Model Number

RL28-54-G-Z/47/112

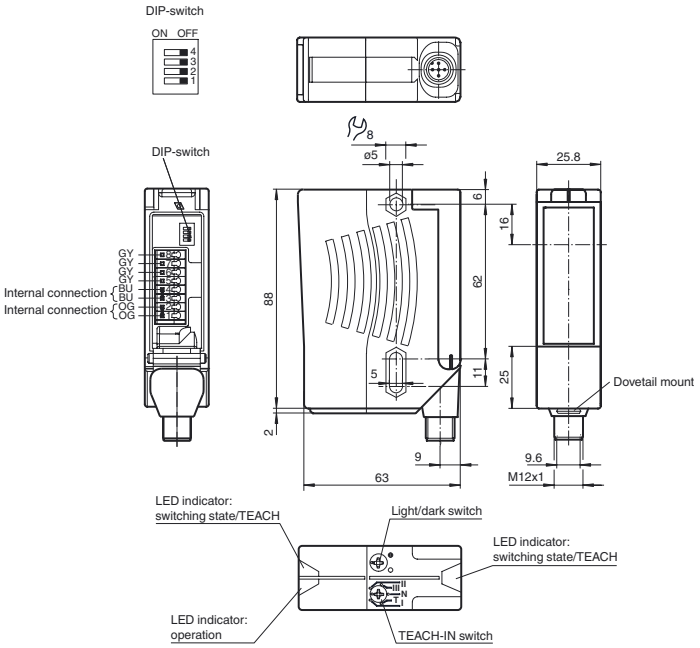
Retroreflective sensor

with metal connector M12; 5-pin, 90° convertible

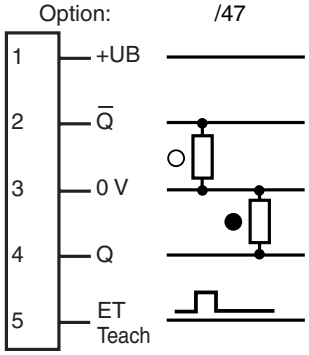
Features

- 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

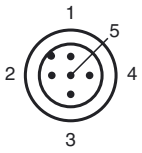


Electrical connection



○ = Light on
● = Dark on

Pinout



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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		
$MTTF_d$		1020 a
Mission Time (T_M)		20 a
Diagnostic Coverage (DC)		0 %
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_B	10 ... 30 V DC
Ripple		10 %
No-load supply current	I_0	≤ 50 mA
Input		
Function input		Ext. Teach-In input (ET)
Output		
Switching type		light/dark on switchable
Signal output		2 PNP, complementary, short-circuit protected, reverse polarity protected , open collectors
Switching voltage		max. 30 V DC
Switching current		max. 200 mA
Voltage drop	U_d	≤ 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		5-pin, M12 x 1 connector, 90° rotatable
Material		
Housing		Plastic ABS
Optical face		Plastic pane
Connector		metal
Mass		90 g
Compliance with standards and directives		
Standard conformity		
Product standard		EN 60947-5-2:2007
Approvals and certificates		
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

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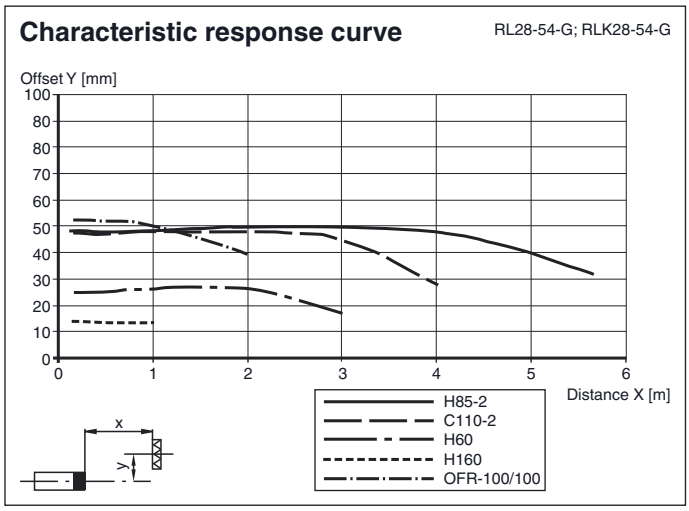
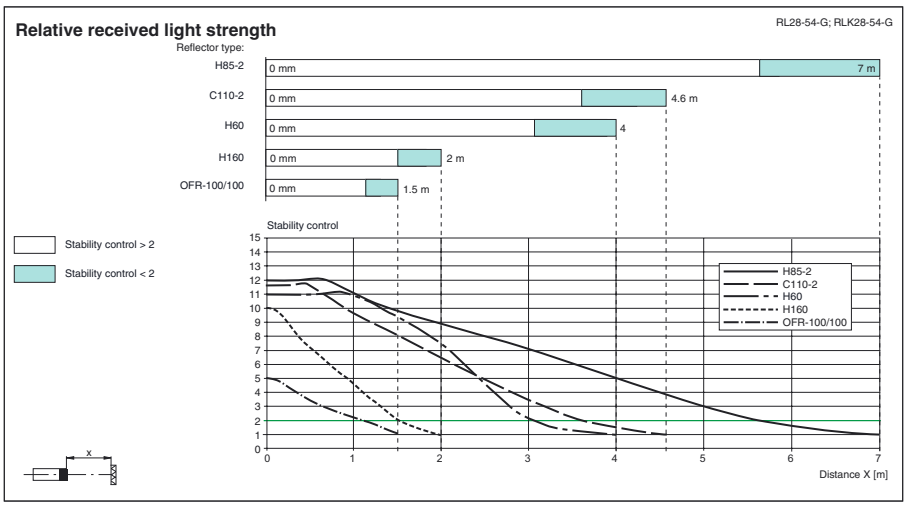
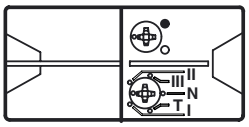
Curves/Diagrams





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 %
  1. LED permanently lit: light path unobstructed
  2. LED off: element to be sensed detected
  3. 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 lenght 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 contras detection mode (Teach-Mode) the stability reseve must be at least 2.5 (see curve „relative received light strength“).

Timer functions

Timer function	Switching type		Receiver exposed Receiver dark
ON 1 2 3 4 Without	Light		ON
	Dark		OFF
ON 1 2 3 4 one shot	Light	t_{OS} t_{OS} t_{OS}	ON OFF
	Dark	t_{OS} t_{OS} t_{OS}	ON OFF

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.

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