screw terminals | Quick disconnect (AMP) or fixed cable |
| Dimensions | Profile length x 42 mm x 37 mm | 102 mm x 45 mm x 32 mm |
| Versions | ■ 1-beam<br>■ 2-beam<br>■ 3-beam<br>■ 4-beam<br>■ 5-beam<br>■ Different profile lengths up to 1,350 mm for different door widths | ■ Different versions with preset field sizes<br>■ Test input<br>■ Control input<br>■ Quick disconnect<br>■ Fixed cable connection |

| | AIR30 | ML29-T | UB500-18GM75 |
|---|---|---|---|
| |  |  |  |
| | Active infrared scanners | Thru-beam sensors | Ultrasonic sensors |
| | Single-beam diffuse mode sensor for monitoring main and secondary closing edges | Single-beam miniature bar photoelectric sensor, ideal for installation in door frames with certification in accordance with rail standard EN 51155 | M18 ultrasonic sensor for measuring distance in entry systems for rail vehicles |
| | Protection | Protection | Protection |
| |  |  |  |
| | ■ **Fine, precise light beam with long sensing range**<br>■ **Narrow, tight beam monitors extremely close to closing edge**<br>■ **Switchable background suppression or background evaluation** | ■ **Very slender miniature model**<br>■ **Ideal for installation in profiles or frames**<br>■ **Infrared light**<br>■ **Integrated switch**<br>■ **Test input**<br>■ **Easy installation – Plug and Play** | ■ **Single head system**<br>■ **Adjustable output functions**<br>■ **Selectable ultrasonic beam width**<br>■ **Teach-in input and synchronization options**<br>■ **Temperature compensation**<br>■ **Degree of protection IP65** |
| | Diameter of the light spot 50 mm at 2 m | Sensing range: max. 3.5 m | Adjustable 30 to 500 mm |
| | Max. 2.5 m | – | – |
| | 10 to 48 V DC/ 11 to 38 V AC | 10 to 32 V DC | 10 to 30 V DC |
| | Relay | 1 PNP | 1 PNP or analog output |
| | -20 °C to 60 °C | -25 °C to 60 °C | -25 °C to 70 °C |
| | Fixed cable | Fixed cable | M12 quick disconnect |
| | 102 mm x 45 mm x 32 mm | 11.6 mm x 85.2 mm x 9.2 mm | M18 x 85 mm |
| | ■ Flush-mounted version<br>■ Light-on<br>■ Light-on/dark-on selectable<br>■ Test input | | ■ PNP output<br>■ Analog output |

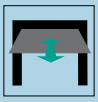
# SENSORS FOR INDUSTRIAL DOORS




***Should the industrial door open only for vehicles or for people as well? Our sensors can be programmed to detect vehicles or people, ensuring secure and effective automatic industrial doors. Trust in INVISIBLE PROTECTION and customise your industrial door sensing requirements.***

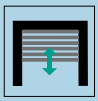
When classifying sensor functionality we differentiate between the following gate types:

**ONE-PIECE, LIFT-UP DOORS**

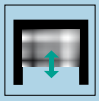


**SWING DOORS**

**SECTIONAL DOORS**

**HIGH-SPEED DOORS**



## MORE EFFECTIVE AND SECURE OPERATION OF AUTOMATIC INDUSTRIAL DOORS

It is important to guarantee convenient and secure operation with automatic industrial doors. Is it also important to have an effective opening and closing function that supports the operation and logistics as much as possible. Several sensor systems are available for automatic opening that are tailored to the particular requirements in this area. The compact, powerful, and extremely robust sensors are ideal for high mounting locations or long sensing distances, and they are easy to install. They come with simple setting options, hassle-free setup and low-maintenance operation. Configurable detection fields and sensing ranges enable adjustment to a vast range of door dimensions. Mounting heights of up to seven meters are no problem.

The door sensors have the ability to differentiate between pedestrians and vehicles. An optional extra is for the industrial door to open only on the approach of a vehicle not a pedestrian.

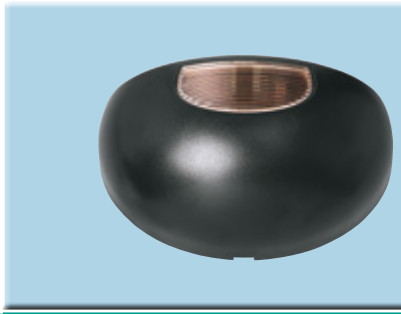
The issue of security is also extremely important with automatic doors. With any up or downward movements of the door, appropriate proper sensor system eliminates the risk of injury at the closing edges.

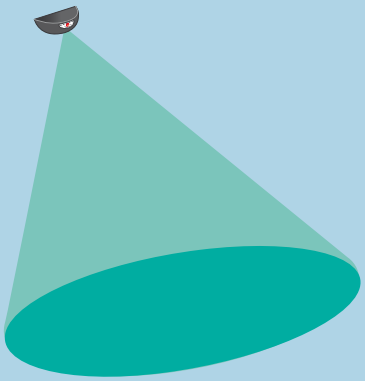
Also available are robust door sensors with a range of operating principles that are not affected by adverse conditions. With long sensing ranges and a variety of adjustment options, they provide automatic low-cost protection for entry routes.

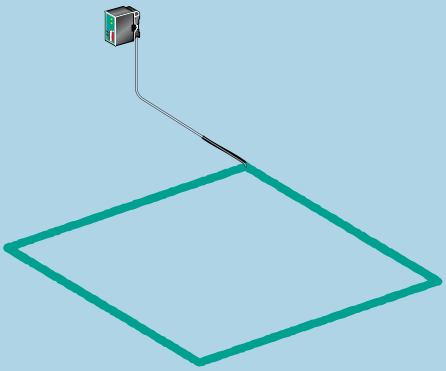
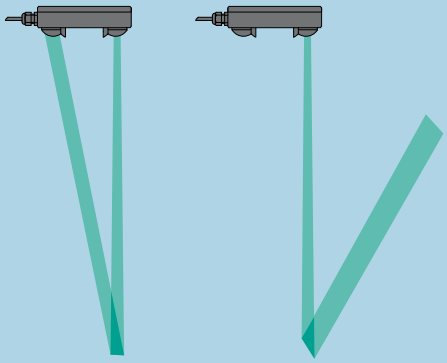
This product area is rounded off with end position controls for the actuators. Pepperl+Fuchs offers a range of inductive sensor solutions in a wide variety of models.

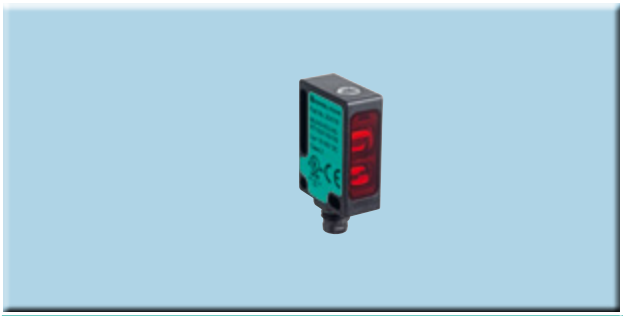
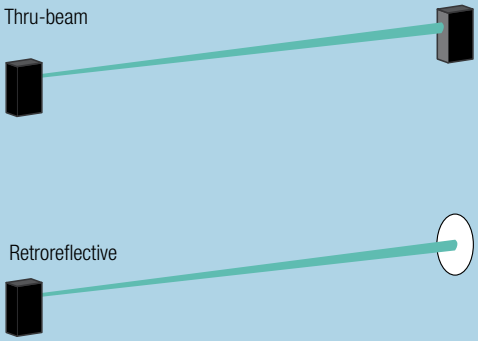
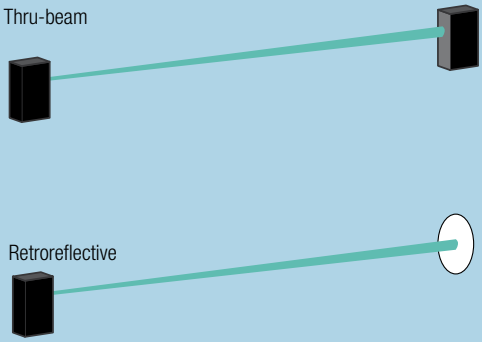
# SENSORS FOR INDUSTRIAL DOORS

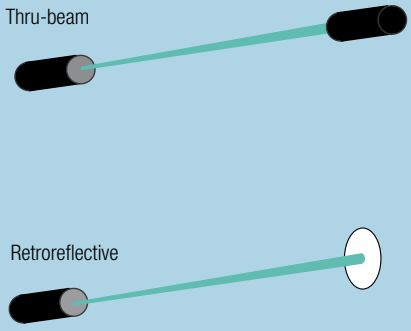
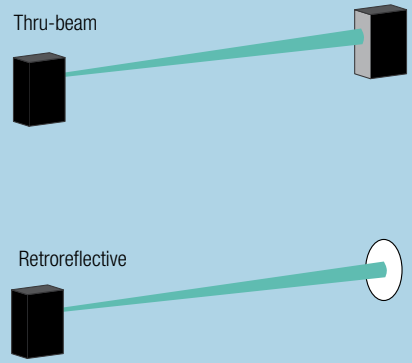
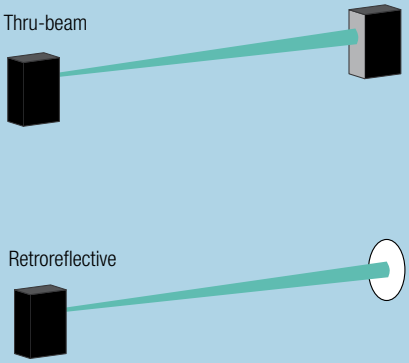




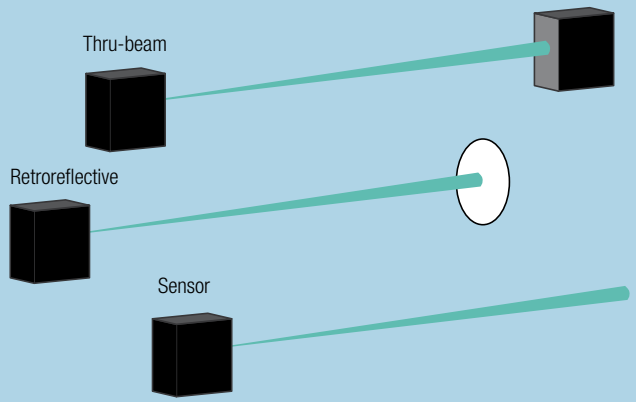
| Series | RMS-G |
|---|---|
| Functional principle | Radar sensors |
| Description | Premium door openers with differentiated person and vehicle detection |
| Function | Opening |
| Application |  |
| Detection area |  |
| Technical specifications | ■ **Sensor differentiates between person/vehicle detection and opens the door depending on the situation**<br>■ **Extra wide detection area and long sensing range**<br>■ **Programmable, also available with remote control**<br>■ **Direction monitoring** |
| Detection area | 7 m x 6 m at installation height of 5 m /<br>8 m x 5 m at installation height of 7 m |
| Installation height | Max. 7 m |
| Operating voltage | 12 to 36 V DC/ 12 to 28 V AC |
| Switching output | 2 relay outputs |
| Operating temperature | -20 °C to 60 °C |
| Connection | Plug-in screw terminals with 8 m connecting cable |
| Dimensions | 123 mm x 65 mm x 57 mm |
| Versions | ■ FCC approval for North America<br>■ Black housing<br>■ White housing<br>■ Vehicle detection up to 60 km/h (40 mph) (version -HS) |

