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Industry-specific sensors

Photoelectric sensors for doors, gates, and elevators

The secure and safe operation of doors and gates is the theme of these specialized sensors from Pepperl+Fuchs/Visolux, which cater for the opening pulse initiation of automatic doors and industrial gates, the monitoring and start-up control of escalators in public facilities, opening pulse generators and closing edge protection for industrial gates, or the vestibule and cabin occupation control and closing edge protection for elevator doors.

In addition, DIN 18650 applies in Germany since 01/07/2006. This places basic requirements on the safety of automatic doors and comprehensively defines the technical requirements for different automatic doors. In addition to the basic product requirements, the standard describes in particular potential risks and safety options.

It obliges manufacturers to carry out a detailed risk assessment. The basic message of the standard is that contrary to earlier practice a limiting of forces is not adequate as the only protection device during door movement. For sliding doors there is the additional stipulation that light barriers for hazard prevention may now only be used in conjunction with motion detectors. As we cooperate closely with leading door manufacturers of automatic doors and are actively involved in creating standard test principles for sensors on doors and safety components at TÜV Nord, sensors of Pepperl+Fuchs incorporate all of the current requirements.

An assortment of different operating principles is employed on this very wide range of sensors offered by Pepperl+Fuchs for this specialized industry:

- Radar sensors for use as opening pulse generators for all automatic doors incl. closing edge protection in sliding doors.

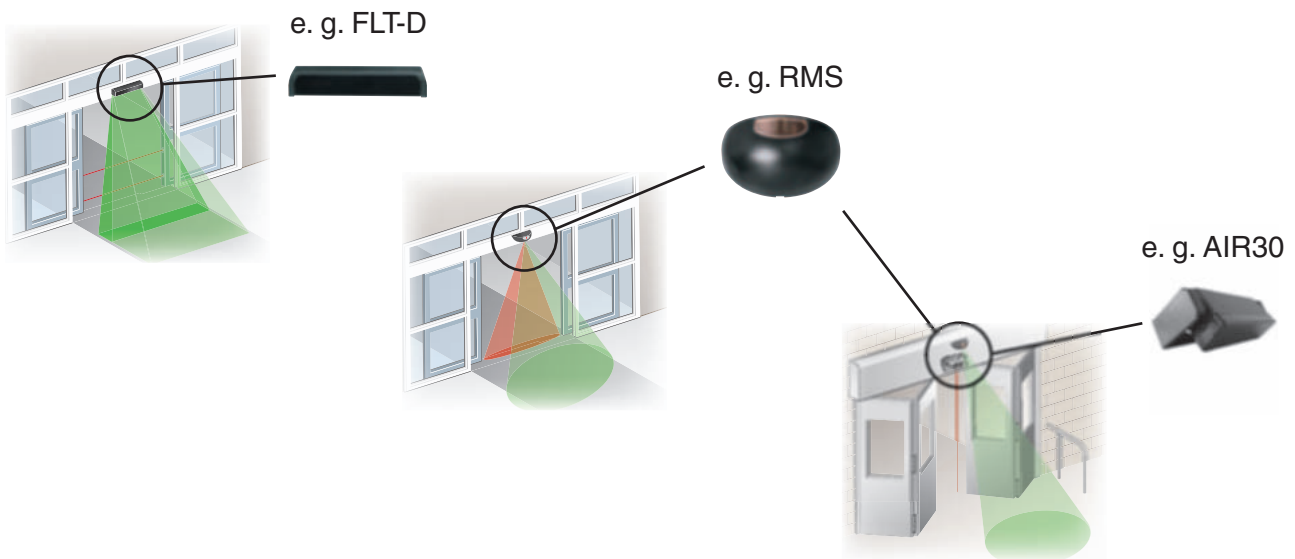
- Light scanners for the detection of the presence of people and safeguarding closing edges on revolving and sliding doors – in buses and trains, too.



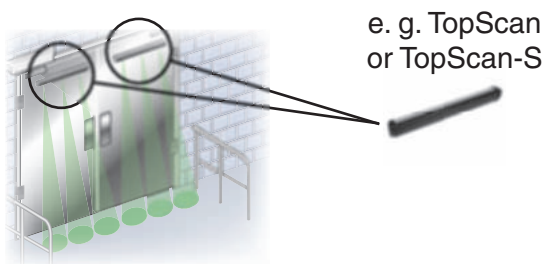
- Area scanners for monitoring the approach areas to door entry compartments and the areas surrounding doors – with optional counter function.
- Loop detectors as opening pulse generators in barriers and gates.
- Light barriers with increased range and water-tight housing for gate and barrier systems
Certificated fire protection light barriers as safety device for fixed installations in fire barriers or fire-proof gates
- Elevator light grids to provide for the safe and convenient operation of the closing edges of lift doors



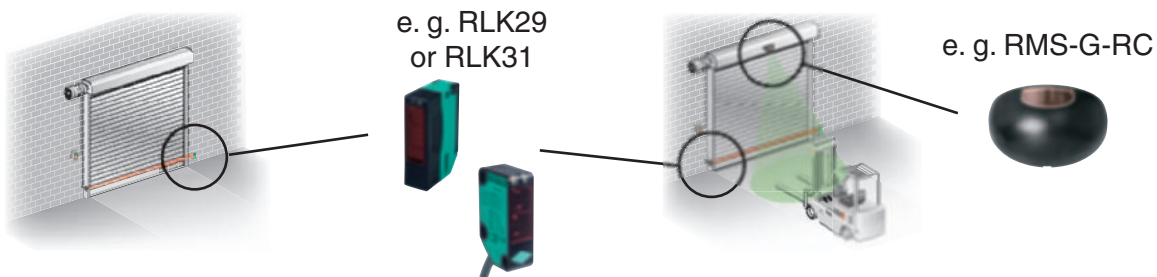
Opening pulse generator and closing edge monitor for automatic doors



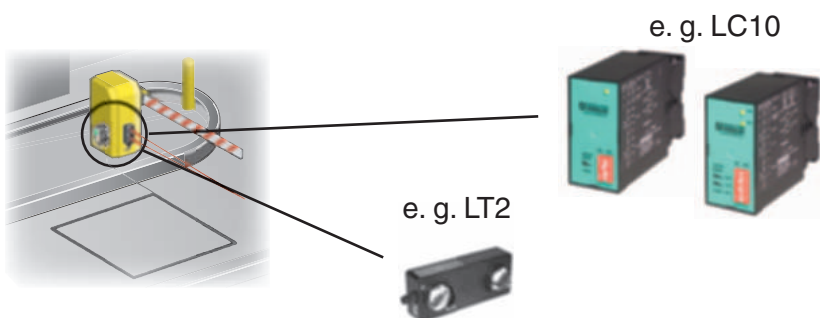
Anti-collision protection for revolving and automatic doors



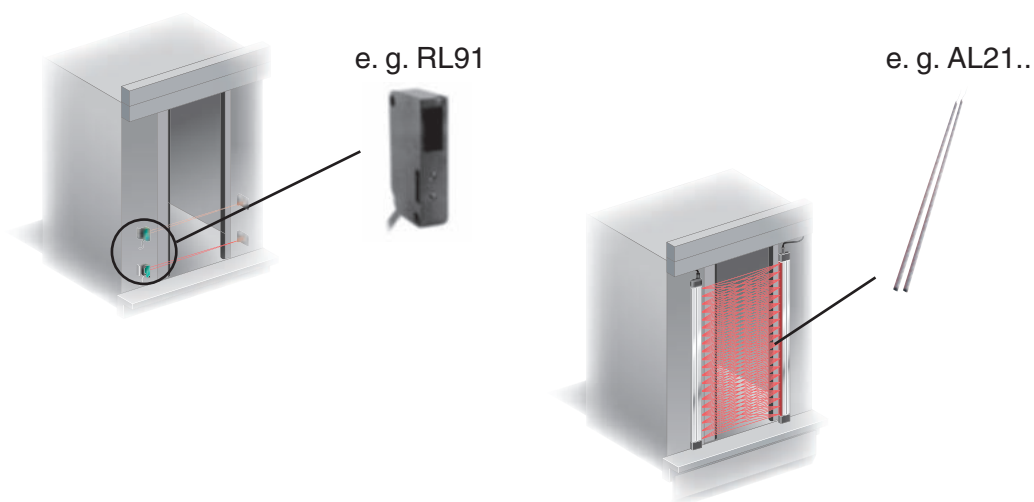
Opening pulse generator, closing edge monitor and pinch protection for industrial doors



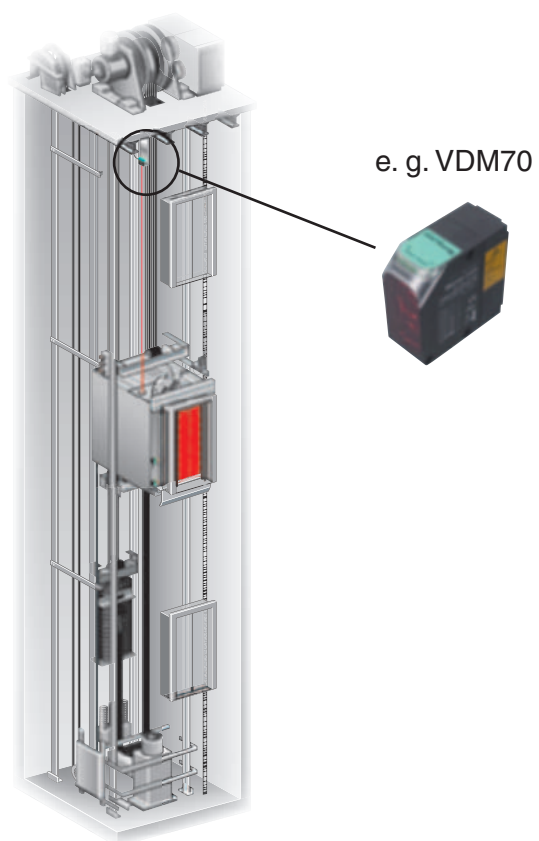
Opening pulse generator and closing edge monitor for cabinet systems



Closing edge monitors for elevators



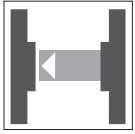
Cage positioning for elevators



Functional principles in overview

Type, size, shape, and surface properties of the objects to be detected, the distance between sensor and object, and the ambient conditions all determine the layout of the system and selection of appropriate types of sensors.

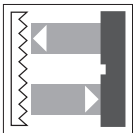
1. Thru-beam sensor



Thru-beam sensors in profile housings for installation in door frames require a pair of devices for operation, consisting of one light transmitter and one light receiver. The transmitter and receiver must be oriented in a line with one another. The infrared light sent out from the transmitter is collected and evaluated by the receiver.

The light barrier can detect people and objects regardless of movement and surface structure, as long as an object breaks the detection beam.

2. Retro reflective sensor



For particular applications, Pepperl+Fuchs offers a particular selection of sensors:

For monitoring elevator doors, particularly narrow reflection light barriers, also with polarisation filter and transistor or relay output, designs for direct-current operation and alternating current designs up to 264 VAC.

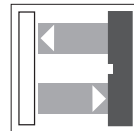
Robust devices with a high protection class of IP67 and visible red light are ideally suited for numerous monitoring tasks in outdoors and boundary areas, or in harsh environments in general. They are equipped with polarisation filters and, with a double functional reserve, can easily span distances of up to 12 m. As "all-voltage sensors", they can work with arbitrary power supply voltages between 24 V and 240 V and with direct or alternating current. Besides a generally high service lifetime, their main advantage is there is no measurable interference emission in these light barriers.

Fire protection light barriers with certification



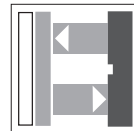
In case of fire, fire may not spread in buildings through halls, entryways, or shafts. Applicable fire protection regulations thus require so-called fire protection enclosures. These include fire protection doors, gates, and shutters, which are normally always closed. So that these doors may remain open in commonly-used entryways, there must be a self-closing mechanism which is triggered in case of fire. However, the door may not close right in the moment where a person is occupying it. Regulators thus require monitoring with corresponding safety systems. The technical challenge is to ignore any smoke and still be able to detect people reliably. This function can be fulfilled, for instance, by certified light barriers from Pepperl+Fuchs.

3. Diffuse mode sensor



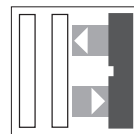
If people and objects must be detected within a sharply defined area, then diffuse mode sensors from Pepperl+Fuchs are ideal. These devices offer configurable detection ranges of up to 6 m, timer functions, and transistor or relay outputs.

Diffuse mode sensor with background suppression



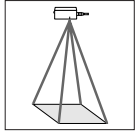
In the background-suppressing operating mode, sensors can be operated for door and gate monitoring and collision prevention in the direction of movement independent of the properties of the background.

Diffuse mode sensor with background evaluation



In the background-evaluation operating mode, the background serves as a reference surface. This allows even reflecting or shiny objects, like vehicles in parking garages, to be detected reliably.

Area scanner



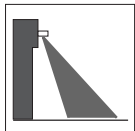
For surface monitoring of doors and gates using area scanners, Pepperl+Fuchs offers the most extensive product line on the market thanks to their years of specialisation in the area.

The product line includes sensors with fan-shaped detection fields and automatic adjustment to the background, sensors for row installation in narrow profile housings, compact sensors for surface detection in different detection field sizes, and counting sensors for counting people with direction detection.

All sensors offer numerous possibilities for the configuration of the monitoring area, e.g. configurable detection ranges, user-switchable detection fields, and a choice between background suppression and background evaluation.

The product line includes designs for direct and alternating current, with transistor or relay outputs, light/dark switches, and configurable timing functions.

Passive infrared motion detectors

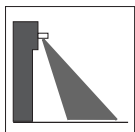


For the monitoring of the space before elevators and doors, as a cost-effective impulse sensor for any automatic system and signal sensors for open entryways, anywhere where people are to be detected, passive-infrared motion

detectors can be used, since they react to changes in the heat images when a person moves within the detection field.

Using zoom technology and apertures, the shape of the monitoring field can be set precisely. The product line includes designs for direct and alternating current.

Radar motion detectors



Radar motion detectors work with microwaves and detect moving objects.

They are used as openers on doors and gates, as control sensors in traffic applications for portable traffic lights, and in

buildings as presence sensors for lighting, air conditioning, and heating.

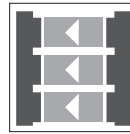
Depending on the radar module, the user can choose the sensor's large range of detection settings using a simple manual configuration or by hand held Remote Control.

Functions like direction detection, distinguishing between people and vehicles, filter functions to prevent interferences, and timer functions give these sensors a broad spectrum of applications.

Latest versions now offer closing edge monitoring with an additional field.

The product line includes designs for direct and alternating current with relay outputs, with configurable light/dark switching, and designs for use outdoors.

Elevator light grids



When operating elevators, it is necessary to prevent incoming or outgoing passengers from being touched or even injured by closing doors.

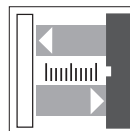
The AL20/AL40 light grid by Pepperl+Fuchs was designed especially for convenience elevators and is the first product of this kind with a 7-segment display. This greatly simplifies operation and service work.

The series includes light grids with 20 or 40 infrared beams and different profile widths. With an operating range of four meters, 1650-mm-high protection fields with up to 194 crossed beams, starting at a height of 20 mm above the floor, can be implemented. In the area close to the floor, smaller beam gaps and an asymmetrical beam pattern ensure that even small objects, like the points of shoes, are detected reliably.

Standard-conformal to the EN81-70 are available light grids up to 1800 mm protection field.

All functional units, including power unit, evaluation electronics, switching outputs, and test input, are integrated directly into the transmitter or receiver module. This compact solution thus avoids separate control units.

Distance measurement device



The time required for a beam of light to cover the route transmitter - object - receiver - is a measure of the distance to the object. One method for the indirect distance measurement is the so-called pulse time measurement.

Pulse time is the time the light beam takes to be reflected back to the source. By measuring this time the distance between the source and the object can be calculated using the speed of light.



Description

Sensors increasingly shape the face of modern building technology. Powerful sensors are indispensable for the operability and safety of automatic door and access systems. Besides the generation of opening pulses for approaching people they must also monitor the main and secondary closing edges to prevent any personal injuries.

Pepperl+Fuchs supplies all sensor components relevant to the operation and safety of automatic door systems.

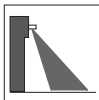
DIN18650

Since 1 July 2006 automatic doors must only be installed in Germany if they meet the requirements defined in DIN 18650. Door sensors specially developed for this purpose make an important contribution to the safety of people and other items.

The active infrared light sensor TopScan-S, for example, is one of the first devices tested by TÜV and certified in accordance with DIN 18650. It can be supplied as a moving sensor and is thus ideally suited for revolving doors.

The radar sensors of series RMS-S provide a maximum of reliability and safety when opening and monitoring sliding doors. One of their interesting highlights is the static function which makes the use of light barriers in addition to a motion detector obsolete and at the same time meets all requirements of the current standard.

	Type code	Principle of operation	Application areas	Page
	RMS-M	Radar motion sensors	Opening pulse	16
	RMS-D		Opening pulse	18
	RMS-D-RC			
	RMS - S		Opening pulse generator and closing edge protection for sliding doors in accordance with DIN18650	20
	FLT-D/38a sw	Area scanner	Closing edge protection and opening pulse generator	24
	PROSCAN/32	Diffuse mode sensor	Closing edge safety along sliding doors	22
	PROSCAN/38a		For bus and railway doors	
	PROSCAN-T/32/76a			
	PIR20	Passive infrared motion detectors	Opening pulse generator for sliding and revolving doors	26
	TOPSCAN-S	Active Infrared area Scanner	Anti-collision protection at revolving doors in accordance with DIN 18650	28
	TOPSCAN2-8-HS-2500-...	Active infrared ara scanner with background suppression and evaluation	Anti-collision protection in revolving and rotating doors	32
	AIR30-8	Active infrared area scanner with background evaluation	Closing edge monitoring in rotating doors	36
	ML29-P/...	Thru-beam sensor	Closing edge monitoring in sliding doors	38
	ML29T-P/25/102/115	Thru-beam sensor	Thru-beam sensor compliant with railway standard EN50155	44
	FLT-8-HW-2800-CLS	Area scanner with background evaluation and counter function	Light scanner for counting people at doorways, with recognition of direction	46



Features

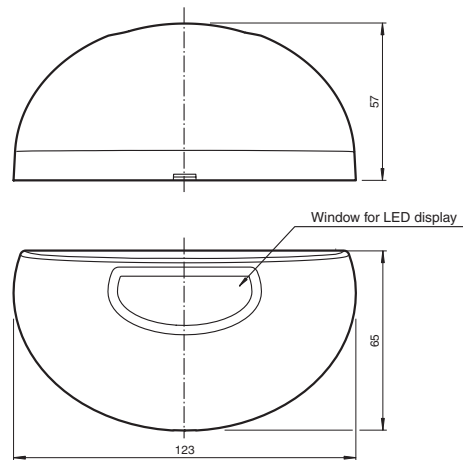
- Opening impulse sensor
- Simple mounting
- Programmable
RMS-M
- Programmable, also with separate remote control
RMS-M-RC

Technical data

		RMS-M	RMS-M-RC
Function principle	Micro wave module	◆	◆
Detection speed	min. 0.1 m/s	◆	◆
Marking	CE	◆	◆
Setting angle	0 ... 40 ° in 5 ° steps	◆	◆
Sensing range	broad: 2000x 4500 mm (TxB) at 2200 mm mounting height and 30° tilt angle narrow: 4500x 2000 mm (TxB) at 2200 mm mounting height and 30° tilt angle	◆	◆
Operating frequency	24.05 ... 24.25 GHz K-Band	◆	◆
Operating mode	Radar motion sensor	◆	◆
Function display	LED red/green	◆	◆
Operating elements	Potentiometer and programming button for setting: Method of connection, dropout time, response time, Interference behavior	◆	◆
Operating elements	sensitivity adjuster	◆	◆
Operating elements	Programming via menu driven remote control possible (Accessories. to order separately)	◆	◆
Operating voltage	12 ... 36 V DC , 12 ... 28 V AC	◆	◆
No-load supply current	≤ 50 mA at 24 V DC	◆	◆
Power consumption	≤ 1 W	◆	◆
Switching type	active/passive	◆	◆
Signal output	relay	◆	◆
Switching voltage	max. 48 V AC / 48 V DC	◆	◆
Switching current	max. 0.5 A AC / 1 A DC	◆	◆
Switch power	max. 24 W / 60 VA	◆	◆
De-energized delay	0.2 ... 10 s adjustable (1 sec factory setting)	◆	◆
Standards	EN 60950:2000; EN 60335-1:1994; EN 301489-3 V1.4.1; EN 61000-6-1:2001, EN 61000-6-2:2001; EN 61000-6-3:2001; EN 61000-4:2001 ; EN 300440-2 V1.1.1	◆	◆
Standards 2	CETECOM	◆	◆
Ambient temperature	-20 ... 60 °C (253 ... 333 K)	◆	◆
Relative humidity	max. 90 % non-condensing	◆	◆
Mounting height	max. 4000 mm	◆	◆
Protection degree	IP54	◆	◆
Connection	terminal strip 4-pin	◆	◆
Housing	ABS, anthracite	◆	◆
Mass	120 g	◆	◆

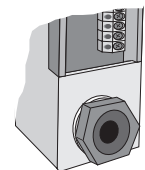
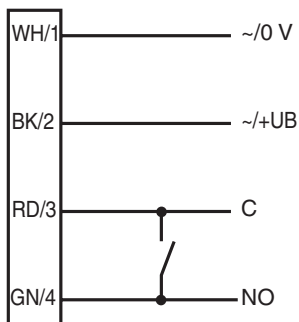


Dimensions



Electrical connection

Connection type

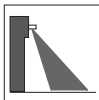


terminal compartment

Functional description

The motion detectors based on the latest 24 GHz technology with microprocessor control ensure high reliability under difficult operating conditions and enable target applications from the supermarket door to the garage gate. The core of the sensors are the planar modules with integrated patch aerals in robust metal design; behind the front-end there is the microprocessor controlled evaluation electronics. The 24 GHz frequency in the so-called K band has been reserved globally for this application area by CETECOM.

The motion detectors of series RMS with their intelligent functions can flexibly respond to the most different requirement profiles.



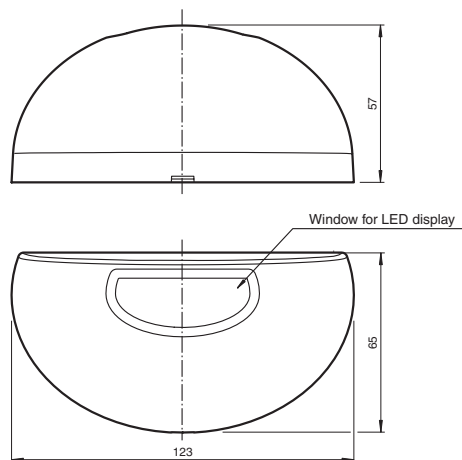
Features

- Opening impulse sensor
- Direction detection
- "Turtle-Mode" for extremely slow motions
- Cross traffic suppression
- 16 preprogrammed basic settings
- Programmable, also with separate remote control RMS-D-RC

Technical data

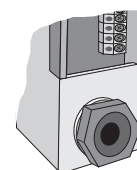
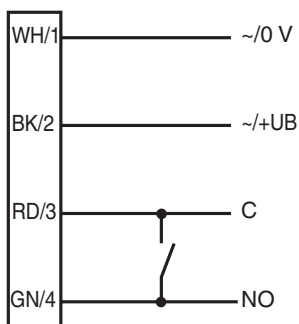
		RMS-D	RMS-D-RC
Function principle	Micro wave module	◆	◆
Detection speed	min. 0.1 m/s	◆	◆
Marking	CE	◆	◆
Setting angle	0 ... 40 ° in 5 ° steps	◆	◆
Sensing range	3000x 2500 mm (TxB) at 2200 mm mounting height and 30° tilt angle	◆	◆
Operating frequency	24.05 ... 24.25 GHz K-Band	◆	◆
Operating mode	Radar motion sensor	◆	◆
Function display	LED red/green	◆	◆
Operating elements	DIP-switch for selection of operating modes : Direction detection , Cross traffic suppression , Turtle mode , Switching type	◆	◆
Operating elements	sensitivity adjuster	◆	◆
Operating elements	Adjuster for de-energised delay	◆	◆
Operating voltage	12 ... 36 V DC , 12 ... 28 V AC	◆	◆
No-load supply current	≤ 50 mA at 24 V DC	◆	◆
Power consumption	≤ 1 W	◆	◆
Switching type	active/passive	◆	◆
Signal output	relay, 1 N.O.	◆	◆
Switching voltage	max. 48 V AC / 48 V DC	◆	◆
Switching current	max. 0.5 A AC / 1 A DC	◆	◆
Switch power	max. 24 W / 60 VA	◆	◆
De-energized delay	0.2 ... 5 s adjustable (1 sec factory setting)	◆	◆
Standards	EN 60950:2000; EN 60335-1:1994; EN 301489-3 V1.4.1; EN 61000-6-1:2001, EN 61000-6-2:2001; EN 61000-6-3:2001; EN 61000-4:2001 ; EN 300440-2 V1.1.1	◆	◆
Standards 2	CETECOM	◆	◆
Ambient temperature	-20 ... 60 °C (253 ... 333 K)	◆	◆
Relative humidity	max. 90 % non-condensing	◆	◆
Mounting height	max. 4000 mm	◆	◆
Protection degree	IP54	◆	◆
Connection	plug-in screw terminals 4-pin , 8 m connecting cable included in delivery	◆	◆
Housing	ABS, anthracite	◆	◆
Mass	120 g	◆	◆

Dimensions



Electrical connection

Connection type



terminal compartment

Functional description

The motion detectors based on the latest 24 GHz technology with microprocessor control ensure high reliability under difficult operating conditions and enable target applications from the supermarket door to the garage gate. The core of the sensors are the planar modules with integrated patch aerals in robust metal design; behind the front-end there is the microprocessor controlled evaluation electronics. The 24 GHz frequency in the so-called K band has been reserved globally for this application area by CETECOM.

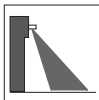
The motion detectors of series RMS with their intelligent functions like direction detection, suppression of crossing traffic and "turtle mode" can flexibly respond to the most different requirement profiles. The suppression of crossing traffic is particularly useful in narrow shopping streets. Here the system can be configured to only open the door when people move towards it whilst ignoring passing traffic. Two sensitivity stages can be set to take into account crossing traffic of different intensity. The use as revolving door sensors on the sides of the door hinges is also possible, because with suppression of crossing traffic enabled the closing door leaf does not cause false triggers.

Sensors for automatic doors,
incl buses and trains

Sensors for industrial gates,
fire protection light barriers

Sensors for elevators

Accessories



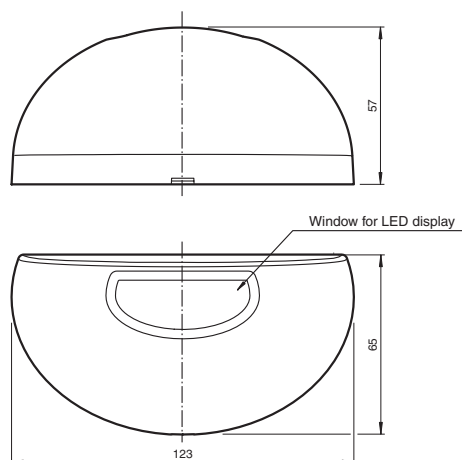
Features

- Opening impulse sensor
- Maximum safety to DIN 18650
- Motion detection/Static detection/Detection of slow-moving or stationary objects
- Closing edge safety on sliding doors with photoelectric sensors replacement
- Approved for escape and rescue routes in accordance with AutSchR (German directive governing automatic sliding doors for rescue routes)
RMS-S-FRW

Technical data

		RMS-S	RMS-S-FRW
Function principle	Micro wave module	◆	◆
Detection speed	min. 0.1 m/s	◆	◆
Marking	CE	◆	◆
Setting angle	0 ... 40 ° in 5 ° steps	◆	◆
Operating frequency	24.05 ... 24.25 GHz K-Band	◆	◆
Operating mode	Radar motion sensor and presence sensor	◆	◆
Function display	LED red/green	◆	◆
Operating elements	Programming push-button for selection of operating modes : Direction detection , Cross traffic suppression , Turtle mode , Switching type	◆	◆
Operating voltage	12 ... 36 V DC	◆	◆
No-load supply current	< 200 mA at 24 V DC	◆	◆
Power consumption	< 3 W	◆	◆
Test input	programmable with U _{B+} or 0 V	◆	◆
Switching type	active/passive	◆	◆
Signal output	2 relay outputs for dynamic output and transistor output pnp/npn for static output , combination of static and dynamic output can be programmed	◆	
	2 relay outputs for dynamic output and transistor output pnp/npn or frequency output or voltage output for static output , combination of static and dynamic output can be programmed		◆
Output type	relay output	◆	◆
Switching voltage	48 V DC / AC	◆	◆
Switching current	max. 1 A DC; 0.5 A AC	◆	
	max. 1 A DC; 0.5 A AC		◆
Switch power	30 W DC / 60 VA AC	◆	◆
Output type	voltage output		◆
Output rated operating current	max. 10 mA at 3.2 V DC		◆
Open loop voltage	max. ≤ 10 V DC		◆
Output type	Frequency output		◆
Output rated operating current	max. 50 mA		◆
	≤ 2 V DC		◆
Pulse/Pause ratio	1:1 , deviation max. 10 %		◆
Output frequency	100 Hz		◆
Standards	EN 60950:2000; EN 60335-1:1994; EN 301489-3 V1.4.1; EN 61000-6-1:2001, EN 61000-6-2:2001; EN 61000-6-3:2001; EN 61000-4:2001 ; EN 300440-2 V1.1.1	◆	◆
Standards 2	CETECOM	◆	◆
Standards 3	DIN 18650	◆	◆
Standards 4	TÜV	◆	◆
Ambient temperature	-20 ... 60 °C (253 ... 333 K)	◆	◆
Relative humidity	max. 90 % non-condensing	◆	◆
Mounting height	max. 3000 mm	◆	◆
Protection degree	IP54	◆	◆
Connection	plug strip 8-pin with cable	◆	◆
Housing	ABS, anthracite	◆	◆
Mass	140 g	◆	◆

Dimensions

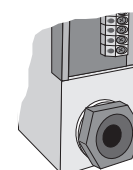


Electrical connection

Connection type

Pinning according 8-pin plug strip (Relay output)

Pin	Signal	Colour
1	+12 ... 36 V DC	white
2	GND	brown
3	Relais 1	green
4	Relais 1	yellow
5	Relais 2	grey
6	Relais 2	pink
7	Testinput	blu
8	Presence output	red



terminal compartment

Pinning according 8-pin plug strip (Voltage output)

Pin	Signal	Colour
1	+12 ... 36 V DC	white
2	GND	brown
3	Uout +	green
4	Uout -	yellow
5	NC	grey
6	NC	pink
7	Testinput	blu
8	Presence output	red

Pinning according 8-pin plug strip (Frequency output)

Pin	Signal	Colour
1	+12 ... 36 V DC	white
2	GND	brown
3	Fout +	green
4	Uin -	yellow
5	Uin +	grey
6	NC	pink
7	Testinput	blu
8	Presence output	red

Functional description

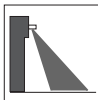
The radar sensors of series RMS-S provide a maximum of reliability and safety when monitoring sliding doors. These are radar motion sensors of the latest generation opening up numerous application options due to their proven principle of operation and their microprocessor control. This is also contributed to by intelligent functions like direction detection, suppression of crossing traffic and "turtle mode".

Normally detection via radar requires the target objects to move. Unlike common radar motion detectors the devices of series RMS-S do, however, have several detection modes (multiple detection). An interesting highlight is here the static function which makes the use of light barriers obsolete. The same technology is used both for dynamic and static detection of people and objects. In this the RMS-S sensors have the optimum safety functions for sliding doors.

