

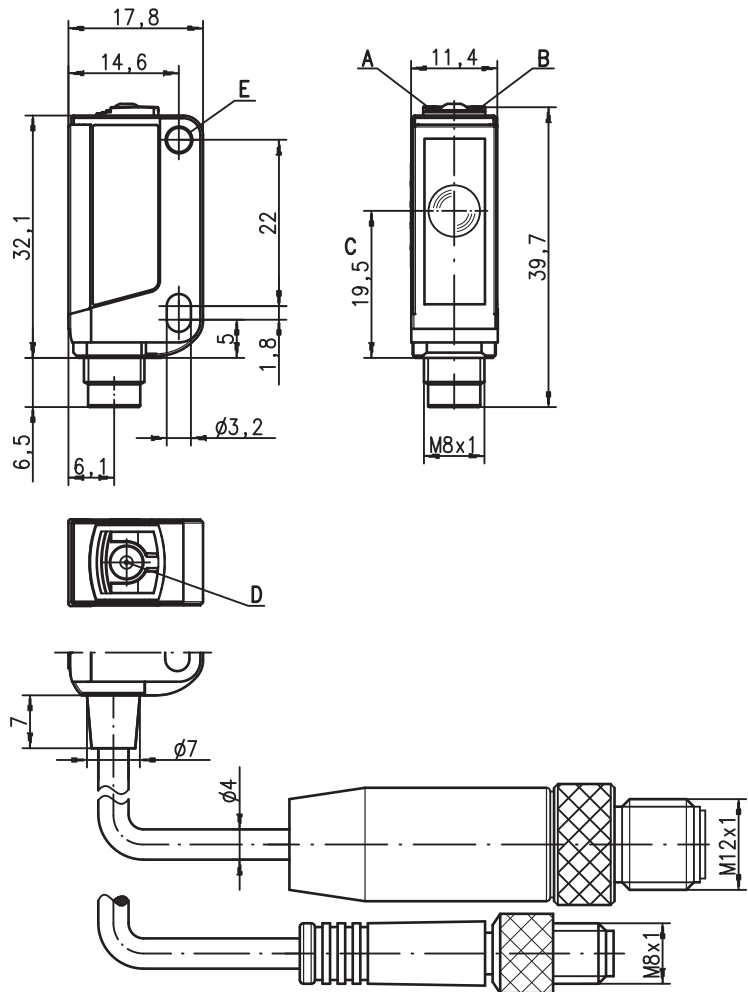
**RKR 3B Foils + Glass panes**

**Retro-reflective photoelectric sensor**

en 08-2011/04 50105367



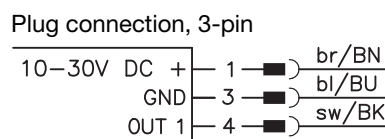
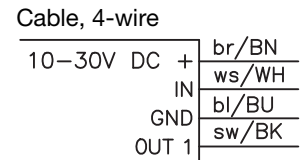
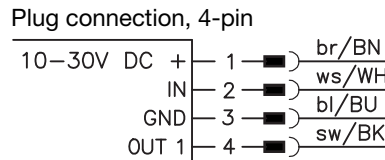
**Dimensioned drawing**



- A** Green indicator diode
- B** Yellow indicator diode
- C** Optical axis
- D** Teach button
- E** Attachment sleeve

- Retro-reflective photoelectric sensor with visible red laser light and autocollimation principle
- Especially for highly transparent foils glass panes
- Small and compact construction with robust plastic housing, protection class IP 67 for industrial application
- Push-pull output with light/dark switching via teach-in button
- High switching frequency for detection of fast events
- Easy adjustment via lockable teach button or teach input
- May also be used with glass reflectors (TG)

**Electrical connection**



**Accessories:**

- (available separately)
- Mounting systems (BT 3...)
  - Cable with M8 or M12 connector (K-D ...)
  - Reflectors
  - Reflective tapes

We reserve the right to make changes • DS\_RKR3B\_Teach\_en.fm

### Specifications

#### Optical data

Typ. op. range limit (TK(S) 100x100) <sup>1)</sup> 0 ... 1.8m  
 Operating range <sup>2)</sup> see tables  
 Light source <sup>3)</sup> LED (modulated light)  
 Wavelength 620nm (visible red light)

#### Timing

Switching frequency 1,000Hz  
 Response time 0.5ms  
 Delay before start-up ≤ 300ms