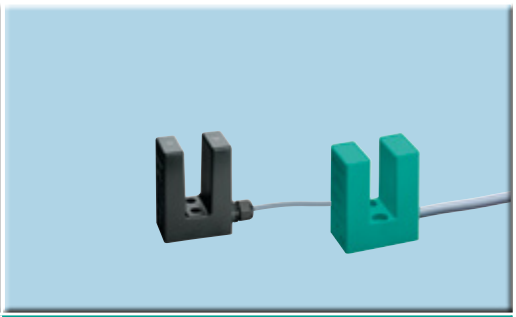
| | VDM28 | LC10 | LT2 · LTK2 |
|---|---|---|---|
| | Distance sensors | Loop detectors | Active infrared scanners |
| | Optical laser distance sensors for long sensing ranges, can be used in difficult ambient conditions | Universal sensor system for detecting vehicles | Precision sensor for very long detection range |
| | Opening | Opening and protection | Protection |
| |  |  |  |
| |  |  |  |
| | ■ **Extremely resistant to interference due to direct Pulse Ranging Technology (PRT) measurement process**<br>■ **Short response time**<br>■ **High repeat accuracy**<br>■ **Largely independent of measuring environment**<br>■ **Not impaired by dust, fog, or extraneous light**<br>■ **For low-temperature applications to -30 °C** | ■ **Complete control interface for wire loops laid in the floor**<br>■ **Reliable detection of vehicles from long distances**<br>■ **Various operating modes**<br>■ **Test function**<br>■ **Boost function to increase sensitivity**<br>■ **Fault indications in the event of loop breaking or short circuit** | ■ **Choice of operating modes: Background suppression ignores objects beyond a selected area/background evaluation uses the background as reference to detect difficult targets**<br>■ **Adjustable detection range and timer functions**<br>■ **Test input for sensor function** |
| | Diameter of the light spot < 10 mm at 8 m | Loop inductance 100 to 1000 µH<br>Loop frequency 20 to 120 kHz | Diameter of the light spot 50 mm at 2 m and 150 mm at 6 m |
| | Sensing range 50 m to reflector<br>Sensing range 8 m or 15 m to background | Sensing range depends on wire loop laid | Max. 2.5 m or 6 m |
| | 10 to 30 V DC | 24 V DC/115 V AC/230 V AC/24 V AC | LT2: 15 to 35 V DC<br>LTK2: 11 to 48 V DC/12 to 24 V AC |
| | 1 push-pull output + analog output<br>2 push-pull outputs | Relay | LT2: 2 PNP or 1 NPN/1 PNP<br>LTK2: Relay |
| | -30 °C to 50 °C | -20 °C to 70 °C | -20 °C to 60 °C |
| | M12 quick disconnect or fixed cable | Socket with terminal | M12 quick disconnect or fixed cable |
| | 25.8 mm x 88 mm x 55 mm | 37.5 mm x 75 mm x 71 mm | 150 mm x 64 mm x 49 mm |
| | ■ Sensing range 50 m (only to reflector)<br>■ Sensing range 15 m<br>■ Sensing range 8 m<br>■ Laser class 1 or 2<br>■ Push-pull and analog output<br>■ 2 push-pull outputs<br>■ Quick disconnect<br>■ Fixed cable connection | ■ Operating voltage 24 V AC<br>■ Operating voltage 24 V DC<br>■ Operating voltage 115 V AC<br>■ Operating voltage 230 V AC<br>■ 1 loop channel<br>■ 2 loop channels<br>■ Direction detection | ■ Installation height 2.5 m<br>■ Installation height 6 m<br>■ Operating voltage DC with NPN output<br>■ Operating voltage DC with PNP output<br>■ Operating voltage AC/DC with relay output<br>■ Quick disconnect<br>■ Fixed cable connection |

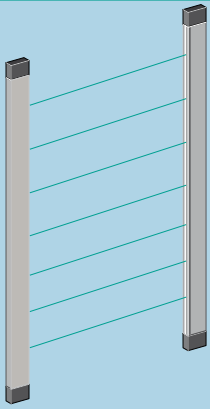
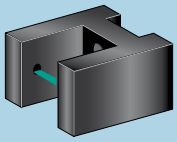
| | | |
|---|---|---|
| |  |  |
| **Series** | **ML8 SERIES** | **ML17 SERIES** |
| **Functional principle** | Retroreflective and thru-beam sensors | Retroreflective and thru-beam sensors |
| **Description** | Basic miniature photoelectric sensor for detecting people, objects and vehicles | Miniature photoelectric sensor for detecting people, objects and vehicles, can be installed anywhere |
| **Function** | Protection | Protection |
| **Application** |  |  |
| **Detection area** |  |  |
| **Technical specifications** | ■ **Miniature design, robust, and waterproof**<br>■ **Ideal for installation in door frames or profiles**<br>■ **Flexible mounting options** | ■ **Compact universal housing for front mounting with M18 thread and thru-holes for side mounting**<br>■ **Ideal for installation in door frames or profiles**<br>■ **Robust and waterproof**<br>■ **Adjustable sensitivity** |
| **Diameter of the light spot** | Approx. 180 mm at 3.5 m | – |
| **Sensing range** | Thru-beam: 4.5 m<br>Retroreflective: 3.5 m | Thru-beam: 20 m<br>Retroreflective: 5 m |
| **Operating voltage** | 10 to 30 V DC | 10 to 30 V DC |
| **Switching output** | 1 PNP or push-pull output | 2 push-pull outputs |
| **Operating temperature** | -30 °C to 55 °C | -20 °C to 55 °C |
| **Connection** | M8 quick disconnect or fixed cable | M8 quick disconnect or fixed cable |
| **Dimensions** | 23 mm x 31 mm x 11 mm | 29 mm x 15 mm x 34.5 mm |
| **Versions** | ■ Thru-beam sensor<br>■ Retroreflective sensor<br>■ 1 PNP output<br>■ Push-pull output<br>■ Light-on<br>■ Dark-on<br>■ Quick disconnect<br>■ Fixed cable connection | ■ Thru-beam sensor<br>■ Retroreflective sensor<br>■ Quick disconnect<br>■ Fixed cable connection |

| GLV18/GLK18 SERIES | 28 SERIES/29 SERIES | 31 SERIES |
|---|---|---|
| Retroreflective and thru-beam sensors | Retroreflective and thru-beam sensors | Retroreflective and thru-beam sensors |
| Single-beam M18 cylindrical sensor for detecting people, objects and vehicles | Robust compact photoelectric sensor with long detection range for single-beam gate protection | Basic photoelectric sensor with universal voltage for detecting people, objects and vehicles |
| Protection | Protection | Protection |
|  |  |  |
|  |  |  |
| ■ **Sturdy plastic M18 housing**<br>■ **Ideal for installation in door frames or profiles**<br>■ **Flush installation mounting set available**<br>■ **Straight or right-angled optical light exit**<br>■ **Most compact and economic universal voltage device on the market**<br>■ **Mounting equipment included with delivery** | ■ **Robust and waterproof housing with multiple mounting options**<br>■ **Long sensing ranges**<br>■ **No discernible interference emissions on any frequencies**<br>■ **Immune to ambient lighting**<br>■ **Particularly immune to interference from service radios and mobile phones** | ■ **Robust and waterproof ultrasonically welded housing**<br>■ **Good optical service data despite narrow housing**<br>■ **Very user-friendly with simple settings and alignment**<br>■ **Immune to ambient lighting** |
| Approx. 200 mm at 5.5 m | Approx. 290 mm at 17 m | Approx. 240 mm at 8 m |
| Thru-beam: 25 m<br>Retroreflective: 8 m | Thru-beam: 40 m/90 m<br>Retroreflective: 14 m/17 m/21 m/42 m | Thru-beam: 43 m<br>Retroreflective: 12 m/16.5 m |
| GLV18: 10 to 30 V DC<br>GLK18: 20 to 250 V AC/DC | RL: 10 to 30 V DC<br>RLK: 12 to 240 V AC/DC | 24 to 240 V DC/12 to 240 V AC |
| GLV18: PNP or NPN<br>GLK18: N-channel MOSFET | RL: 2 PNP or push-pull output<br>RLK: Relay | Relay |
| -20 °C to 60 °C | -20 °C to 60 °C | -25 °C to 55 °C |
| M12 quick disconnect or fixed cable | Terminal compartment or M12 quick disconnect or fixed cable | Fixed cable |
| 39.6 mm x 18 mm or 69 mm x 18 mm | 25.8 mm x 88 mm x 54 mm | 18 mm x 62 mm x 35 mm |
| ■ Thru-beam sensor<br>■ Retroreflective sensor<br>■ Straight light exit<br>■ Side light exit<br>■ Operating voltage DC<br>■ Operating voltage AC/DC<br>■ Quick disconnect<br>■ Fixed cable connection | ■ Thru-beam sensor<br>■ Retroreflective sensor<br>■ Laser light or red light<br>■ Adjustable timer functions<br>■ Terminal compartment, quick disconnect or fixed cable connection<br>■ Set with mounting set and reflector | ■ Thru-beam sensor<br>■ Retroreflective sensor<br>■ Light-on<br>■ Dark-on<br>■ Set with mounting set and reflector |



| | |
|---|---|
| **Series** | **61 SERIES** |
| **Functional principle** | Thru-beam and retroreflective sensors; diffuse mode sensor |
| **Description** | Basic photoelectric sensor with universal voltage for detecting people, objects, and vehicles |
| **Function** | Protection |
| **Application** |  |
| **Detection area** |   |
| **Technical specifications** | ■ **Robust and waterproof housing**<br>■ **Adjustable timer functions and operation modes**<br>■ **Sensitivity/test range adjuster**<br>■ **Immune to ambient lighting**<br>■ **Can be used in very low temperatures** |
| **Detection area** | Retroreflective sensor and diffuse mode sensor approx. 350 mm at 18 m or 17 mm at 1 m<br>Thru-beam sensor: approx. 840 mm at 20 m |
| **Sensing range** | Retroreflective and thru-beam sensor: max. 25 m<br>Diffuse mode sensors: max. 1.5 m or 4.7 m |
| **Operating voltage** | 24 to 240 V DC/12 to 240 V AC |
| **Switching output** | Relay or push-pull output |
| **Operating temperature** | -40 °C to 55 °C |
| **Connection** | M12 quick disconnect or fixed cable |
| **Dimensions** | 45 mm x 74 mm x 49 mm |
| **Versions** | ■ Thru-beam sensor<br>■ Retroreflective sensor<br>■ Diffuse mode sensor<br>■ Quick disconnect<br>■ Fixed cable connection<br>■ Relay output<br>■ Push-pull output |



| SLCT/SLCTS SERIES | SJ15/SJ30 SERIES |
|---|---|
| Safety light grid | Inductive slot sensors |
| Narrow safety light grid with TÜV approval for detecting people and vehicles | Slot initiators for non-contact end position control |
| Protection | End position switch-off |
|  |  |
|  |  |
| ■ **Protection field height of 200 mm to 2,400 mm**<br>■ **Designs in type 2 (SLCT) or type 4 (SLCS) in accordance with EN ISO/IEC 61496-1**<br>■ **Extremely slim housing**<br>■ **Integrated evaluation**<br>■ **Immune to ambient lighting**<br>■ **Installable on three sides** | ■ **Very accurate switching points** |
| Protection field height 200 mm to 2,400 mm in 100 mm steps | – |
| Max. 8 m | Slot width 15 mm or 30 mm |
| 24 V DC | 10 to 30 V DC or 20 to 253 V AC |
| PNP | PNP or 2-wire AC |
| -30 °C to 60 °C | - 25 °C to 70 °C |
| M12 quick disconnect | Fixed cable |
| 20 mm x 30 mm x protection field height + 119 mm | 48 mm x 30 mm x 60 mm (SJ15), 34mm x 51mmx 110mm (SJ30) |
| ■ Different protection field heights<br>■ SLCT: Self-testing (type 2)<br>■ SLCS: Self-monitoring (type 4)<br>■ Resolution 30 mm<br>■ Resolution 90 mm | ■ Slot width 15 mm (SJ15)<br>■ Slot width 30 mm (SJ30)<br>■ PNP output<br>■ 2-wire AC NC contact<br>■ 2-wire AC NO contact |



## INDUCTIVE SENSORS

**Our range of inductive sensors for industrial gates can be found on pages 46/47.**

***When your foot is in the door, be on the safe side! Whether monitoring or positioning elevators – your protection is the number one priority. Trust in INVISIBLE PROTECTION and let us take you safely and comfortably to the next level.***

## CONTINUOUS MONITORING AND RELIABLE POSITIONING OF ELEVATORS

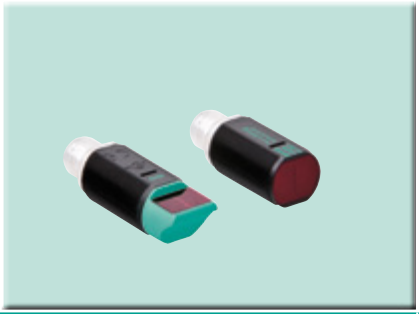
Your protection is paramount in this area. When operating elevators, it is essential that the elevator door does not collide with or injure passengers when closing.