In normal motion detection for opening pulse generation the sensor registers all movement at a distance of at least 2.5 cm at a minimum speed of 0.1 m/s. The device can evaluate the direction of movement and thus be programmed to e.g. only open the door when it is approached, if the movement is away from it, or in any direction of movement.

Whilst the dynamic detection is enabled with the door closed, the system switches to static detection as soon as the door is opened. In this mode the sensor captures the static objects within and in front of the closing range of the door; the environment will be automatically learned adaptively. This permits the complete monitoring of a defined safety area. With these functions a single sensor is sufficient for opening pulse generation and the safety monitoring for personal protection.

In addition, the device has approval for escape and rescue routes.



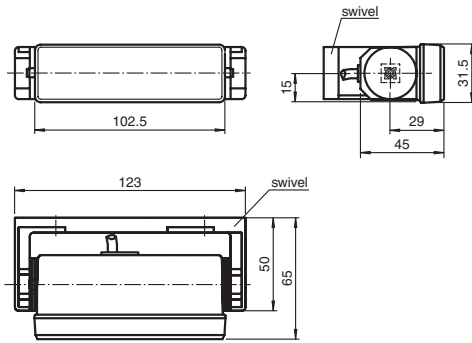
Features

- Closing safety monitoring over the complete door width
- Auto-TEACH function
- Maximum safety due to a minimum distance of the light beam
- Automatic long-time drift compensation
- Open time: adjustable time for automatic adaptation to a new background
- Small size
- Mounting bracket included in delivery
- Certification in accordance with rail and automobile standards
PROSCAN-T/32/76a

Technical data

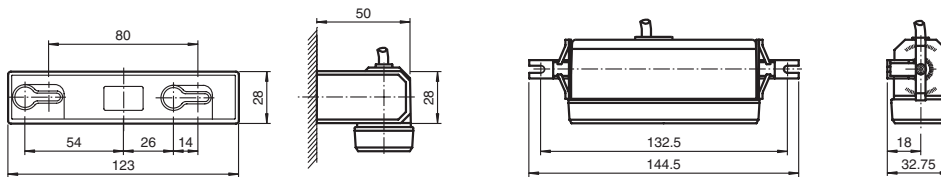
		PROSCAN/32	PROSCAN/38a	PROSCAN-T/32/76a
Detection field	total field: 2300 mm x 80 mm left/right field: 1150 mm x 80 mm center field: 1000 mm x 80 mm	◆	◆	◆
Light source	12 x IRED	◆	◆	◆
Teach-in time	approx. 4 s	◆	◆	◆
Marking	CE	◆	◆	◆
Open Time	3 min/10 s, programmable	◆	◆	
	3 s / 10 s, programmable			◆
Light type	infrared, modulated light	◆	◆	◆
Function display	LED red: on for object detection, flashes during teaching phase	◆	◆	◆
Operating elements	Programmable switch for switching type, open time, detection field	◆	◆	◆
Operating voltage	12 ... 38 V DC	◆		◆
	12 ... 38 V DC / 12 ... 28 V AC		◆	
Ripple	10 %	◆		◆
No-load supply current	100 mA	◆	◆	◆
Power consumption	3 VA		◆	
Test input	emitter deactivation with +Ub	◆		◆
Switching type	Output active / inactive programmable	◆	◆	◆
Signal output	Relay, 1 alternator		◆	
	1 pnp, short-circuit proof, protected from reverse polarity, open collector	◆		◆
Switching voltage	38 V DC	◆		◆
	48 V DC		◆	
Switching current	1 A at 24 V DC		◆	
	200 mA	◆		◆
Response time	< 50 ms	◆	◆	◆
De-energized delay	200 ms	◆	◆	◆
Standards	EN 60947-5-2	◆	◆	◆
Standards 2	EN 50155			◆
	EN 61000-6-2 without EN 61000-4-5, EN 61000-4-11	◆	◆	
Standards 3	EN 50121-3-2			◆
	EN 61000-6-3	◆	◆	
Standards 4	E1 RL72/245/EWG (RL95/54/EG)			◆
Standards 5	2006/28/EG			◆
Ambient temperature	-20 ... 60 °C (253 ... 333 K)	◆	◆	◆
Storage temperature	-20 ... 70 °C (253 ... 343 K)	◆	◆	◆
Mounting height	1000 ... 2500 mm	◆	◆	◆
Protection degree	IP52	◆	◆	◆
Connection	fixed cable 3 m, halogen-free, with ferrite core			◆
	fixed cable 5 m	◆	◆	
Housing	ABS	◆	◆	◆
Optical face	PMMA	◆	◆	◆
Mass	approx. 100 g	◆	◆	◆

Dimensions



Mounting dimensions for swivel

Mounting dimensions with mounting bracket set AIR30

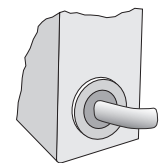
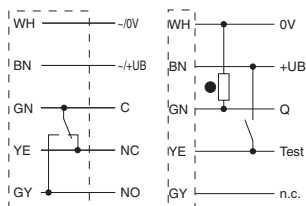


Electrical connection

Connection type

Option /38a

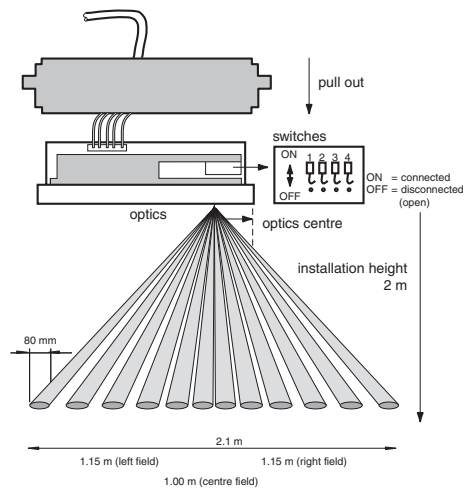
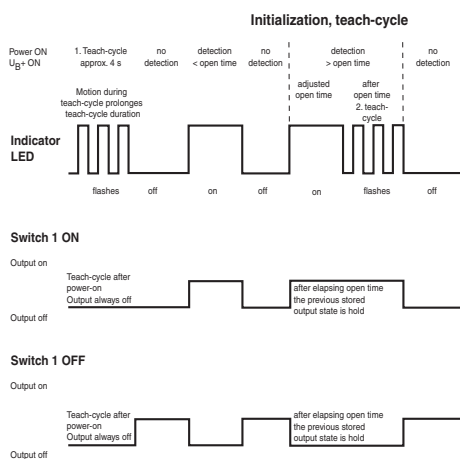
Option /32

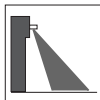


fixed cable

Diagrams

Timing diagram Proscan





Features

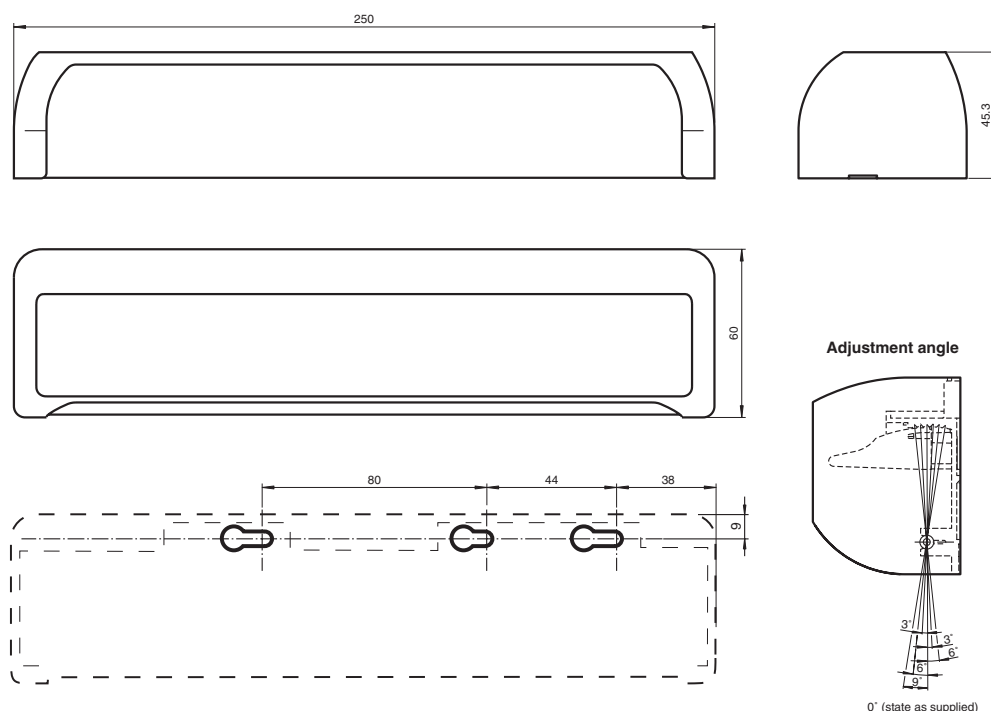
- Vestibule and closing edge monitoring for automatic sliding doors
- Closing safety monitoring over the complete door width
- Open time: adjustable time for automatic adaptation to a new background
- Test input
- Opening impulse sensor
- 20 programmable monitoring fields
- Test body detection according to EN12650

Technical data

Detection field	programmable , total field: 2200 mm x 1500 mm (WxD) at 2200 mm installation height	◆
Light source	10 IRED 950 nm	◆
Marking	CE, UL	◆
Setting angle	-6 ... 9 ° at 2200 mm installation height	◆
Open Time	programmable	◆
Operating mode	Energetic diffuse mode sensor	◆
Light type	infrared, modulated light	◆
Function display	LED red: on for object detection, flashes during teaching phase	◆
Operating elements	Programmable switch for switching type, open time, detection field	◆
Parameterisation display	5 LED, red	◆
Operating voltage	12 ... 31 V DC / 12 ... 30 V AC	◆
No-load supply current	≤ 100 mA	◆
Power consumption	3.5 VA	◆
Test input	active with +U _B	◆
Switching type	Light/dark ON selectable programmable	◆
Signal output	Relay, 1 alternator	◆
Switching voltage	AC : 30 V ; DC : 32 V	◆
Switching current	300 mA	◆
Switch power	55 VA	◆
Response time	≤ 110 ms	◆
Standards	EN 60947-5-2	◆
Standards 2	EN 61000-6-1 ,	◆
Standards 3	EN 61000-6-2 without EN 61000-4-5, EN 61000-4-11 ,	◆
Standards 4	EN 61000-6-3 , EN 61000-6-4	◆
Standards 5	ANSI 156,10 (as activation sensor)	◆
Ambient temperature	-20 ... 60 °C (253 ... 333 K)	◆
Storage temperature	-30 ... 75 °C (243 ... 348 K)	◆
Mounting height	max. 2200 mm	◆
Protection degree	IP54 (in the mounted state)	◆
Connection	terminal strip 8-pin 1 ... 1.5 mm ²	◆
Housing	PC	◆
Optical face	PC	◆
Covering	ASA , black	◆
Mass	195 g	◆

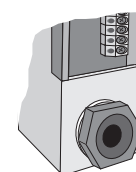
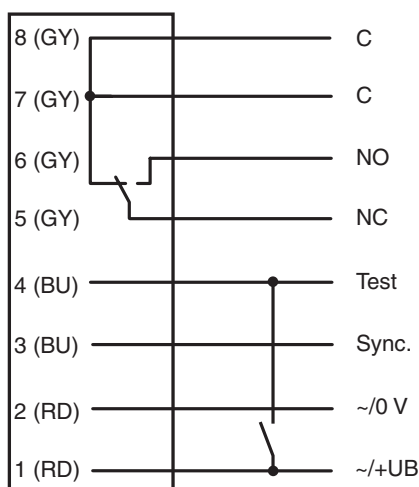
FLT-D/38a sw

Dimensions



Electrical connection

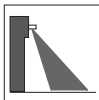
Connection type



terminal compartment

Description

The FLT-D has special features that make it suitable for use in door control systems and safety systems for closing edges. The FLT-D is an energetic area scanner. Movable objects are detected in a defined field by an optical transmitter/receiver section and a corresponding signal is generated to the door control system by an analyser unit. Immediately after the device is turned on, the reflected radiation characteristics of the environment located in the detection field are programmed as a reference. This allows for error-free monitoring even under changing ambient conditions such as rain, snow or dirt. If the environment is permanently changed, reprogramming will occur after a defined period of time. This eliminates interfering factors, for example an object placed in the entrance area of a door. The FLT-D is delivered from the factory with standard programming. If necessary, the field sizes, programming time, sensitivity and type of switching can be changed or reprogrammed. The entire functionality of the FLT-D can be checked using its test input.



Features

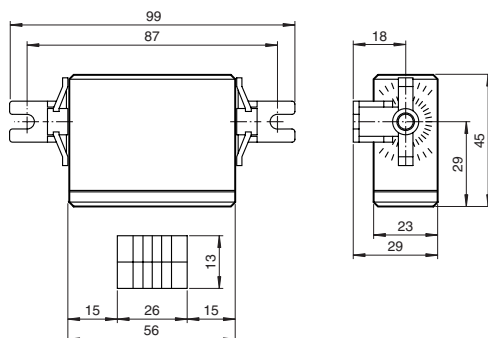
- Small dimensions
- Precise range adjustment possible using 12 Fresnel lenses
- Zoom function for infinite adjustment of the detection-angle size
- Switches at a temperature difference of ± 2 °C relative to the background
- Mounting bracket included in delivery

Technical data

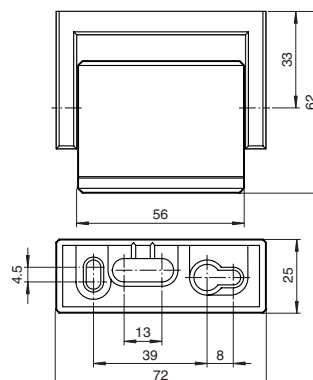
		PIR20/31 sw
Effective detection range	max. 12 m (frontal)	◆
Detection field	max. 1800 mm x 2600 mm for a mounting height of 2500 mm	◆
Approvals	CE	◆
Operating display	LED green	◆
Function display	LED red: illuminates upon detection	◆
Operating elements	zoom screw for detection field adjustment , sensitivity adjuster , changeover switch, active/passive	◆
Operating voltage	12 ... 24 V AC / 12 ... 30 V DC	◆
No-load supply current	approx. 15 mA	◆
Power consumption	approx. 350 mW at 24 V	◆
Switching type	Output active / inactive , programmable	◆
Signal output	Relay, 1 alternator	◆
Switching voltage	48 V AC/DC	◆
Switching current	1 A	◆
Switch power	max. 30 W / 60 VA	◆
De-energized delay	0.5 s (fixed setting)	◆
Standards	89/336 EWG	◆
Ambient temperature	-20 ... 60 °C (253 ... 333 K)	◆
Mounting height	recommended: max. 3.5 m	◆
Protection degree	IP52	◆
Connection	screw terminals, removable	◆
Housing	ABS, black	◆
Optical face	Plastic lens	◆
Mass	approx. 40 g	◆

Dimensions

Mounting dimensions with mounting bracket



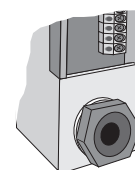
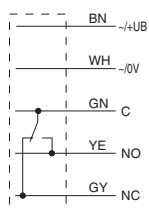
Mounting dimensions for swivel



Electrical connection

Connection type

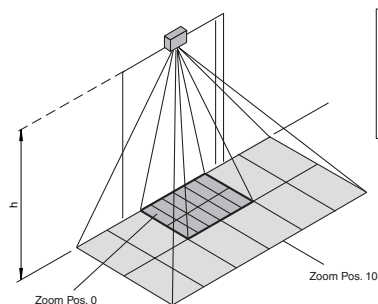
Option /31



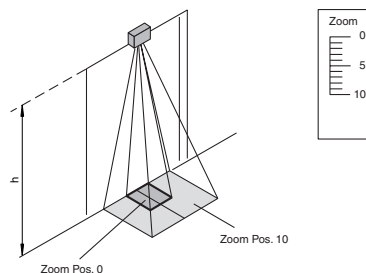
terminal compartment

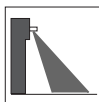
Diagrams

Field dimension max.



Field dimension min.





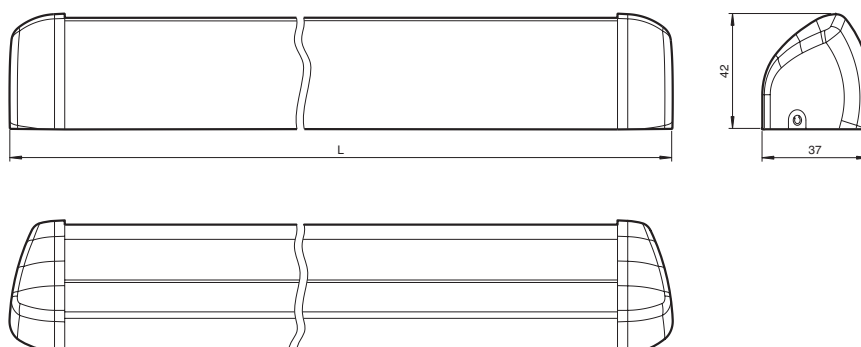
Features

- Moving presence sensor for swing doors
- Configurable for a wide range of door leaf widths
- Certified as cat. 2 in accordance with DIN 18650
- Test piece detection
- Modular construction with master/slave
- Reversible closing safety
- Mechanical adjustable detection range
- Background evaluation

Technical data

		TopScan-S-M/L310	TopScan-S-M2S/L750	TopScan-S-M3S/L900	TopScan-S-M5S/L1400
Detection range min.	0 ... 1500 mm	◆	◆	◆	◆
Detection range max.	0 ... 2500 mm	◆	◆	◆	◆
Light source	IRE D	◆	◆	◆	◆
Black/White difference (6 %/90 %)	< 2 % at 2000 mm sensor range	◆	◆	◆	◆
Marking	CE	◆	◆	◆	◆
Number of beams	(number of built-in sensor modules AIR 16)	1	3	4	6
Operating mode	Background evaluation	◆	◆	◆	◆
Diameter of the light spot	3 cm x 8 cm at 2000 mm sensor range	◆	◆	◆	◆
Function display	LED red/green	◆	◆	◆	◆
Operating elements	sensing range adjuster	◆	◆	◆	◆
Operating voltage	24 V DC +/- 20 %	◆	◆	◆	◆
No-load supply current		65 mA	175 mA	230 mA	340 mA
Test input	active at U = 11 V DC at 30 V DC inactive at U = -3 V DC at 5 V DC	◆	◆	◆	◆
Switching type	Relay de-energized at object inside the scanning range	◆	◆	◆	◆
Signal output	Relay, 1 alternator	◆	◆	◆	◆
Switching voltage	≤ 250 V AC/DC	◆	◆	◆	◆
Switching current	≤ 1 A	◆	◆	◆	◆
Response time	≤ 70 ms	◆	◆	◆	◆
Standards	EN 60947-5-2	◆	◆	◆	◆
Standards 2	EN 61000-6-2 without EN 61000-4-5, EN 61000-4-11	◆	◆	◆	◆
Standards 3	EN 61000-6-3	◆	◆	◆	◆
Standards 4	DIN 18650	◆	◆	◆	◆
Standards 5	EN 12978	◆	◆	◆	◆
Ambient temperature	-10 ... 50 °C (263 ... 323 K)	◆	◆	◆	◆
Length of housing L		310 mm	750 mm	900 mm	1400 mm
Mounting height	max. 2500 mm	◆	◆	◆	◆
Protection degree	IP52 , IP54 Optional (with special seal)	◆	◆	◆	◆
Connection	screw terminals	◆	◆	◆	◆
Housing	aluminium / ABS	◆	◆	◆	◆
Optical face	PMMA	◆	◆	◆	◆

Dimensions



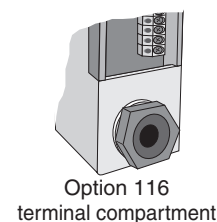
Electrical connection

Connection type

Pin	Assignment
1	GND (0V)
2	UB +24 V DC \pm 20 %
3	Relay - center contact
4	Relay break contact
5	Relay make contact
6	Test input

Explanation:
Relay:
 Relay is inactive during detection
 Relay is active in free detection field

Test input:
 Test input is inactive at: $U_{low} = -3 \text{ V} \dots +5 \text{ V DC}$
 Test input is active at: $U_{high} = +11 \text{ V} \dots +30 \text{ V DC}$



Functional description

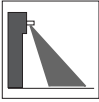
The TopScan-S is an active infrared scanner.

TopScan-S operates on the active infrared method with evaluation in the background, and enables traveling installation on door wings apart from static operation. Thus, it is ideal for securing the closing edges of automatic revolving doors. In case of revolving doors, a sensor mounted to the door wing offer the best possible protection as it always monitors the direct vicinity of the respectively present door wing position.

Arrangement

The TopScan-S consists of an aluminum profile with front cover which can be adapted as required to the various door widths of up to 1,400 mm. The profile is fitted with sensor modules, and is arranged modularly according to the master/slave principle. The minimum arrangement with sensor modules in keeping with German standard DIN 18650 consists of a master module AIR16-S master and a slave module AIR16-S slave and provides a twin-beam protection. For a 900 mm door, for example, a master module and three slave units are required whilst a seven-beam system with master and six slaves covers a maximum variant of 1,400 mm.

The TopScan-S system can either be ordered in the requested configuration or it can be flexibly plugged together as required for the necessary expansion stage.



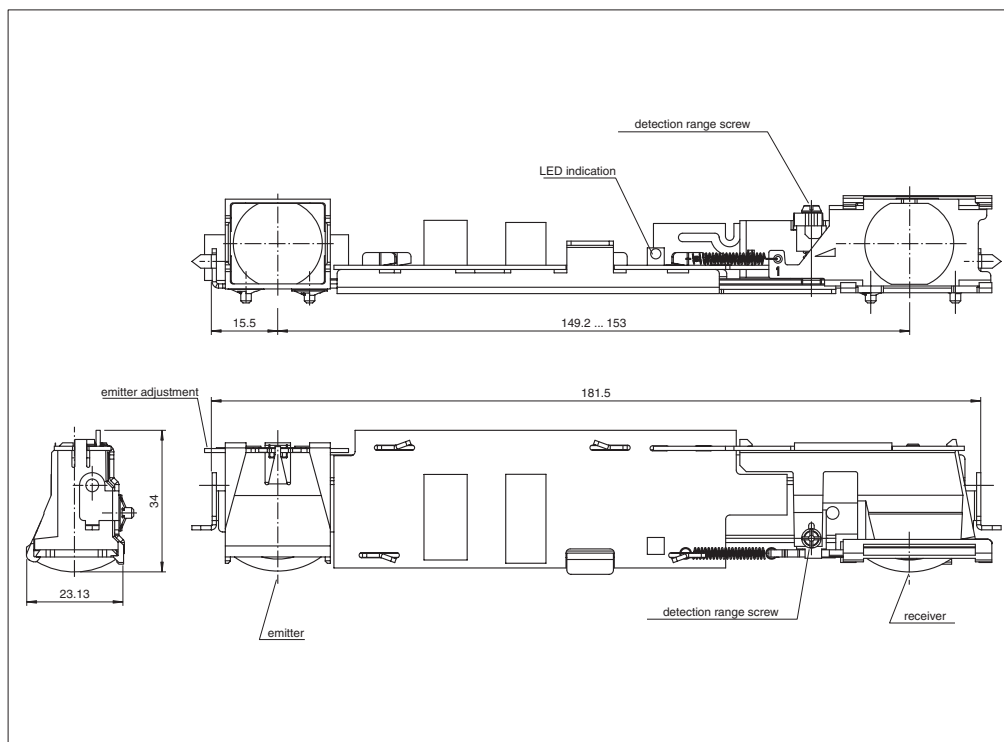
Features

- **Sensor module for configurable TopScan-S**
- **Certified as cat. 2 in accordance with DIN 18650**
- **Slave module**
AIR 16-S SLAVE
- **Master module**
AIR 16-S MASTER

Technical data

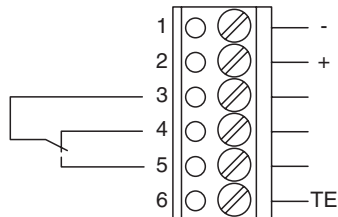
		AIR 16-S MASTER	AIR 16-S SLAVE
Detection range min.	0 ... 1500 mm	◆	◆
Detection range max.	0 ... 2500 mm	◆	◆
Light source	IREDD	◆	◆
Black/White difference (6 %/90 %)	< 2 % at 2000 mm sensor range	◆	◆
Marking	CE	◆	◆
Operating mode	Background evaluation	◆	◆
Diameter of the light spot	3 cm x 8 cm at 2000 mm sensor range	◆	◆
Function display	LED red/green	◆	◆
Operating elements	sensing range adjuster	◆	◆
Operating voltage	24 V DC +/- 20 %	◆	◆
No-load supply current	55 mA		◆
	65 mA	◆	
Test input	active at U = 11 V DC at 30 V DC inactive at U = -3 V DC at 5 V DC	◆	
Switching type	Relay de-energized at object inside the scanning range	◆	
Signal output	Relay, 1 alternator	◆	
Switching voltage	≤ 250 V AC/DC	◆	
Switching current	≤ 1 A	◆	
Response time	≤ 70 ms	◆	◆
Standards	EN 60947-5-2	◆	◆
Standards 2	EN 61000-6-2 without EN 61000-4-5, EN 61000-4-11	◆	◆
Standards 3	EN 61000-6-3	◆	◆
Standards 4	DIN 18650	◆	◆
Standards 5	EN 12978	◆	◆
Ambient temperature	-10 ... 50 °C (263 ... 323 K)	◆	◆
Mounting height	max. 2500 mm	◆	◆

Dimensions



Electrical connection

Connection type



Pin	Assignment
1	GND (0V)
2	UB +24 V DC \pm 20 %
3	Relay - center contact
4	Relay break contact
5	Relay make contact
6	Test input

Explanation:

Relay:

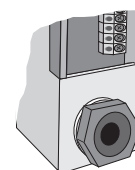
Relay is inactive during detection

Relay is active in free detection field

Test input:

Test input is inactive at: $U_{low} = -3 \text{ V} \dots +5 \text{ V DC}$

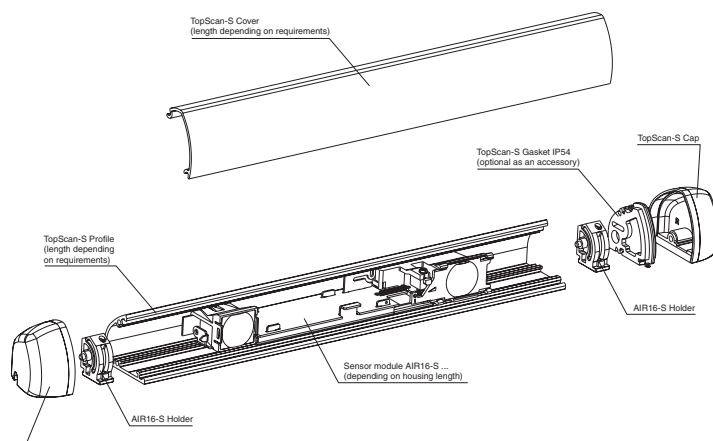
Test input is active at: $U_{high} = +11 \text{ V} \dots +30 \text{ V DC}$

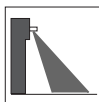


Option 116
terminal compartment

Description

Design of the device





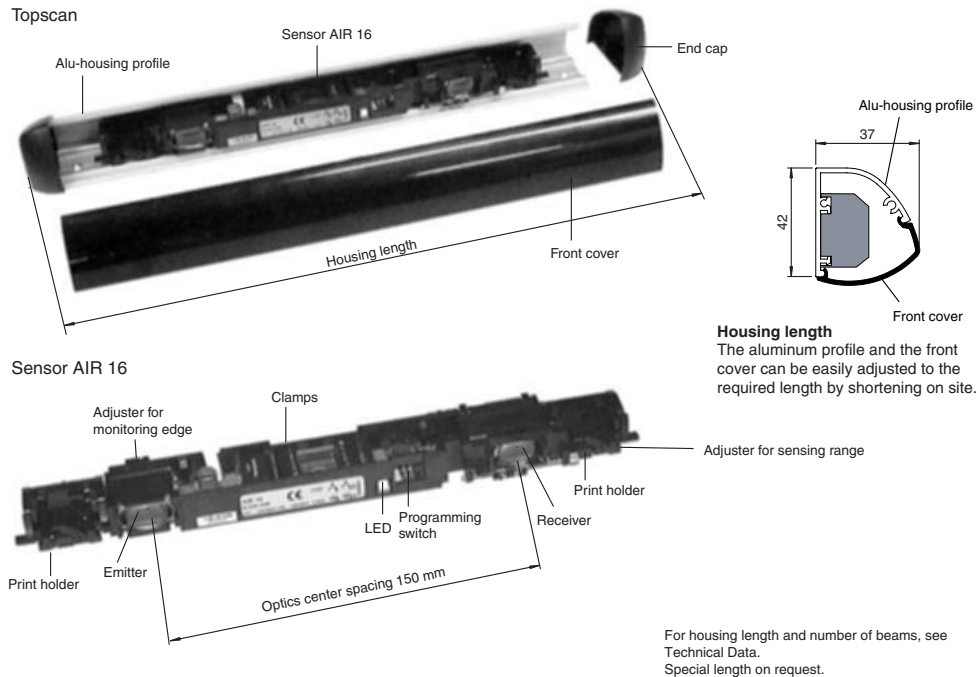
Features

- Configurable scanner in an aluminium housing, with 1 beam
- Mechanical adjustable detection range
- Reversible closing safety
- Detection in wide passageways
- Selectable background suppression and evaluation
- Fast and simple replacement of system parts due to an innovative latching mechanism

Technical data

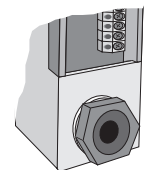
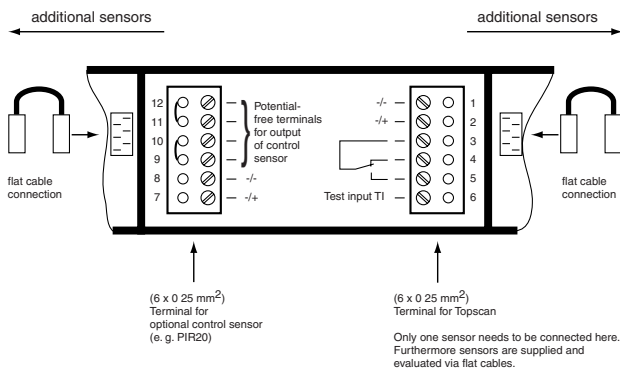
		TOPSCAN2-8-HS-2500-1/L 330/38a	TOPSCAN2-8-HS-2500-1/L 750/38a	TOPSCAN2-8-HS-2500-1/L 900/38a	TOPSCAN2-8-HS-2500-1/L 1000/38a
Detection range min.	0 ... 1500 mm by background evaluation, 500 ... 1500 mm by background suppression	◆	◆	◆	◆
Detection range max.	0 ... 2500 mm with background evaluation, 500 ... 2500 mm with background suppression	◆	◆	◆	◆
Light source	IREAD	◆	◆	◆	◆
Black/White difference (6 %/90 %)	< 20 % at 2000 mm sensor range	◆	◆	◆	◆
Marking	CE	◆	◆	◆	◆
Number of beams	1 (number of built-in sensor modules AIR 16)	◆	◆	◆	◆
Operating mode	switching between background suppression/evaluation	◆	◆	◆	◆
Diameter of the light spot	75 x 75 mm by sensing range 2000 mm	◆	◆	◆	◆
Function display	LED red	◆	◆	◆	◆
Operating elements	Detection range adjuster, light-dark switch, changeover switch for mode of operation	◆	◆	◆	◆
Operating voltage	17 ... 30 V DC , 18 ... 28 V AC	◆	◆	◆	◆
No-load supply current	< 100 mA	◆	◆	◆	◆
Test input	emitter deactivation with U = 17 ... 30 V DC only in background evaluation mode of operation	◆	◆	◆	◆
Switching type	Light/dark switch	◆	◆	◆	◆
Signal output	Relay, 1 alternator	◆	◆	◆	◆
Switching voltage	max. 24 V DC , 48 V AC	◆	◆	◆	◆
Switching current	≤ 1 A	◆	◆	◆	◆
Switch power	24 W / 55 VA	◆	◆	◆	◆
Response time	30 ms , 2 s after test	◆	◆	◆	◆
Standards	EN 60947-5-2	◆	◆	◆	◆
Standards 2	EN 61000-6-2 without EN 61000-4-5, EN 61000-4-11	◆	◆	◆	◆
Standards 3	EN 61000-6-3	◆	◆	◆	◆
Ambient temperature	-20 ... 60 °C (253 ... 333 K)	◆	◆	◆	◆
Length of housing L		330 mm	750 mm	900 mm	1000 mm
Mounting height	max. 2500	◆	◆	◆	◆
Protection degree	IP52	◆	◆	◆	◆
Connection	screw terminals	◆	◆	◆	◆
Housing	aluminium / ABS	◆	◆	◆	◆
Optical face	PMMA	◆	◆	◆	◆
Mass	approx. 200 g	◆			
	approx. 400 g		◆		
	approx. 500 g			◆	◆