#### Electrical data

Operating voltage  $U_B$  <sup>4)</sup> 10 ... 30VDC (incl. residual ripple)  
 Residual ripple ≤ 15% of  $U_B$   
 Open-circuit current ≤ 15mA  
 Switching output <sup>5)</sup> .../6.42 1 push-pull switching output  
 pin 4: PNP light switching, NPN dark switching  
 pin 2: teach input  
 .../6.42...-S8.3 1 push-pull switching output  
 pin 4: PNP light switching, NPN dark switching  
 pin 2: activation input  
 .../4.48 1 PNP switching output, light switching  
 pin 2: activation input  
 light/dark reversible  
 Signal voltage high/low  $\geq (U_B - 2V) / \leq 2V$   
 Output current max. 100mA  
 Operating range setting via teach-in

#### Indicators

Green LED ready  
 Yellow LED light path free

#### Mechanical data

Housing <sup>6)</sup> plastic (PC-ABS), 1 attachment sleeve, nickel-plated steel  
 Optics cover plastic (PMMA)  
 Weight with connector: 10g  
 with 200mm cable and connector: 20g  
 with 2m cable: 50g  
 2m cable (cross section 4x0.20mm<sup>2</sup>),  
 connector M8 metal,  
 0.2m cable with connector M8 or M12

Connection type

#### Environmental data

Ambient temp. (operation/storage) -30°C ... +55°C / -30°C ... +70°C  
 Protective circuit <sup>7)</sup> 2, 3  
 VDE safety class III  
 Protection class IP 67  
 Light source free group (in accordance with EN 62471)  
 Standards applied IEC 60947-5-2  
 Certifications UL 508 <sup>4)</sup>

#### Options

##### Teach-in input/activation input

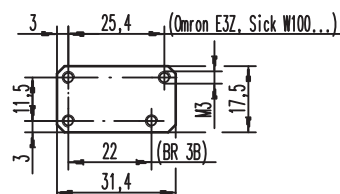
Transmitter active/not active  $\geq 8V / \leq 2V$   
 Activation/disable delay  $\leq 1ms$   
 Input resistance 30kΩ

- 1) Typ. operating range limit: max. attainable range without performance reserve
- 2) Operating range: recommended range with performance reserve
- 3) Average life expectancy 100,000h at an ambient temperature of 25°C
- 4) For UL applications: for use in class 2 circuits according to NEC only
- 5) The push-pull switching outputs must not be connected in parallel
- 6) Patent Pending Publ. No. US 7,476,848 B2
- 7) 2=polarity reversal protection, 3=short-circuit protection for all transistor outputs

### Remarks

Adapter plate:

BT 3.2 (part no. 50103844) for alternate mounting on 25.4mm hole spacing (Omron E3Z, Sick W100...)



### Tables

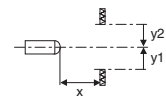
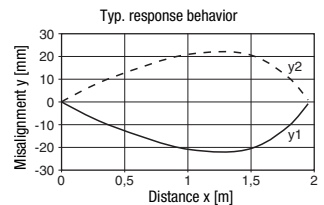
Reflectors	Operating range
1 TK(S) 100x100	0 ... 1.5m
2 TK 40x60	0 ... 1.0m
3 MTKS 50x50	0 ... 1.0m
4 TK 20x40	0 ... 0.5m

1	0	1,5	1,8
2	0	1	1,2
3	0	1	1,2
4	0	0,5	0,6

□ Operating range [m]  
 □ Typ. operating range limit [m]

TK ... = adhesive  
 TKS ... = screw type  
 MTKS ... = micro triple, screw type

### Diagrams



### Remarks

Mounting system:



- ① = BT 3 (part no. 50060511)
- ②+③ = BT 3.1 <sup>1)</sup> (part no. 50105585)
- ①+②+③ = BT 3B (part no. 50105546)

1) Packaging unit: PU = 10 pcs.

**Order guide**

Selection table				Order code →							
Equipment ↓				RKR 3B/6.42 Part No. 50104702	RKR 3B/6.42-S8 Part No. 50104703	RKR 3B/6.42, 200-S8 Part No. 50104704	RKR 3B/6.42, 200-S12 Part No. 50105763	RKR 3B/6.42-S8.3 on request	RKR 3B/6.42, 200-S8.3 on request	RKR 3B/6D 42 Part No. 50107914	
Output 1 (OUT 1)	push-pull switching output, configurable		light switching	○	● <sup>1)</sup>	● <sup>1)</sup>	● <sup>1)</sup>	● <sup>1)</sup>	● <sup>1)</sup>	● <sup>1)</sup>	●
			dark switching	●	●	●	●	●	●	● <sup>1)</sup>	
	PNP transistor output		light switching	○							
			dark switching	●							
Input (IN)	teach input			●	●	●	●			●	
	activation input										
Connection	cable 2,000mm		4-wire	●						●	
	M8 connector, metal		3-pin					●			
	M8 connector, metal		4-pin		●						
	200mm cable with M8 connector		3-pin						●		
	200mm cable with M8 connector		4-pin			●					
	200mm cable with M12 connector		4-pin				●				
Configuration	teach-in via button (lockable) and teach input			●	●	●	●			●	
	teach-in via button							●	●		
Special area of application	optimized for detection of foils < 20µm			●	●	●	●	●	●	●	
	optimized for detection of PET and glass bottles										