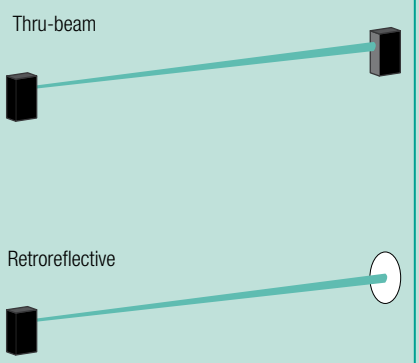
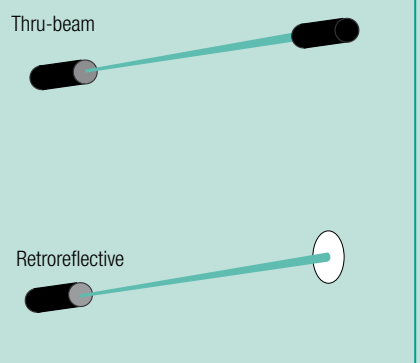
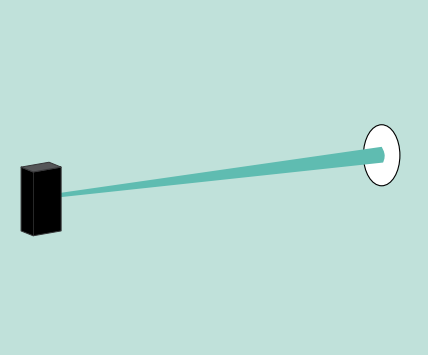
Our narrow elevator light grid enables reliable protection in relation to elevator doors, passenger monitoring and access control. The special features include dynamic beam crossing with up to 135 active beams, reliable object detection down to a distance of zero millimeters, and extremely high resistance to ambient light. These fulfill the demanding requirements of the popular glass elevators that are synonymous with modern architecture and innovative technology.

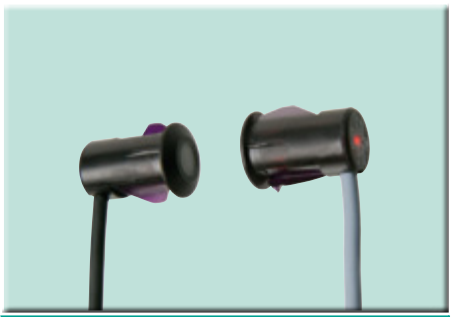
These systems continue to fulfill the most recent standards in accordance with EN81-70 and EN12016. These reliable light grid solutions not only provide convenience and protection for elevator passengers, they are also a cost-effective investment in terms of installation, setup, and maintenance. Typical fields of application include hotels, skyscrapers, shopping malls, hospitals, and retirement homes.

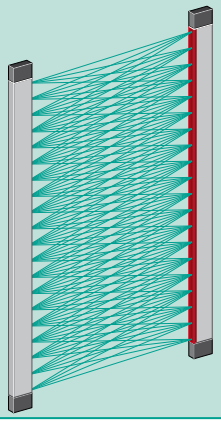
Single-beam sensors offer a simpler and more economic option for protecting the cab doors. The extra slim and yet robust housing enables mounting in the narrowest of gaps in door frames or other spaces. A selection of single-beam sensors in small housings or with a universal voltage supply are available.

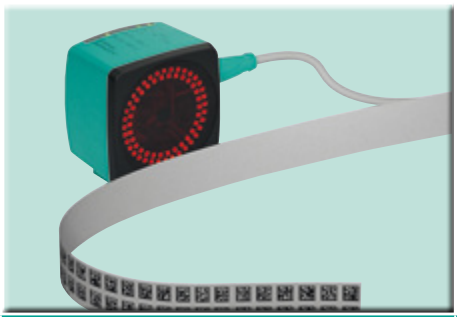
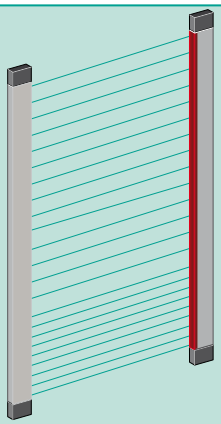
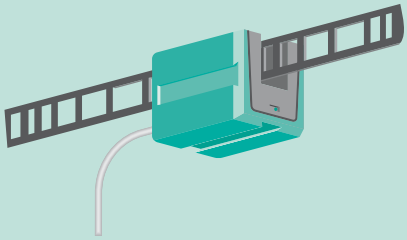
A precise load-independent positioning of the elevator cab, soft braking, and smooth travel also add to the comfortable operation of elevators. With a broad range of sensor technologies, Pepperl+Fuchs can respond to the requirements of each individual application. The range extends from simple photoelectric slot sensors, rotary encoders, and special slot-type initiators to extremely precise distance measurement devices and positioning systems that are accurate to the millimeter - non-contact and comprehensive.



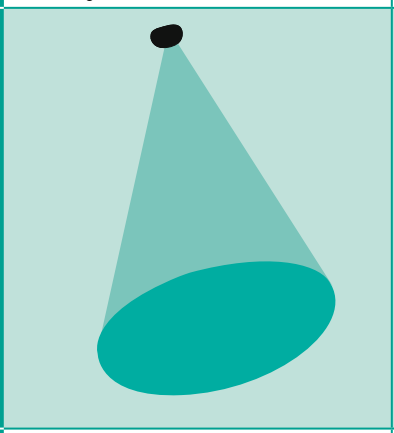
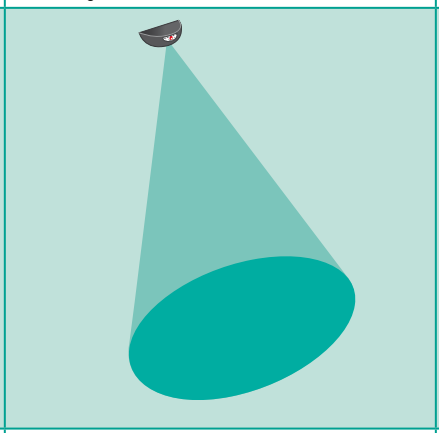
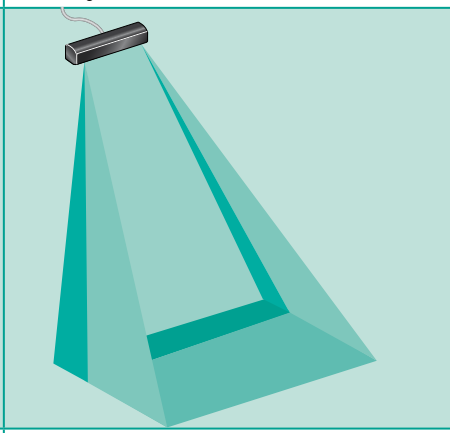
| Series | ML17 SERIES | GLV18/GLK18 SERIES | 28 SERIES/29 SERIES |
|---|---|---|---|
| Functional principle | Retroreflective and thru-beam sensors | Retroreflective and thru-beam sensors | Retroreflective sensors |
| Description | Miniature photoelectric sensor for detecting people, objects and vehicles can be installed anywhere | Single-beam M18 cylindrical sensor for detecting people, objects and vehicles | Robust compact photoelectric sensor with long sensing range for detecting people, objects and vehicles |
| Function | Protection | Protection | Protection |
| Detection area |  |  |  |
| Technical specifications | ■ **Compact universal housing for front mounting with M18 thread and thru-holes for side mounting**<br>■ **Ideal for installation in frames or profiles**<br>■ **Robust and waterproof**<br>■ **Adjustable sensitivity** | ■ **Sturdy plastic M18 housing**<br>■ **Ideal for installation in frames or profiles**<br>■ **Flush installation mounting set available**<br>■ **Straight or right-angled optical light exit**<br>■ **Most compact and economic universal voltage device on the market**<br>■ **Mounting equipment included with delivery** | ■ **Robust and waterproof housing with multiple mounting options**<br>■ **Long sensing ranges**<br>■ **No discernible interference emissions on any frequencies**<br>■ **Immune to ambient lighting**<br>■ **Particularly immune to interference from service radios and mobile phones** |
| Diameter of the light spot | – | Approx. 200 mm at 5.5 m | Approx. 290 mm at 17 m |
| Sensing range | Thru-beam: 20 m<br>Retroreflective: 5 m | Thru-beam: 25 m<br>Retroreflective: 8 m | 14 m/17 m/21 m/42 m |
| Operating voltage | 10 to 30 V DC | GLV18: 10 to 30 V DC<br>GLK18: 20 to 250 V AC/DC | 12 to 240 V AC/DC |
| Switching output | 2 push-pull outputs | GLV18: PNP or NPN<br>GLK18: N-channel MOSFET | Relay |
| Operating temperature | -20 °C to 55 °C | -20 °C to 60 °C | -20 °C to 60 °C |
| Connection | M8 quick disconnect or fixed cable | M12 quick disconnect or fixed cable | Terminal compartment |
| Dimensions | 29 mm x 15 mm x 34.5 mm | 39.6 mm x 18 mm or 69 mm x 18 mm | 25.8 mm x 88 mm x 54 mm |
| Versions | ■ Thru-beam sensor<br>■ Retroreflective sensor<br>■ Quick disconnect<br>■ Fixed cable connection | ■ Test input<br>■ PNP output<br>■ NPN output<br>■ Operating voltage DC<br>■ Operating voltage AC/DC | ■ Laser light or red light<br>■ Adjustable timer functions<br>■ Light-on<br>■ Dark-on<br>■ Set with mounting set and reflector<br>■ Version for safety devices on fire doors (approval in accordance with VdS test report FSA) |

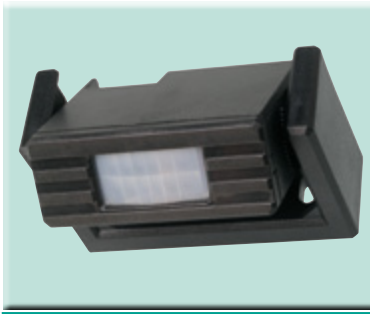
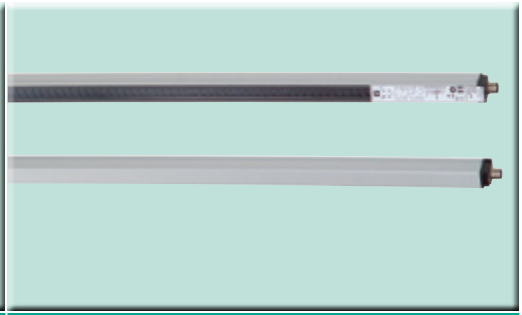
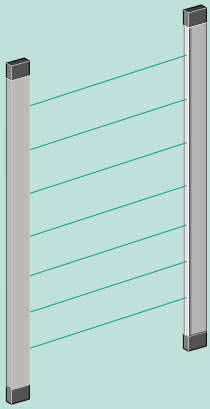
| |  |  |  |
|---|---|---|---|
| | **31 SERIES** | **91 SERIES** | **BB10** |
| | Retroreflective sensors | Retroreflective sensors | Thru-beam sensors |
| | Basic photoelectric sensor with universal voltage for detecting people, objects and vehicles | Basic photoelectric sensor with universal voltage for detecting people, objects and vehicles | Hold-beam photoelectric sensors in plug-in housing for 13 mm hole |
| | Protection | Protection | Protection |
| |  |  |  |
| | ■ **Robust and waterproof ultrasonically welded housing**<br>■ **Good optical service data despite narrow housing**<br>■ **Very user-friendly due to simple settings and alignment**<br>■ **Immune to ambient lighting** | ■ **Slim housing suitable for small columns**<br>■ **Sturdy plastic housing**<br>■ **Various mounting options** | ■ **Very compact model**<br>■ **Infrared light**<br>■ **Integral circuit with no external control interface unit**<br>■ **Narrow opening angle suitable for mounting in pairs**<br>■ **Test input** |
| | Approx. 240 mm at 8 m | Approx. 160 mm at 4 m | Approx. 1,300 mm at 6 m |
| | 12 m or 16.5 m | Max. 9 m | Max. 8 m |
| | 24 to 240 V DC/12 to 240 V AC | RL: 12 to 30 V DC<br>RLK: 96 ... 264 V AC<br>RL/38a: 12 to 30 V DC/18 to 28 V AC | 10 to 30 V DC |
| | Relay | RL: 1 NPN/1 PNP<br>RLK: Relay | 1 NPN or 1 PNP |
| | -25 °C to 55 °C | -25 °C to 55 °C | -40 °C to 60 °C |
| | Fixed cable | M12 quick disconnect or fixed cable | Fixed cable |
| | 18 mm x 62 mm x 35 mm | 19.5 mm x 85 mm x 50 mm | 22 mm x 12.5 mm x 12.5 mm |
| | ■ Light-on<br>■ Dark-on<br>■ Set with mounting set and reflector | ■ Operating voltage DC with NPN/PNP<br>■ Operating voltage AC with relay<br>■ Operating voltage AC/DC with relay<br>■ Infrared light<br>■ Red light<br>■ Light-on<br>■ Dark-on<br>■ Quick disconnect<br>■ Fixed cable connection | ■ PNP output<br>■ NPN output<br>■ Light-on<br>■ Dark-on |