Dimensions



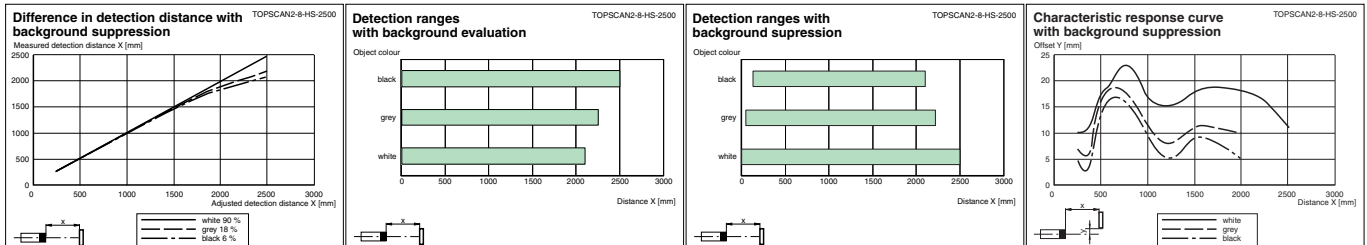
Electrical connection

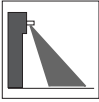
Connection type



terminal compartment

Diagrams





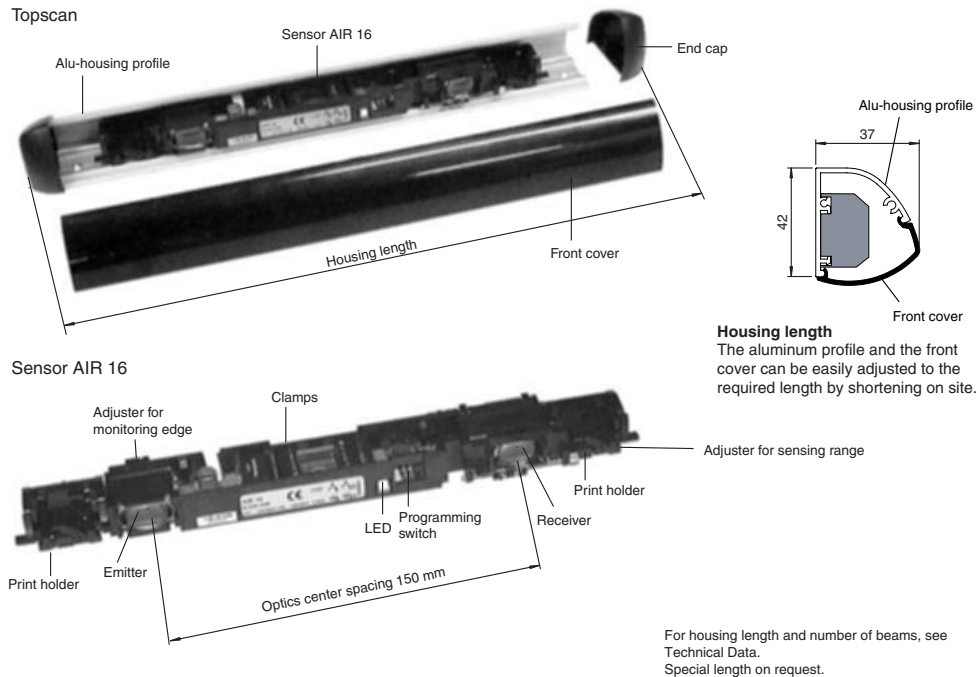
Features

- Mechanical adjustable detection range
- Reversible closing safety
- Detection in wide passageways
- Selectable background suppression and evaluation
- Fast and simple replacement of system parts due to an innovative latching mechanism
- Configurable scanner in an aluminium housing, with 3 beams
TOPSCAN2-8-HS-2500-3/L900/38a
TOPSCAN2-8-HS-2500-3/L1200/38a
TOPSCAN2-8-HS-2500-3/L1350/38a
- Configurable scanner in an aluminium housing, with 2 beams
TOPSCAN2-8-HS-2500-2/L750/38a

Technical data

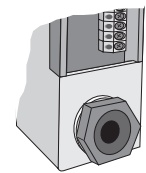
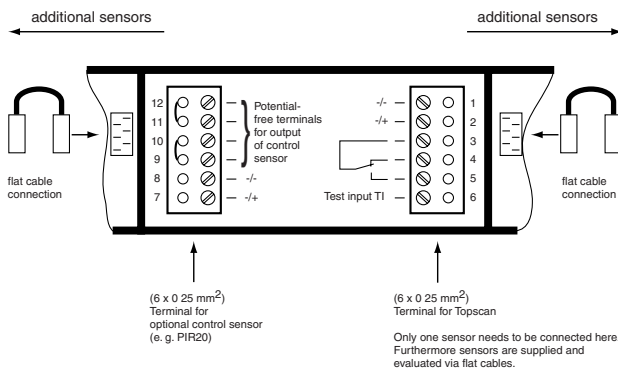
		TOPSCAN2-8-HS-2500-2/L750/38a	TOPSCAN2-8-HS-2500-3/L900/38a	TOPSCAN2-8-HS-2500-3/L1200/38a	TOPSCAN2-8-HS-2500-3/L1350/38a
Detection range min.	0 ... 1500 mm by background evaluation, 500 ... 1500 mm by background suppression	◆	◆	◆	◆
Detection range max.	0 ... 2500 mm with background evaluation, 500 ... 2500 mm with background suppression	◆	◆	◆	◆
Light source	IRED	◆	◆	◆	◆
Black/White difference (6 %/90 %)	< 20 % at 2000 mm sensor range	◆	◆	◆	◆
Marking	CE	◆	◆	◆	◆
Number of beams	2 (number of built-in sensor modules AIR 16)	◆			
	3 (number of built-in sensor modules AIR 16)		◆	◆	◆
Operating mode	switching between background suppression/evaluation	◆	◆	◆	◆
Diameter of the light spot	75 x 75 mm by sensing range 2000 mm	◆	◆	◆	◆
Function display	LED red	◆	◆	◆	◆
Operating elements	Detection range adjuster, light-dark switch, changeover switch for mode of operation	◆	◆	◆	◆
Operating voltage	17 ... 30 V DC , 18 ... 28 V AC	◆	◆	◆	◆
No-load supply current	< 100 mA	◆	◆	◆	◆
Test input	emitter deactivation with U = 17 ... 30 V DC only in background evaluation mode of operation	◆	◆	◆	◆
Switching type	Light/dark switch	◆	◆	◆	◆
Signal output	Relay, 1 alternator	◆	◆	◆	◆
Switching voltage	max. 24 V DC , 48 V AC	◆	◆	◆	◆
Switching current	≤ 1 A	◆	◆	◆	◆
Switch power	24 W / 55 VA	◆	◆	◆	◆
Response time	30 ms , 2 s after test	◆	◆	◆	◆
Standards	EN 60947-5-2	◆	◆	◆	◆
Standards 2	EN 61000-6-2 without EN 61000-4-5, EN 61000-4-11	◆	◆	◆	◆
Standards 3	EN 61000-6-3	◆	◆	◆	◆
Ambient temperature	-20 ... 60 °C (253 ... 333 K)	◆	◆	◆	◆
Length of housing L		750 mm	900 mm	1200 mm	1350 mm
Mounting height	max. 2500	◆	◆	◆	◆
Protection degree	IP52	◆	◆	◆	◆
Connection	screw terminals	◆	◆	◆	◆
Housing	aluminium / ABS	◆	◆	◆	◆
Optical face	PMMA	◆	◆	◆	◆
Mass	approx. 500 g	◆			
	approx. 650 g		◆	◆	◆

Dimensions



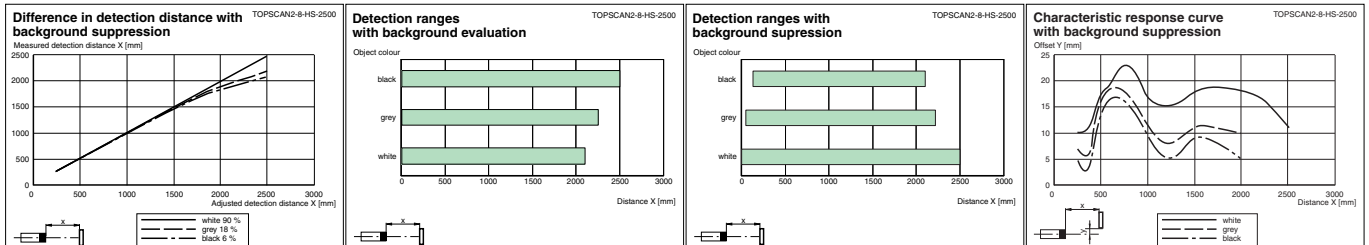
Electrical connection

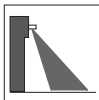
Connection type



terminal compartment

Diagrams





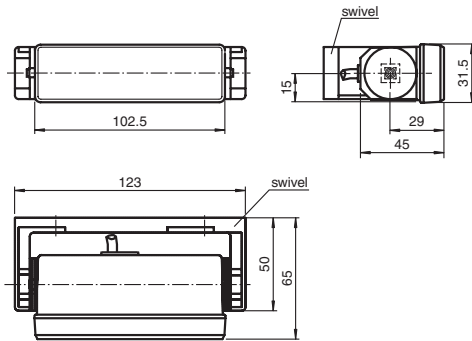
Features

- Closing edge safety on revolving doors and carousel doors
- Mechanical adjustable detection range
- Light/dark switch
- Mounting bracket included in delivery
- **Background suppression**
AIR30-8-H-2500/32/76a
AIR30-8-H-2500/38a
- **Background evaluation**
AIR30-8-HW-2500/32/76a
AIR30-8-HW-2500/38a/76a

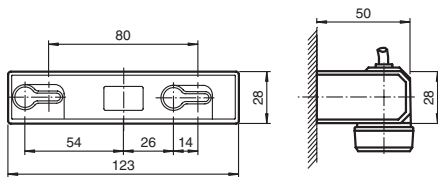
Technical data

		AIR30-8-HW-2500/32/76a	AIR30-8-HW-2500/38a/76a	AIR30-8-H-2500/32/76a	AIR30-8-H-2500/38a
Detection range					
Detection range min.	0 ... 1000 mm	◆	◆		
	100 ... 1000 mm			◆	◆
Detection range max.	0 ... 2500 mm	◆	◆		
	100 ... 2500 mm			◆	◆
Light source	IREDD	◆	◆	◆	◆
Black/White difference (6 %/90 %)	≤ 400 mm at a distance of 2000 mm	◆	◆	◆	◆
Approvals	CE	◆	◆	◆	◆
Operating mode	Background suppression			◆	◆
	Background evaluation	◆	◆		
Light type	infrared, modulated light	◆	◆	◆	◆
Diameter of the light spot	50 mm at 2000 mm sensor range	◆	◆	◆	◆
Angle of divergence	approx. 1.4 °	◆	◆	◆	◆
Function display	LED red: lights up, when output is active	◆	◆	◆	◆
Operating elements	Sensing range adjuster, light/dark switch	◆	◆	◆	◆
Operating voltage	10 ... 30 V DC	◆		◆	
	10 ... 48 V DC / 11 ... 38 V AC		◆		◆
No-load supply current	100 mA	◆	◆	◆	◆
Test input	emitter deactivation at +U _B	◆	◆	◆	◆
Switching type	light/dark ON, switchable	◆	◆	◆	◆
Signal output	relay, 1 N.O.		◆		◆
	1 PNP output, short-circuit proof, protected from reverse polarity, open collector	◆		◆	
Switching voltage	≤ 240 V AC / 24 V DC		◆		◆
	30 V DC	◆		◆	
Switching current	≤ 200 mA	◆		◆	
	≤ 200 mA AC / 1 A DC		◆		◆
Response time	50 ms	◆	◆	◆	◆
De-energized delay	approx. 200 ms	◆	◆	◆	◆
Standards	EN 60947-5-2 EN 61000-6-2 without EN 61000-4-5, EN 61000-4-11 EN 61000-6-3	◆	◆	◆	◆
Ambient temperature	-20 ... 60 °C (253 ... 333 K)	◆	◆	◆	◆
Storage temperature	-20 ... 75 °C (253 ... 348 K)	◆	◆	◆	◆
Protection degree	IP54	◆	◆	◆	◆
Connection	fixed cable 5 m	◆	◆	◆	◆
Housing	Luran	◆	◆	◆	◆
Optical face	plastic	◆	◆	◆	◆
Mass	40 g	◆		◆	
	50 g		◆		◆

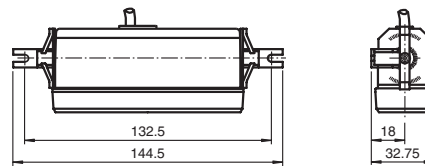
Dimensions



Mounting dimensions for swivel



Mounting dimensions with mounting bracket set AIR30



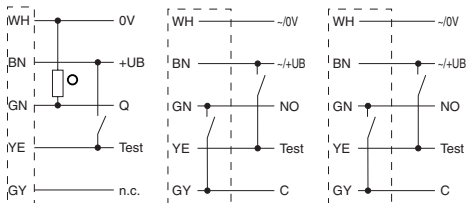
Electrical connection

Connection type

Option /32/76a

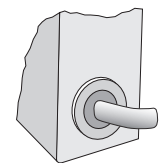
Option -H.../38a

Option -HW.../38a/76a



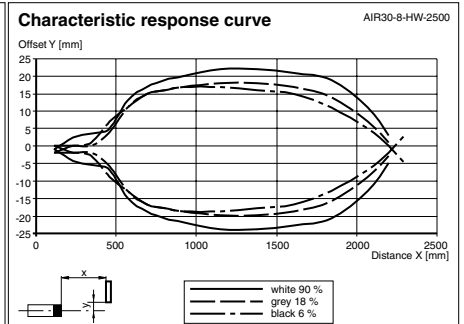
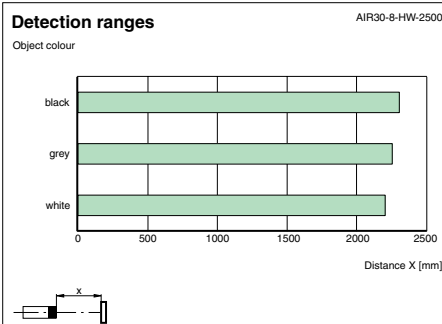
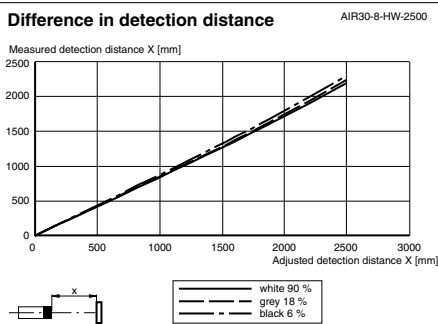
Note:
Test input can not
be used, if sensor
is supplied with
AC voltage!

Note:
Test input can not
be used, if sensor
is supplied with
AC voltage!



fixed cable

Diagrams





Sensors for automatic doors,
incl buses and trains



Features

- Double beam version Master/Slave (2x emitter, 2x receiver)
- Dual-trace closing edge safety on doors
- Ideal for installation in door profiles
- Small, compact design
- Test input

Sensors for industrial gates,
fire protection light barriers

Technical data

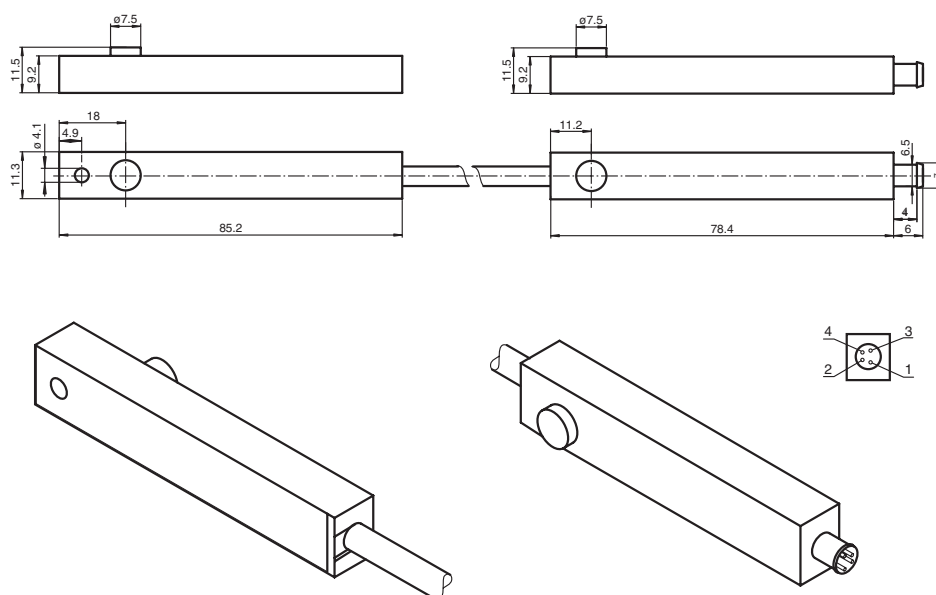
Effective detection range	0 ... 5 m	◆
Threshold detection range	7 m	◆
Light source	IRET , 880 nm	◆
Approvals	CE	◆
Light type	infrared, modulated light	◆
Angle of divergence	emitter +/- 8 ° , receiver +/- 10 °	◆
Optical face	lateral	◆
Ambient light limit	40000 Lux	◆
Operating voltage	11 ... 30 V DC	◆
No-load supply current	≤ 35 mA per device	◆
Test input	emitter deactivation at 0 V	◆
Switching type	light ON	◆
Signal output	1 PNP output, short-circuit proof, protected from reverse polarity, open collector	◆
Switching voltage	max. 30 V DC	◆
Switching current	max. 0.1 A	◆
Switching frequency	50 Hz	◆
Response time	10 ms	◆
Standards	EN 60947-5-2	◆
Standards 2	EN 61000-6-2	◆
Standards 3	EN 61000-6-3	◆
Ambient temperature	-20 ... 60 °C (253 ... 333 K)	◆
Storage temperature	-20 ... 75 °C (253 ... 348 K)	◆
Relative humidity	90 % , non-condensing	◆
Protection degree	IP65	◆
Connection	Plastic connector diameter 6.5 mm; 4-pin	◆
Housing	Transmitter: PMMA black Receiver: PMMA red	◆
Optical face	Plastic pane	◆
Mass	555 g	◆

ML29-2P/25/103/143

Sensors for elevators

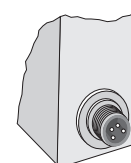
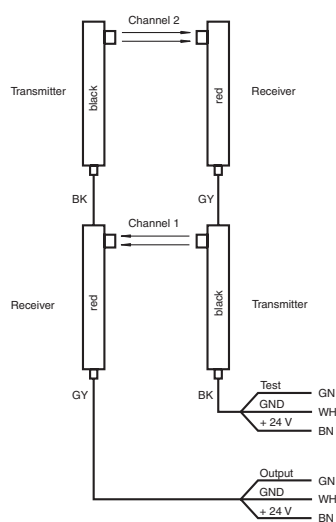
Accessories

Dimensions



Electrical connection

Connection type



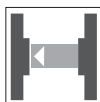
Option 143
plug M8, 4 pin

Sensors for automatic doors,
incl buses and trains

Sensors for industrial gates,
fire protection light barriers

Sensors for elevators

Accessories



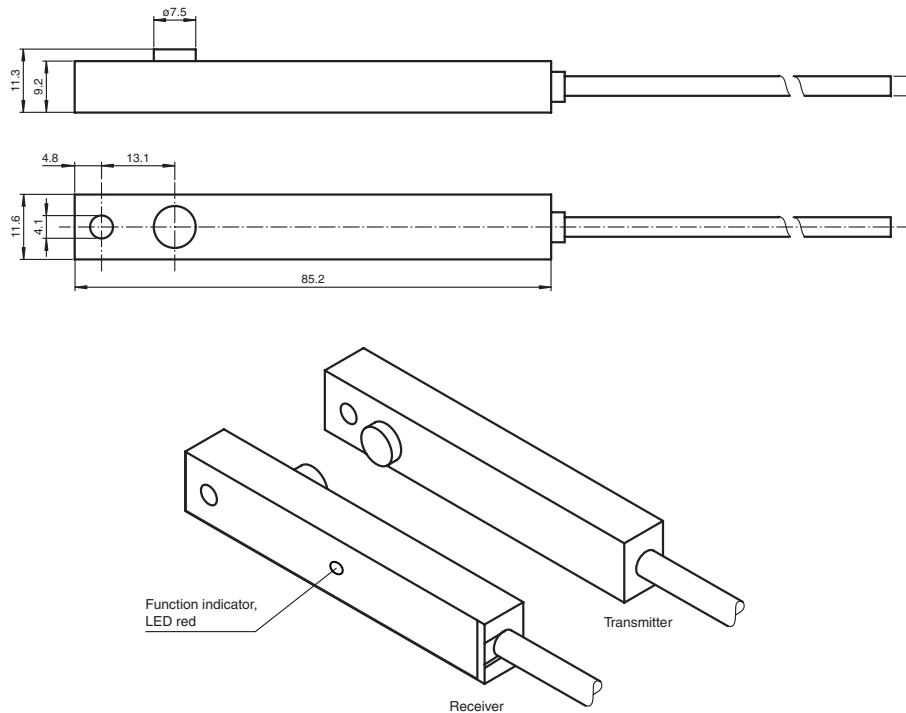
Features

- Ideal for installation in door profiles
- Light-On switching

Technical data

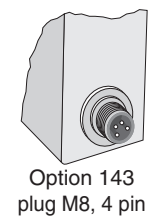
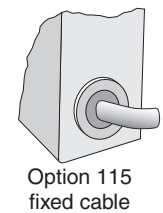
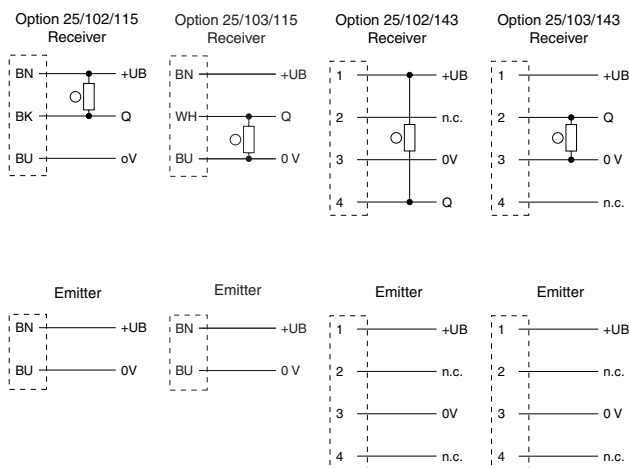
		ML29-P/25/102/115	ML29-P/25/102/143	ML29-P/25/103/115	ML29-P/25/103/143
Effective detection range	0 ... 6 m	◆	◆	◆	◆
Threshold detection range	8.5 m	◆	◆	◆	◆
Light source	IRET , 880 nm	◆	◆	◆	◆
Approvals	CE	◆	◆	◆	◆
Light type	infrared, modulated light	◆	◆	◆	◆
Angle of divergence	+/- 8 °	◆	◆	◆	◆
Optical face	lateral	◆	◆	◆	◆
Ambient light limit	40000 Lux	◆	◆	◆	◆
Function display	LED red in receiver : lights up, when receiving the light beam	◆	◆	◆	◆
Operating voltage	11 ... 30 V DC	◆	◆	◆	◆
No-load supply current	Emitter: ≤ 25 mA Receiver: ≤ 10 mA	◆	◆	◆	◆
Test input	emitter deactivation at +U _B ≤ 5 V DC	◆	◆	◆	◆
Switching type	light ON	◆	◆	◆	◆
Signal output	1 NPN output, short-circuit proof, protected from reverse polarity, open collector 1 PNP output, short-circuit proof, protected from reverse polarity, open collector	◆	◆	◆	◆
Switching voltage	max. 30 V DC	◆	◆	◆	◆
Switching current	max. 0.1 A	◆	◆	◆	◆
Switching frequency	100 Hz	◆	◆	◆	◆
Response time	5 ms	◆	◆	◆	◆
Standards	EN 60947-5-2	◆	◆	◆	◆
Standards 2	EN 61000-6-2	◆	◆	◆	◆
Standards 3	EN 61000-6-3	◆	◆	◆	◆
Ambient temperature	-20 ... 60 °C (253 ... 333 K)	◆	◆	◆	◆
Storage temperature	-20 ... 75 °C (253 ... 348 K)	◆	◆	◆	◆
Relative humidity	90 % , non-condensing	◆	◆	◆	◆
Protection degree	IP65	◆	◆	◆	◆
Connection	fixed cable 6 m Plastic connector diameter 6.5 mm; 4-pin	◆	◆	◆	◆
Housing	PMMA , black	◆	◆	◆	◆
Optical face	Plastic pane	◆	◆	◆	◆
Mass	per device 120 g	◆	◆	◆	◆

Dimensions

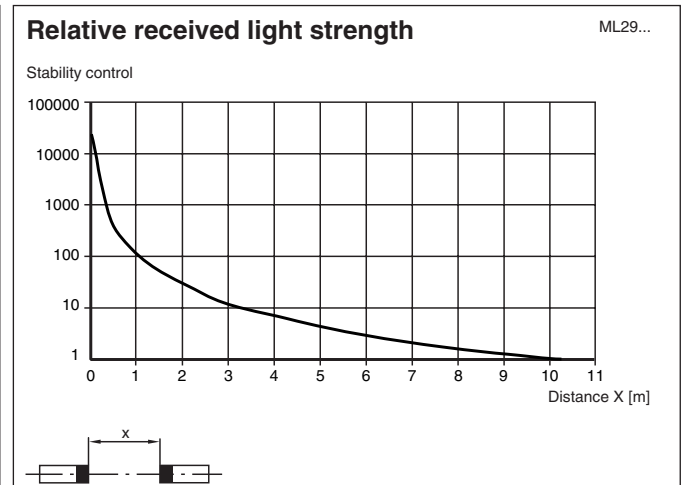
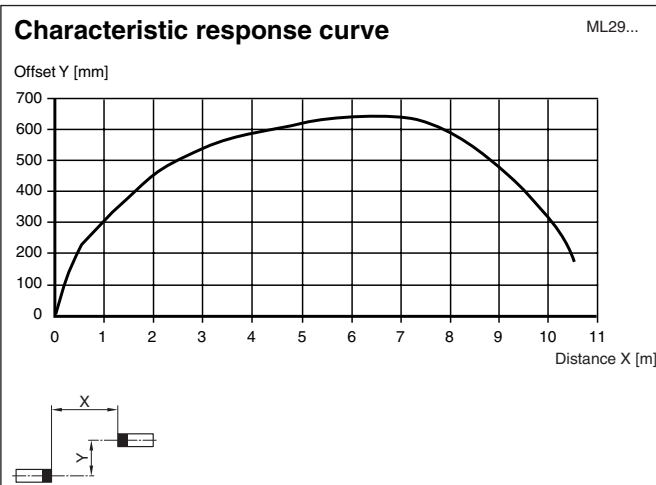


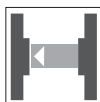
Electrical connection

Connection type



Diagrams





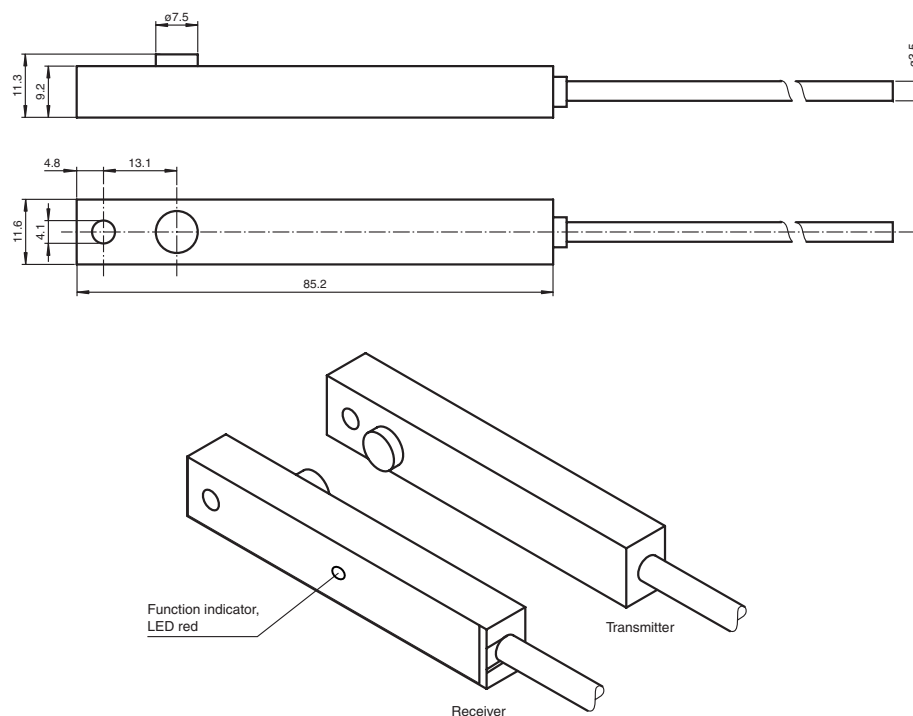
Features

- Ideal for installation in door profiles
- Dark-On switching

Technical data

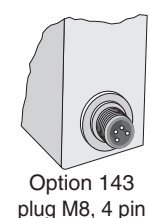
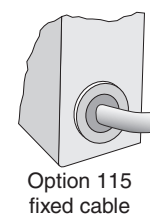
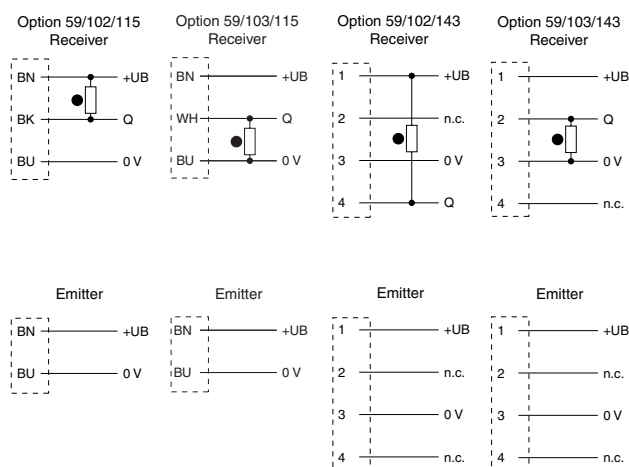
		ML29-P/59/102/115	ML29-P/59/102/143	ML29-P/59/103/115	ML29-P/59/103/143
Effective detection range	0 ... 6 m	◆	◆	◆	◆
Threshold detection range	8.5 m	◆	◆	◆	◆
Light source	IRET , 880 nm	◆	◆	◆	◆
Approvals	CE	◆	◆	◆	◆
Light type	infrared, modulated light	◆	◆	◆	◆
Angle of divergence	+/- 8 °	◆	◆	◆	◆
Optical face	lateral	◆	◆	◆	◆
Ambient light limit	40000 Lux	◆	◆	◆	◆
Function display	LED red in receiver : lights up, when receiving the light beam	◆	◆	◆	◆
Operating voltage	11 ... 30 V DC	◆	◆	◆	◆
No-load supply current	Emitter: ≤ 25 mA Receiver: ≤ 10 mA	◆	◆	◆	◆
Test input	emitter deactivation at +U _B ≤ 5 V DC	◆	◆	◆	◆
Switching type	dark ON	◆	◆	◆	◆
Signal output	1 NPN output, short-circuit proof, protected from reverse polarity, open collector	◆	◆		
	1 PNP output, short-circuit proof, protected from reverse polarity, open collector			◆	◆
Switching voltage	max. 30 V DC	◆	◆	◆	◆
Switching current	max. 0.1 A	◆	◆	◆	◆
Switching frequency	100 Hz	◆	◆	◆	◆
Response time	5 ms	◆	◆	◆	◆
Standards	EN 60947-5-2	◆	◆	◆	◆
Standards 2	EN 61000-6-2	◆	◆	◆	◆
Standards 3	EN 61000-6-3	◆	◆	◆	◆
Ambient temperature	-20 ... 60 °C (253 ... 333 K)	◆	◆	◆	◆
Storage temperature	-20 ... 75 °C (253 ... 348 K)	◆	◆	◆	◆
Relative humidity	90 % , non-condensing	◆	◆	◆	◆
Protection degree	IP65	◆	◆	◆	◆
Connection	fixed cable 6 m	◆		◆	
	Plastic connector diameter 6.5 mm; 4-pin		◆		◆
Housing	PMMA , black	◆	◆	◆	◆
Optical face	Plastic pane	◆	◆	◆	◆
Mass	per device 120 g	◆	◆	◆	◆

Dimensions



Electrical connection

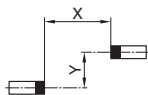
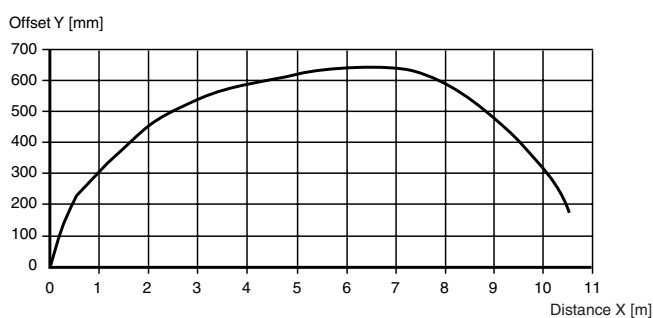
Connection type



Diagrams

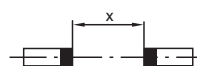
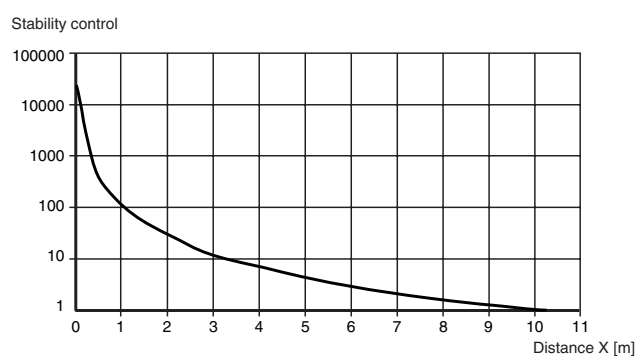
Characteristic response curve

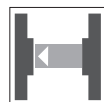
ML29...