1) Presetting, light/dark switching, adjustable

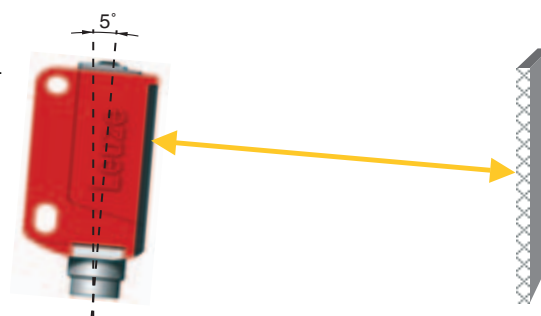
**General information**

- **Approved purpose:**  
This product may only be used by qualified personnel and must only be used for the approved purpose. This sensor is not a safety sensor and is not to be used for the protection of persons..
- The light spot may not exceed the reflector.
- Preferably use MTKS 50x50 reflectors.
- For reflecting objects, the sensor has to be mounted approx. 5° angular towards the object.

**Sensor adjustment (teach) via teach button**



- **Prior to teaching:**  
**Clear the light path to the reflector!**  
The device setting is stored in a fail-safe way. A re-configuration following voltage interruption or switch-off is thus not required.

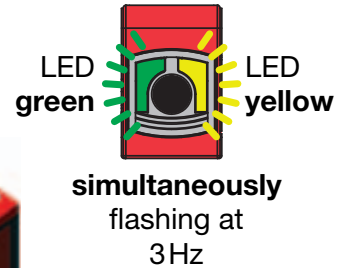
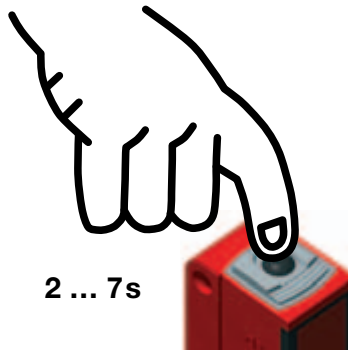


**Standard teaching for average sensor sensitivity for bottle detection**

- Press teach button until both LEDs flash **simultaneously**.
- Release teach button.
- Ready – bottles can be detected.



If the receive signal from the reflector is too weak, the sensor indicates the error status by means of fast and simultaneous flashing of the green and yellow LEDs. Please check the alignment, operating range, and soiling and carry out another teaching.

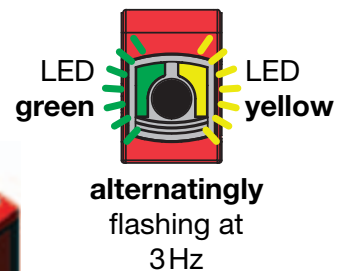
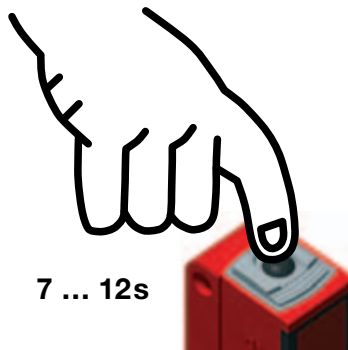


**Teaching for increased sensor sensitivity for foil detection**

- Press teach button until both LEDs flash **alternatingly**.
- Release teach button.
- Ready – foils can be detected.

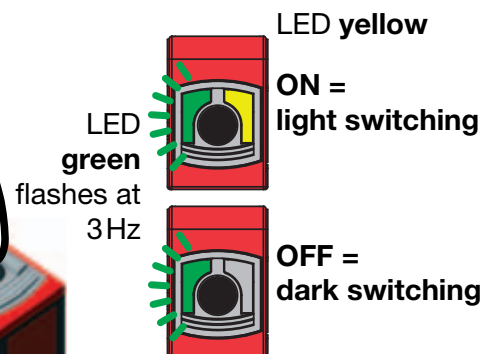
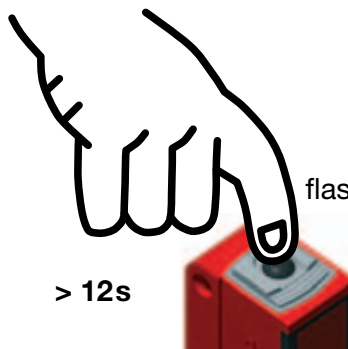


If the receive signal from the reflector is too weak, the sensor indicates the error status by means of fast and simultaneous flashing of the green and yellow LEDs. Please check the alignment, operating range, and soiling and carry out another teaching.