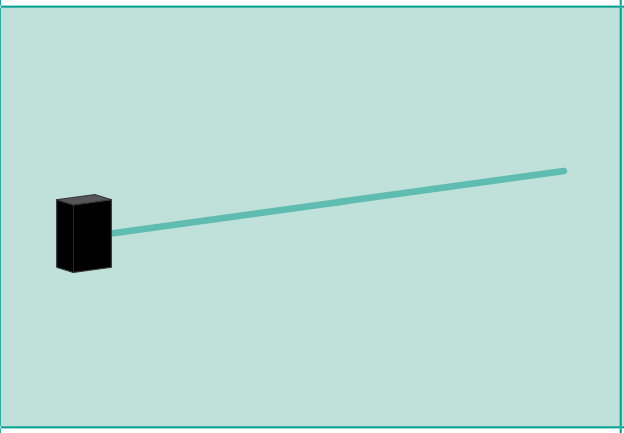
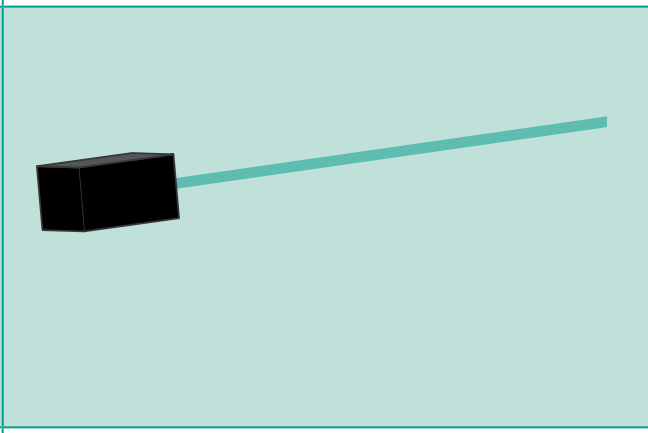
| Series | AL2109 |
|---|---|
| Functional principle | Thru-beam light grids |
| Description | Light grid with fine resolution for detecting people and objects |
| Function | Protection |
| Detection area |  |
| Technical specifications | ■ **Conformity to EN 81-70 and EN 12015/16**<br>■ **Integrated controller**<br>■ **Infrared light**<br>■ **Extremely dense monitoring field with 135 beams and up to 7 times crossover**<br>■ **Object detection up to 'zero distance'**<br>■ **Automatic adjustment of beam configuration**<br>■ **Blanking of defective beams**<br>■ **Insensitive to reflection and ambient light** |
| Detection area | Field height 1.8 m |
| Sensing range | Max. 3.5 m |
| Operating voltage | 11 to 30 V DC |
| Switching output | 1 PNP/1 NPN |
| Operating temperature | -10 °C to 55 °C |
| Connection | Fixed cable or M8 quick disconnect |
| Dimensions | 9 mm x 34 mm x 2 m |
| Versions | ■ Light-on<br>■ Dark-on<br>■ Quick disconnect<br>■ Fixed cable connection<br>■ Version with ATEX approval for zone 2 and 22 (TÜV 08 ATEX 554855 X) |

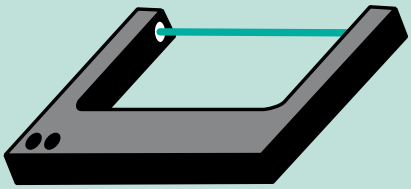
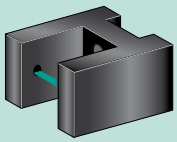
| | AL20/AL40 | PCV | WCS |
|---|---|---|---|
| |  |  |  |
| | Thru-beam light grids | Incident light positioning system | Positioning systems |
| | Light grid with high sensing range for detecting people and objects | Reliable position detection system with 2D code tape and the latest camera technology | Non-contact, absolute position detection system |
| | Protection | Opening and protection | Protection |
| |  |  |  |
| | ■ **Integrated controller**<br>■ **Infrared light**<br>■ **Dense sensor field enables detection of small objects**<br>■ **Automatic adjustment of beam configuration for maximum resolution**<br>■ **Operation and status LEDs**<br>■ **Insensitive to reflection and ambient light**<br>■ **Blanking of defective beams** | ■ **Absolute positioning system on 2 axes**<br>■ **Noncontact, silent, and wear-free**<br>■ **Output of position, speed and other customer information**<br>■ **Extremely reliable positioning using Data Matrix codes**<br>■ **Self-adhesive code strip for fast installation** | ■ **Absolute and non-contact measurement**<br>■ **Optimized for control and elevator systems**<br>■ **Reliable position calculation at object speeds of up to 12.5 m/s**<br>■ **Output of position and speed**<br>■ **Slip-free system**<br>■ **Self-diagnostics and automatic dirty/dusty lens recognition** |
| | Field height 1.65 m | Read field: 40 mm x 25 mm | Measuring length: Max. 327 m |
| | Max. 5.6 m | Read distance: 80 mm | — |
| | 12 to 30 V DC | 15 to 30 V DC | 10 to 30 V DC |
| | 1 PNP/1 NPN | 1 to 3 switching outputs, PNP | — |
| | -10 °C to 60 °C | -10 °C to 40 °C | 0 to 60 °C |
| | Fixed cable or M12 pigtail | M12 quick disconnect | M12 quick disconnect |
| | Profile width x 30 mm x 2 mm | 70 mm x 70 mm x 50 mm | 90 mm x 99 mm x 115 mm |
| | ■ Profile width 12 mm (ALXX12)<br>■ Profile width 16 mm (ALXX16)<br>■ Beam gap 20 to 44 mm (AL20XX)<br>■ Beam gap 40 to 88 mm (AL40XX)<br>■ Pigtail connector<br>■ Fixed cable connection | ■ Read head with RS422 and RS485 interface<br>■ Data Matrix code strip up to 10 km long | ■ Read head with RS485 interface<br>■ Stainless steel code rail up to 314.5 m long |

# SENSORS FOR ELEVATORS

| Series | RADEC | RMS | FLT-D |
|---|---|---|---|
| Functional principle | Radar sensors | Radar sensors | Active infrared area scanners |
| Description | Standard microwave motion sensor with basic functionality | Premium microwave motion sensor with intelligent additional functions | Area sensors with two detection fields |
| Function | Monitoring | Monitoring | Monitoring |
| Detection area |  |  |  |
| Technical specifications | ■ **Reliable movement detection of people and vehicles**<br>■ **Adjustable sensitivity**<br>■ **Modifiable detection area**<br>■ **Direction monitoring**<br>■ **Cross-traffic suppression**<br>■ **Wall and ceiling mountable** | ■ **Reliable movement detection of people and vehicles**<br>■ **Easily programmable with DIP switch and 16 pre-programmed basic settings**<br>■ **Direction monitoring**<br>■ **Cross-traffic suppression**<br>■ **Turtle mode** | ■ **Continuous area detection with 20 programmable detection fields**<br>■ **Teach-in mode**<br>■ **Configuration of field sizes, teach-in mode, sensitivity, switch type and master/slave operation**<br>■ **Test item detection in accordance with EN 12650** |
| Detection area | 4.5 m x 2 m/2 m x 4.5 m | 4.5 m x 2 m/2.5 m x 3 m/4 m x 2 m | 2.2 m x 1.5 m (full field) |
| Installation height | Max. 4 m | Max. 4 m | Max. 2.2 m |
| Operating voltage | 12 to 36 V DC/12 to 38 V AC | 12 to 36 V DC/ 12 to 38 V AC | 12 to 31 V DC/ 12 to 30 V AC |
| Switching output | Relay | Relay | Relay |
| Operating temperature | -20 °C to 60 °C | -20 °C to 60 °C | -20 °C to 60 °C |
| Connection | Connector strip with 2.5 m connecting cable | Connector strip with 5 m connecting cable | Terminal block |
| Dimensions | 101 mm x 60 mm x 59 mm | 123 mm x 65 mm x 57 mm | 250 mm x 60 mm x 45 mm |
| Versions | ■ Mono (no direction detection)<br>■ Stereo (with direction detection)<br>■ Black housing<br>■ Silver housing<br>■ White housing | ■ Mono (no direction detection)<br>■ Stereo (with direction detection)<br>■ Extra wide detection area<br>■ Remote controllable<br>■ FCC approval for North America<br>■ Black housing<br>■ White housing | |

| | FLT-8 | PIR20 | SLCT SERIES |
|---|---|---|---|
| |  |  |  |
| | Active infrared area scanners | Passive infrared scanners | Safety light grid |
| | Area scanners with long detection range for detecting people and objects | Presence sensors based on infrared thermal radiation for detecting people | Narrow safety light grid with TÜV approval for detecting people and vehicles |
| | Monitoring | Monitoring | Protection |
| |  |  |  |
| | ■ **3 or 4 beams in a housing form the detection area**<br>■ **500 mm x 500 mm maximum detection range**<br>■ **Various operating modes: Background suppression ignores objects beyond a selected area/background evaluation uses background as reference to detect difficult objects** | ■ **Detection of people by modifying the thermal image +/-0.5 °C**<br>■ **Operates only in the event of motion**<br>■ **Compact design**<br>■ **Precise and continuous adjustment of the detection field through aperture and zoom function**<br>■ **Suitable for flush-mounting** | ■ **Protection field height of 200 mm to 2,400 mm**<br>■ **Type 2 according to EN ISO/IEC 61496-1**<br>■ **Extremely slim housing**<br>■ **Integrated evaluation**<br>■ **Immune to ambient lighting**<br>■ **Installable on three sides** |
| | 500 mm x 500 mm/50 mm x 500 mm/ 300 mm x 500 mm | 1.8 m x 2.6 m | Protection field height 200 mm to 2,400 mm in 100 mm steps |
| | Max. 2.8 m | Max. 5 m | Max. 8 m |
| | 15 to 48 V DC/ 15 to 48 V AC/DC | 12 to 30 V DC/12 to 24 V DC | 24 V DC |
| | 2 PNP or 1 NPN/1 PNP or relay | Relay | PNP |
| | -20 °C to 60 °C | -20 °C to 60 °C | -30 °C to 60 °C |
| | M16 quick disconnect or fixed cable | Screw terminals | M12 quick disconnect |
| | 150 mm x 64 mm x 52 mm | 56 mm x 23 mm x 45 mm | 20 mm x 30 mm x protection field height + 119 mm |
| | ■ Background suppression (-H)<br>■ Background evaluation (-HW)<br>■ Counter function and direction detection (CLS)<br>■ Operating voltage DC with NPN/PNP output<br>■ Operating voltage DC with 2 PNP outputs<br>■ Operating voltage AC/DC with relay output<br>■ Light-on or dark-on switching<br>■ Quick disconnect or fixed cable connection | ■ Black housing<br>■ White housing | ■ Different protection field heights<br>■ Resolution 30 mm<br>■ Resolution 90 mm |