Relative received light strength

ML29...





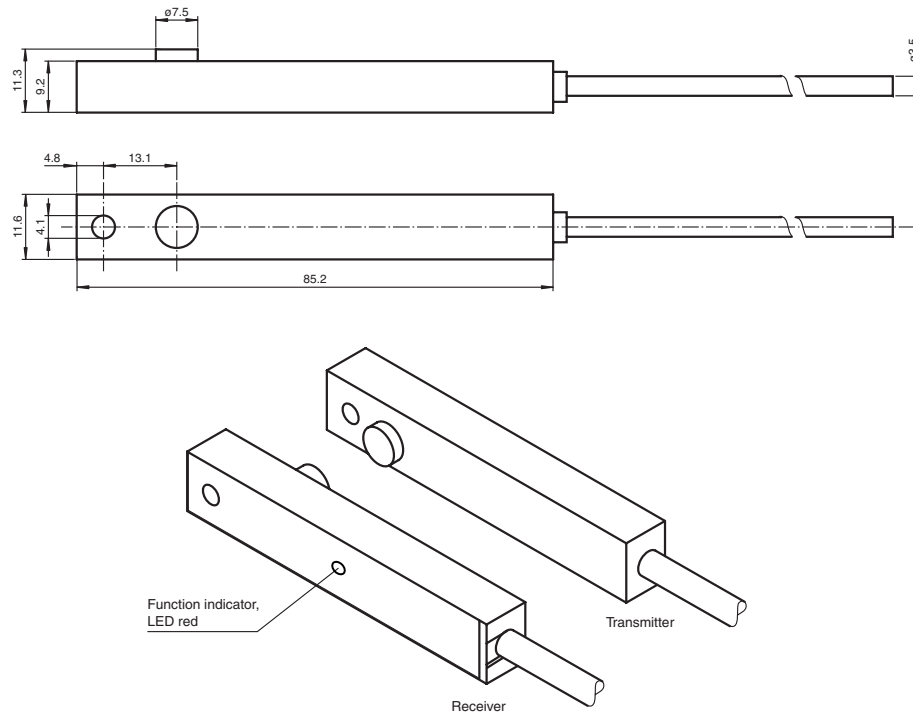
Features

- Ideal for installation in door profiles
- Certification in accordance with railway standard EN50155

Technical data

		ML29T-P/32/59/115 100mm
Effective detection range	0 ... 2.5 m	◆
Threshold detection range	3.5 m	◆
Light source	IRET , 950 nm	◆
Approvals	CE	◆
Light type	infrared, modulated light	◆
Angle of divergence	+/- 8 °	◆
Optical face	lateral	◆
Ambient light limit	40000 Lux	◆
Function display	LED red in receiver : lights up, when receiving the light beam	◆
Operating voltage	10 ... 32 V DC	◆
No-load supply current	Emitter: ≤ 20 mA Receiver: ≤ 10 mA	◆
Test input	emitter deactivation at +U _B ≤ 5 V DC	◆
Switching type	dark ON	◆
Signal output	1 PNP output, short-circuit proof, protected from reverse polarity, open collector	◆
Switching voltage	max. 32 V DC	◆
Switching current	max. 0.2 A	◆
Switching frequency	10 Hz	◆
Response time	50 ms	◆
Standards	EN 60947-5-2	◆
Standards 2	EN 50121-3-2	◆
Standards 3	EN 50155	◆
Standards 5		◆
Ambient temperature	-25 ... 60 °C (248 ... 333 K)	◆
Storage temperature	-25 ... 75 °C (248 ... 348 K)	◆
Relative humidity	90 % , non-condensing	◆
Protection degree	IP65	◆
Connection	Fixed cable 100 mm	◆
Housing	PMMA , black	◆
Optical face	Plastic pane	◆
Mass	per device 120 g	◆

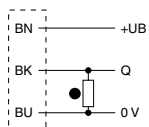
Dimensions



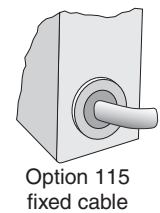
Electrical connection

Connection type

Option 32/59/115
Receiver



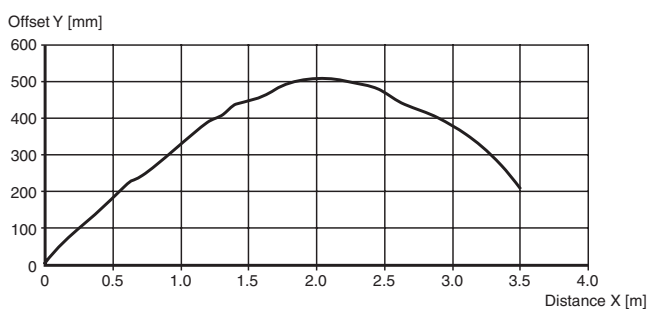
Emitter



Diagrams

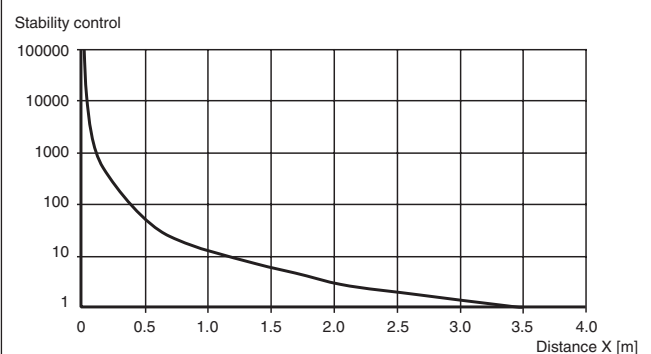
Characteristic response curve

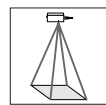
ML29T...



Relative received light strength

ML29T...





Features

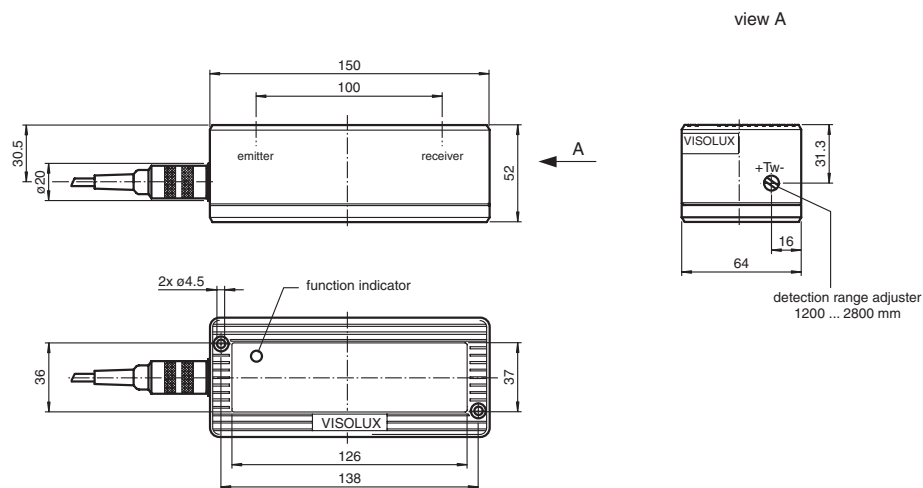
- Counting in two motion directions
- Each motion direction has an output
- Counting of approx. 3 persons per seconds
- Background evaluation
- Protection degree IP65

Technical data

		FLT-8-HW-2800-CLS
Detection field	500 mm x 500 mm at 2000 mm sensor range	◆
Detection range min.	0 ... 1200 mm	◆
Detection range max.	0 ... 2800 mm	◆
Light source	4 IRED	◆
Marking	CE	◆
Operating mode	Background evaluation	◆
Light type	infrared, modulated light	◆
Function display	2 LEDs red, light up in case of detection	◆
Operating elements	sensing range adjuster	◆
Operating voltage	15 ... 48 V DC	◆
Ripple	10 %	◆
No-load supply current	60 mA	◆
Switching type	light ON	◆
Signal output	2 pulse outputs pnp, short-circuit proof, open collectors	◆
Switching voltage	≤ 48 V DC	◆
Switching current	≤ 200 mA	◆
Switching frequency	3 Hz	◆
Response time	40 ms at a remission level of 6 % 10 ms at a remission level of 18 %	◆
De-energized delay	150 ms	◆
Standards	EN 60947-5-2	◆
Standards 2	EN 61000-6-2 without EN 61000-4-5, EN 61000-4-11	◆
Standards 3	EN 61000-6-3	◆
Ambient temperature	-20 ... 60 °C (253 ... 333 K)	◆
Storage temperature	-20 ... 75 °C (253 ... 348 K)	◆
Mounting height	max. 2800	◆
Protection degree	IP65	◆
Connection	Connector, with 2 m cable connector	◆
Housing	Makrolon GV30 black	◆
Optical face	glass, red	◆
Mass	350 g	◆



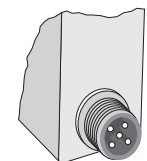
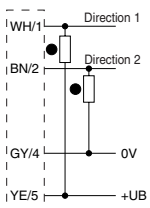
Dimensions



Electrical connection

Connection type

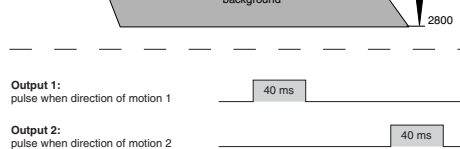
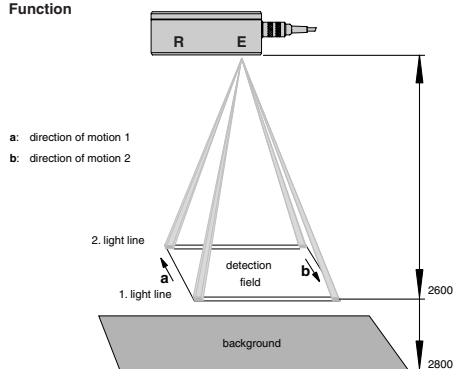
Option CLS



plug M12, 5 pin

Diagrams

Function



Date of issue: 06/19/2007

Sensors for automatic doors,
incl buses and trains

Sensors for industrial gates,
fire protection light barriers

Sensors for elevators

Accessories



Description

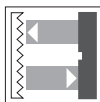
The applications for our door sensors include activation and safeguarding of industrial gates.

The specific requirements for an opening pulse generator for gate areas are, for example, met by the radar sensor RMS-G. The adjustable detection field can be adapted to any gate dimension. This accommodates installation heights up to seven meters without problems. The RMS-G can differentiate between people and vehicles.

An induction loop before a gate is another affordable variant of an opening pulse generator. The loop detector LC10 is particularly well suited for this kind of solution.

If the gate moves up or down the risk of injury at the closing edges must be eliminated using suitable sensors. The robust gate light barriers of series 29 and 31 are ideal for this purpose.

	Type code	Principle of operation	Application areas	Page
	RLK29-55/25/116 RLK29-55/59/116	Retroreflective sensor with polarization filters	Pinch protection and closing edge monitoring	50
	RLK31-54			52
	LA31/LK31	Thru-beam sensor	Pinch protection and closing edge monitoring	56
	RMS-G-RC	Radar motion sensors	Opening pulse generators for industrial gates	58
	LT2-8-HS-2000 LT2-8-HS-6000	Diffuse mode sensor with background suppression and evaluation	Opening pulse generators and closing edge monitoring for barriers	60
	LTK2-8-HS-2000 LTK2-8-HS-6000			62
	LC10-1	Loop detectors with connection for an induction loop	Opening pulse generators for gates	66
	LC10-2	Loop detectors with connection for two induction loops		68
	MLV12-54-2563/49/124	Fire protection reflection light barrier with polarization filters	Closing edge monitoring for fire-proof gates	70



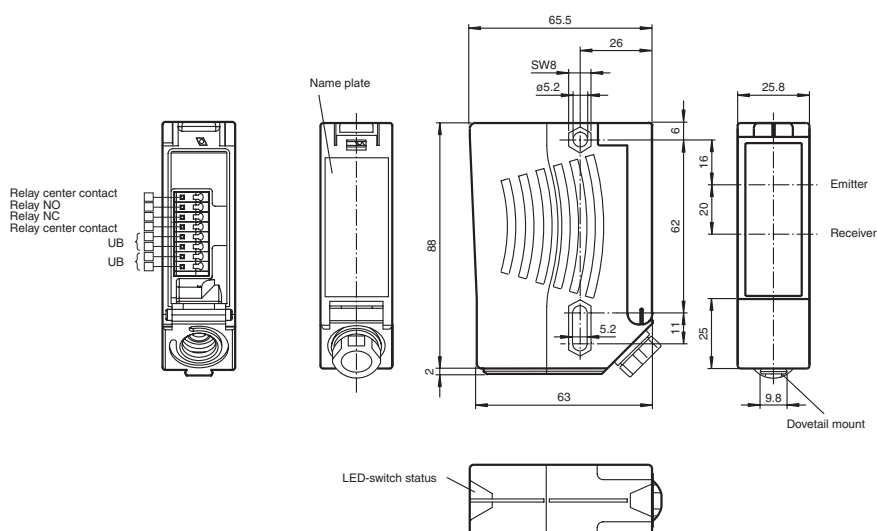
Features

- Retroreflective sensor with increased range and water-tight housing for door and cabinet systems
- No measurable emitted interference on all frequencies
- Particularly insensitive to interference in the service radio and mobile phone ranges
- 2500 V Proof voltage between the relay connection terminals and the device electronics
- Not sensitive to ambient light, even with energy saving lamps
- Supplied with reflector and mounting accessory
RLK29-55/25/116-Set

Technical data

		RLK29-55/25/116	RLK29-55/25/116-Set
Effective detection range	0 ... 12 m	◆	◆
Reflector distance	0.04 ... 12 m (with C110-2 reflector)	◆	◆
Threshold detection range	14 m		◆
	14 m (with H85 reflector)	◆	
Light source	LED	◆	◆
Approvals	CE	◆	◆
USA	cULus	◆	◆
Canada	cULus	◆	◆
Reference target	reflector C110_2 Diameter: 84 mm , included with delivery		◆
Light type	red, modulated light 640 nm	◆	◆
Diameter of the light spot	approx. 35 mm at a distance of 12 m	◆	◆
Angle of divergence	± 1 °	◆	◆
Ambient light limit	90000 Lux	◆	◆
Function display	LED red illuminates: when beam is free flashes: when level falls below function reserve off: when beam is interrupted	◆	◆
Operating voltage	24 ... 230 V AC/DC	◆	◆
Ripple	10 %	◆	◆
No-load supply current	≤ 8.5 mA	◆	◆
Power consumption	0.2 W at 24 V DC , 1.8 W at 230 V AC 3 VA	◆	◆
Switching type	light ON	◆	◆
Signal output	Relay, 1 alternator	◆	◆
Switching voltage	230 V AC	◆	◆
Switching current	max. 2 A	◆	◆
Switching frequency	7 Hz	◆	◆
Response time	50 ms	◆	◆
Standards	EN 60947-5-2	◆	◆
Ambient temperature	-20 ... 60 °C (253 ... 333 K)	◆	◆
Storage temperature	-30 ... 70 °C (243 ... 343 K)	◆	◆
Protection degree	IP67	◆	◆
Connection	terminal compartment	◆	◆
Housing	Plastic ABS, flame resistant	◆	◆
Optical face	plastic	◆	◆
Mass	approx. 200 g		◆
	100.7 g	◆	

Dimensions

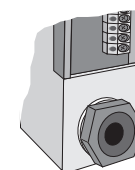
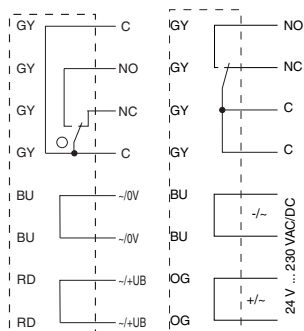


Electrical connection

Connection type

Option /25/116

Option 55/25/116

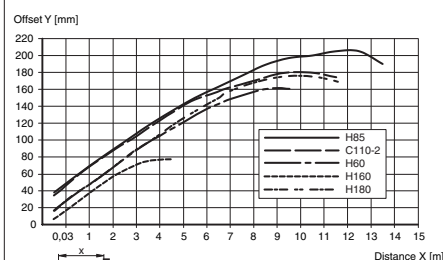


Option 116
terminal compartment

Diagrams

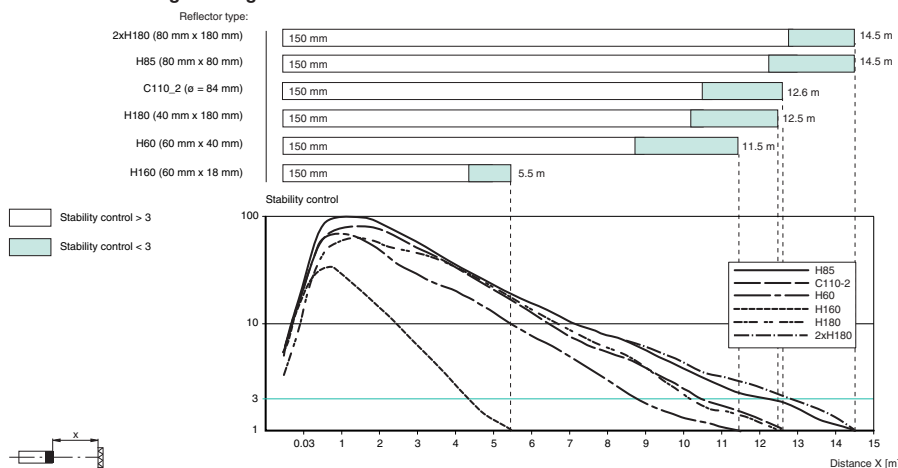
Characteristic response curve

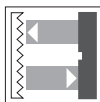
RLK29-55-...



Relative received light strength

RLK29-55-...





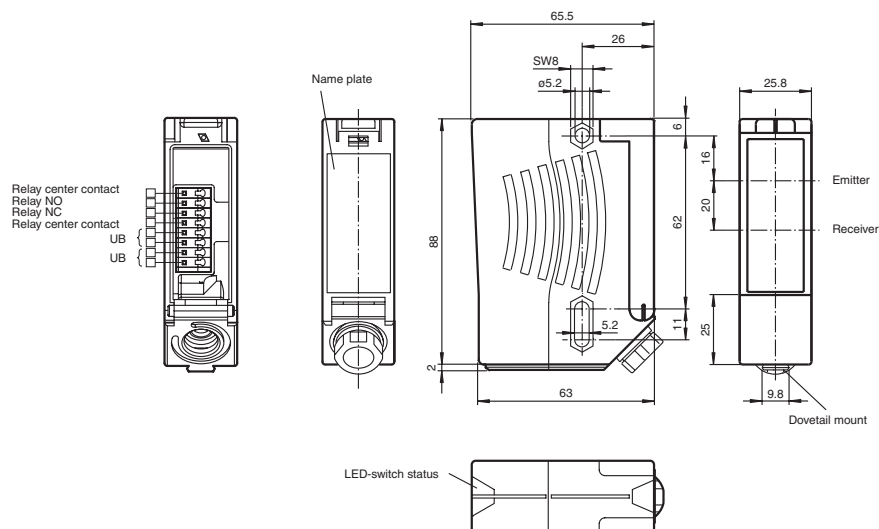
Features

- Retroreflective sensor with increased range and water-tight housing for door and cabinet systems
- No measurable emitted interference on all frequencies
- 2500 V Proof voltage between the relay connection terminals and the device electronics
- Particularly insensitive to interference in the service radio and mobile phone ranges
- Not sensitive to ambient light, even with energy saving lamps
RLK29-55/59/116
- Supplied with reflector and mounting accessory
RLK29-55/59/116-Set

Technical data

		RLK29-55/59/116	RLK29-55/59/116-Set
Effective detection range	0 ... 12 m	◆	◆
Reflector distance	0.04 ... 12 m (with C110-2 reflector)	◆	◆
Threshold detection range	14 m	◆	◆
	14 m (with H85 reflector)	◆	◆
Light source	LED	◆	◆
Approvals	CE	◆	◆
USA	cULus	◆	◆
Kanada	cULus	◆	◆
Reference target	reflector C110_2 Diameter: 84 mm , included with delivery	◆	◆
Light type	red, modulated light 640 nm	◆	◆
Diameter of the light spot	approx. 35 mm at a distance of 12 m	◆	◆
Angle of divergence	± 1 °	◆	◆
Ambient light limit	90000 Lux	◆	◆
Function display	LED red illuminates: when beam is free flashes: when level falls below function reserve off: when beam is interrupted	◆	◆
Operating voltage	24 ... 230 V AC/DC	◆	◆
Ripple	10 %	◆	◆
No-load supply current	≤ 8.5 mA	◆	◆
Power consumption	0.2 W at 24 V DC , 1.8 W at 230 V AC 3 VA	◆	◆
Switching type	dark ON	◆	◆
Signal output	Relay, 1 alternator	◆	◆
Switching voltage	230 V AC	◆	◆
Switching current	max. 2 A	◆	◆
Switching frequency	7 Hz	◆	◆
Response time	50 ms	◆	◆
Standards	EN 60947-5-2	◆	◆
Ambient temperature	-20 ... 60 °C (253 ... 333 K)	◆	◆
Storage temperature	-30 ... 70 °C (243 ... 343 K)	◆	◆
Protection degree	IP67	◆	◆
Connection	terminal compartment	◆	◆
Housing	Plastic ABS, flame resistant	◆	◆
Optical face	plastic	◆	◆
Mass	100.7 g	◆	◆

Dimensions

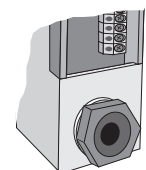
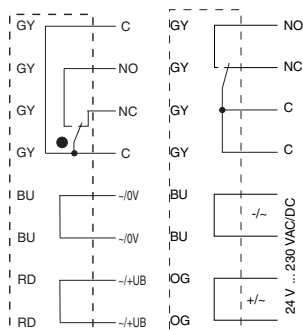


Electrical connection

Connection type

Option /59/116

Option 55/59/116

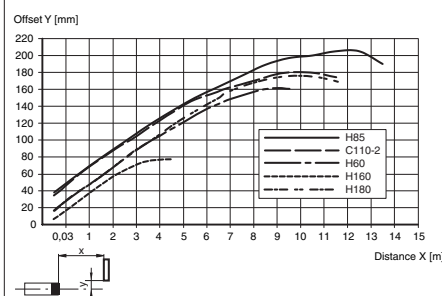


Option 116
terminal compartment

Diagrams

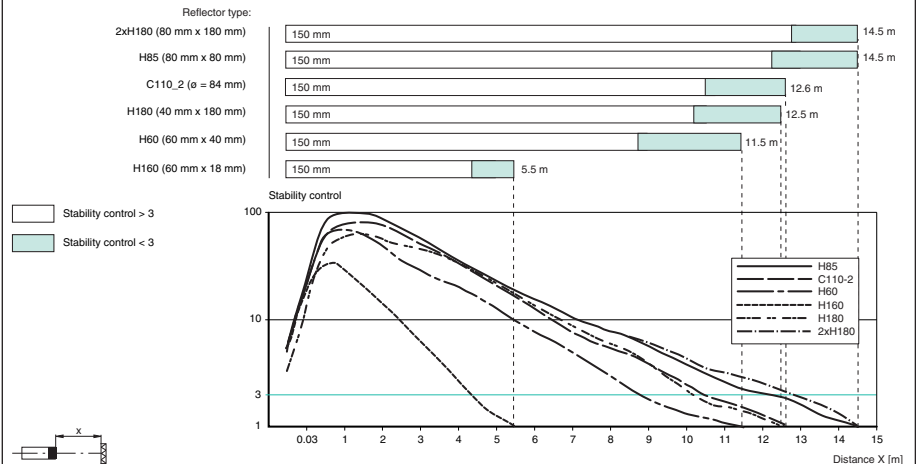
Characteristic response curve

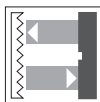
RLK29-55-...



Relative received light strength

RLK29-55-...





Features

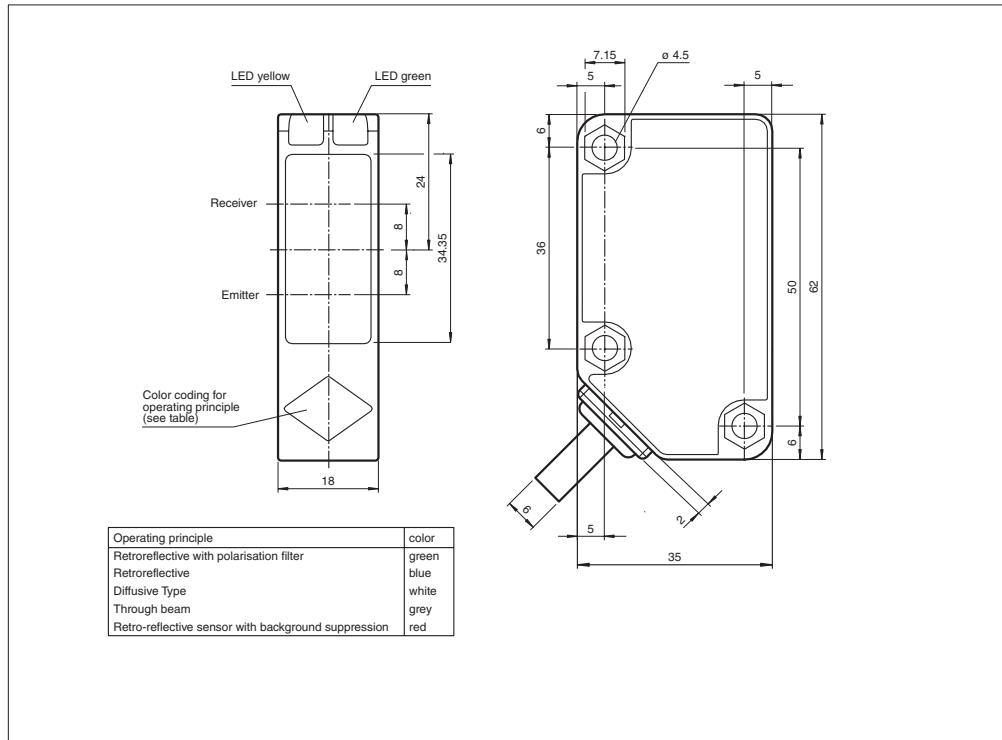
- Operating voltage AC / DC
- Very clearly visible LED
- Relay output
- Compact and stable housing
- Protection class II
- Supplied with reflector and mounting accessory

Technical data

Effective detection range	0 ... 9000 mm	◆
Reflector distance	20 ... 9000 mm	◆
Threshold detection range	12 m with reflector C110-2	◆
Light source	LED, 630 nm polarised	◆
Approvals	CE	◆
Light type	red, modulated light	◆
Diameter of the light spot	approx. 200 mm at a distance of 6 m	◆
Angle of divergence	3 °	◆
Ambient light limit	50000 Lux	◆
Accessories provided	reflector C110_2 Mounting bracket OMH-RL31-01	◆
Operating display	LED green: power on	◆
Function display	LED yellow: 1. LED lits constantly: signal > 2 x switching point (function reserve) 2. LED flashes: signal between 1 x switching point and 2 x switching point 3. LED off: signal < switching point	◆
Operating voltage	24 ... 240 V AC 12 ... 240 V DC	◆
Protection class	II, rated voltage ≤ 250 V AC with degree of pollution 1-2 according to IEC 60664-1 Output circuit basis insulation of input circuit according to EN50178, rated insulation voltage 240 V AC	◆
No-load supply current	≤ 40 mA	◆
Power consumption	≤ 2 VA	◆
Switching type	light ON	◆
Signal output	1 relay output, 1 alternator	◆
Switching voltage	max. 240 V AC	◆
Switching current	max. 3 A	◆
Switching frequency	20 Hz	◆
Response time	≤ 25 ms	◆
Standards	EN 60947-5-2	◆
Ambient temperature	-25 ... 55 °C (248 ... 328 K)	◆
Storage temperature	-40 ... 70 °C (233 ... 343 K)	◆
Protection degree	IP67	◆
Connection	fixed cable 2 m, 5-core	◆
Housing	plastic	◆
Optical face	PMMA	◆
Mass	154 g	◆
Mounting	Mounting accessories included	◆

RLK31-54/25/31/115 SET

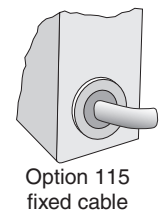
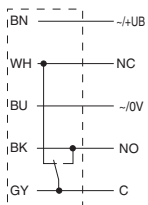
Dimensions



Electrical connection

Connection type

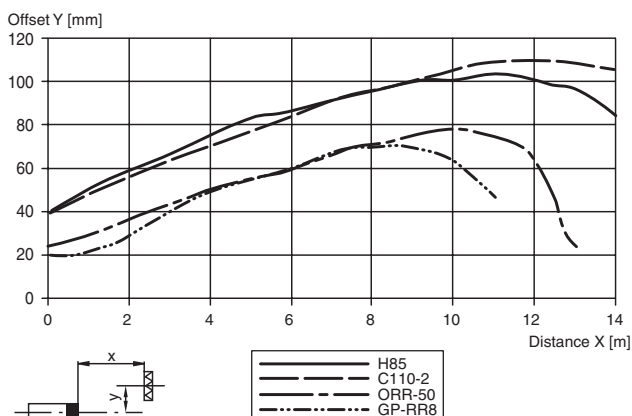
Option 31/115



Diagrams

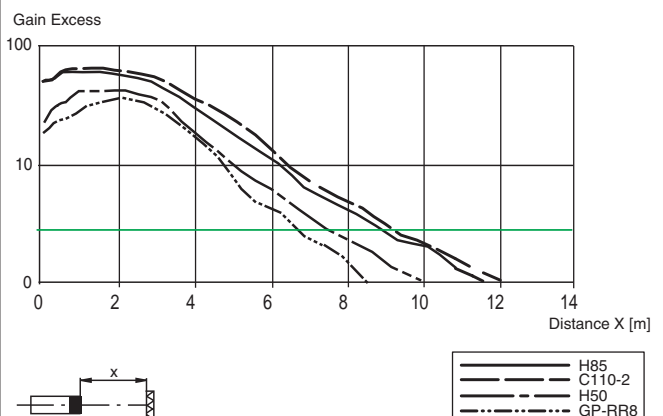
Characteristic response curve

RLK31-54/...31/115



Relative received light strength

RL31-54/...
RLK31-54/...



