



**Model Number**

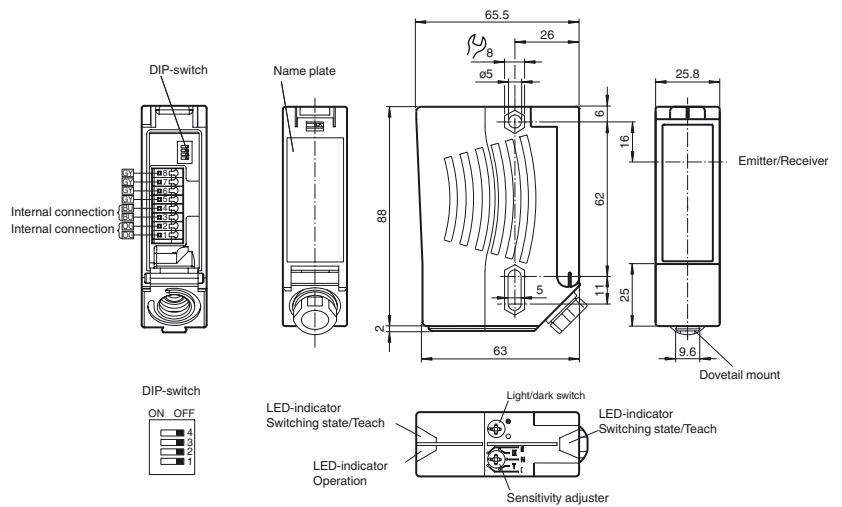
**RL28-54-G-Z/76a/110/116**

Retroreflective sensor  
with terminal compartment

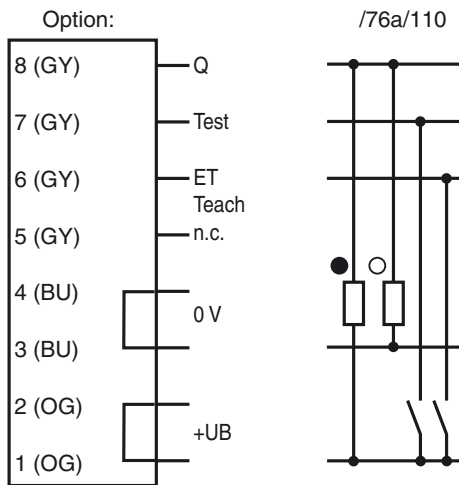
**Features**

- Detects transparent objects, i.e., clear glass, PET and transparent films
- TEACH-IN switch for setting the contrast detection levels
- Automatic adjustment in case of soiling in contrast detection mode
- Ultra bright LEDs for power on, pre fault indication and switching state
- Flashing power on LED in case of short-circuit
- Not sensitive to ambient light, even with energy saving lamps
- Impulsed time element off-delay
- Waterproof, protection degree IP67
- Protection class II

**Dimensions**



**Electrical connection**



○ = Light on  
● = Dark on

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Subject to modifications without notice

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

Effective detection range	0 ... 5.6 m
Reflector distance	0 ... 5.6 m
Threshold detection range	7 m

Reference target	H85-2 reflector
Light source	LED
Light type	modulated visible red light , 660 nm
Diameter of the light spot	approx. 90 mm at a distance of 5.6 m
Angle of divergence	Emitter: 1 ° Receiver: 1.2 °
Ambient light limit	50000 Lux

**Functional safety related parameters**

MTTF <sub>d</sub>	1020 a
Mission Time (T <sub>M</sub> )	20 a
Diagnostic Coverage (DC)	90 %

**Indicators/operating means**

Operating display	LED green, flashes in case of short-circuit
Function display	2 LEDs yellow for switching state, stability control, TEACH-IN and contrast detection mode
Controls	rotary switch for light/dark, 5-step switch for contrast recognition adjustment
Contrast detection levels	10 % - clean, water filled PET bottles 18 % - clear glass bottles 40 % - colored glass or opaque materials adjustable by TEACH-IN key or external wire

**Electrical specifications**

Operating voltage	U <sub>B</sub>	10 ... 30 V DC
Ripple		10 %
No-load supply current	I <sub>0</sub>	≤ 50 mA

