



Retroreflective sensor RL28-54-G-Z/76a/110/116

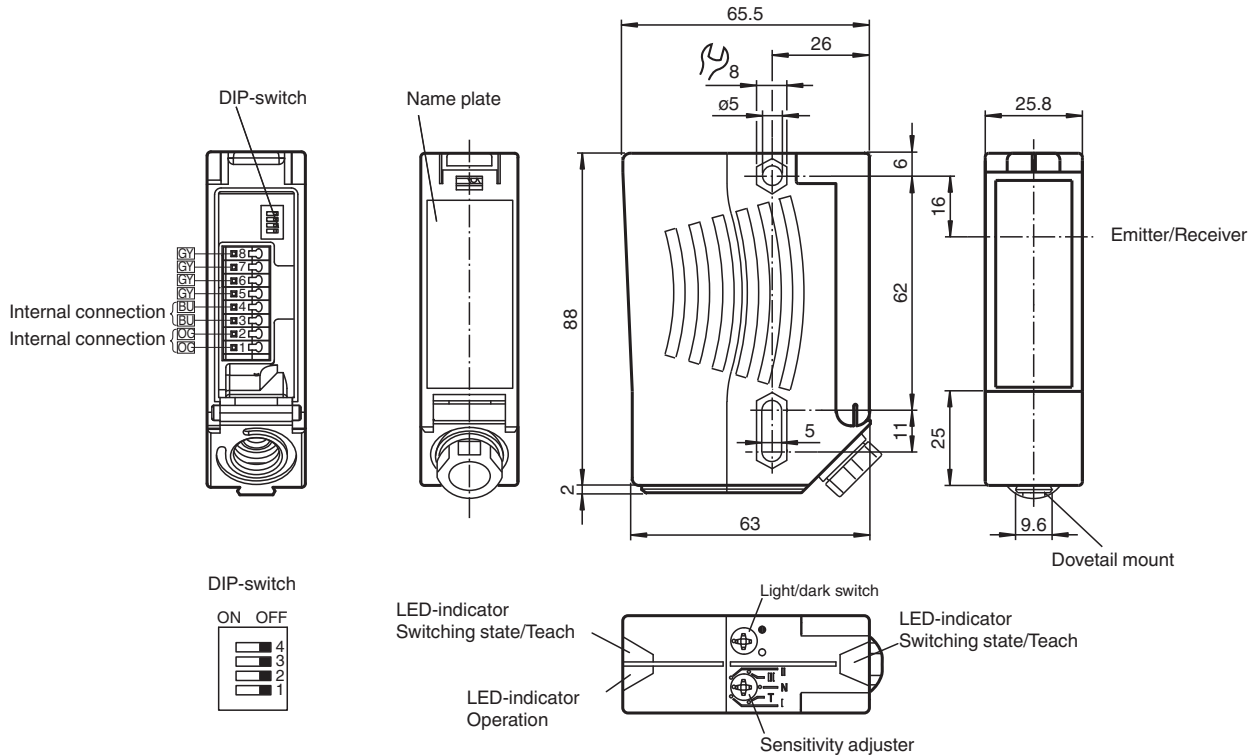


- Detects transparent objects, i.e., clear glass, PET and transparent films
- TEACH-IN switch for setting the contrast detection levels
- Automatic adjustment in case of soiling in contrast detection mode
- Ultra bright LEDs for power on, weak signal indication and switching state
- Flashing power on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

Retroreflective sensor with polarization filter for clear object detection



Dimensions



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
Polarization filter	yes
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)	90 %

Indicators/operating means

Operation indicator	LED green, flashes in case of short-circuit
Function indicator	2 LEDs yellow for switching state, stability control, TEACH-IN and contrast detection mode
Control elements	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

Test input	emitter deactivation at +U _B
Function input	Ext. Teach-In input (ET)

Output

Switching type		light/dark on switchable
Signal output		1 push-pull (4 in 1) output, short-circuit protected, reverse polarity protected
Switching voltage		max. 30 V DC
Switching current		max. 100 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

Conformity

Product standard	EN 60947-5-2
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Approvals and certificates

EAC conformity	TR CU 020/2011
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	CCC approval / marking not required for products rated ≤36 V