Date of issue: 06/21/2007

Sensors for automatic doors, incl buses and trains

Sensors for industrial gates, fire protection light barriers

Sensors for elevators

Accessories



Features

- Operating voltage AC / DC
- Very clearly visible LED
- Protection class II
- Relay output
- Compact and stable housing
- Supplied with reflector and mounting accessory

Technical data


Effective detection range	0 ... 30 m	◆
Threshold detection range	43 m	◆
Light source	LED, 630 nm	◆
Approvals	CE	◆
Alignment aid	LED yellow: 1. LED illuminates: Sufficient light signal received, emitter und receiver alignment is correct 2. LED flashes: Reaching switching point 3. LED off: Light beam is interrupted or the alignment is out	◆
Light type	red, modulated light	◆
Diameter of the light spot	approx. 800 mm at a distance of 30 m	◆
Angle of divergence	Emitter: 0.5 °, Receiver: 1.5 °	◆
Ambient light limit	50000 Lux	◆
Accessories provided	2 x Mounting bracket OMH-RL31-01	◆
Operating display	LED green: power on	◆
Function display	LED yellow: 1. LED lits constantly: signal > 2 x switching point (function reserve) 2. LED flashes: signal between 1 x switching point and 2 x switching point 3. LED off: signal < switching point	◆
Operating voltage	24 ... 240 V AC 12 ... 240 V DC	◆
Protection class	II, rated voltage ≤ 250 V AC with degree of pollution 1-2 according to IEC 60664-1 Output circuit basis insulation of input circuit according to EN50178, rated insulation voltage 240 V AC	◆
No-load supply current	Emitter: ≤ 40 mA Receiver: ≤ 3 mA	◆
Power consumption	Emitter: ≤ 2 VA Receiver: ≤ 1 VA	◆
Switching type	light ON	◆
Signal output	1 relay output, 1 alternator	◆
Switching voltage	max. 250 V AC/DC	◆
Switching current	max. 3 A	◆
Switching frequency	≤ 20 Hz	◆
Response time	≤ 25 ms	◆
Standards	EN 60947-5-2	◆
Ambient temperature	-25 ... 55 °C (248 ... 328 K)	◆
Storage temperature	-40 ... 70 °C (233 ... 343 K)	◆
Protection degree	IP67	◆
Connection	Emitter: fixed cable 2 m, 2-core Receiver: fixed cable 2 m, 5-core	◆
Housing	plastic	◆
Optical face	PMMA	◆
Mass	Emitter: 116 g Receiver: 131 g	◆
Mounting	Mounting accessories included	◆

LA31/LK31/25/31/115 SET

Sensors for automatic doors, incl buses and trains



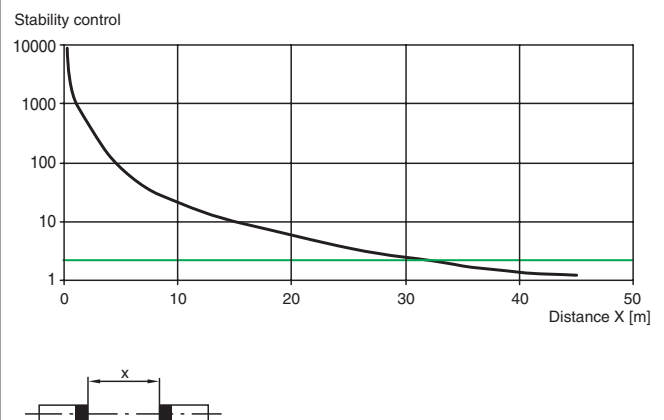
Connection type

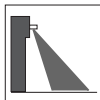


Option 115
fixed cable

BN	— —	+UB/~
BU	— —	0 V/~

Sensors for elevators





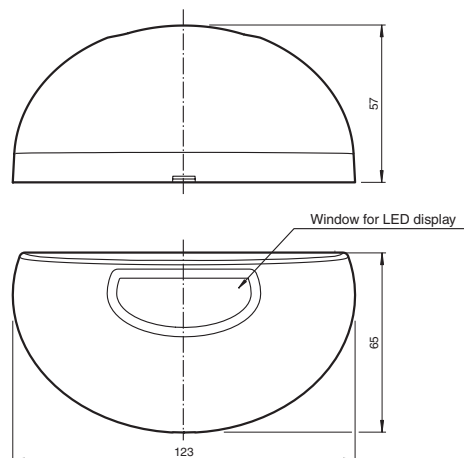
Features

- Opening impulse sensor
- Programmable, also with separate remote control
- Direction detection
- Differentiated vehicle / personnel detection
- Cross traffic suppression
- 2 relay outputs
- Simple mounting

Technical data

		RMS-G-RC
Marking	CE	◆
Operating mode	Radar motion sensor	◆
Detection speed	min. 0.1 m/s	◆
Setting angle	0 ... 40 ° in 5 ° steps	◆
Sensing range	7000x 6000 mm (TxB) at 5000 mm mounting height and 30° tilt angle 8000x 5000 mm (TxB) at 7000 mm mounting height and 30° tilt angle	◆
Operating frequency	24.05 ... 24.25 GHz K-Band	◆
Function display	LED red/green	◆
Operating elements	Programming push-button for selection of operating modes : Direction detection , Cross traffic suppression , Vehicle detection , Switching type	◆
Operating elements	Adjuster for de-energised delay	◆
Operating elements	Programming via 2 keys , alternative via remote control (Accessories. to order separately)	◆
Operating voltage	12 ... 36 V DC , 12 ... 28 V AC	◆
No-load supply current	≤ 50 mA at 24 V DC	◆
Power consumption	≤ 1 W	◆
Switching type	active/passive	◆
Signal output	2 relay outputs	◆
Switching voltage	max. 48 V AC / 48 V DC	◆
Switching current	max. 0.5 A AC / 1 A DC	◆
Standards	EN 60950:2000; EN 60335-1:1994; EN 301489-3 V1.4.1; EN 61000-6-1:2001, EN 61000-6-2:2001; EN 61000-6-3:2001; EN 61000-4:2001 ; EN 300440-2 V1.1.1	◆
Standards 2	CETECOM	◆
Ambient temperature	-20 ... 60 °C (253 ... 333 K)	◆
Protection degree	IP54	◆
Connection	plug-in screw terminals 4-pin and 2 pin , 8 m connecting cable included in delivery	◆
Housing	ABS, anthracite	◆
Mass	120 g	◆

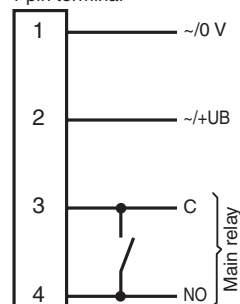
Dimensions



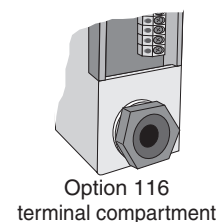
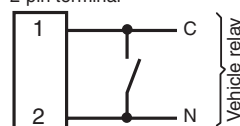
Electrical connection

Connection type

4-pin terminal



2-pin terminal



Functional description

The motion detectors based on the latest 24 GHz technology with microprocessor control ensure high reliability under difficult operating conditions and enable target applications from the supermarket door to the garage gate. The core of the sensors are the planar modules with integrated patch aerials in robust metal design; behind the front-end there is the microprocessor controlled evaluation electronics. The 24 GHz frequency in the so-called K band has been reserved globally for this application area by CETECOM.

The motion detectors of series RMS with their intelligent functions like direction detection, suppression of crossing traffic and "turtle mode" can flexibly respond to the most different requirement profiles. The suppression of crossing traffic is particularly useful in narrow shopping streets. Here the system can be configured to only open the door when people move towards it whilst ignoring passing traffic. Two sensitivity stages can be set to take into account crossing traffic of different intensity. The use as revolving door sensors on the sides of the door hinges is also possible, because with suppression of crossing traffic enabled the closing door leaf does not cause false triggers.

The specific requirements for an opening pulse generator for gate areas are, for example, met by the radar sensor RMS-G. The adjustable detection field can be adapted to any gate dimension. This accommodates installation heights up to seven meters without problems. The RMS-G can differentiate between people and vehicles.



Features

- Background suppression and evaluation
- Mechanical adjustable detection range
- Light/dark switching
- Adjustable time functions
- Test input

Technical data

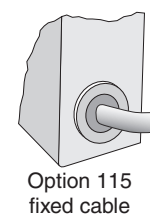
		LT2-8-HS-2000/47/105	LT2-8-HS-2000/47/115	LT2-8-HS-2000/49/105	LT2-8-HS-2000/49/115
Detection range min.	0 ... 500 mm by background evaluation, 350 ... 500 mm by background suppression	◆	◆	◆	◆
Detection range max.	0 ... 2000 mm by background evaluation, 350 ... 2500 mm by background suppression	◆	◆	◆	◆
Light source	IREDD	◆	◆	◆	◆
Marking	CE	◆	◆	◆	◆
Operating mode	switching between background suppression/evaluation	◆	◆	◆	◆
Light type	infrared, modulated light	◆	◆	◆	◆
Diameter of the light spot	50 mm at 2000 mm sensor range	◆	◆	◆	◆
Function display	LED green: power on LED red: object detection	◆	◆	◆	◆
Operating elements	Detection range setting, programming switch for time functions, time setting	◆	◆	◆	◆
Operating voltage	15 ... 35 V DC	◆	◆	◆	◆
Ripple	10 %	◆	◆	◆	◆
No-load supply current	100 mA	◆	◆	◆	◆
Test input	emitter deactivation with +Ub	◆	◆	◆	◆
Switching type	Light/dark ON selectable programmable , Factory setting: light ON	◆	◆	◆	◆
Signal output	1 npn, 1 pnp, short-circuit proof, open collectors 2 pnp, antivalent, short-circuit proof, open collectors	◆	◆	◆	◆
Switching voltage	35 V DC	◆	◆	◆	◆
Switching current	200 mA	◆	◆	◆	◆
Response time	50 ms	◆	◆	◆	◆
Timer function	Programmable on/off delay, adjustable 0.1 ... 10 s	◆	◆	◆	◆
Standards	EN 60947-5-2	◆	◆	◆	◆
Standards 2	EN 61000-6-2 without EN 61000-4-5, EN 61000-4-11	◆	◆	◆	◆
Standards 3	EN 61000-6-3	◆	◆	◆	◆
Ambient temperature	-20 ... 60 °C (253 ... 333 K)	◆	◆	◆	◆
Protection degree	IP65	◆	◆	◆	◆
Connection	fixed cable 5 m Plastic M12 connector, 5-pin, without cable	◆	◆	◆	◆
Housing	Makrolon GV30	◆	◆	◆	◆
Optical face	Hardened plastic lens	◆	◆	◆	◆
Mass	320 g	◆	◆	◆	◆

Sensors for automatic doors, incl buses and trains

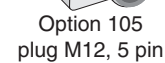


Connection type

Option 49/115



Option 115
fixed cable



Option 105
plug M12, 5 pin

Sensors for elevators





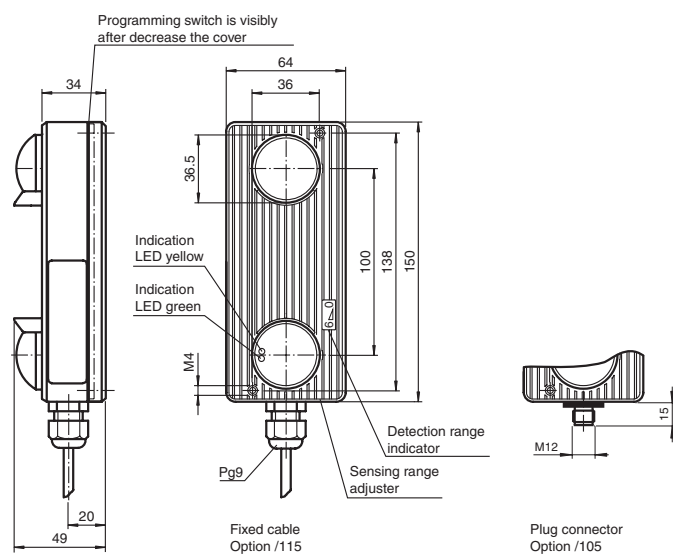
Features

- Background suppression and evaluation
- Mechanical adjustable detection range
- Light/dark switching
- Adjustable time functions
- Test input

Technical data

		LT2-8-HS-6000/47/105	LT2-8-HS-6000/47/115	LT2-8-HS-6000/49/105	LT2-8-HS-6000/49/115
Detection range min.	0 ... 500 mm by background evaluation, 350 ... 500 mm by background suppression	◆	◆	◆	◆
Detection range max.	0 ... 6000 mm by background evaluation, 200 ... 6000 mm by background suppression	◆	◆	◆	◆
Light source	IREDD	◆	◆	◆	◆
Marking	CE	◆	◆	◆	◆
Operating mode	switching between background suppression/evaluation	◆	◆	◆	◆
Light type	infrared, modulated light	◆	◆	◆	◆
Diameter of the light spot	150 mm at 6000 mm sensor range 50 mm at 2000 mm sensor range	◆		◆	
Function display	LED green: power on LED red: object detection	◆	◆	◆	◆
Operating elements	Detection range setting, programming switch for time functions, time setting	◆	◆	◆	◆
Operating voltage	15 ... 35 V DC	◆	◆	◆	◆
Ripple	10 %	◆	◆	◆	◆
No-load supply current	100 mA	◆	◆	◆	◆
Test input	emitter deactivation with +Ub	◆	◆	◆	◆
Switching type	Light/dark ON selectable programmable, Factory setting: light ON	◆	◆	◆	◆
Signal output	1 npn, 1 pnp, short-circuit proof, open collectors 2 pnp, antivalent, short-circuit proof, open collectors			◆	◆
Switching voltage	35 V DC	◆	◆	◆	◆
Switching current	200 mA	◆	◆	◆	◆
Response time	100 ms	◆	◆	◆	◆
Timer function	Programmable on/off delay, adjustable 0.1 ... 10 s	◆	◆	◆	◆
Standards	EN 60947-5-2	◆	◆	◆	◆
Standards 2	EN 61000-6-2 without EN 61000-4-5, EN 61000-4-11	◆	◆	◆	◆
Standards 3	EN 61000-6-3	◆	◆	◆	◆
Ambient temperature	-20 ... 60 °C (253 ... 333 K)	◆	◆	◆	◆
Protection degree	IP65	◆	◆	◆	◆
Connection	fixed cable 5 m Plastic M12 connector, 5-pin, without cable		◆	◆	◆
Housing	Makrolon GV30	◆	◆	◆	◆
Optical face	Hardened plastic lens	◆	◆	◆	◆
Mass	320 g	◆	◆	◆	◆

Dimensions



Electrical connection

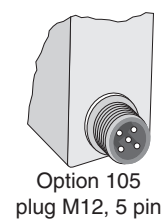
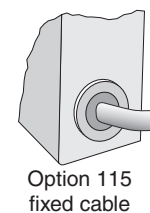
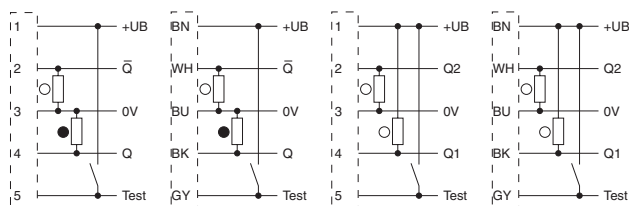
Connection type

Option 47/105

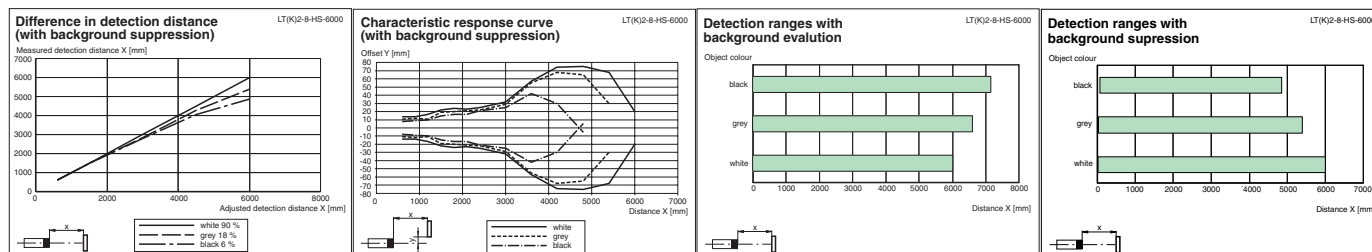
Option 47/115

Option 49/105

Option 49/115



Diagrams





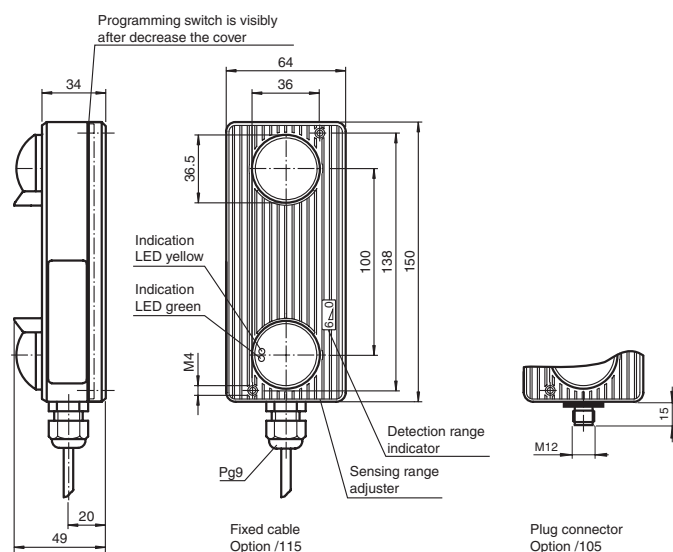
Features

- Background suppression and evaluation
- Mechanical adjustable detection range
- Light/dark switching
- Adjustable time functions

Technical data

		LTK2-8-HS-2000/31/105	LTK2-8-HS-2000/31/115	LTK2-8-HS-6000/31/105	LTK2-8-HS-6000/31/115
Detection range min.	0 ... 500 mm by background evaluation, 350 ... 500 mm by background suppression	◆	◆	◆	◆
Detection range max.	0 ... 2000 mm by background evaluation, 350 ... 2500 mm by background suppression	◆	◆		
	0 ... 6000 mm by background evaluation, 200 ... 6000 mm by background suppression			◆	◆
Light source	IREd	◆	◆	◆	◆
Marking	CE	◆	◆	◆	◆
Operating mode	switching between background suppression/evaluation	◆	◆	◆	◆
Light type	infrared, modulated light	◆	◆	◆	◆
Diameter of the light spot	150 mm at 6000 mm sensor range 50 mm at 2000 mm sensor range	◆	◆		
Function display	LED green: power on LED red: object detection	◆	◆	◆	◆
Operating elements	Detection range setting, programming switch for time functions, time setting	◆	◆	◆	◆
Operating voltage	11 ... 48 V DC / 12 ... 24 V AC	◆	◆	◆	◆
No-load supply current	100 mA	◆	◆	◆	◆
Switching type	Light/dark ON selectable programmable , Factory setting: light ON	◆	◆	◆	◆
Signal output	Relay, 1 alternator	◆	◆	◆	◆
Switching voltage	240 V AC/DC	◆	◆	◆	◆
Switching current	2 A	◆	◆	◆	◆
Response time	100 ms 50 ms	◆	◆		
Timer function	Programmable on/off delay, adjustable 0.1 ... 10 s	◆	◆	◆	◆
Standards	EN 60947-5-2	◆	◆	◆	◆
Standards 2	EN 61000-6-2 without EN 61000-4-5, EN 61000-4-11	◆	◆	◆	◆
Standards 3	EN 61000-6-3	◆	◆	◆	◆
Ambient temperature	-20 ... 60 °C (253 ... 333 K)	◆	◆	◆	◆
Protection degree	IP65	◆	◆	◆	◆
Connection	fixed cable 5 m Plastic M12 connector, 5-pin, without cable	◆	◆	◆	◆
Housing	Makrolon GV30	◆	◆	◆	◆
Optical face	Hardened plastic lens	◆	◆	◆	◆
Mass	320 g	◆	◆	◆	◆

Dimensions

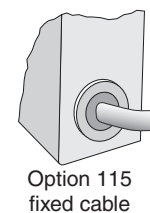
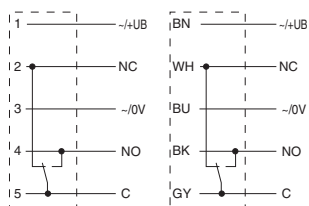


Electrical connection

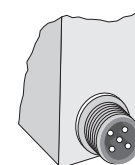
Connection type

Option 31/105

Option 31/115

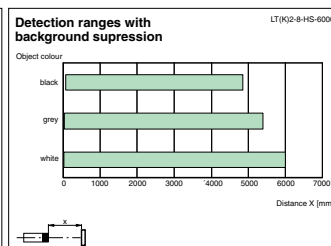
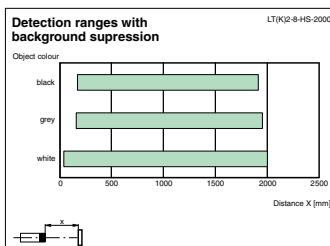
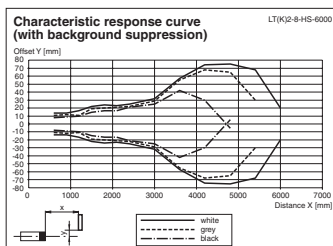
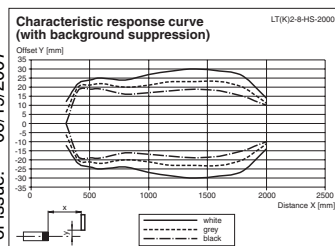
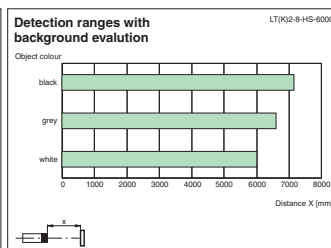
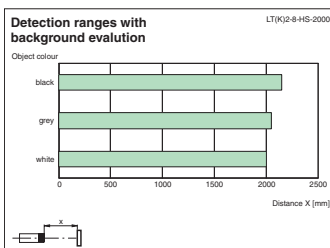
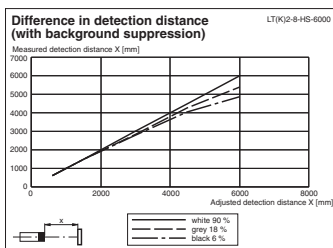
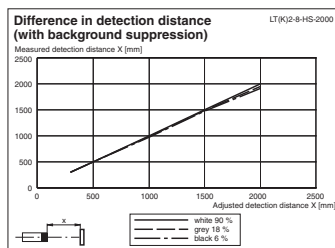


Option 115
fixed cable



Option 105
plug M12, 5 pin

Diagrams





Features

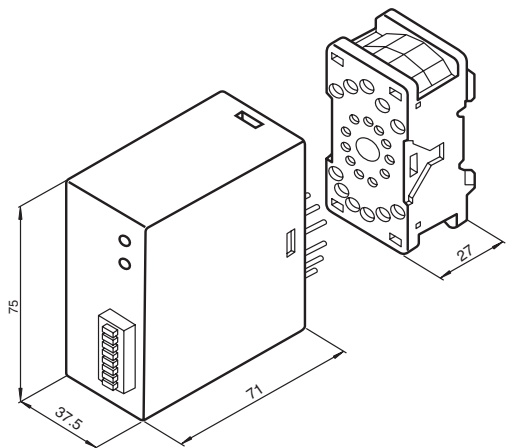
- Reliable detection with long service life
- Different operating modes
- Boost function for increasing sensitivity
- Changeable loop frequency
- Display of loop frequency and sensitivity
- Fault display for loop break and loop short circuit
- Test function

Technical data

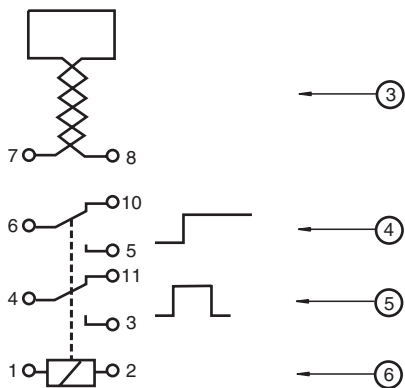
		LC10-1-D 115 VAC	LC10-1-D 230 VAC	LC10-1-D 24 VAC	LC10-1-D 24 VDC
Marking	CE	◆	◆	◆	◆
Operating mode	Pulsed and continuous signal	◆	◆	◆	◆
Operating elements	DIP-switch	◆	◆	◆	◆
Switching state	LED	◆	◆	◆	◆
Operating voltage	115 V AC (electrically isolated from loop)	◆			
	230 V AC (electrically isolated from loop)		◆		
	24 V AC (electrically isolated from loop)			◆	
	24 V DC (no electrical isolation)				◆
Ripple	-15 %/+10 %	◆	◆	◆	◆
Power consumption	1.6 VA	◆	◆	◆	◆
Settling time	2 s	◆	◆	◆	◆
Loop inductivity	100 ... 1000 µH	◆	◆	◆	◆
Loop frequency	20 ... 120 kHz	◆	◆	◆	◆
Number of channels	1	◆	◆	◆	◆
Switching voltage	250 V AC	◆	◆	◆	◆
Switching current	6 A	◆	◆	◆	◆
Output type	relay	◆	◆	◆	◆
Pulse length	period or 800 ms Pulse	◆	◆	◆	◆
Response time	100 ms	◆	◆	◆	◆
Ambient temperature	-20 ... 70 °C (253 ... 343 K)	◆	◆	◆	◆
Storage temperature	-40 ... 70 °C (233 ... 343 K)	◆	◆	◆	◆
Protection degree	IP30	◆	◆	◆	◆
Connection	Plug socket ; 11-pin Terminal connection ≤ 1.5 mm ²	◆	◆	◆	◆



Dimensions



Electrical connection



Description

Number	Explanation	Connector terminals
3	Loop connection	7/8
4	Signal output, maintained contact	5/6 = NO 6/10 = NC
5	signal output, pulse contact	3/4 = NO 4/11 = NC
6	Operating voltage	1/2



Features

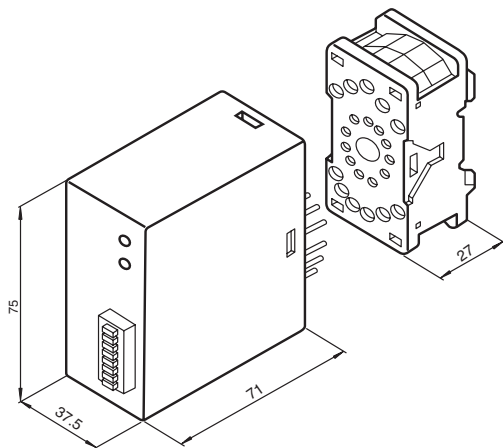
- Reliable detection with long service life
- Dual inputs
- Boost function for increasing sensitivity
- Changeable loop frequency
- Display of loop frequency and sensitivity
- Fault display for loop break and loop short circuit
- Direction detection
- Test function

Technical data

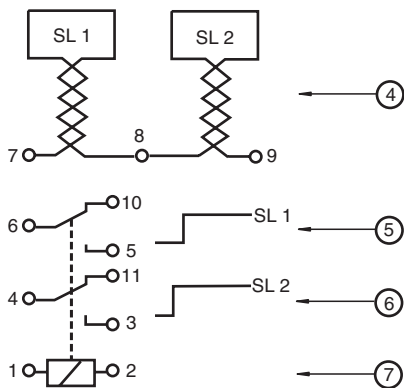
		LC10-2-D 115 VAC	LC10-2-D 230 VAC	LC10-2-D 24 VAC	LC10-2-D 24VDC
Marking	CE	◆	◆	◆	◆
Operating mode	Continuous signal	◆	◆	◆	◆
Operating elements	DIP-switch	◆	◆	◆	◆
Switching state	LED	◆	◆	◆	◆
Operating voltage	115 V AC (electrically isolated from loop)	◆			
	230 V AC (electrically isolated from loop)		◆		
	24 V AC (electrically isolated from loop)			◆	
	24 V DC (no electrical isolation)				◆
Ripple	-15 %/+10 %	◆	◆	◆	◆
Power consumption	2.2 VA	◆	◆	◆	◆
Settling time	2 s	◆	◆	◆	◆
Loop inductivity	100 ... 1000 µH	◆	◆	◆	◆
Loop frequency	20 ... 120 kHz	◆	◆	◆	◆
Number of channels	2	◆	◆	◆	◆
Switching voltage	250 V AC	◆	◆	◆	◆
Switching current	6 A	◆	◆	◆	◆
Output type	relay	◆	◆	◆	◆
Pulse length	period	◆	◆	◆	◆
Response time	200 ms	◆	◆	◆	◆
Ambient temperature	-20 ... 70 °C (253 ... 343 K)	◆	◆	◆	◆
Storage temperature	-40 ... 70 °C (233 ... 343 K)	◆	◆	◆	◆
Protection degree	IP30	◆	◆	◆	◆
Connection	Plug socket ; 11-pin Terminal connection ≤ 1.5 mm ²	◆	◆	◆	◆



Dimensions



Electrical connection



Description

Number	Explanation	Connector terminals
3	Loop connection, Loops 1/2	7/8 = Loop 1 8/9 = Loop 2
4	Signal output, Loop 1	5/6 = NO 6/10 = NC
5	Signal output, Loop 2	3/4 = NO 4/11 = NC
6	Operating voltage	1/2