**Input**

Test input	emitter deactivation at +U <sub>B</sub>
Function input	Ext. Teach-In input (ET)

**Output**

Switching type	light/dark on switchable	
Signal output	1 push-pull output, short-circuit protected, reverse polarity protected	
Switching voltage	max. 30 V DC	
Switching current	max. 100 mA	
Voltage drop	U <sub>d</sub>	≤ 2.5 V DC
Switching frequency	f	1000 Hz
Response time		0.5 ms
Timer function		Impulsed time element off-delay 20 ms

**Ambient conditions**

Ambient temperature	-40 ... 60 °C (-40 ... 140 °F)
Storage temperature	-40 ... 75 °C (-40 ... 167 °F)

**Mechanical specifications**

Protection degree	IP67
Connection	terminal compartment with 8 spring-loaded terminals for wire cross section 0.5 ... 1.5 mm <sup>2</sup> , insulation stripping 7.5 ... 8.5 mm, M16 x 1.5 cable gland

**Material**

Housing	Plastic ABS
Optical face	Plastic pane
Mass	90 g

**Compliance with standards and directives**

Standard conformity	
Product standard	EN 60947-5-2:2007

**Approvals and certificates**

Protection class	II, rated voltage ≤ 250 V AC with pollution degree 1-2 according to IEC 60664-1 Caution! The protection class 2 is only valid when the terminal compartment is closed.
UL approval	cULus
CCC approval	Products with a maximum operating voltage of ≤36 V do not bear a CCC marking because they do not require approval.

**Accessories****OMH-05**

Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm

**OMH-07**

Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm

**OMH-21**

Mounting bracket

**OMH-22**

Mounting bracket

**OMH-MLV11-K**

dove tail mounting clamp

**OMH-RLK29**

Mounting bracket

**OMH-RLK29-HW**

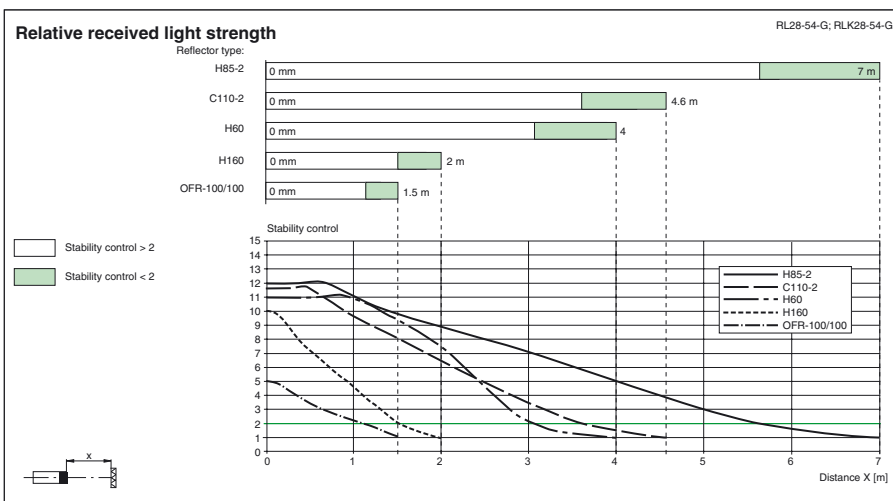
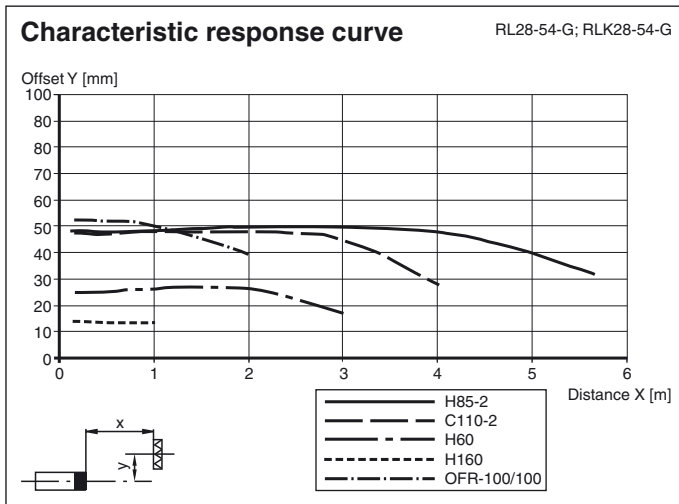
Mounting bracket for rear wall mounting