Ambient conditions

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

Mechanical specifications

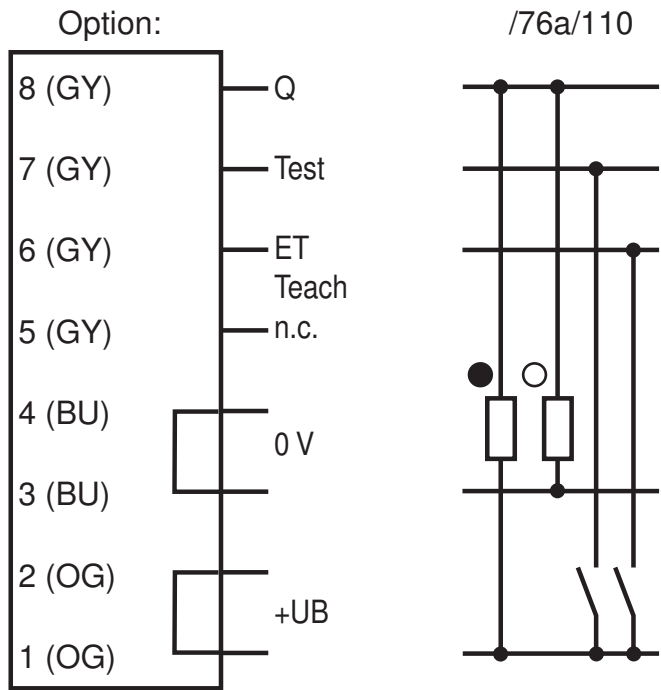
Housing width	25.8 mm
Housing height	88 mm

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Technical Data

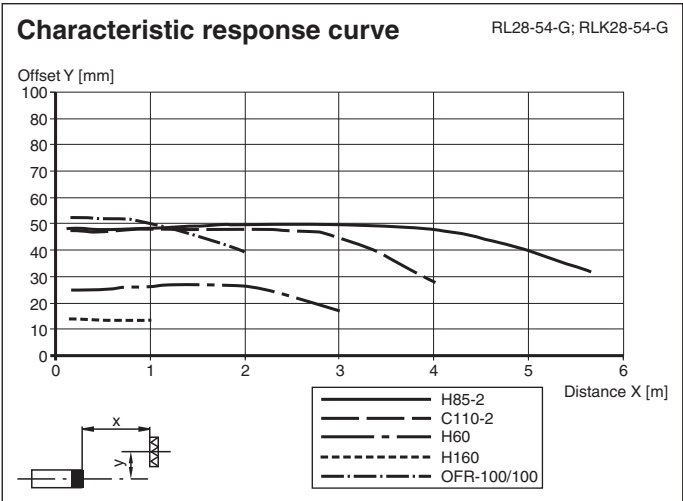
Housing depth	65.5 mm
Degree of protection	IP67
Connection	terminal compartment with 8 spring-loaded terminals for wire cross section 0.5 ... 1.5 mm², insulation stripping 7.5 ... 8.5 mm, M16 x 1.5 cable gland
Material	
Housing	Plastic ABS
Optical face	Plastic pane
Mass	90 g