Features

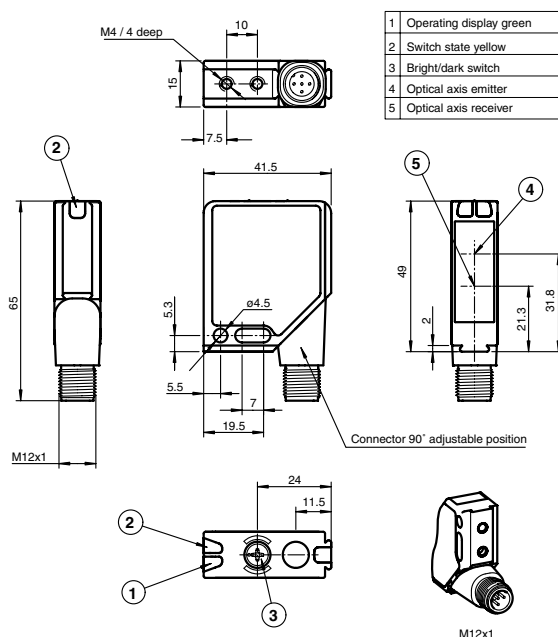
- Retroreflective sensor for safety devices on fire protection enclosures (Fire doors)
- Ultra bright LEDs for power on, stability control and switching state
- Not sensitive to ambient light, even with switched energy saving lamps
- Multiple device installation possible, no mutual interference
- Approval in accordance with VdS Test Report FSA and externally monitored manufacture (Ü Symbol)
- Sturdy housing, high grade surface
- Waterproof, protection class IP67
- High protection against contact

Technical data

Effective detection range	0 ... 2.1 m (with H60 reflector)	◆
Reflector distance	0.2 ... 2.1 m	◆
Light source	LED, 660 nm	◆
Approvals	CE	◆
USA	UL	◆
Kanada	UL	◆
Reference target	H60 reflector	◆
Light type	red, modulated light	◆
Diameter of the light spot	approx. 70 mm	◆
Angle of divergence	1.5 °	◆
Ambient light limit	50000 Lux	◆
Operating display	LED green, flashes in case of short-circuit	◆
Function display	2 LEDs yellow, light up when light beam is free, flash when falling short of the stability control, off when light beam is interrupted	◆
Operating elements	rotary switch for light/dark	◆
Operating voltage	10 ... 30 V DC	◆
Protection class	2 in acc. with VDE	◆
Ripple	max. 10 %	◆
No-load supply current	max. 40 mA	◆
Control input		◆
Switching type	Light/dark ON, switchable	◆
Signal output	1 NPN and 1 PNP output, direct switching, short-circuit proof, protected from reverse polarity, open collector	◆
Switching voltage	max. 30 V DC	◆
Switching current	max. 0.2 A	◆
Voltage drop	≤ 2.5 V DC	◆
Switching frequency	≤ 40 Hz	◆
Response time	10 ms	◆
Standards	EN 60947-5-2	◆
Ambient temperature	-40 ... 60 °C (233 ... 333 K)	◆
Storage temperature	-40 ... 75 °C (233 ... 348 K)	◆
Protection degree	IP67	◆
Connection	connector, 5-pin with metal thread M12 x 1, may be rotated 90°	◆
Housing	Frame: die-cast zinc, nickel-plated Laterals: plastic PC, glass-fiber reinforced	◆
Optical face	Plastic pane	◆
Mass	60 g	◆

MLV12-54-2563/49/124

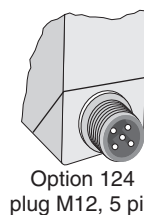
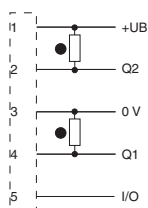
Dimensions



Electrical connection

Connection type

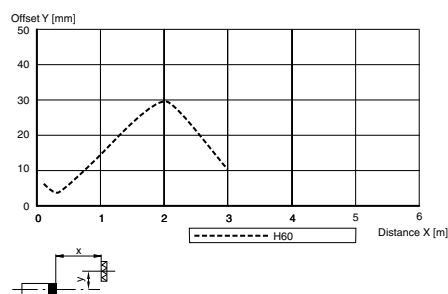
Option /49/124



Diagrams

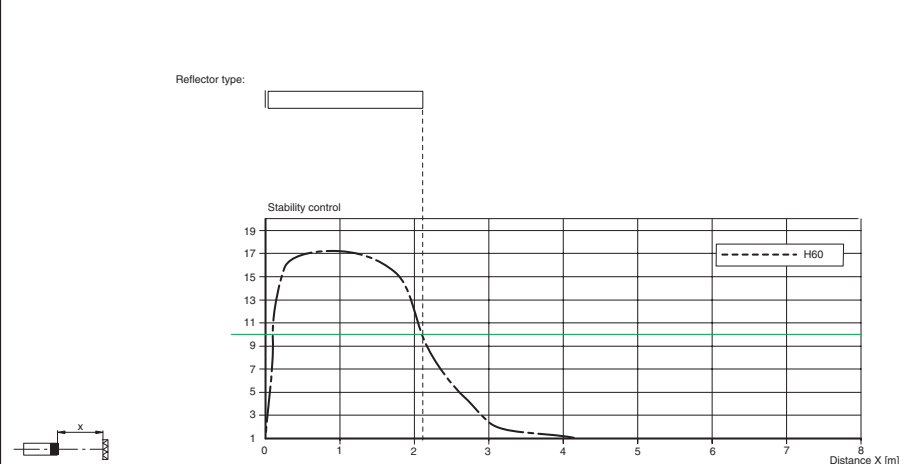
Characteristic response curve

MLV12-54-2563



Relative received light strength

MLV12-54-2563





Here, two different areas are differentiated. Firstly personal protection, and secondly the exact positioning of the cage.

Protection description

Glass elevators, standing for modern design and innovative technology, require a pinch protection which suits the shape and operation of the elevator door and provides optimum safety. We offer specially developed sensors for passenger and comfort elevators.


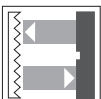
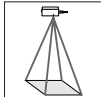
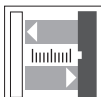
In our elevator light grids we combine a slim design with high functional scope. The automatic beam crossing creates e.g. a grid of up to 135 detection beams. The capture of items, animals or people is guaranteed until the door fully closes.

Light barriers are simple and affordable options for protecting the cabin door. Extra slim housings permit the installation in tight spaces in the door frame or in other gaps. Different principles of operation and devices for low or multiple voltages are available.

Positioning description

The determination of distances is one of the basic sensor technologies.

This technology is used for cabin positioning.

	Type code	Principle of operation	Application areas	Page
	AL2109-P-1820/136/143	Light grids for elevators	Closing edge monitoring in elevator doors	74
	AL2012-P-1650/49/76a AL2016-P-1650/49/76a AL4012-P-1650/49/76a AL4016-P-1650/49/76a			76
	RL91-54-RT/25/49/115 RL91-54-RT/38a/59/115 RL91-54-RT/49/59/115 RLK91-54-RT/31/59/115	Retroreflective sensors with polarization filter	Single beam closing edge monitoring in elevator doors	78
	RL91-6-IR/25/38a/115 RL91-6-IR/25/49/115 RL91-6-IR/38a/59/115 RL91-6-IR/49/59/115 RLK91-6-IR/25/31/115 RLK91-6-IR/31/59/115	Retroreflective sensors with long range		82
	FLT-8-H-2800-300/120a FLT-8-H-2800-300/25/31 FLT-8-H-2800-50/120a FLT-8-H-2800-50/25/31 FLT-8-H-2800-500/120a FLT-8-H-2800-500/59/101 FLT-8-H-2800-500/59/31	Area scanner with background suppression	Vestibule/cabin monitoring	86
	FLT-8-HW-2800-300/25/31 FLT-8-HW-2800-50/25/31 FLT-8-HW-2800-50/31/59 FLT-8-HW-2800-500/25/31 FLT-8-HW-2800-500/59/101	Area scanner with background evaluation		88
	VDM70-10-L VDM70-250-R	Distance measurement device	Cage positioning	90



Features

- Object detection up to distance of zero
- Dense monitoring field with up to 135 beams
- Automatic crossing of beams
- Automatic beam suppression
- Ambient light limit > 100,000 Lux
- Protected M8 connector
- In accord with EN81-70 and EN12015/16
- Various possibilities for mounting
- Profile width 9 mm

Technical data

Effective detection range	0 ... 3500 mm	◆
Light source	IREC 950 nm	◆
Approvals	CE	◆
Field height	1800 mm	◆
Chipping	automatic, 3x/5x/7x (depending on distance between transmitter/receiver)	◆
Tuning-out of beam	Defective beams are faded out after 60 s. Deactivation of the light grid upon failure of 2 adjacent beams or more than 50 % of all beams	◆
Beam spacing	90 mm	◆
Number of beams	61 ... 135 (dynamic)	◆
Light type	infrared, modulated light	◆
Angle of divergence	Emitter: < 20 ° , Receiver: < 6 °	◆
Ambient light limit	> 100000 Lux	◆
Function display	LED red (in receiver): Illuminates after connecting operating power, out when object is detected, flashes in case of permanent interruption of 2 neighbouring beams	◆
Operating voltage	11 ... 30 V DC	◆
Ripple	10 %	◆
No-load supply current	< 180 mA	◆
Switching type	Light/dark ON selectable programmable	◆
Signal output	1 PNP and 1 NPN, short-circuit proof	◆
Switching voltage	max. 30 V DC	◆
Switching current	100 mA	◆
Switching frequency	< 3 Hz	◆
Response time	< 100 ms	◆
Standards	EN 12015, EN 12016	◆
Ambient temperature	-10 ... 60 °C (263 ... 333 K)	◆
Storage temperature	-20 ... 65 °C (253 ... 338 K)	◆
Protection degree	IP54	◆
Connection	Connector, male	◆
Housing	aluminium	◆
Optical face	plastic	◆
Mass	2000 g (device)	◆

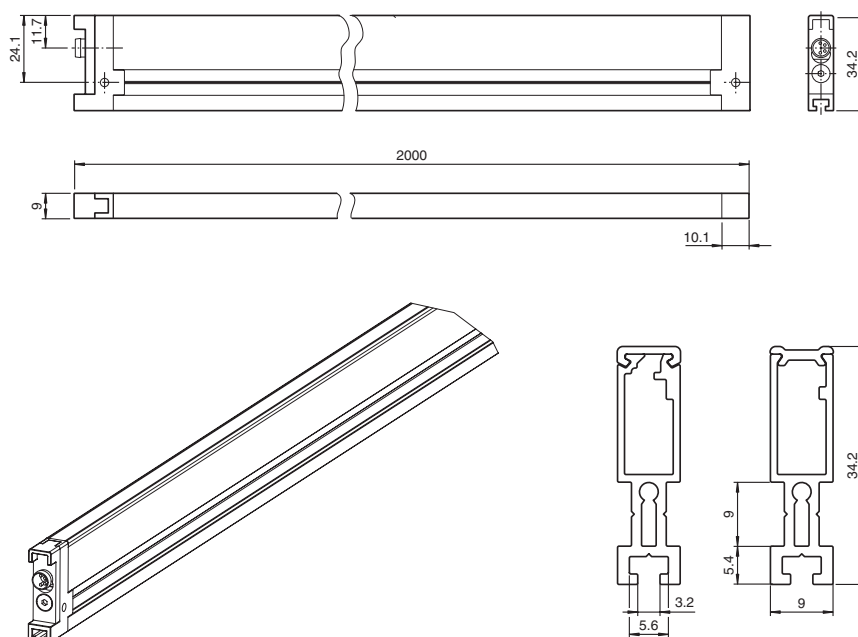
AL2109-P-1820/40b/49/143

Sensors for automatic doors,
incl buses and trainsSensors for industrial gates,
fire protection light barriers

Sensors for elevators

Accessories

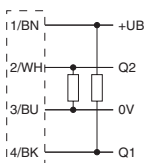
Dimensions



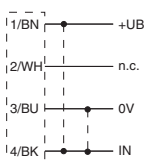
Electrical connection

Connection type

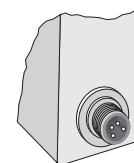
Option /40b/49/143
Receiver



Emitter



Don't leave
input floating!



Option 143
plug M8, 4 pin

Functional description

The preferred use of the AL2109 light grid is access monitoring in elevators. It consists of a transmitter and receiver unit. The entire electronic evaluation system as well as the power supply is integrated into the device. No additional external components are required for operation.

The light grid is equipped with automatic switching from 7x to 5x to 3x crossing in its standard design. At a distance of more than 0.8 m between transmitter and receiver, the light grid selects the "7x crossing" operating mode. In this operating mode, each receiver evaluates the beams of 7 transmitters. In this manner, 7x crossing increases resolution to 135 beams.

The red LED in the top end of the receiver is continuously lit after the operating voltage is applied. This indicates the light grid is ready for operation.

When an object is detected, the red LED turns off until the light beams are no longer interrupted.

The AL2109 elevator light grid is equipped with beam masking. If one of the 21 transmitters or receivers is continuously covered (for example by dirt or sticking), that beam is taken out of the evaluation after 60 seconds. It is removed from the programming and the light grid is again ready for operation. The light grid does not indicate continuous detection until 2 adjacent beams or more than half of all beams fail. This state is indicated by the red LED, which in this case flashes.



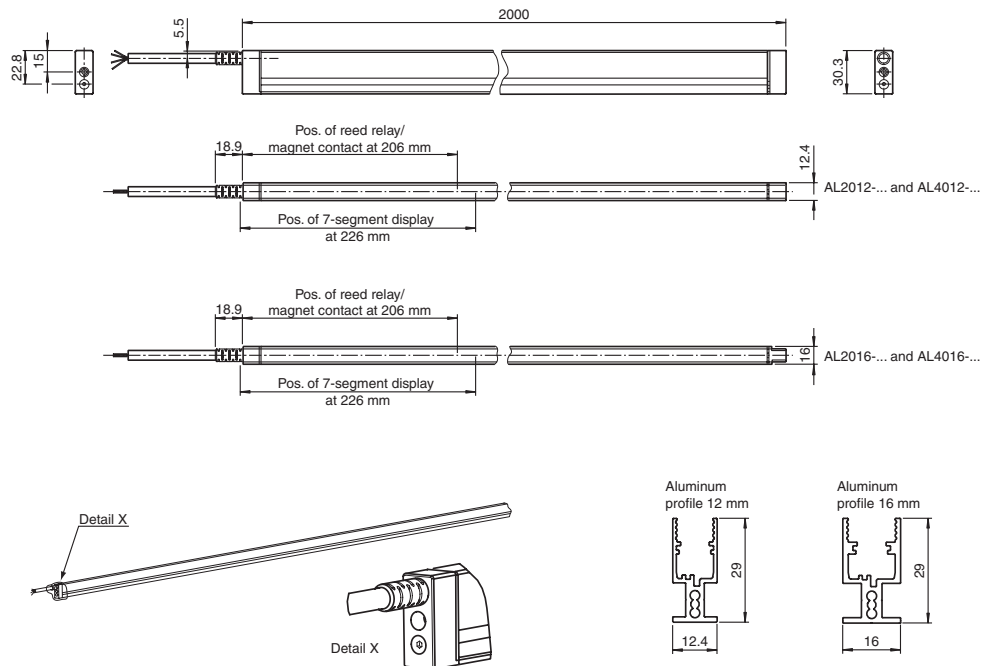
Features

- Automatic crossing of beams
- High resolution
- 7-segment display for status and service functions
- Integrated control and power supply unit (12 V DC ... 30 V DC)
- Automatic adaptation of operation mode (1;3 or 5-fold chipping)
- Various possibilities for mounting (lateral or at the rear over the complete length)
- Mirroring proof
- Profile width 12 mm and 16 mm

Technical data

		AL2012-P-1650/49/76a	AL2016-P-1650/49/76a	AL4012-P-1650/49/76a	AL4016-P-1650/49/76a
Effective detection range	0 ... 4000 mm	◆	◆	◆	◆
Threshold detection range	5600 mm	◆	◆	◆	◆
Light source	IREDD	◆	◆	◆	◆
Approvals	CE	◆	◆	◆	◆
Field height	1605 mm	◆	◆		
	1650 mm			◆	◆
Chipping	automatically 1X/5X (depending on distance between transmitter/receiver)	◆	◆	◆	◆
Tuning-out of beam	Defective beams are faded out after 60 s. Deactivation of the light grid upon failure of 2 adjacent beams or more than 50 % of all beams	◆	◆	◆	◆
Beam spacing	lower range: 20 mm upper range: 44 mm			◆	◆
	lower range: 40 mm upper range: 88 mm	◆	◆		
Number of beams	20 ... 94 (dynamic)	◆	◆		
	40 ... 194 (dynamically)			◆	◆
Light type	infrared, 940 nm	◆	◆	◆	◆
Angle of divergence	Emitter: > 20 ° , Receiver: > 10 °	◆	◆	◆	◆
Ambient light limit	16000 Lux	◆	◆	◆	◆
Function display	7-segment display in receiver display function can be activated: switching status, self test and alignment aid	◆	◆	◆	◆
Operating voltage	12 ... 30 V DC	◆	◆	◆	◆
Ripple	10 %	◆	◆	◆	◆
No-load supply current	< 150 mA	◆	◆	◆	◆
Switching type	Light/dark ON selectable programmable	◆	◆	◆	◆
Signal output	1 PNP and 1 NPN, short-circuit proof	◆	◆	◆	◆
Switching voltage	max. 30 V DC	◆	◆	◆	◆
Switching current	200 mA	◆	◆	◆	◆
Switching frequency	> 1 Hz	◆	◆	◆	◆
Response time	< 220 ms	◆	◆	◆	◆
Standards	EN 12015, EN 12016	◆	◆	◆	◆
Ambient temperature	-10 ... 60 °C (263 ... 333 K)	◆	◆	◆	◆
Storage temperature	-20 ... 75 °C (253 ... 348 K)	◆	◆	◆	◆
Protection degree	IP65	◆	◆	◆	◆
Connection	5 m fixed cable (appropriate for conveyor chains, according to UL E140404, 600 V rated insulation voltage, 90° C)	◆	◆	◆	◆
Housing	aluminium	◆	◆	◆	◆
Optical face	plastic	◆	◆	◆	◆
Mass	2000 g (device)	◆	◆	◆	◆

Dimensions



Sensors for automatic doors,
incl buses and trains

Sensors for industrial gates,
fire protection light barriers

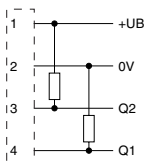
Sensors for elevators

Accessories

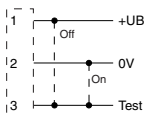
Electrical connection

Connection type

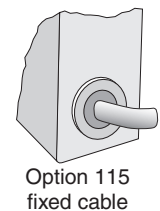
Option /49/76a
Receiver



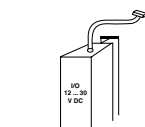
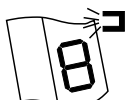
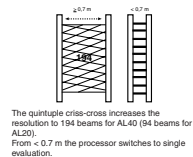
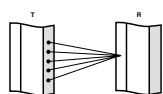
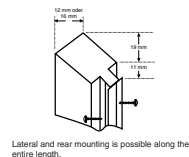
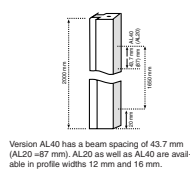
Emitter

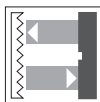


Don't leave test
input floating!



Description





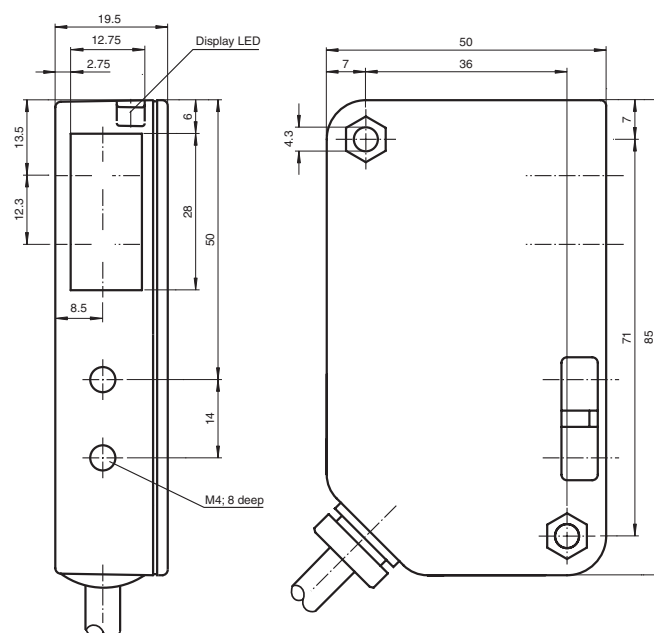
Features

- Retroreflective sensor for single-beam closing edge protection
- Sturdy and compact design
- Optimal price/power ratio
- Various possibilities for mounting

Technical data

		RL91-54-RT/25/38a/73c	RL91-54-RT/25/49/115	RL91-54-RT/38a/59/115	RL91-54-RT/38a/59/73c	RL91-54-RT/49/59/115	RL91-54-RT/49/59/73c
Effective detection range	0 ... 4 m	◆	◆	◆	◆	◆	◆
Reflector distance	0.2 ... 4000 mm	◆	◆	◆	◆	◆	◆
Threshold detection range	8 m (with H85 reflector)	◆	◆	◆	◆	◆	◆
Light source	LED	◆	◆	◆	◆	◆	◆
Approvals	CE	◆	◆	◆	◆	◆	◆
USA	cULus	◆	◆	◆	◆	◆	◆
Kanada	cULus	◆	◆	◆	◆	◆	◆
Light type	red, modulated light	◆	◆	◆	◆	◆	◆
Diameter of the light spot	approx. 160 mm at a distance of 4000 mm	◆	◆	◆	◆	◆	◆
Angle of divergence	approx. 2.5 °	◆	◆	◆	◆	◆	◆
Ambient light limit	90000 Lux	◆	◆	◆	◆	◆	◆
Function display	LED red, flashes when falling short of the stability control	◆	◆	◆	◆	◆	◆
Operating voltage	12 ... 30 V DC	◆	◆	◆	◆	◆	◆
	12 ... 30 V DC / 18 ... 28 V AC	◆	◆	◆	◆	◆	◆
No-load supply current	< 100 mA	◆	◆	◆	◆	◆	◆
Switching type	dark ON	◆	◆	◆	◆	◆	◆
	light ON	◆	◆	◆	◆	◆	◆
Signal output	Weak current relay, 1 NC	◆	◆	◆	◆	◆	◆
	Weak current relay, 1 alternator	◆	◆	◆	◆	◆	◆
	1 npn, 1 pnp synchronised-switching, short-circuit proof, protected against reverse polarity	◆	◆	◆	◆	◆	◆
Switching voltage	max. 125 V AC	◆	◆	◆	◆	◆	◆
	max. 30 V DC	◆	◆	◆	◆	◆	◆
Switching current	1 A / 24 V DC, 0.5 A / 110 V AC	◆	◆	◆	◆	◆	◆
	200 mA	◆	◆	◆	◆	◆	◆
Switching frequency	25 Hz	◆	◆	◆	◆	◆	◆
Response time	20 ms	◆	◆	◆	◆	◆	◆
Standards	EN 60947-5-2	◆	◆	◆	◆	◆	◆
Ambient temperature	-20 ... 55 °C (253 ... 328 K)	◆	◆	◆	◆	◆	◆
Storage temperature	-20 ... 75 °C (253 ... 348 K)	◆	◆	◆	◆	◆	◆
Protection degree	IP65	◆	◆	◆	◆	◆	◆
Connection	M12 connector, 4-pin	◆	◆	◆	◆	◆	◆
	5 m fixed cable	◆	◆	◆	◆	◆	◆
Housing	Luran	◆	◆	◆	◆	◆	◆
Optical face	glass	◆	◆	◆	◆	◆	◆
Mass	100 g	◆	◆	◆	◆	◆	◆

Dimensions



Electrical connection

Connection type

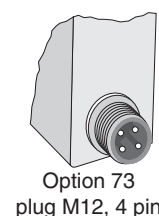
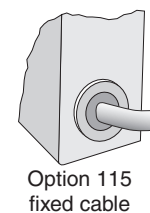
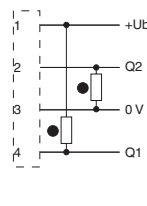
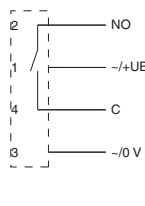
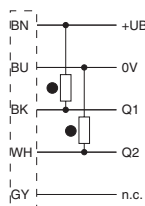
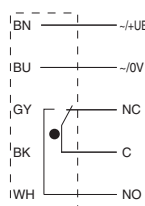
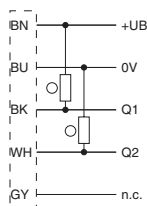
Option /25/49/115

Option /38a/59/115

Option /49/59/115

Option /38a/73c

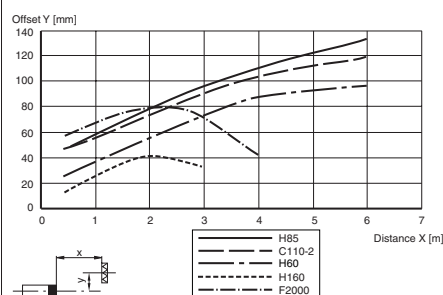
Option /49/59/73c



Diagrams

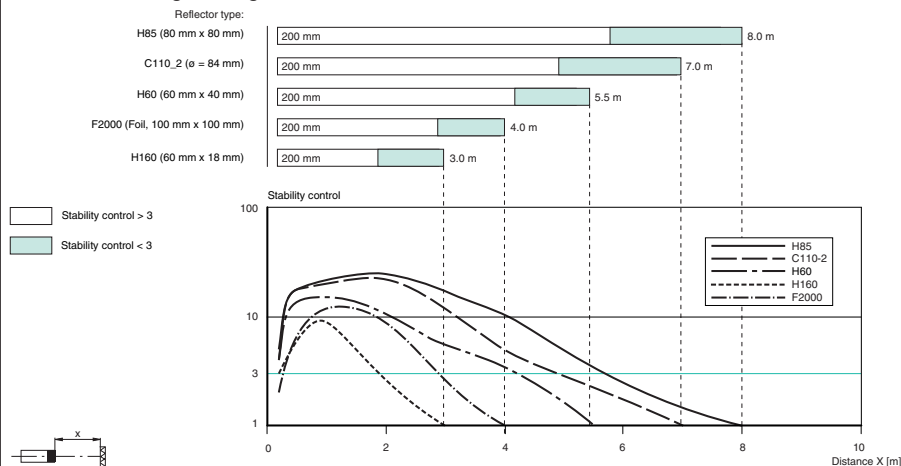
Characteristic response curve

RL(K)91-54



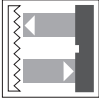
Relative received light strength

RL(K)91-54

Sensors for automatic doors,
incl buses and trainsSensors for industrial gates,
fire protection light barriers

Sensors for elevators

Accessories



Features

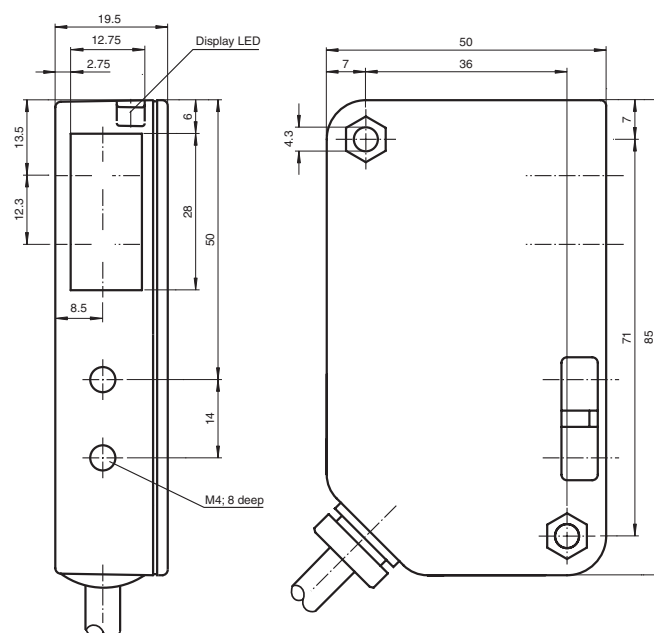
- Retroreflective sensor for single-beam closing edge protection
- Sturdy and compact design
- Optimal price/power ratio
- Various possibilities for mounting

Technical data

Effective detection range	0 ... 4 m	◆
Reflector distance	0.2 ... 4000 mm	◆
Threshold detection range	7 m (with H85 reflector)	◆
Light source	LED	◆
Approvals	CE	◆
USA	cULus	◆
Kanada	cULus	◆
Light type	red, modulated light	◆
Diameter of the light spot	approx. 160 mm at a distance of 4000 mm	◆
Angle of divergence	approx. 2.5 °	◆
Ambient light limit	90000 Lux	◆
Function display	LED red, flashes when falling short of the stability control	◆
Operating voltage	96 ... 264 V AC	◆
Power consumption	12 VA	◆
Switching type	dark ON	◆
Signal output	Weak current relay, 1 alternator	◆
Switching voltage	max. 240 V AC	◆
Switching current	2.5 A / 240 V AC	◆
Switching frequency	25 Hz	◆
Response time	20 ms	◆
Standards	EN 60947-5-2	◆
Ambient temperature	-20 ... 55 °C (253 ... 328 K)	◆
Storage temperature	-20 ... 75 °C (253 ... 348 K)	◆
Protection degree	IP65	◆
Connection	5 m fixed cable	◆
Housing	Luran	◆
Optical face	glass	◆
Mass	100 g	◆

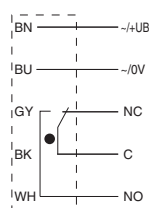
RLK91-54-RT/31/59/115

Dimensions

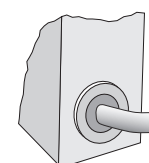


Electrical connection

Option /31/59/115



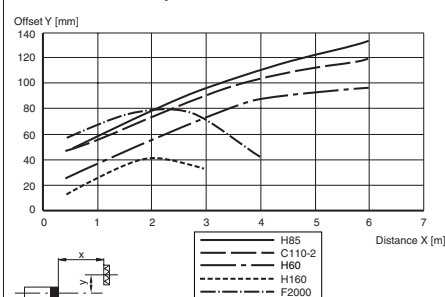
Connection type

Option 115
fixed cable

Diagrams

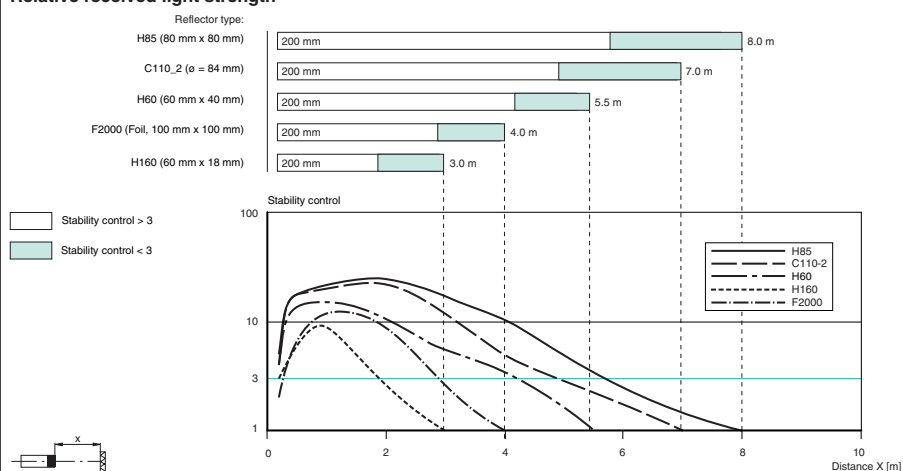
Characteristic response curve

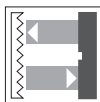
RL(K)91-54



Relative received light strength

RL(K)91-54





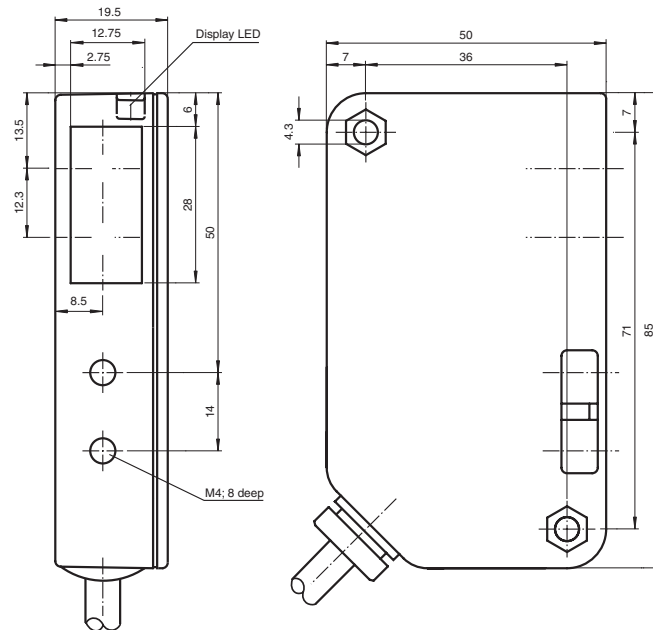
Features

- Retroreflective sensor for single-beam closing edge protection
- Sturdy and compact design
- Infrared light
- Optimal price/power ratio
- Various possibilities for mounting