**OMH-RL28-C**

Protective cover

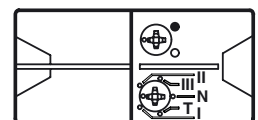
Other suitable accessories can be found at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

Curves/Diagrams



TEACH-IN

- Switch position "N" (standard operation):**  
LEDs are lit when the light beam is unobstructed, they flash when the value falls short of the function reserve and they go out when the beam is interrupted.
- Switch position "T" (Teach-in mode):**  
After 1 s, the LED flashes slowly (approx. 1.5 Hz). The sensor is now ready to be set for a specific contrast detection value either via the mechanical switch (pos. I, II or III) or an external signal.
- Switch positions "I", "II" and "III" (contrast detection mode)**  
Contrast recognition values: I for 10 %, II for 18 %, III for 40 %
  - LED permanently lit: light path unobstructed
  - LED off: element to be sensed detected
  - LED flashes rapidly: detection failure, excessive soiling, function reserve too low.



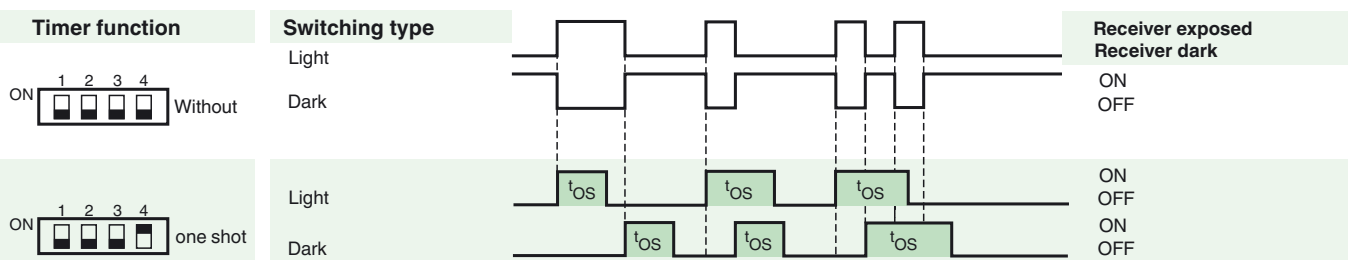
Ext. TEACH-IN input

The desired contrast recognition capability can be adjusted by applying of a logic „high“ pulse with a certain pulse length when the switch is in position T.

- I: 50 ms (30 ms ... 100 ms)
- II: 150 ms (100 ms ... 200 ms)
- III: > 200 ms

It is possible to change the contrast detection level without re-teaching. For contrast detection mode (Teach-Mode) the stability reserve must be at least 2.5 (see curve „relative received light strength“).

Timer functions



The Light-/Dark-Switch (Left, outer switch) is shown in the "Dark ON" position.

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Type	Description	Notes
-Z	one shot timer	Fixed time interval 0.02 s

## Additional information

### Mounting instructions:

The sensor is held in place by two pass-through drill holes for M5. The surface underneath must be flat to prevent the housing from moving when it is tightened into position. We recommend securing the nuts in place with spring screws to prevent the sensor from going out of adjustment.

#### Outdoor mounting:

The sensors must be protected from shock and splashed water. It may be necessary to provide a covering.

### Adjustment:

Align the unit to the reflector in the "N" switch setting. The yellow LED must be lit constantly. Move the switch to the "T" setting and wait for about 1 sec. until the yellow LED starts flashing slowly.

Move the switch to the setting for the desired contrast detection level: "I" for 10%, "II" for 18%, "III" for 40%.

or

In switch setting "T", select the appropriate contrast detection level by applying a pulse through the control lead to connection pin 5 (see "TEACH-IN").

### Contrast detection levels:

The output becomes inactive if dirt and dust make it impossible to readjust the setting. In this case the yellow LED will flash quickly.

If dirt and dust continue to accumulate, detection of slight contrasts can no longer be guaranteed.