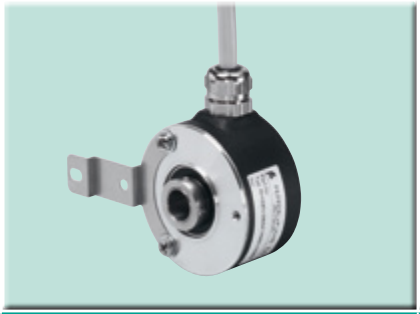
| Series | VDM28 | VDM100 |
|---|---|---|
| Functional principle | Distance sensors | Distance measurement devices |
| Description | Optical laser distance sensors for long sensing ranges, can be used in difficult ambient conditions | Optical laser distance measurement devices for long sensing ranges for accurate positioning of elevator car |
| Function | Positioning | Positioning |
| Detection area |  |  |
| Technical specifications | ■ **Extremely resistant to interference due to direct Pulse Ranging Technology (PRT) measurement process**<br>■ **Short response time**<br>■ **High repeat accuracy**<br>■ **Largely independent of measuring environment**<br>■ **Not impaired by dust, fog, or extraneous light**<br>■ **For low-temperature applications to -30 °C** | ■ **Noncontact position measurement with direct Pulse Ranging Technology (PRT) measurement process**<br>■ **Ultrafast data acquisition**<br>■ **Resistant to interference and ambient light**<br>■ **Long sensing ranges**<br>■ **SSI interface**<br>■ **Simple configuration** |
| Detection area | Diameter of the light spot < 10 mm at 8 m | Diameter of the light spot approx. 15 cm at 50 m |
| Mounting height/ Sensing range | Sensing range 50 m to reflector<br>Sensing range 8 m or 15 m to background | Sensing range: 50 m/150 m/300 m |
| Operating voltage | 10 to 30 V DC | 18 to 30 V DC |
| Switching output | 1 push-pull output + analogue output<br>2 push-pull outputs | 2 PNP in/outputs, independent |
| Operating temperature | -30 °C to 50 °C | -10 °C to 50 °C |
| Connection | M12 quick disconnect or fixed cable | M12 quick disconnect |
| Dimensions | 25.8 mm x 88 mm x 55 mm | 170 mm x 140 mm x 100 mm |
| Versions | ■ Sensing range 50 m (to reflector)<br>■ Sensing range 15 m<br>■ Sensing range 8 m<br>■ Laser class 1 or 2<br>■ Push-pull and analog output<br>■ 2 push-pull outputs<br>■ Quick disconnect<br>■ Fixed cable connection | ■ Sensing range 50 m<br>■ Sensing range 150 m<br>■ Sensing range 300 m |

| | GL SERIES | SJ15/SJ30 SERIES | VARIKONT L |
|---|---|---|---|
| |  |  |  |
| | Photoelectric slot sensors | Inductive slot sensors | Inductive sensor |
| | Photoelectric slot sensor for non-contact and easy positioning of elevators | Slot initiators for non-contact end position control | Inductive compact sensors for non-contact detection of metallic objects |
| | Positioning | Positioning | Positioning |
| |  |  | |
| | ■ **High switching frequency**<br>■ **Simple electric installation as only one device needs to be wired**<br>■ **No calibration of the optical axes required**<br>■ **Robust and wear-free**<br>■ **Immune to ambient lighting** | ■ **Suitable for positioning of elevators**<br>■ **Very accurate switching points**<br>■ **Simple electric installation as only one device needs to be wired**<br>■ **No calibration required** | ■ **Cube design**<br>■ **Tool-free, quick mounting with new quick-clamping lever**<br>■ **Flexible targeting with rotating and swiveling sensor head**<br>■ **Long switching distances up to 40 mm**<br>■ **Operating mode recognizable from all angles with unique four-corner LEDs**<br>■ **Degree of protection IP69K** |
| | Slot widths: 10 mm/20 mm/30 mm/50 mm/80 mm/ 120 mm/220 mm | Slot width 15 mm or 30 mm | Flush sensing range: 20 mm<br>Nonflush sensing range: 40 mm |
| | – | – | Switching element function: PNP complimentary |
| | 10 to 30 V DC | 10 to 30 V DC or 20 to 253 V AC | 10 to 30 V DC |
| | 1 PNP | PNP or 2-wire AC | 4-wire DC |
| | -10 °C to 60 °C | -20 °C to 60 °C | -25 °C to 85 °C |
| | M8 quick disconnect | Fixed cable | M12 quick disconnect |
| | 39.6 mm x 18 mm or 69 mm x 18 mm | 48 mm x 30 mm x 60 mm (SJ15), 34mm x 51mmx 110mm (SJ30) | 67 mm x 40 mm x 40 mm |
| | ■ Various slot widths from 10 mm to 220 mm<br>■ Infrared light (-IR)<br>■ Red light (-RT)<br>■ Laser light (-LAS)<br>■ EX-version with ATEX approval for zone 2 | ■ Slot width 15 mm (SJ15)<br>■ Slot width 30 mm (SJ30)<br>■ PNP output<br>■ 2-wire AC NC contact<br>■ 2-wire AC NO contact | ■ NBB20-L2M-A2-V1<br>■ NBN40-L2M-A2-V1 |

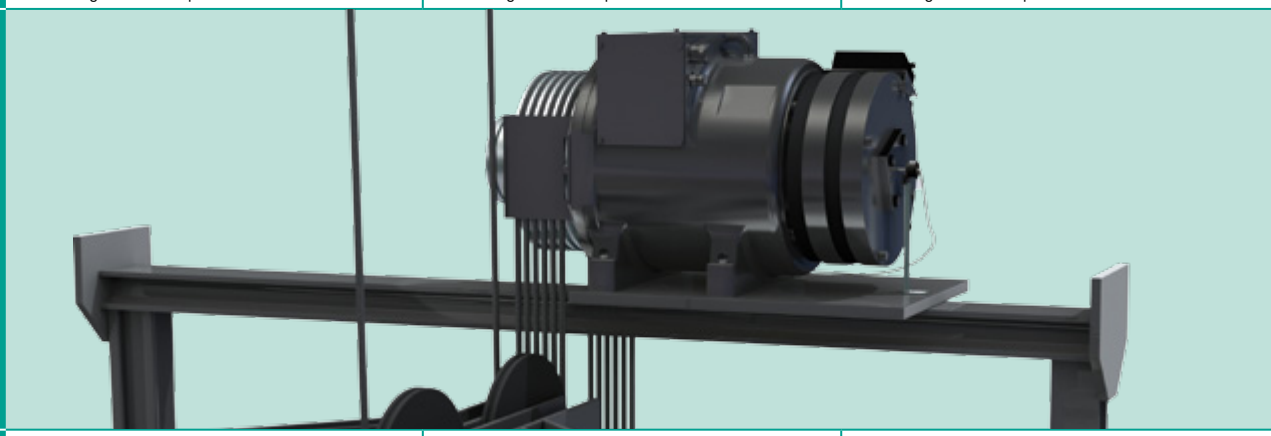
**INDUCTIVE SENSORS**

**Our range of inductive sensors for elevators can be found on pages 46/47.**

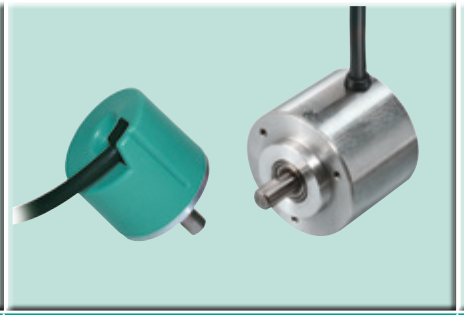
# ROTARY ENCODER FOR ELEVATORS



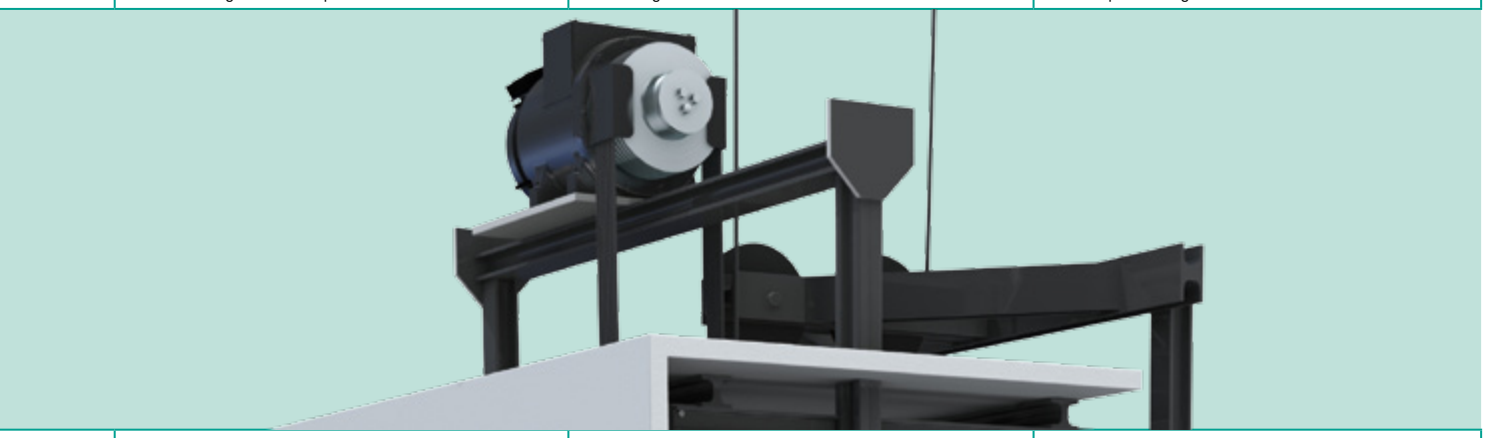
| Series | RHI58N | RHI90 | RSI58/RVI58 |
|---|---|---|---|
| Functional principle | Incremental rotary encoder | Incremental rotary encoder | Incremental rotary encoder |
| Description | Basic hollow shaft rotary encoder for high-quality rotational speed control and precise positioning | Special hollow shaft rotary encoder for high-quality rotational speed control in elevator construction | Recessed hollow shaft rotary encoder for high-quality rotational speed control and precise positioning |
| Function | Positioning/rotational speed | Positioning/rotational speed | Positioning/rotational speed |



| | | | |
|---|---|---|---|
| Technical specifications | ■ **European industrial standard ø 58 mm**<br>■ **Hollow shafts ø 10, 12, 15 mm**<br>■ **Up to 50,000 pulses/revolution** | ■ **Compact design ø 90 mm**<br>■ **Hollow shafts ø 16, 20, 24, 25, 30, 38, 45 mm**<br>■ **Up to 50,000 pulses/revolution**<br>■ **Very high resolution and accuracy** | ■ **European industrial standard ø 58 mm**<br>■ **Recessed hollow shaft 10 and 12 mm**<br>■ **Solid shaft 6 and 10 mm**<br>■ **Servo flange or clamping flange**<br>■ **Up to 50,000 pulses/revolution** |
| Pulse count | Max. 50,000 | Max. 50,000 | Max. 50,000 |
| Output/interface | Push-pull or RS422 | Push-pull or RS422 | Push-pull or RS422 |
| Operating voltage | 10 ... 30 V DC or 5 V DC | 10 to 30 V DC or 5 V DC | 10 to 30 V DC or 5 V DC |
| Max. rotational speed | max. 6,000 $min^{-1}$ | Max. 3,500 $min^{-1}$ | Max. 12,000 $min^{-1}$ |
| Operating temperature | -5 °C to 80 °C (flexible cables)<br>-20 °C to 80 °C (fixed cables) | -5 °C to 70 °C (flexible cables)<br>-20 °C to 70 °C (fixed cables) | -5 °C to 80 °C (flexible cables)<br>-20 °C to 80 °C (fixed cables) |
| Connection | Fixed cable | Fixed cable and quick disconnect type 9416 | Fixed cable and quick disconnect type 9416 |
| Dimensions | ø 58 mm x 38 mm | ø 90 mm x 48.5 mm | RSI: ø 58 mm x 44 mm<br>RVI: ø 58 mm x 46 mm |
| Versions | ■ Push-pull output<br>■ 5 V with RS422 interface<br>■ 10 to 30 V with RS422 interface | ■ Push-pull output<br>■ 5 V with RS422 interface<br>■ 10 to 30 V with RS422 interface | ■ Push-pull output<br>■ 5 V with RS422 interface<br>■ 10 to 30 V with RS422 interface |



| | TVI40/TVI50 | CXM58 | CVM58S |
|---|---|---|---|
| | Incremental rotary encoder | Absolute rotary encoder | Safety absolute rotary encoder |
| | Small-scale solid shaft rotary encoder for precise detection of rotational speed and positioning | Absolute rotary encoder with application profile for elevator systems DSP417 (lift profile) | Rotational speed with integrated functional safety for safe stop and safe rotational speed in conjunction with safe control |
| | Positioning/rotational speed | Positioning | Reliable positioning |