Technical data

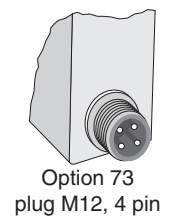
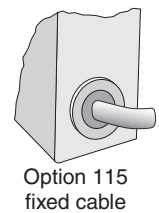
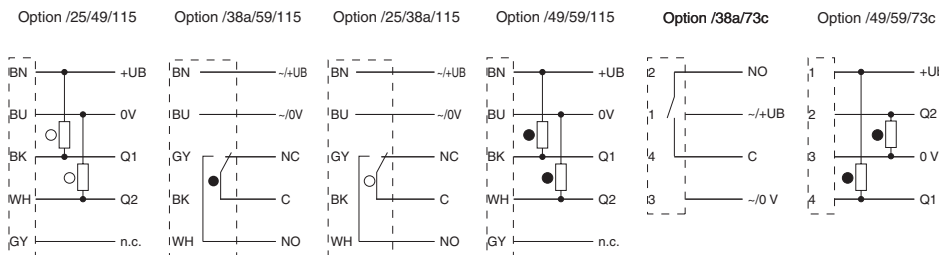
		RL91-6-IR/25/38a/115	RL91-6-IR/25/49/115	RL91-6-IR/38a/59/115	RL91-6-IR/38a/59/73c	RL91-6-IR/49/59/115	RL91-6-IR/49/59/73c
Effective detection range	0 ... 6 m	◆	◆	◆	◆	◆	◆
Reflector distance	0 ... 6 m	◆	◆	◆	◆	◆	◆
Threshold detection range	9 m (with H85 reflector)	◆	◆	◆	◆	◆	◆
Light source	LED	◆	◆	◆	◆	◆	◆
Approvals	CE	◆	◆	◆	◆	◆	◆
USA	cULus	◆	◆	◆	◆	◆	◆
Canada	cULus	◆	◆	◆	◆	◆	◆
Light type	infrared, modulated light	◆	◆	◆	◆	◆	◆
Diameter of the light spot	approx. 230 mm at a distance of 6000 mm	◆	◆	◆	◆	◆	◆
Angle of divergence	approx. 2.5 °	◆	◆	◆	◆	◆	◆
Ambient light limit	90000 Lux	◆	◆	◆	◆	◆	◆
Function display	LED red, flashes when falling short of the stability control	◆	◆	◆	◆	◆	◆
Operating voltage	12 ... 30 V DC		◆			◆	◆
	12 ... 30 V DC / 18 ... 28 V AC			◆			
No-load supply current	< 100 mA	◆	◆	◆	◆	◆	◆
Switching type	dark ON			◆	◆	◆	◆
	light ON	◆	◆				
Signal output	Weak current relay, 1 NC				◆		
	Weak current relay, 1 alternator	◆		◆			
	1 npn, 1 pnp synchronised-switching, short-circuit proof, protected against reverse polarity		◆			◆	◆
Switching voltage	max. 125 V AC	◆		◆	◆		
	max. 30 V DC		◆			◆	◆
Switching current	1 A / 24 V DC, 0.5 A / 110 V AC	◆		◆	◆		
	200 mA		◆			◆	◆
Switching frequency	25 Hz	◆	◆	◆	◆	◆	◆
Response time	20 ms	◆	◆	◆	◆	◆	◆
Standards	EN 60947-5-2	◆	◆	◆	◆	◆	◆
Ambient temperature	-20 ... 55 °C (253 ... 328 K)	◆	◆	◆	◆	◆	◆
Storage temperature	-20 ... 75 °C (253 ... 348 K)	◆	◆	◆	◆	◆	◆
Protection degree	IP65	◆	◆	◆	◆	◆	◆
Connection	M12 connector, 4-pin				◆		◆
	5 m fixed cable	◆	◆	◆		◆	
Housing	Luran	◆	◆	◆	◆	◆	◆
Optical face	Luran	◆	◆	◆	◆	◆	◆
Mass	100 g	◆	◆	◆	◆	◆	◆

Dimensions



Electrical connection

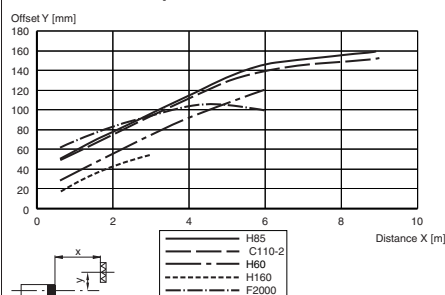
Connection type



Diagrams

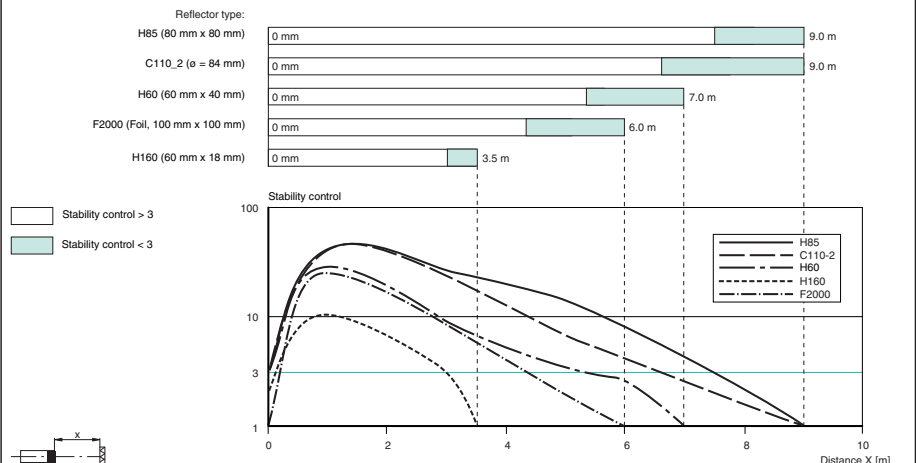
Characteristic response curve

RL(K)91-6



Relative received light strength

RL(K)91-6


Sensors for automatic doors,
incl buses and trains

Sensors for industrial gates,
fire protection light barriers

Sensors for elevators

Accessories



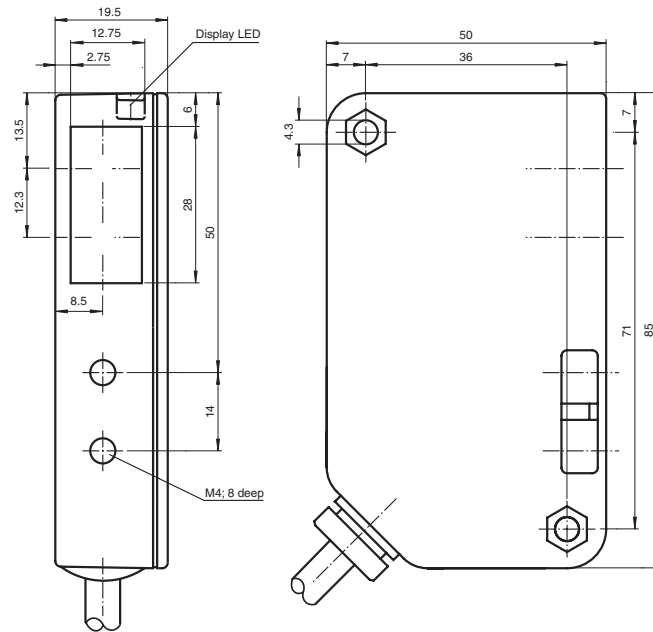
Features

- Retroreflective sensor for single-beam closing edge protection
- Sturdy and compact design
- Infrared light
- Optimal price/power ratio
- Various possibilities for mounting

Technical data

		RLK91-6-IR/25/31/115	RLK91-6-IR/31/59/115
Effective detection range	0 ... 6 m	◆	◆
Reflector distance	0 ... 6 m	◆	◆
Threshold detection range	9 m (with H85 reflector)	◆	◆
Light source	LED	◆	◆
Approvals	CE	◆	◆
USA	cULus	◆	◆
Canada	cULus	◆	◆
Light type	infrared, modulated light	◆	◆
Diameter of the light spot	approx. 230 mm at a distance of 6000 mm	◆	◆
Angle of divergence	approx. 2.5 °	◆	◆
Ambient light limit	90000 Lux	◆	◆
Function display	LED red, flashes when falling short of the stability control	◆	◆
Operating voltage	96 ... 264 V AC	◆	◆
Power consumption	12 VA	◆	◆
Switching type	dark ON	◆	◆
	light ON	◆	◆
Signal output	Weak current relay, 1 alternator	◆	◆
Switching voltage	max. 240 V AC	◆	◆
Switching current	2.5 A / 240 V AC	◆	◆
Switching frequency	25 Hz	◆	◆
Response time	20 ms	◆	◆
Standards	EN 60947-5-2	◆	◆
Ambient temperature	-20 ... 55 °C (253 ... 328 K)	◆	◆
Storage temperature	-20 ... 75 °C (253 ... 348 K)	◆	◆
Protection degree	IP65	◆	◆
Connection	5 m fixed cable	◆	◆
Housing	Luran	◆	◆
Optical face	Luran	◆	◆
Mass	100 g	◆	◆

Dimensions

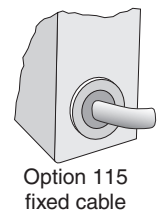
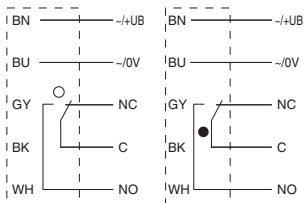


Electrical connection

Connection type

Option /25/31/115

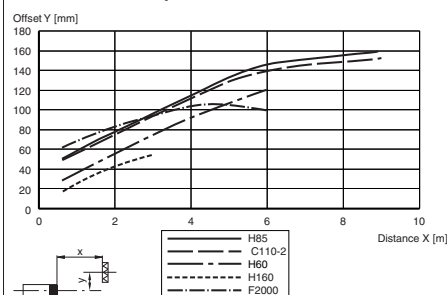
Option /31/59/115



Diagrams

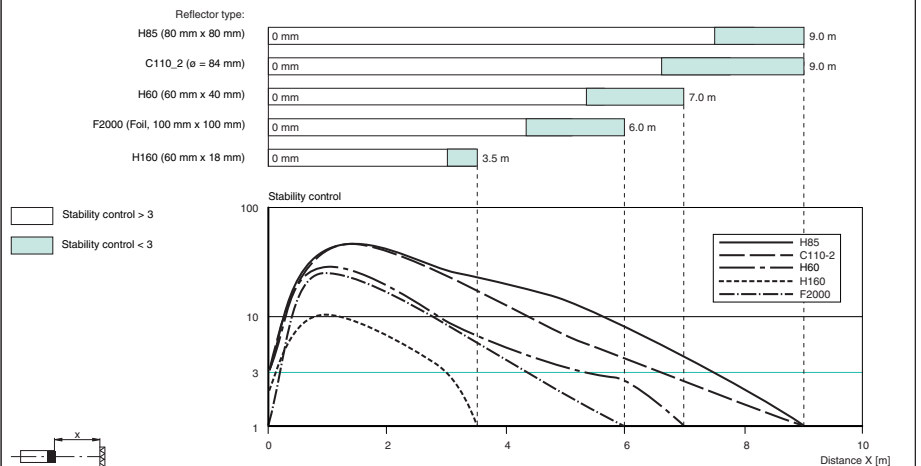
Characteristic response curve

RL(K)91-6



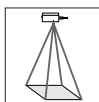
Relative received light strength

RL(K)91-6

Sensors for automatic doors,
incl buses and trainsSensors for industrial gates,
fire protection light barriers

Sensors for elevators

Accessories



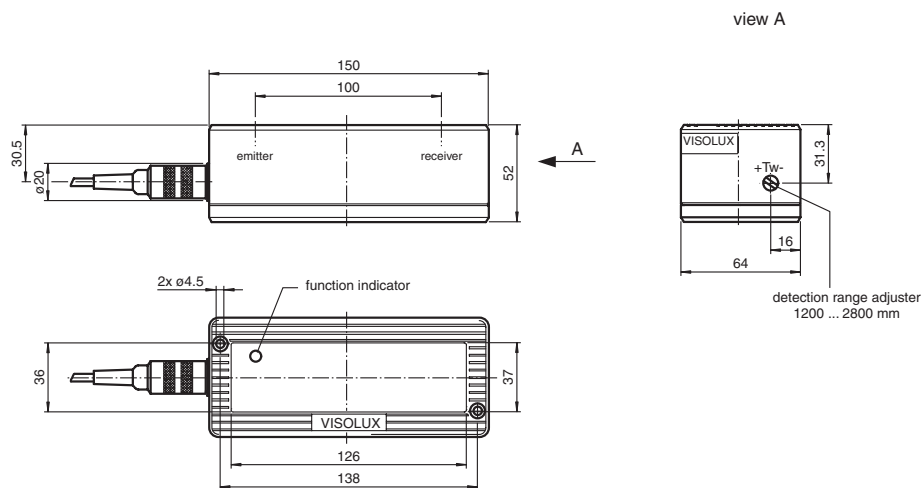
Features

- High operating distance
- Background suppression
- Protection degree IP65

Technical data

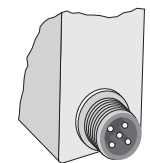
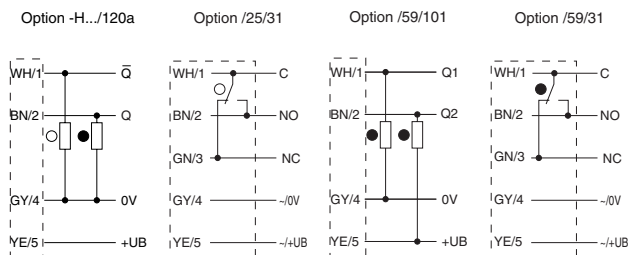
		FLT-8-H-2800-300/120a	FLT-8-H-2800-300/25/31	FLT-8-H-2800-500/120a	FLT-8-H-2800-500/59/101	FLT-8-H-2800-500/59/31	FLT-8-H-2800-50/120a	FLT-8-H-2800-50/25/31
Detection field	300 mm x 500 mm at 2000 mm sensor range	◆	◆					
	50 mm x 500 mm at 2000 mm sensor range						◆	◆
	500 mm x 500 mm at 2000 mm sensor range			◆	◆	◆		
Detection range min.	100 ... 1200 mm	◆	◆	◆	◆	◆	◆	◆
Detection range max.	100 ... 2800 mm	◆	◆	◆	◆	◆	◆	◆
Light source	3 x IRED						◆	◆
	4 x IRED	◆	◆	◆	◆	◆		
Light spot representation	43 mm x 43 mm at 2000 mm	◆	◆	◆	◆	◆	◆	◆
Marking	CE	◆	◆	◆	◆	◆	◆	◆
Operating mode	Background suppression	◆	◆	◆	◆	◆	◆	◆
Light type	infrared, modulated light	◆	◆	◆	◆	◆	◆	◆
Function display	LED red	◆	◆	◆	◆	◆	◆	◆
Operating elements	sensing range adjuster	◆	◆	◆	◆	◆	◆	◆
Operating voltage	15 ... 48 V AC/DC		◆			◆		◆
	15 ... 48 V DC	◆		◆	◆		◆	
No-load supply current	100 mA	◆	◆	◆	◆	◆	◆	◆
Power consumption	2.5 W	◆	◆	◆	◆	◆	◆	◆
Switching type	dark ON				◆	◆		
	light/dark switching	◆		◆			◆	
	light ON		◆					◆
Signal output	Relay, 1 alternator		◆			◆		◆
	1 pnp and 1 npn short-circuit proof, open collector, synchronized-switching				◆			
	2 pnp, antivalent, short-circuit proof, open collectors	◆		◆			◆	
Switching voltage	≤ 250 V AC/DC		◆			◆		◆
	48 V DC	◆		◆	◆		◆	
Switching current	≤ 2 A		◆			◆		◆
	200 mA	◆		◆	◆		◆	
Response time	100 ms	◆	◆	◆	◆	◆	◆	◆
Standards	EN 60947-5-2	◆	◆	◆	◆	◆	◆	◆
Standards 2	EN 61000-6-2 without EN 61000-4-5, EN 61000-4-11	◆	◆	◆	◆	◆	◆	◆
Standards 3	EN 61000-6-3	◆	◆	◆	◆	◆	◆	◆
Ambient temperature	-20 ... 60 °C (253 ... 333 K)	◆	◆	◆	◆	◆	◆	◆
Storage temperature	-20 ... 75 °C (253 ... 348 K)	◆	◆	◆	◆	◆	◆	◆
Mounting height	max. 2800	◆	◆	◆	◆	◆	◆	◆
Protection degree	IP65	◆	◆	◆	◆	◆	◆	◆
Connection	Connector, with 2 m cable connector	◆	◆	◆	◆	◆	◆	◆
Housing	Makrolon GV30 black	◆	◆	◆	◆	◆	◆	◆
Optical face	glass, red	◆	◆	◆	◆	◆	◆	◆
Mass	320 g	◆	◆	◆	◆	◆	◆	◆

Dimensions



Electrical connection

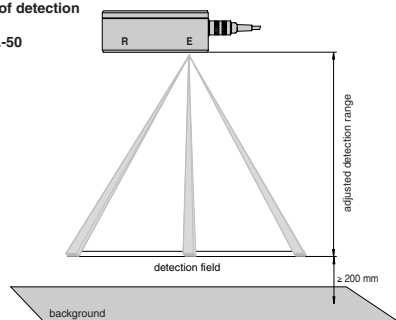
Connection type



plug M12, 5 pin

Diagrams

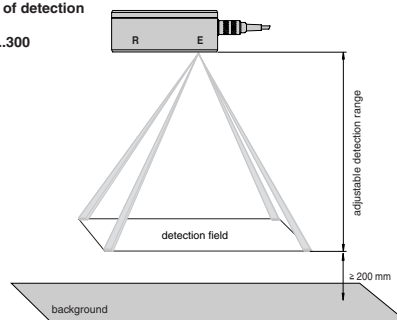
Size of detection field
FLT...-50



Detection field size versus adjusted detection range:

detect. field	detection field size	spot size
1500 mm	380 mm x 38 mm	30 mm x 30 mm
1800 mm	450 mm x 50 mm	35 mm x 35 mm
2000 mm	500 mm x 50 mm	43 mm x 43 mm
2500 mm	610 mm x 61 mm	57 mm x 57 mm
2800 mm	685 mm x 68 mm	64 mm x 64 mm

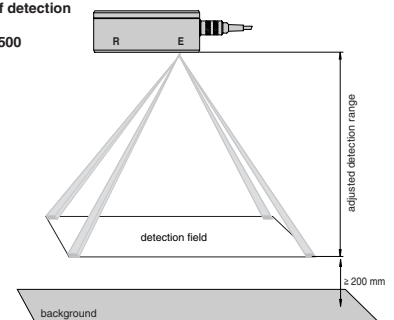
Size of detection field
FLT...300



Detection field size versus adjusted detection range:

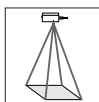
detect. range	detection field size	spot size
1500 mm	380 mm x 220 mm	30 mm x 30 mm
1800 mm	450 mm x 270 mm	35 mm x 35 mm
2000 mm	500 mm x 300 mm	43 mm x 43 mm
2500 mm	610 mm x 370 mm	57 mm x 57 mm
2800 mm	685 mm x 415 mm	64 mm x 64 mm

Size of detection field
FLT...500



Detection field size versus adjusted detection range:

detect. field	detection field size	spot size
1500 mm	380 mm x 380 mm	30 mm x 30 mm
1800 mm	450 mm x 450 mm	35 mm x 35 mm
2000 mm	500 mm x 500 mm	43 mm x 43 mm
2500 mm	610 mm x 610 mm	57 mm x 57 mm
2800 mm	685 mm x 685 mm	64 mm x 64 mm



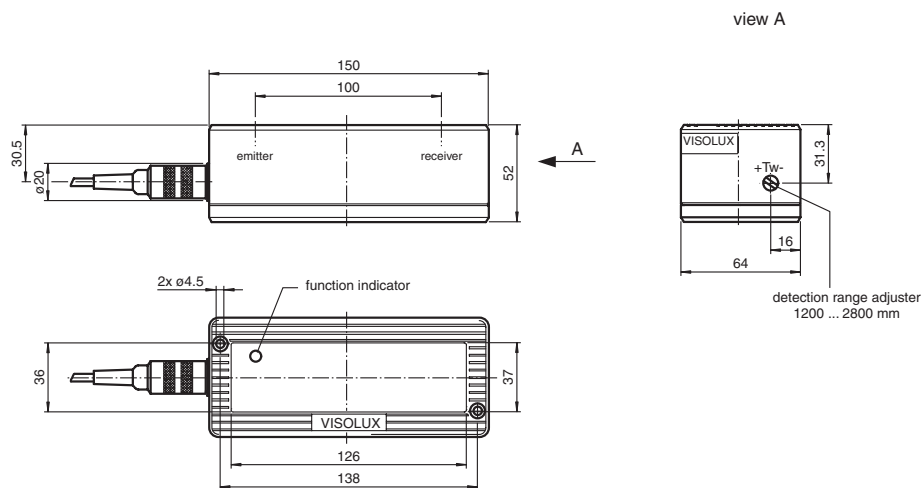
Features

- High operating distance
- Possible detection range down to 0 m
- Background evaluation
- Reliable detection even of difficult objects by means of background evaluation
- Protection degree IP65

Technical data

		FLT-8-HW-2800-300/25/31	FLT-8-HW-2800-50/25/31	FLT-8-HW-2800-50/31/59	FLT-8-HW-2800-500/25/31	FLT-8-HW-2800-500/59/101
Detection field	300 mm x 500 mm at 2000 mm sensor range	◆				
	50 mm x 500 mm at 2000 mm sensor range		◆	◆		
	500 mm x 500 mm at 2000 mm sensor range				◆	◆
Detection range min.	0 ... 1200 mm	◆	◆	◆	◆	◆
Detection range max.	0 ... 2800 mm	◆	◆	◆	◆	◆
Light source	3 x IRED		◆	◆		
	4 IRED	◆			◆	◆
Light spot representation	43 mm x 43 mm at 2000 mm	◆	◆	◆	◆	◆
Marking	CE	◆	◆	◆	◆	◆
Operating mode	Background evaluation	◆	◆	◆	◆	◆
Light type	infrared, modulated light	◆	◆	◆	◆	◆
Function display	LED red	◆	◆	◆	◆	◆
Operating elements	sensing range adjuster	◆	◆	◆	◆	◆
Operating voltage	15 ... 48 V AC/DC	◆	◆	◆	◆	
	15 ... 48 V DC					◆
No-load supply current	100 mA	◆	◆	◆	◆	◆
Power consumption	2.5 W	◆	◆	◆	◆	◆
Switching type	dark ON			◆		◆
	light ON	◆	◆		◆	
Signal output	Relay, 1 alternator	◆	◆	◆	◆	
	1 pnp and 1 npn short-circuit proof, open collector, synchronized-switching					◆
Switching voltage	≤ 250 V AC/DC	◆	◆	◆	◆	
	48 V DC					◆
Switching current	≤ 2 A	◆	◆	◆	◆	
	200 mA					◆
Response time	100 ms	◆	◆	◆	◆	◆
Standards	EN 60947-5-2	◆	◆	◆	◆	◆
Standards 2	EN 61000-6-2 without EN 61000-4-5, EN 61000-4-11	◆	◆	◆	◆	◆
Standards 3	EN 61000-6-3	◆	◆	◆	◆	◆
Ambient temperature	-20 ... 60 °C (253 ... 333 K)	◆	◆	◆	◆	◆
Storage temperature	-20 ... 75 °C (253 ... 348 K)	◆	◆	◆	◆	◆
Mounting height	max. 2800	◆	◆	◆	◆	◆
Protection degree	IP65	◆	◆	◆	◆	◆
Connection	Connector, with 2 m cable connector	◆	◆	◆	◆	◆
Housing	Makrolon GV30 black	◆	◆	◆	◆	◆
Optical face	glass, red	◆	◆	◆	◆	◆
Mass	320 g	◆	◆	◆	◆	◆

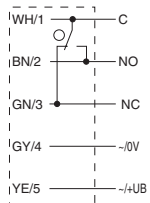
Dimensions



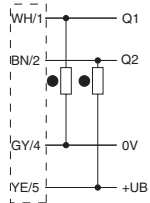
Electrical connection

Connection type

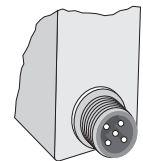
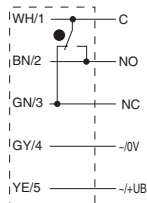
Option /25/31



Option /59/101

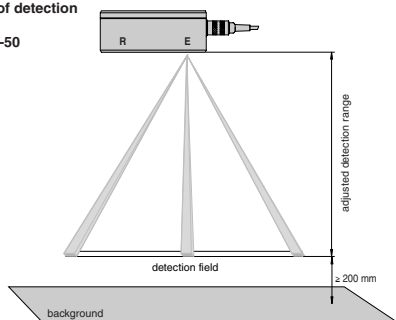


Option /59/31



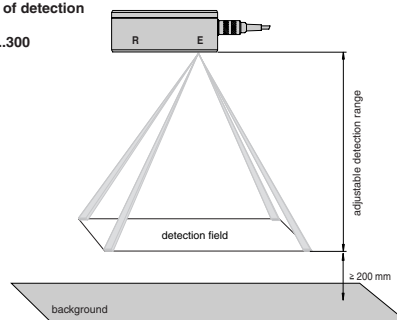
plug M12, 5 pin

Diagrams

Size of detection field
FLT...-50

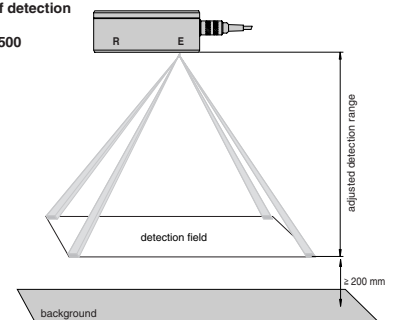
Detection field size versus adjusted detection range:

detect. field	detection field size	spot size
1500 mm	380 mm x 38 mm	30 mm x 30 mm
1800 mm	450 mm x 50 mm	35 mm x 35 mm
2000 mm	500 mm x 50 mm	43 mm x 43 mm
2500 mm	610 mm x 61 mm	57 mm x 57 mm
2800 mm	685 mm x 68 mm	64 mm x 64 mm

Size of detection field
FLT...300

Detection field size versus adjusted detection range:

detect. range	detection field size	spot size
1500 mm	380 mm x 220 mm	30 mm x 30 mm
1800 mm	450 mm x 270 mm	35 mm x 35 mm
2000 mm	500 mm x 300 mm	43 mm x 43 mm
2500 mm	610 mm x 370 mm	57 mm x 57 mm
2800 mm	685 mm x 415 mm	64 mm x 64 mm

Size of detection field
FLT...500

Detection field size versus adjusted detection range:

detect. field	detection field size	spot size
1500 mm	380 mm x 380 mm	30 mm x 30 mm
1800 mm	450 mm x 450 mm	35 mm x 35 mm
2000 mm	500 mm x 500 mm	43 mm x 43 mm
2500 mm	610 mm x 610 mm	57 mm x 57 mm
2800 mm	685 mm x 685 mm	64 mm x 64 mm



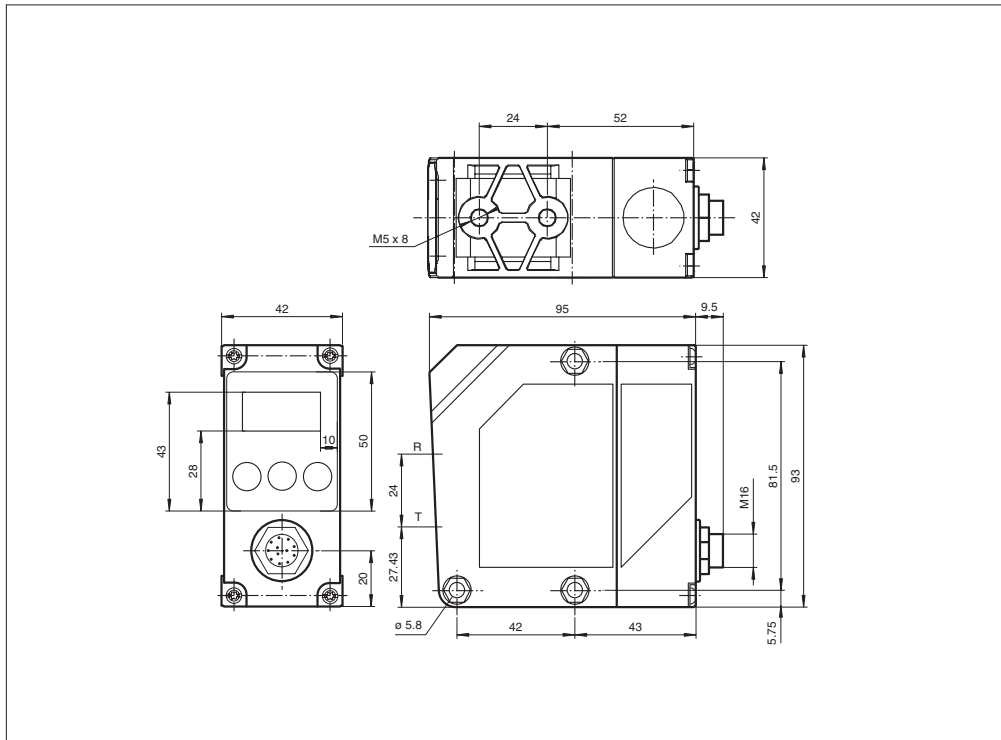
Features

- Can be aligned using an integrated pilot laser
- SSI interface
- Adjustable switch outputs
- Not sensitive to ambient light
- Distance measurement using reflector
VDM70-250-R/20/87/160
- Distance measurement using object
VDM70-10-L/87/122/160
- Analogue output 4 mA ... 20 mA
VDM70-10-L/87/122/160