Connection Assignment

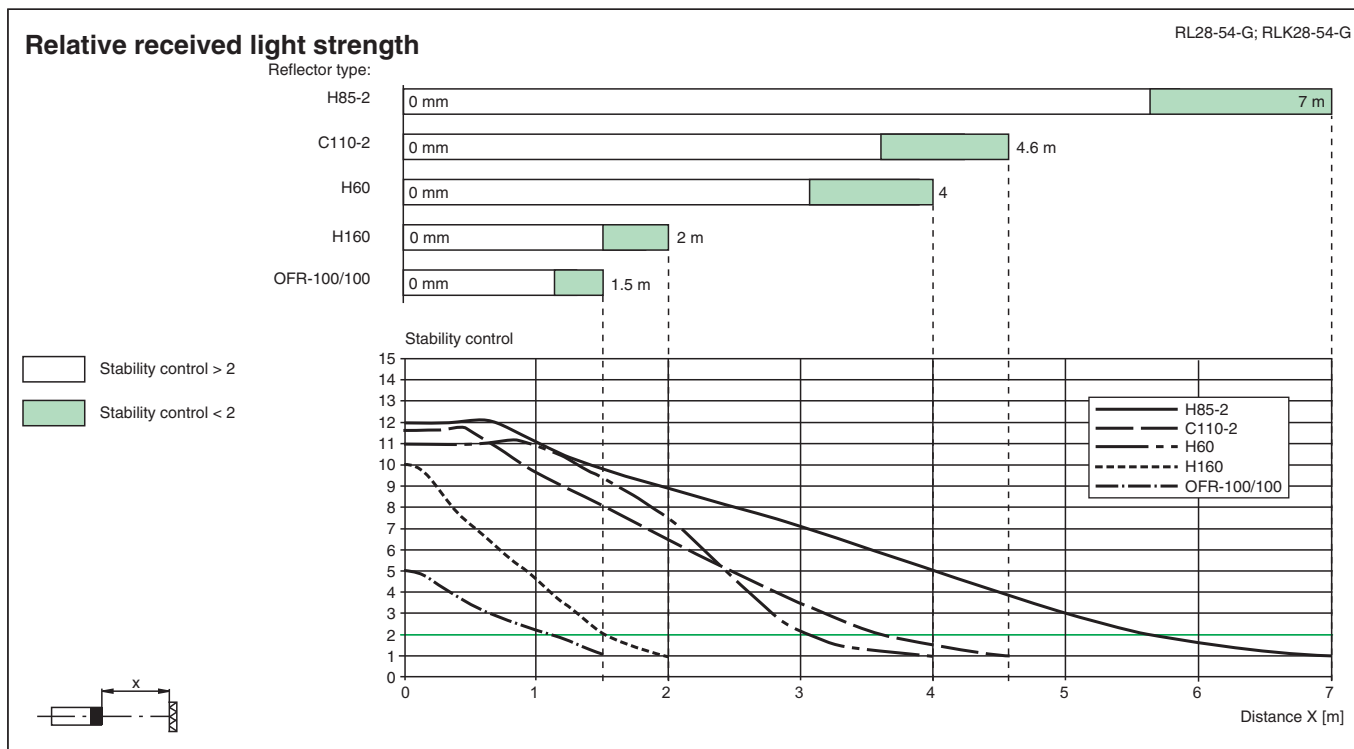


○ = Light on
● = Dark on

Characteristic Curve



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Mounting

Zeitfunktionen Fonctions de temporisation Funzioni di temporizzazione

Timer functions Funciones de tiempo

Zeitfunktion	Schaltungsart		Empfänger belichtet Empfänger dunkel
ON 1 2 3 4 Ohne	Hell Dunkel		EIN AUS
ON 1 2 3 4 IAB	Hell Dunkel		EIN AUS EIN AUS

Der H/D-Schalter (Schalter links außen) ist in Stellung Dunkelschaltung dargestellt.

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

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

Fonction de temporisation	Mode de commutation		Récepteur éclairé Récepteur non éclairé
ON 1 2 3 4 sans	clair foncé		activé désactivé
ON 1 2 3 4 IAB	clair foncé		activé désactivé activé désactivé

Le commutateur H/D (commutateur à l'extrême gauche) est représenté en position commutation obscur.

Función de tiempo	Modo de conmutación		Receptor recibiendo luz Receptor oscuro
ON 1 2 3 4 Sin	Claro Oscuro		ON OFF
ON 1 2 3 4 IAB	Claro Oscuro		ON OFF ON OFF

El conmutador H/D (conmutador exterior izquierdo) está representado en posición de recucción de la luz.

Funzione tempo	Modo di commutazione		Ricevitore illuminato Ricevitore scuro
ON 1 2 3 4 Senza	Chiaro Scuro		Un Disattivo
ON 1 2 3 4 IAB	Chiaro Scuro		Un Disattivo Un Disattivo

L'interruttore chiaro/scuro (interruttore sul lato esterno sinistro) è rappresentato in posizione di azionamento in scuro.

Accessories

	OMH-05	Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm
	OMH-21	Mounting bracket: mounting aid for sensors in the RL* series
	OMH-22	Mounting aid for RL* series
	OMH-RLK29	Mounting bracket
	OMH-RLK29-HW	Mounting bracket for rear wall mounting
	OMH-RL28-C	Weld slag cover model

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

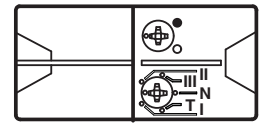
The desired contrast recognition capability can be adjusted by applying of a logic „high“ pulse with a certain pulse length when the switch is in position T.

I: 50 ms (30 ms ... 100 ms)

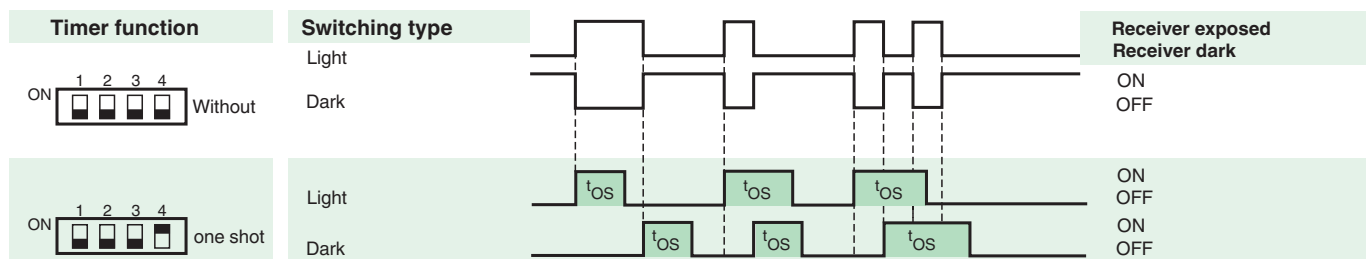
II: 150 ms (100 ms ... 200 ms)

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.

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.