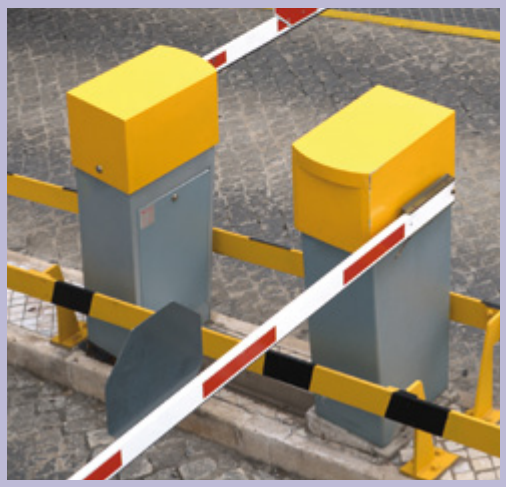


| | | | |
|---|---|---|---|
| | ■ **Robust and compact design**<br>■ **Solid shaft**<br>■ **Up to 1024 pulses/revolution**<br>■ **Resilient metal disk**<br>■ **Favourable target/line device** | ■ **European industrial standard ø 58 mm**<br>■ **DSP 406, Class 1 and 2**<br>■ **Galvanically isolated CANopen interface**<br>■ **Addressing via DIP switch in removable housing cover**<br>■ **Two end switches** | ■ **European industrial standard ø 58 mm**<br>■ **DSP 406/301/304, Class 1 and 2**<br>■ **Galvanically isolated CANopen interface**<br>■ **SIL3 according to EN ISO/IEC 62061**<br>■ **PI e according to EN ISO/IEC 13849-1**<br>■ **Servo flange or clamping flange**<br>■ **Two end switches** |
| | Max. 1,024 | Transfer rate: max. 1 MBit/s | Transfer rate: max. 1 MBit/s |
| | Push-pull/RS422 interface with 5 V | CANopen interface | CANopen interface |
| | 4.75 to 30 V DC | 10 to 30 V DC | 10 to 30 V DC |
| | Max. 6,000 $min^{-1}$ | max. 12,000 $min^{-1}$ | max. 12,000 $min^{-1}$ |
| | -10 °C to 70 °C | -40 °C to 85 °C | -30 °C to 70 °C |
| | Fixed cable | Terminal compartment | Terminal compartment |
| | TVI40: ø 40 mm x 37 mm<br>TVI50: ø 50 mm x 39 mm | Multiturn: ø 58 mm x 110 mm<br>Single turn: ø 58 mm x 94 mm | Multiturn: ø 58 mm x 138 mm<br>Single turn: ø 58 mm x 122 mm |
| | ■ Push-pull output<br>■ 5 V with RS422 interface | ■ Multiturn resolution 14 Bit<br>■ Total resolution 30 bit<br>■ Recessed hollow shaft<br>■ Solid shaft | ■ Multiturn resolution 14 Bit<br>■ Total resolution 30 bit<br>■ Servo flange or clamping flange |

***Do you want to restrict or allow access? Trust in INVISIBLE PROTECTION and let us provide a non-contact solution for trouble-free and secure access.***

## EFFICIENCY AND SERVICE FOR ESCALATORS

Escalators make our day-to-day life easier. To reduce energy costs and save on wear, it is helpful if they stop or operate at a reduced speed when not in use. They should then start operation again as soon as someone steps on them. Our small standard photoelectric or motion sensors enable the escalators to automatically start as soon as people are detected.



## COMMERCIAL AND INDUSTRIAL GATE SYSTEMS

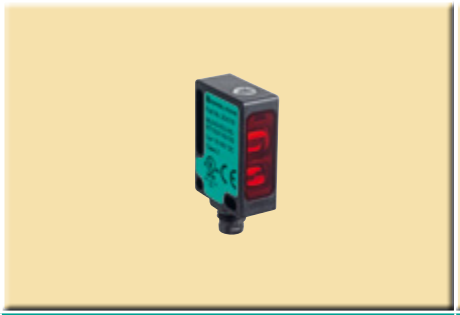
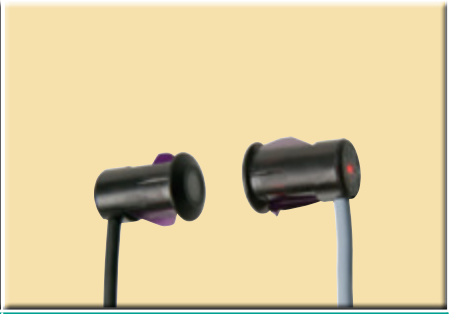
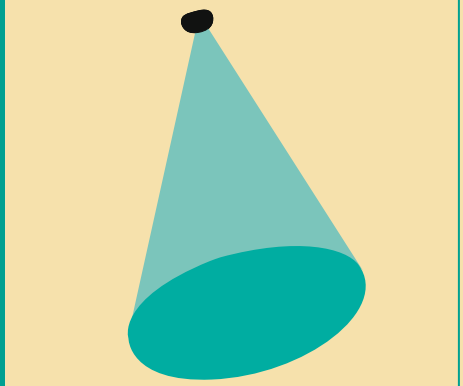
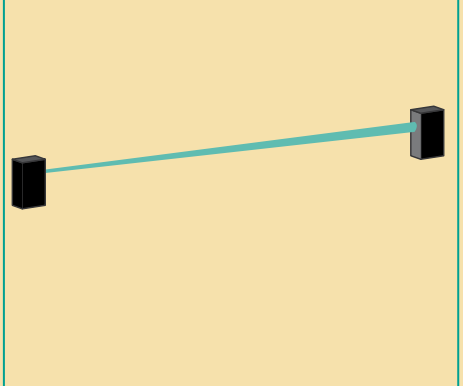
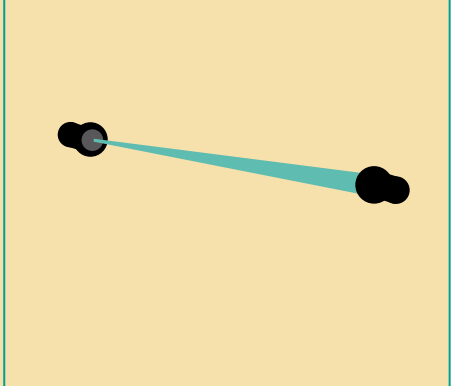
Commercial and industrial gate systems provide optimal security and guarantee efficient control of entrance and exit areas. Various sensors and systems help in this regard as activation sensors and to monitor the gate closing areas.


## PROTECTION WITH FIRE DOORS: IGNORES SMOKE AND DETECTS PEOPLE

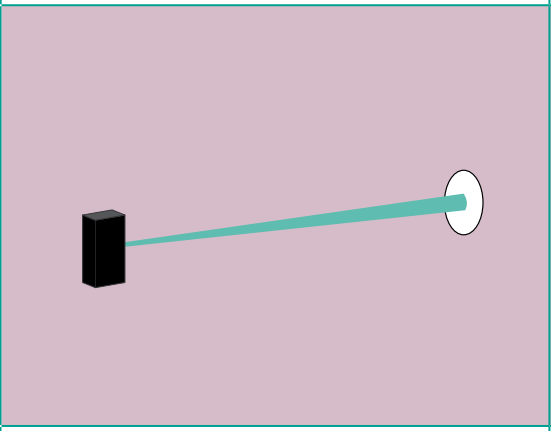
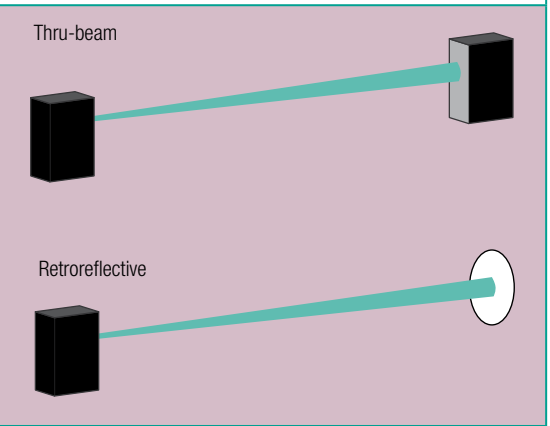
Fire barriers such as fire doors and fire dampers are designed to prevent fires and smoke from spreading along corridors, passages or chutes. This kind of barrier usually remains permanently closed, but can stay open in exceptional cases if the protected route is used very frequently. However, an automatic closing mechanism with a safety monitor is then required.
Pepperl+Fuchs' multifunctional fire protection sensors offer greater reliability and a wider range of functions for applications of this nature.
The Property Insurers Association has certified and approved these sensors in accordance with VdS test report FSA.

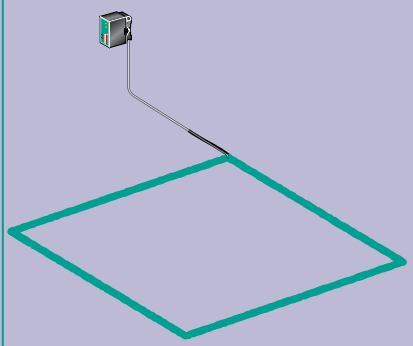
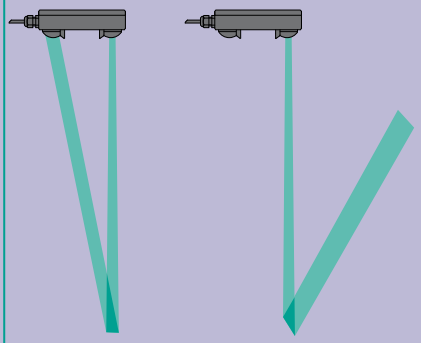
# SENSORS FOR ESCALTORS AND MOVING WALKWAYS