Technical data

		VDM70-10-L/87/122/160	VDM70-250-R/20/87/160
Light source	laser diode	◆	◆
Approvals	CE, cULus	◆	◆
Laser class	1 EN 60825-1	◆	◆
Alignment aid	adjustment laser, Laser class 2	◆	◆
Linearity error	+/- 3 mm	◆	◆
	+/- 8 mm	◆	◆
Measurement range	0.5 ... 10 m by 90 % reflection (white)	◆	◆
	0.5 ... 250 m on reflector	◆	◆
Reference target	Kodak white (90%)	◆	◆
	OFR100/100	◆	◆
Light type	IR-laser 900 nm	◆	◆
	adjustment laser red light 650 nm	◆	◆
Diameter of the light spot	20 mm x 20 mm at a distance of 10 m	◆	◆
	3 mm x 10 mm at a distance of 4 m	◆	◆
Resolution	0.1 mm or 0.125 mm	◆	◆
Hysteresis	min. 10 mm (adjustable)	◆	◆
Temperature influence	< ± 5 mm absolute	◆	◆
Operating display	LED green	◆	◆
Function display	LED yellow: switching state, LED orange: error message	◆	◆
Operating elements	Keypad (3 membrane keys) for parameter settings on the LCD display	◆	◆
Operating voltage	18 ... 30 V DC	◆	◆
Protection class	II	◆	◆
Ripple	10 % within the supply tolerance	◆	◆
No-load supply current	190 mA	◆	◆
Interfaces	RS 422, SSI	◆	◆
Signal output	2 pnp, short-circuit proof, protected against reverse polarity	◆	◆
Switching current	100 mA	◆	◆
Measurement output	1 analogue output 4 ... 20 mA, short-circuit/overload protected	◆	◆
Response time	12 ms	◆	◆
Repeat accuracy	± 2 mm	◆	◆
	± 4 mm	◆	◆
Other outputs	Service output, plausibility output, PNP, short-circuit proof 50 mA	◆	◆
Standards	EN 60947-5-2	◆	◆
Ambient temperature	-10 ... 50 °C (263 ... 323 K)	◆	◆
Storage temperature	-30 ... 75 °C (243 ... 348 K)	◆	◆
Protection degree	IP67	◆	◆
Connection	with 12-pin, M16 connector	◆	◆
Housing	ABS	◆	◆
Optical face	PMMA	◆	◆
Mass	230 g	◆	◆

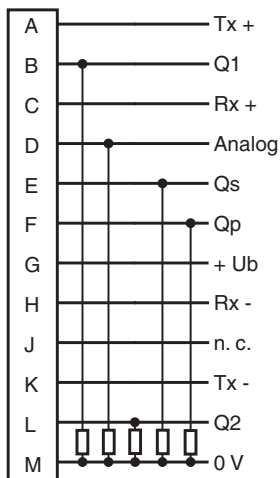
Dimensions



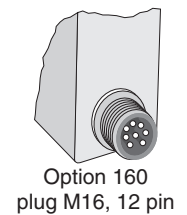
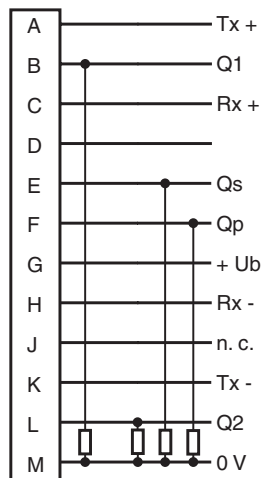
Electrical connection

Connection type

VDM70-10-L/87/122/160

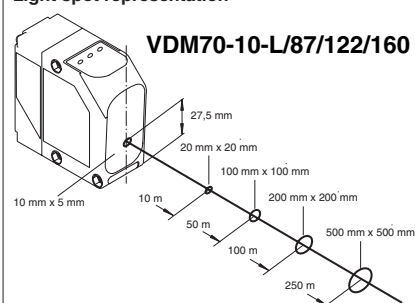


VDM70-250-R/20/87/160

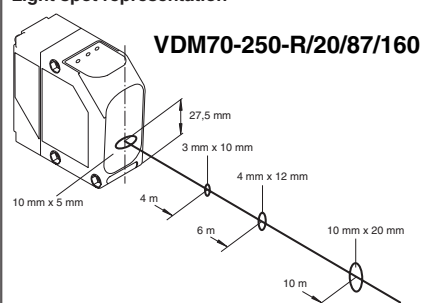


Diagrams

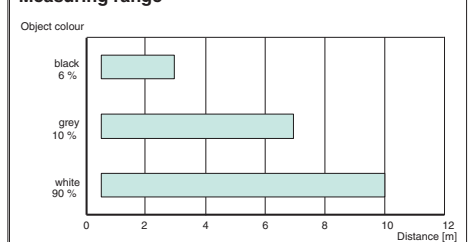
Light spot representation




Light spot representation



Measuring range





Sockets for plastic connectors Ø 6.5 mm

Appropriate for sensors in the ML29 line with connection option /143				
Cable sheath	Length ¹⁾	Number of strands	Ø (mm ²)	Straight form
PVC, gray	3 m	4	0,25	ML29 connection socket 3m 4-pin
	6 m	4	0,25	ML29 connection socket 6m 4-pin

¹⁾ other lengths on request

















M12 cable sockets

					
Cable sheath	Length ¹⁾	Number of strands	Ø (mm ²)	Straight shape	Angled shape
PVC	2 m	4	0,34	V1-G-2M-PVC	V1-W-2M-PVC
	5 m	4	0,34	V1-G-5M-PVC	V1-W-5M-PVC
	2 m	5	0,34	V15-G-2M-PVC	V15-W-2M-PVC
	5 m	5	0,34	V15-G-5M-PVC	V15-W-5M-PVC
PUR	2 m	4	0,34	V1-G-2M-PUR	V1-W-2M-PUR
	5 m	4	0,34	V1-G-5M-PUR	V1-W-5M-PUR
	2 m	5	0,34	V15-G-2M-PUR	V15-W-2M-PUR
	5 m	5	0,34	V15-G-5M-PUR	V15-W-5M-PUR

¹⁾ other lengths on request

Model key for cable sockets

















V15-W-2M-PVC	— Cable material	— PVC — PUR
	— Cable length	— 2 m — 5 m — other lengths on request
	— Cable outlet	— W angled — G straight
	— Connection method	— V15 M12 x 1. 5-pin, DC

Illustration	Description	Part Number	Series													
			MLV12	RLK29	RL91	RLK91	31 series	AIR30	LT	FLT	Proscan	Topscan	TOPSCAN-S	RMS	AL21	AL20/40
	Rectangular reflector	H50 REFLECTOR		●	●	●										
	Rectangular reflector	H60 REFLECTOR	●	●	●	●										
	Rectangular reflector	H85 REFLECTOR		●	●	●										
	Rectangular reflector	H160 REFLECTOR		●	●	●										
	Rectangular reflector	H180 REFLECTOR		●	●	●										
	Round reflector	C110-2 REFLECTOR		●	●	●										
	Reflector foil	OFR-100/100		●	●	●										
	Installation aid	Reflector Weather Cap	●	●	●	●										
	Installation aid	OMH-MLV12-HWG	●													
	Installation aid	OMH-MLV12-HWK	●													
	Installation aid	OMH-K01	●													
	Installation aid	OMH-K02	●													
	Installation aid	OMH-21		●												
	Installation aid	OMH-RLK29		●												
	Installation aid	OMH-RLK29-HW		●												
	Installation aid	OMH-91			●											
	Installation aid	OMH-RL31-01 OMH-RL31-02 OMH-RL31-03				●										

Sensors for automatic doors,
incl buses and trainsSensors for industrial gates,
fire protection light barriers

Sensors for elevators

Accessories

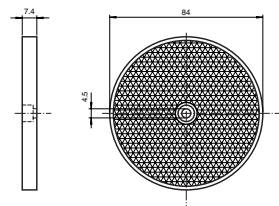
Illustration	Description	Part Number	Series											
			MLV12	RLK29	RL91 RLK91	31 series	AIR30	LT FLT	Proscan	Topscan	TOPSCAN-S	RMS	AL21	AL20/40
	Installation aid	AIR30 mounting cap					●							
	Installation aid	UP mounting frame					●		●					
	Installation aid	Mounting plate LT Mounting plate FLT						●						
	Alignment aid	FLT-50-AR FLT-300-AR FLT-500-AR						●						
	Sensor module	AIR16								●				
	Spare part	AIR16 bearing block								●				
	Ribbon cable	Intermediate cable WK AIR16 200 mm/300 mm/700 mm								●				
	Installation aid	RMS Weather cap										●		
	Remote control	RMS Remote Control										●		
	Installation aid	Mounting Set AL2109 back board											●	
	Installation aid	Mounting Set AL2109 lateral											●	
	Installation aid	Mounting Set AL2109 extension											●	
	Installation aid	Cover trunnion												●
	Spare part	TopScan S Profile TopScan S Cover									●			
	Spare part	TopScan S Cap Set TopScan S Gasket IP54									●			
	Spare part	AIR16-S Holder Set ZWKAIR16-S-TOPSCAN 160mm ZWKAIR16-S-TOPSCAN 240mm									●			

Model number**REFLEKTOR C110-2**

Reflector, round \varnothing 84 mm, central mounting hole

**Technical data**

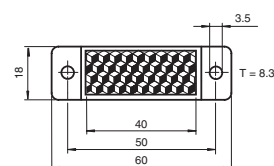
General specifications	
Construction type	circular
Ambient conditions	
Ambient temperature	-20 ... 85 °C (253 ... 358 K)
Mechanical specifications	
Material	PMMA/ABS
Dimensions	Diameter: 84 mm
Mounting	mounting hole

Dimensions**Model number****REFLEKTOR H160**

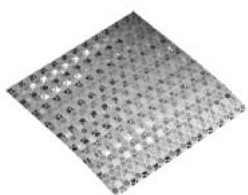
Reflector, rectangular 60 mm x 18 mm, mounting holes

**Technical data**

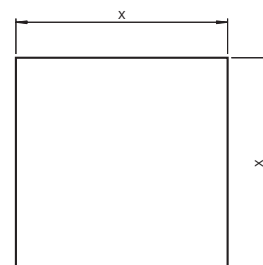
General specifications	
Construction type	rectangular
Ambient conditions	
Ambient temperature	-20 ... 85 °C (253 ... 358 K)
Mechanical specifications	
Material	PMMA/ABS
Dimensions	60 mm x 18 mm x 8.3 mm
Mounting	mounting holes

Dimensions**Model number****OFR-100/100**

Reflective tape 100 mm x 100 mm

**Technical data**

General specifications	
Construction type	rectangular
Ambient conditions	
Ambient temperature	-20 ... 85 °C (253 ... 358 K)
Mechanical specifications	
Material	IRF6000
Dimensions	100 mm x 100 mm
Mounting	self-adhesive

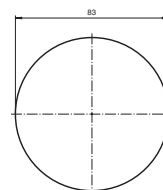
Dimensions**Model number****Reflector Weather Cap**

Weather hood for series reflector

**Technical data**

Mechanical specifications	
Material	plastic
Mass	approx. 60 g
Mounting	Mounting accessories included
Suitable series	
Series	C110-2, H50

Suitable reflector C110-2 or H50 to be ordered separately!

Dimensions

Mounting bracket



Mechanical specifications

Material	Steel, powder coated
Mass	approx. 175 g
Mounting	Mounting accessories included
Suitable series	
Series	RL23 RL28 RL29

The technical drawing shows two views of a mechanical component. The top view is a front elevation showing a base plate with a total width of 112 mm and a height of 62 mm. It features a central vertical slot with a width of 20 mm and a depth of 40 mm. A horizontal slot with a radius of R10 is located at the bottom center. A diagonal rib with a thickness of 6.3 mm extends from the right side towards the center. A circular hole with a diameter of Ø8 is positioned on the left side. The bottom view is a side elevation showing a total length of 70 mm and a height of 30 mm. It includes a horizontal slot with a width of 35 mm and a depth of 15 mm. A diagonal rib with a thickness of 6.3 mm extends from the right side towards the center. A circular hole with a diameter of Ø8 is positioned on the left side. A fillet with a radius of R10 is shown at the bottom center. Dimensions are given in millimeters.

Mounting bracket



Mechanical specifications

Material	Metal sheet (steel), black coated
Mass	approx. 70 g
Mounting	Mounting accessories included
Suitable series	
Series	RL91

Fixation clamp for sensors with dove tail



Mechanical specifications

Material	anodised aluminium
Mass	approx. 10 g
Suitable series	
Series	MLV12

Fixation clamp for sensors with dove tail



Mechanical specifications

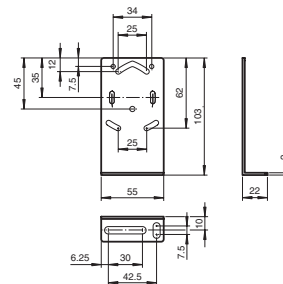
Material	anodised aluminium
Mass	approx. 5 g
Suitable series	
Series	MLV12

Model number**OMH-RL31-01**

Mounting bracket

**Technical data****Mechanical specifications**

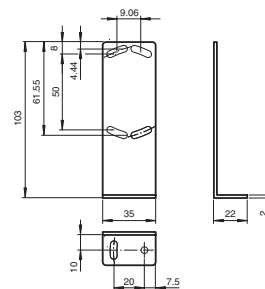
Material	Metal sheet (steel), zinc plated
Suitable series	
Series	Series 31

Dimensions**Model number****OMH-RL31-02**

Mounting bracket

**Technical data****Mechanical specifications**

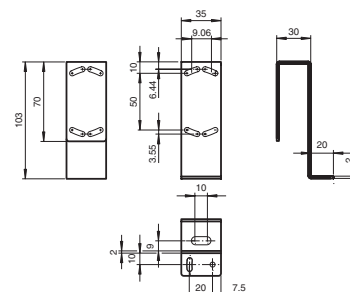
Material	Metal sheet (steel), zinc plated
Suitable series	
Series	Series 31

Dimensions**Model number****OMH-RL31-03**

Mounting bracket

**Technical data****Mechanical specifications**

Material	Metal sheet (steel), zinc plated
Suitable series	
Series	Series 31

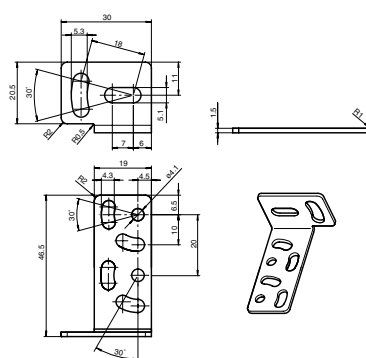
Dimensions

Model number**OMH-MLV12-HWG**

Mounting bracket for series MLV12 sensors

**Technical data****Mechanical specifications**

Material	Metal sheet (steel), nickel-plated
Mass	approx. 15 g
Suitable series	
Series	MLV12

Dimensions

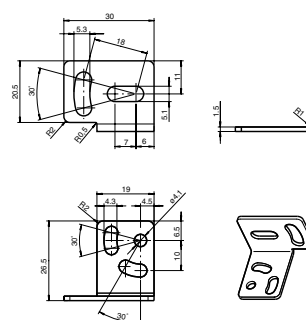
Sensors for automatic doors,
incl buses and trains

Model number**OMH-MLV12-HWK**

Mounting bracket for series MLV12 sensors

**Technical data****Mechanical specifications**

Material	Metal sheet (steel), nickel-plated
Mass	approx. 10 g
Suitable series	
Series	MLV12

Dimensions

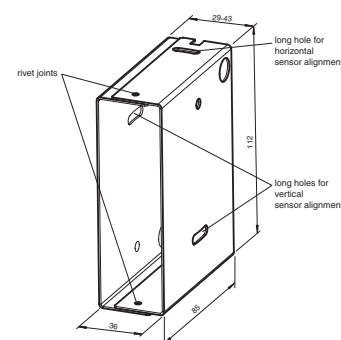
Sensors for industrial gates,
fire protection light barriers

Model number**OMH-RLK29**

Mounting bracket

**Technical data****Mechanical specifications**

Material	Stainless steel
Mass	approx. 85 g
Suitable series	
Series	RLK28 RLK29

Dimensions

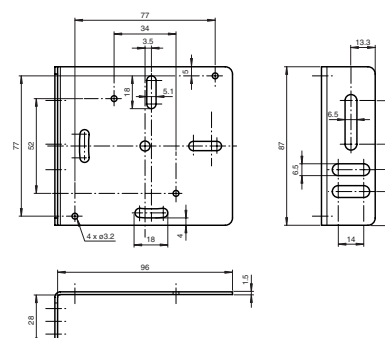
Sensors for elevators

Model number**OMH-RLK29-HW**

Mounting bracket for rear wall mounting

**Technical data****Mechanical specifications**

Material	Stainless steel
Mass	approx. 150 g
Dimensions	136 mm x 52 mm x 3 mm
Suitable series	
Series	RL23 RL28 RL29 RL32

Dimensions

Accessories

Model number**RMS Weather cap**

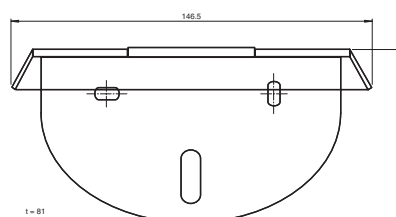
Weather hood for series RMS

**Technical data****Mechanical specifications**

Material	plastic
Mounting	Mounting accessories included

Suitable series

Series	RMS
--------	-----

Dimensions**Model number****RMS Remote control**

infrared remote control for series RMS

**Technical data****General specifications**

Light type	Infrared
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Electrical specifications

Operating voltage	2x 1,5 V, ALKALINE LR6 / AA included with delivery
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Ambient conditions

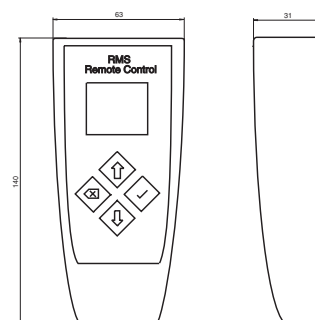
Ambient temperature	-20 ... 60 °C (253 ... 333 K)
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Mechanical specifications

Protection degree	IP54
Material	ABS, black
Mass	100 g
Dimensions	140 mm x 63 mm x 31 mm

Suitable series

Series	RMS
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Dimensions**Model number****TopScan-S Test Kit**

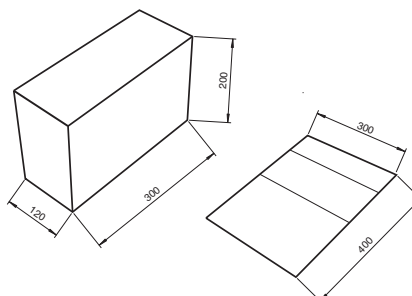
Adjustment accessories TopScan-S

**Technical data****Mechanical specifications**

Material	Board
Mass	approx. 315 g

Suitable series

Series	TOPSCAN-S
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Dimensions**Model number****TopScan-S Gasket IP54**

Housing seal TopScan-S

**Technical data****Ambient conditions**

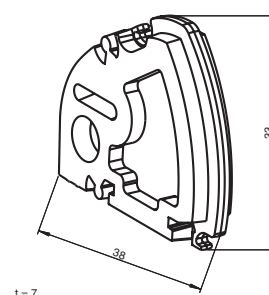
Ambient temperature	-10 ... 50 °C (263 ... 323 K)
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Mechanical specifications

Material	Rubber seal
Mass	approx. 4 g

Suitable series

Series	TOPSCAN-S
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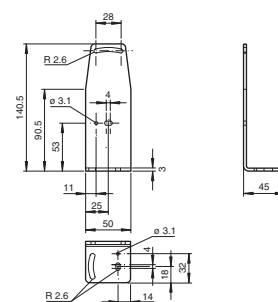
Dimensions

Model number**OMH-VDM35**

Mounting bracket

**Technical data****Mechanical specifications**

Material	Metal sheet (steel), zinc plated
Mounting	Mounting accessories included
Suitable series	
Series	VDM35 , VDM70

DimensionsSensors for automatic doors,
incl buses and trains**Model number****OMH-VDM35-01**

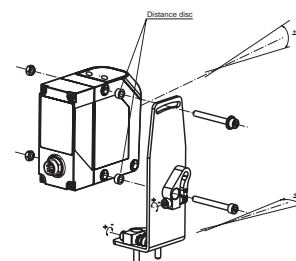
Adjustment set series VDM35

**Technical data****General specifications**

Accessories provided	Mounting bracket not included
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Mechanical specifications

Material	aluminium, black anodised
Mounting	Mounting accessories included
Suitable series	
Series	VDM35 , VDM70

DimensionsSensors for industrial gates,
fire protection light barriers**Model number****VDM35-AR**

alignment aid for series VDM35

**Technical data****General specifications**

Light type	Red light, 650 nm
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Electrical specifications

Operating voltage	3 V DC battery: 2 AAA-size batteries
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Ambient conditions

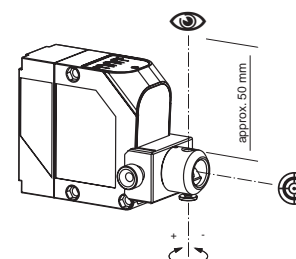
Operating temperature	0 ... 40 °C (273 ... 313 K)
Storage temperature	-40 ... 85 °C (233 ... 358 K)

Mechanical specifications

Protection degree	IP20
Material	aluminium
Housing	PA 6
Mass	250 g
Dimensions	

Suitable series

Series	VDM35 , VDM70
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Dimensions

Sensors for elevators

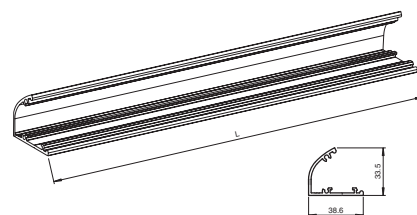
Accessories

Model number**TopScan-S Profile L1400**

Housing profile TopScan-S

**Technical data**

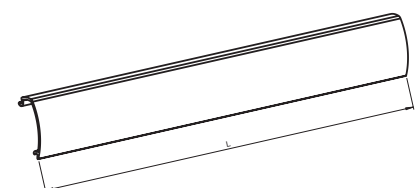
Ambient conditions	
Ambient temperature	-10 ... 50 °C (263 ... 323 K)
Mechanical specifications	
Material	aluminium
Suitable series	
Series	TOPSCAN-S

Dimensions**Model number****TopScan-S Cover L1400**

Housing cover TopScan-S

**Technical data**

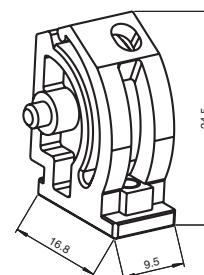
Ambient conditions	
Ambient temperature	-10 ... 50 °C (263 ... 323 K)
Mechanical specifications	
Material	Polyamide (PA)
Suitable series	
Series	TOPSCAN-S

Dimensions**Model number****AIR16-S Holder Set**

Bearing block for AIR16-S sensor module for installation in TopScan-S profile section

**Technical data**

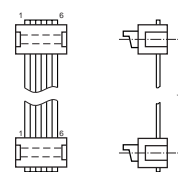
Mechanical specifications	
Material	aluminium
Mass	approx. 6 g
Mounting	Mounting accessories included
Suitable series	
Series	TOPSCAN-S

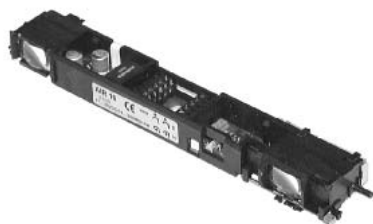
Dimensions**Model number****ZWKAIR16-S-TOPSCAN 160mm
ZWKAIR16-S-TOPSCAN 240mm**

Flat cable for connection of sensor module AIR16-S

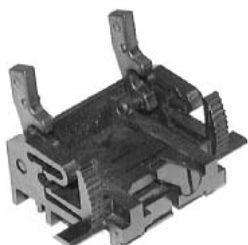
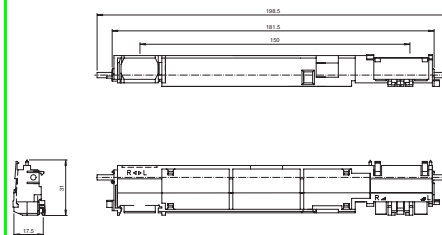
**Technical data**

Mechanical specifications	
Cable	
Length L	160 mm 240 mm
Suitable series	
Series	TOPSCAN-S

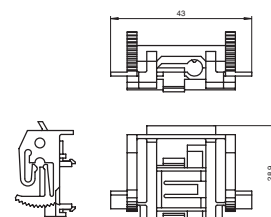
Dimensions



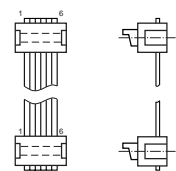
Operating voltage	17 ... 30 V DC , 18 ... 28 V AC
Ambient conditions	
Ambient temperature	-20 ... 60 °C (253 ... 333 K)
Suitable series	
Series	TOPSCAN



Material	plastic
Mass	approx. 5 g
Suitable series	
Series	TOPSCAN



Cable	
Length L	200 mm
Suitable series	
Series	TOPSCAN



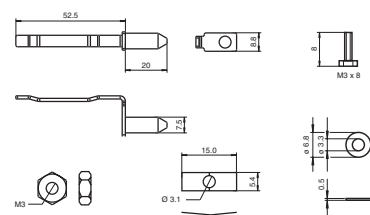
Accessories

Model number**Mounting Set AL2109 back board**

Mounting aid

**Technical data****Mechanical specifications**

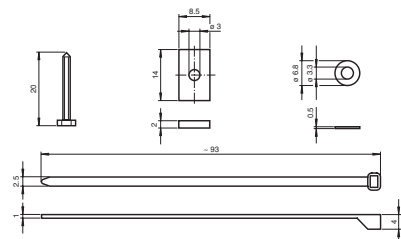
Mass	approx. 30 g
Suitable series	
Series	AL21

Dimensions**Model number****Mounting Set AL2109 lateral**

Mounting aid

**Technical data****Mechanical specifications**

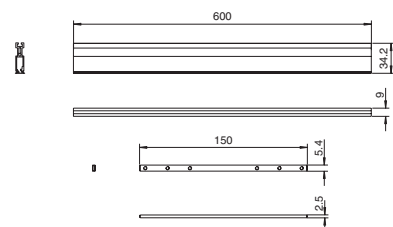
Mass	approx. 12 g
Suitable series	
Series	AL21

Dimensions**Model number****Mounting Set AL2109 extension**

Mounting aid

**Technical data****Mechanical specifications**

Length of housing L	600 mm
Material	Aluminium housing
Mass	approx. 400 g
Mounting	Mounting accessories included
Suitable series	
Series	AL21

Dimensions

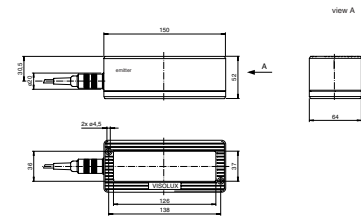
Model number

FLT-50-AR
FLT-300-AR
FLT-500-AR

alignment aid for FLT...-300

**Technical data**

General specifications	
Light type	Red light
Ambient conditions	
Ambient temperature	-20 ... 60 °C (253 ... 333 K)
Storage temperature	-20 ... 75 °C (253 ... 348 K)
Mechanical specifications	
Protection degree	IP65
Material	
Housing	Makrolon GV30 black
Optical face	glass, red
Suitable series	
Series	FLT

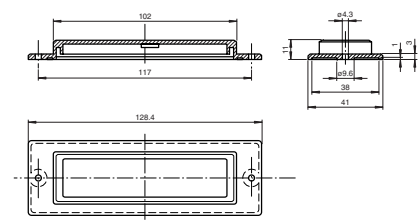
Dimensions**Model number**

EINBAUDECKEL AIR30

Flush-mounted cover for AIR30 series sensors

**Technical data**

Mechanical specifications	
Material	plastic
Mass	approx. 16 g
Suitable series	
Series	AIR30

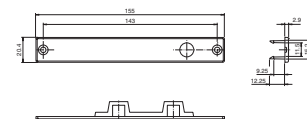
Dimensions**Model number**

ML29 Front Plate

Front plate for thru-beam sensors in series ML29

**Technical data**

Ambient conditions	
Ambient temperature	-20 ... 85 °C (253 ... 358 K)
Mechanical specifications	
Material	Makrolon (IR permeable)
Mass	approx. 11 g
Suitable series	
Series	ML29

Dimensions

Device options

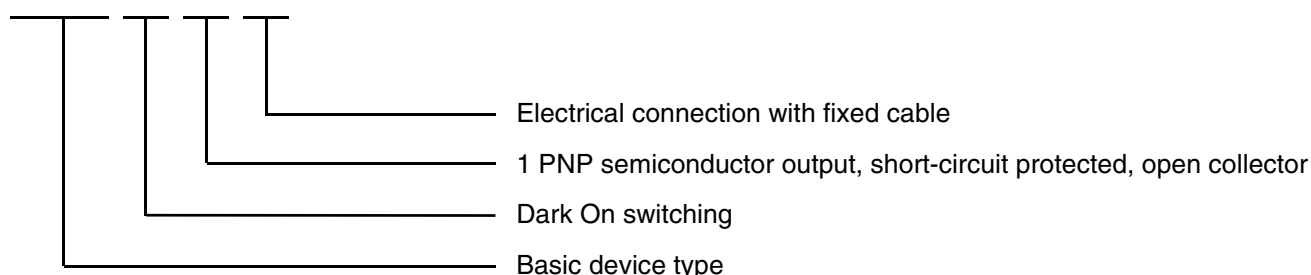
For the best possible fit to your application, our products are available in both their series designs and in different electrical variants with different connection systems, and with other useful options.

In the following table, you will find a listing of the options offered for special products. These device options are attached to the device's model number as numeric codes with a forward slash(/) in ascending order (e.g. -AL2016-P-1650/49/76a).

Option	Description	Output	Input	Operating mode	Connection
/25	Light-On switching			◆	
/31	Relay output	◆			
/32	1 PNP output, short-circuit protected, open collector, 0.2 A/30 V DC	◆			
/38a	Low-current relay output, 1 switcher (1 A/55 V AC/24 V DC)	◆			
/47	2 PNP outputs, short-circuit protected, antivalent, open collectors, 0.2 A/30 V DC	◆			
/49	1 PNP and 1 NPN output, short-circuit protected, open collectors, direct current, 0.2 A/30 V DC	◆			
/59	Dark-On switching			◆	
/73	Plastic connector M12 x 1, 4-pin				◆
/76a	Sensor with input for transmitter suppression ($V_e = +24$ V DC)		◆		
/95	Metal connector M8 x 1, 4-pin				◆
/101	1 PNP and 1 NPN output, short-circuit protected, open collectors, direct current, 0.2 A/48 V DC	◆			
/102	1 NPN output, short-circuit protected, open collector, 0.1 A/30 V DC	◆			
/103	1 PNP output, short-circuit protected, open collector, 0.1 A/30 V DC	◆			
/105	M12 plastic plug, 5-pin, without cable				◆
/115	Fixed cable				◆
/115a	Fixed cable with M8 connector				◆
/115b	Fixed cable with M12 connector				◆
/116	Terminal space				◆
/120a	2 PNP outputs, short-circuit protected, antivalent, open collectors, 0.2 A/48 V DC	◆			
/124	M12 metallic plug, 5-pin, pin layout on Euro standard				◆
/143	M8 plastic plug connector, 4-pin				◆

Example:

ML29-P/59/103/115



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Алматы (727)345-47-04
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Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Благовещенск (4162)22-76-07
Брянск (4832)59-03-52
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Кемерово (3842)65-04-62
Киров (8332)68-02-04
Коломна (4966)23-41-49
Кострома (4942)77-07-48
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Курган (3522)50-90-47
Липецк (4742)52-20-81

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Нижегород (831)429-08-12
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Ноябрьск (3496)41-32-12
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Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Петрозаводск (8142)55-98-37
Псков (8112)59-10-37
Пермь (342)205-81-47

Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Саранск (8342)22-96-24
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Сыктывкар (8212)25-95-17
Тамбов (4752)50-40-97
Тверь (4822)63-31-35

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