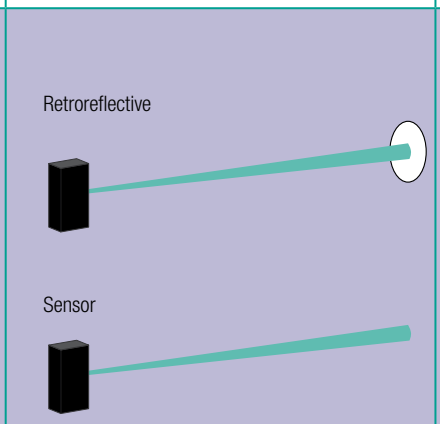
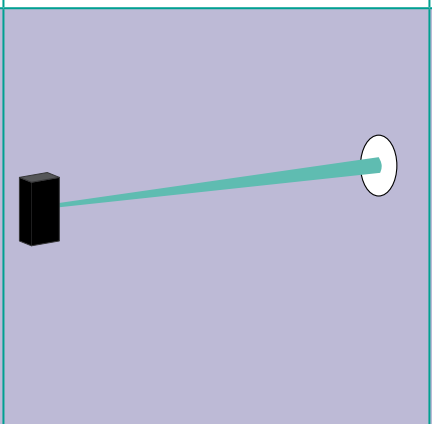
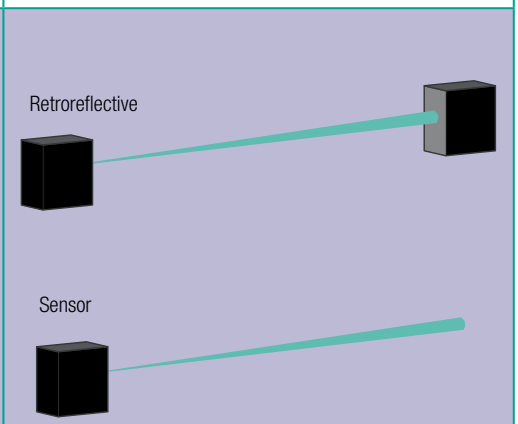
*We get every escalator moving! With multifunctional sensors, INVISIBLE PROTECTION enables efficient start or acceleration of escalators following breaks in use.*

| | | | |
|---|---|---|---|
| |  |  |  |
| | **RADEC** | **ML8 SERIES** | **BB10** |
| | Radar sensors | Thru-beam sensors | Thru-beam sensors |
| | Standard microwave motion sensor with basic functionality | Basic miniature photoelectric sensor for detecting people, objects, and vehicles | Miniature phototoelectric photoelectric sensors in plug-in housing for 13 mm hole |
| | Activation | Activation | Activation |
| |  |  |  |
| | ■ **Reliable movement detection of people and vehicles**<br>■ **Adjustable sensitivity**<br>■ **Modifiable detection area**<br>■ **Direction monitoring**<br>■ **Cross-traffic suppression**<br>■ **Wall and ceiling mountable** | ■ **Miniature design, robust and waterproof**<br>■ **Ideal for installation in door frames or profiles**<br>■ **Flexible mounting options** | ■ **Very compact model**<br>■ **Infrared light**<br>■ **Integral circuit with no external control interface unit**<br>■ **Narrow opening angle suitable for mounting in pairs**<br>■ **Test input** |
| | 4.5 m x 2 m | Diameter of the light spot approx. 180 mm at 3.5 m | Diameter of the light spot 1300 mm at 6 m |
| | Max. 4 m | Sensing range: max. 4.5 m | Sensing range: max. 8 m |
| | 12 to 36 V DC/12 to 38 V AC | 10 to 30 V DC | 10 to 30 V DC |
| | Relay | 1 PNP | 1 NPN or 1 PNP |
| | -20 °C to 60 °C | -30 °C to 55 °C | -40 °C to 60 °C |
| | Connector strip with 2.5 m connecting cable | M8 quick disconnect or fixed cable | Fixed cable |
| | 101 mm x 60 mm x 59 mm | 23 mm x 31 mm x 11 mm | 22 mm x 12.5 mm x 12.5 mm |
| | ■ Mono (no direction detection)<br>■ Stereo (with direction detection)<br>■ Black housing<br>■ Silver housing<br>■ White housing | ■ Quick disconnect<br>■ Fixed cable connection | ■ PNP output<br>■ NPN output<br>■ Light on<br>■ Dark on |

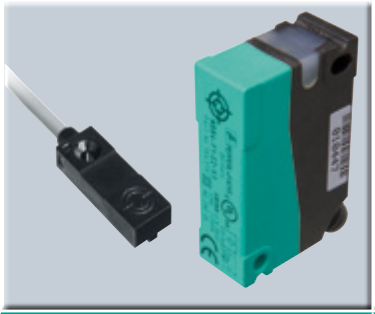
*Fire doors close automatically in the event of a fire and can only be opened to leave the building.*
*Our fire protection sensors ignore smoke and reliably detect people and objects.*
*INVISIBLE PROTECTION provides reliable operation even in the event of a fire.*

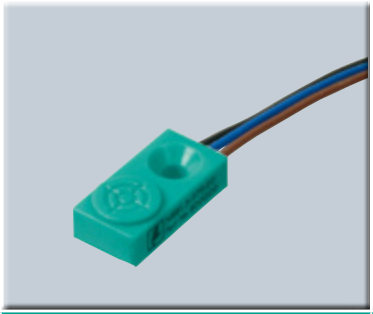
| | | |
|---|---|---|
| |  |  |
| **Series** | **MLV12 SERIES** | **28 SERIES** |
| **Functional principle** | Retroreflective sensors | Retroreflective and thru-beam sensors |
| **Description** | Small-scale fire protection sensor | Compact fire protection sensor |
| **Function** | Protection | Protection |
| **Detection area** |  |  |
| **Technical specifications** | ■ **Approval in accordance with VdS test report FSA and externally monitored manufacture**<br>■ **In the event of fire, smoke is ignored but people and objects in smoke are reliably detected**<br>■ **High contact protection**<br>■ **Immune to ambient lighting**<br>■ **Multiple device installation possible, no cross-talk** | ■ **Approval in accordance with VdS test report FSA and externally monitored manufacture**<br>■ **In the event of fire, smoke is ignored but people and objects in smoke are reliably detected**<br>■ **Immune to ambient lighting**<br>■ **Multiple device installation possible, no cross-talk** |
| **Diameter of the light spot** | Approx. 70 mm at 2 m | Approx. 50 mm at 3 m |
| **Sensing range** | Max. 2.1 m | Thru-beam: max. 10 m<br>Retroreflective: max. 3 m |
| **Operating voltage** | 10 to 30 V DC | 12 to 240 V AC/DC |
| **Switching output** | 1 PNP and 1 NPN | Relay |
| **Operating temperature** | -40 °C to 60 °C | -40 °C to 60 °C |
| **Connection** | M12 quick disconnect (can be turned 90°) | Terminal compartment with cage tension spring terminals |
| **Dimensions** | 41.5 mm x 49 mm x 15 mm | 25.8 mm x 88 mm x 65.5 mm |
| **Versions** | | ■ Thru-beam sensor<br>■ Retroreflective sensor |

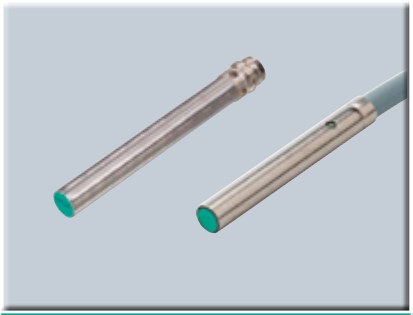
| | | | |
|---|---|---|---|
| |  |  |  |
| **Series** | **VDM28** | **LC10** | **LT2 · LTK2** |
| **Functional principle** | Distance sensors | Loop detectors | Active infrared scanners |
| **Description** | Optical laser distance sensors for long sensing ranges, can be used in difficult ambient conditions | Universal sensor systems for detecting vehicles | Precision sensors for very long detection range |
| **Function** | Open | Opening and protection | Protection |
| **Detection area** |  |  |  |
| **Advantages** | ■ **Extremely resistant to interference due to direct Pulse Ranging Technology (PRT) measurement process**<br>■ **Short response time**<br>■ **High repeat accuracy**<br>■ **Largely independent of measuring environment**<br>■ **Not impaired by dust, fog or extraneous light**<br>■ **For low-temperature applications to -30 °C** | ■ **Complete control interface for wire loops laid in the floor**<br>■ **Reliable detection of vehicles from long distances**<br>■ **Various operating modes**<br>■ **Test function**<br>■ **Boost function to increase sensitivity**<br>■ **Fault indications in the event of loop breaking or short circuit** | ■ **Choice of operating modes: Background suppression ignores objects/background evaluation uses the background as reference to detect difficult targets**<br>■ **Adjustable detection range and timer functions**<br>■ **Test input** |
| **Diameter of the light spot** | <10 mm at 8 m | Loop inductance 100 to 1000 µH<br>Loop frequency 20 to 120 kHz | Approx. 150 mm at 6 m |
| **Mounting height/ Sensing range** | 8 m or 15 m to background | Sensing range depends on wire loop laid | Max 6 m |
| **Operating voltage** | 10 to 30 V DC | 24 V DC/115 V AC/230 V AC/24 V AC | LT2: 15 to 35 V DC<br>LTK2: 11 to 48 V DC/12 to 24 V AC |
| **Switching output** | 1 push-pull output + analogue output<br>2 push-pull outputs | Relay | LT2: 2 PNP or 1 NPN/1 PNP<br>LTK2: Relay |
| **Operating temperature** | -30 °C to 50 °C | -20 °C to 70 °C | -20 °C to 60 °C |
| **Connection** | M12 quick disconnect or fixed cable | Socket with terminal | M12 quick disconnect or fixed cable |
| **Dimensions** | 25.8 mm x 88 mm x 55 mm | 37.5 mm x 75 mm x 71 mm | 150 mm x 64 mm x 49 mm |
| **Versions** | ■ Sensing range 15 m<br>■ Sensing range 8 m<br>■ Push-pull and analogue output<br>■ 2 push-pull outputs<br>■ Quick disconnect<br>■ Fixed cable connection | ■ Operating voltage 24 V AC<br>■ Operating voltage 24 V DC<br>■ Operating voltage 115 V AC<br>■ Operating voltage 230 V AC<br>■ 1 loop channel<br>■ 2 loop channels<br>■ Direction detection | ■ Operating voltage DC with NPN output<br>■ Operating voltage DC with PNP output<br>■ Operating voltage AC/DC with relay output<br>■ Quick disconnect<br>■ Fixed cable connection |

| | 28 SERIES/29 SERIES | 31 SERIES | 61 SERIES |
|---|---|---|---|
| |  |  |  |
| | Retroreflective sensors and diffuse mode sensors | Retroreflective sensors | Retroreflective sensors and diffuse mode sensors |
| | Robust compact photoelectric sensor with long sensing range for detecting people, objects and vehicles | Basic photoelectric sensor with universal voltage for detecting people, objects and vehicles | Basic photoelectric sensor with universal voltage for detecting people, objects and vehicles |
| | Protection | Protection | Protection |
| |  |  |  |
| | ■ **Robust and waterproof housing with multiple mounting options**<br>■ **Long sensing ranges**<br>■ **No discernible interference emissions on any frequencies**<br>■ **Immune to ambient lighting**<br>■ **Particularly immune to interference from service radios and mobile phones** | ■ **Robust and waterproof ultrasonically welded housing**<br>■ **Good optical service data despite narrow housing**<br>■ **Very user-friendly due to simple settings and alignment**<br>■ **Immune to ambient lighting** | ■ **Robust and waterproof housing**<br>■ **Adjustable timer functions and operation modes**<br>■ **Sensitivity/test range adjuster**<br>■ **Immune to ambient lighting**<br>■ **Can be used in very low temperatures** |
| | Approx. 35 mm at 12 m | Approx. 200 mm at 6 m | Retroreflective sensor: approx. 350 mm at 18 m<br>Diffuse mode sensors: 17 mm at 1 m |
| | Retroreflective: 14 m/21 m<br>Sensor: 700 mm/2000 mm | Max. 12 m | Retroreflective sensor: max. 25 m<br>Diffuse mode sensors: max. 1.5 m or 4.7 m |
| | RL28: 24 V DC<br>RLK29: 24 to 230 V AC/DC | 24 to 240 V DC/12 to 240 V AC | 24 to 240 V DC/12 to 240 V AC |
| | RL28: 2 PNP<br>RLK29: Relay | Relay | Relay |
| | -20 °C to 60 °C or - 40 °C to 60 °C (RL28) | -25 °C to 55 °C | -40 °C to 55 °C |
| | Terminal compartment or M12 quick disconnect or fixed cable | Fixed cable | M12 quick disconnect or fixed cable |
| | 25.8 mm x 88 mm x 54 mm | 18 mm x 62 mm x 35 mm | 45 mm x 74 mm x 49 mm |
| | ■ Retroreflective sensor<br>■ Diffuse mode sensor<br>■ Light-on<br>■ Dark-on<br>■ With or without sensitivity adjuster<br>■ Terminal compartment, quick disconnect or fixed cable connection<br>■ Supplied with mounting set and reflector<br>■ Version with heated front lens (RL28) | ■ Light-on<br>■ Dark-on<br>■ Supplied with mounting set and reflector | ■ Retroreflective sensor<br>■ Diffuse mode sensor, energetic<br>■ Quick disconnect<br>■ Fixed cable connection |

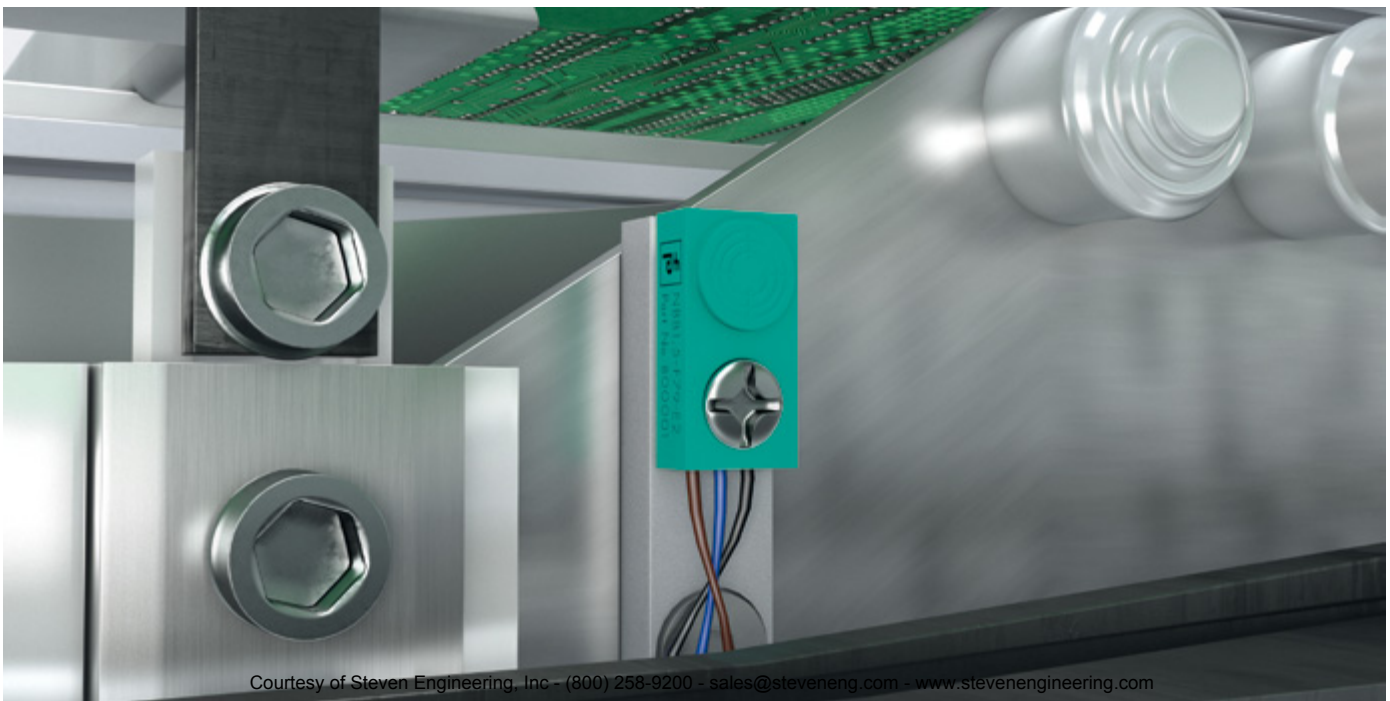
# INDUCTIVE SENSORS FOR END POSITION CONTROL FOR AUTOMATIC DOORS,

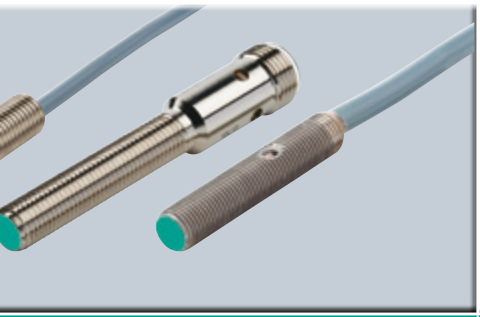


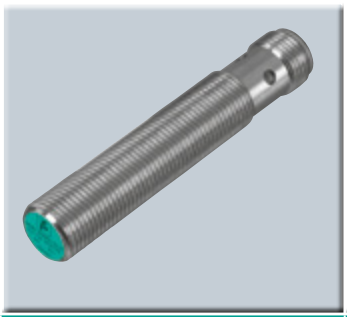


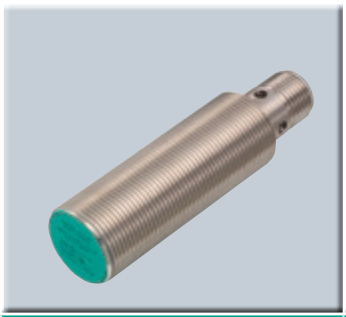


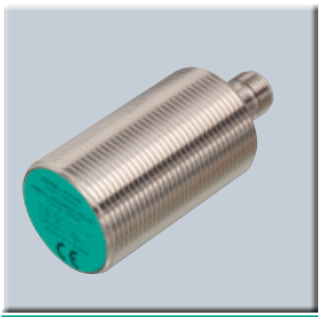
| Series | F1 AND F29 SERIES | F79 SERIES | 4M AND 6.5M SERIES | |
|---|---|---|---|---|
| Functional principle | Inductive sensors | Inductive sensors | Inductive sensors | |
| Description | Non-contact detection of metal objects | Non-contact detection of metal objects | Non-contact detection of metal objects | |
| Function | End position control of electromechanical actuators | End position control of electromechanical actuators | End position control of electromechanical actuators | |
| Model | **Cube design** | **Flat, rectangular design** | **Cylindrical design**<br>**Smooth housing** | |
| Sensing range | **Flush: 4 mm**<br>**Non-flush: 4 mm or 8 mm** | **Flush: 1.5 mm** | **Flush: 0.8 mm or 2 mm** | |
| Switching element function | PNP NO contact or NPN NO contact | PNP NO contact or NPN NO contact | PNP NO contact or NPN NO contact | |
| Operating voltage | 10 to 30 V DC | 10 to 30 V DC | 10 to 30 V DC | |
| Output | 3-wire DC | 3-wire DC | 3-wire DC | |
| Operating temperature | -25 °C to 70 °C | -25 °C to 70 °C | -25 °C to 70 °C | |
| Connection | M8 quick disconnect or fixed cable | Fixed cable | M8 quick disconnect or fixed cable | |
| Dimensions | 26 mm x 40 mm x 12 mm | 16 mm x 4 mm x 8 mm | ø 4 mm x 25 mm or<br>ø 6.5 mm x 25 mm/30 mm | |
| Versions | ■ F1 design<br>■ F29 design<br>■ Quick disconnect<br>■ Fixed cable connection | | ■ Quick disconnect<br>■ Fixed cable connection | |



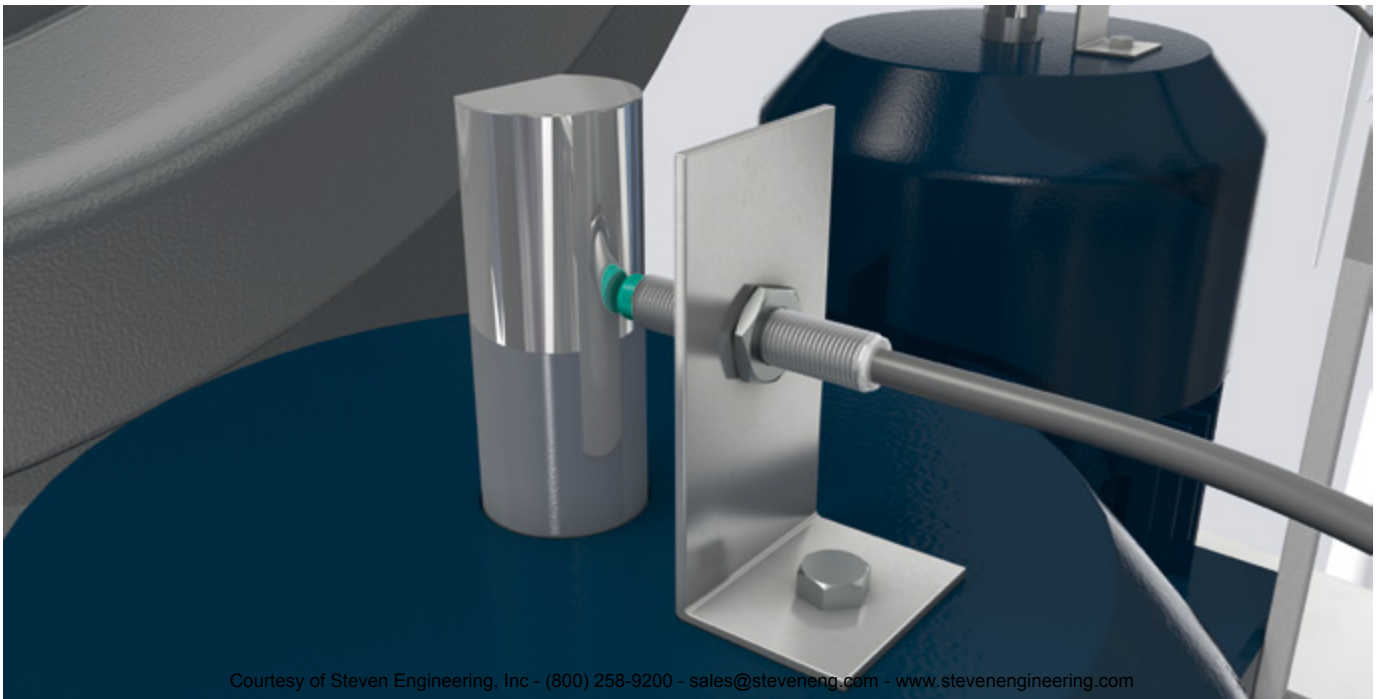








| 5GM AND 8GM SERIES | 12GM SERIES | 18GM SERIES | 30GM SERIES |
|---|---|---|---|
| Inductive sensors | Inductive sensors | Inductive sensors | Inductive sensors |
| Non-contact detection of metal objects | Non-contact detection of metal objects | Non-contact detection of metal objects | Non-contact detection of metal objects |
| End position control of electromechanical actuators | End position control of electromechanical actuators | End position control of electromechanical actuators | End position control of electromechanical actuators |
| **Cylindrical housing with M5 or M8 thread** | **Cylindrical housing with M12 thread** | **Cylindrical housing with M18 thread** | **Cylindrical housing with M30 thread** |
| **Flush: 0.8 mm or 1.5 mm or 2 mm<br>Non-flush: 2 mm** | **Flush: 2 mm or 4 mm<br>Non-flush: 4 mm** | **Flush: 5 mm or 8 mm<br>Non-flush: 8 mm** | **Flush: 10 mm or 15 mm<br>Non-flush: 15 mm** |
| PNP NO contact or NPN NO contact | PNP NO contact or NPN NO contact | PNP NO contact or NPN NO contact | PNP NO contact or NPN NO contact |
| 10 to 30 V DC | 10 to 30 V DC | 10 to 30 V DC | 10 to 30 V DC |
| 3-wire DC | 3-wire DC | 3-wire DC | 3-wire DC |
| -25 °C to 70 °C | -25 °C to 70 °C | -25 °C to 70 °C or -40 °C to 40 °C | -25 °C to 70 °C or -40 °C to 40 °C |
| M8 or M12 quick disconnect or fixed cable | M12 quick disconnect or fixed cable | M12 quick disconnect or fixed cable | M12 quick disconnect or fixed cable |
| M5 x 25 mm<br>M8 x 25 mm; 40 mm; 50 mm | M12 x 50 mm | M18 x 50 mm | M30 x 50 mm |
| ■ Quick disconnect<br>■ Fixed cable connection | ■ Quick disconnect<br>■ Fixed cable connection | ■ Quick disconnect<br>■ Fixed cable connection<br>■ Extended temperature range to -40 °C | ■ Quick disconnect<br>■ Fixed cable connection<br>■ Extended temperature range to -40 °C |



Courtesy of Steven Engineering, Inc - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com

# YOUR APPLICATION. OUR CHALLENGE.

## PROCESS INTERFACES

- Intrinsically safe barriers
- Signal conditioners
- Fieldbus infrastructure
- Remote I/O systems
- HART interface solutions
- Wireless solutions
- Level measurement
- Purge and pressurization systems
- Industrial monitors and HMI solutions
- Explosion protection equipment
- Solutions with process interfaces

## INDUSTRIAL SENSORS

- Proximity sensors
- Photoelectric sensors
- Industrial vision
- Ultrasonic sensors
- Rotary encoders
- Positioning systems
- Inclination and acceleration sensors
- AS-Interface
- Identification systems
- Logic control units

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