**Adjusting the switching behavior of the switching output – light/dark switching**

- Press teach button until the green LED flashes. The yellow LED displays the current setting of the switching output:  
 ON = output switches on light  
 OFF = output switches on dark
- Continue to press the teach button in order to change the switching behavior.
- Release teach button.
- Ready.

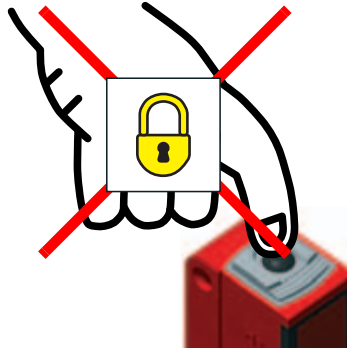


**Locking the teach button via the teach input**



A **static high signal** ( $\geq 4$  ms) at the teach input locks the teach button on the device if required, such that no manual operation is possible (e.g., protection from erroneous operation or manipulation).

If the teach input is not connected or if there is a static low signal, the button is unlocked and can be operated freely.



**Sensor adjustment (teach) via teach input**



The following description applies to PNP switching logic!

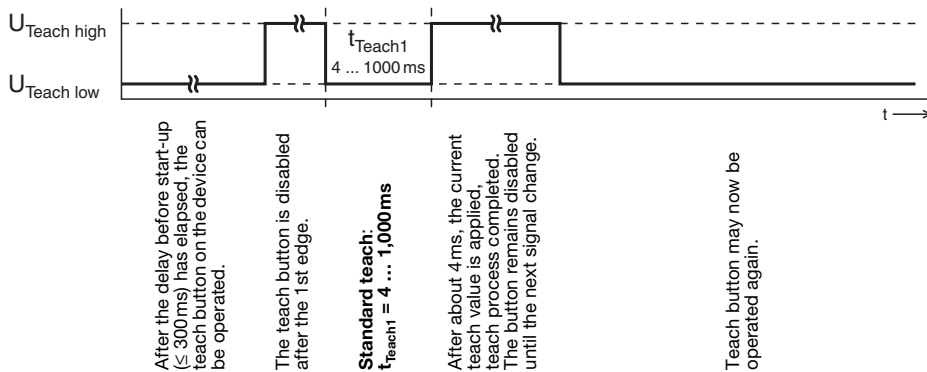
$U_{\text{Teach low}} \leq 2V$

$U_{\text{Teach high}} \geq (U_B - 2V)$

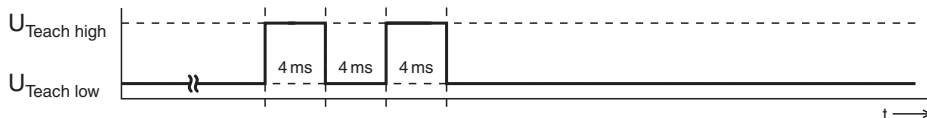
**Prior to teaching: Clear the light path to the reflector!**

The device setting is stored in a fail-safe way. A reconfiguration following voltage interruption or switch-off is thus not required.

**Standard teaching for average sensor sensitivity for bottle detection**



**Quick standard teach**

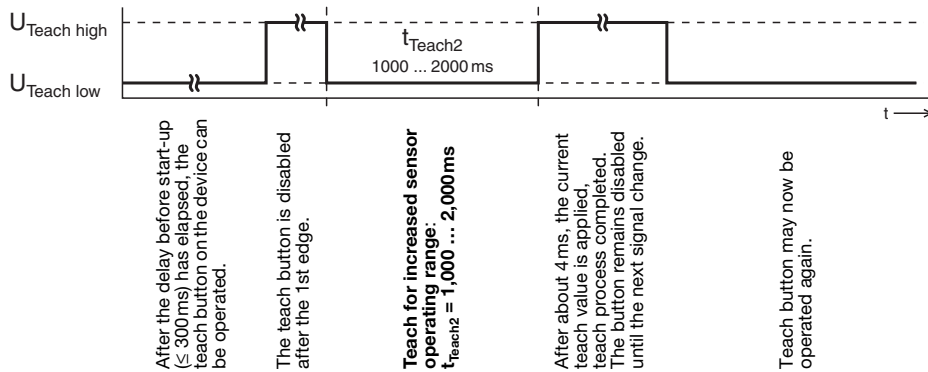


**shortest teaching duration for standard teaching: approx. 12ms**



If the receive signal from the reflector is too weak, the sensor indicates the error status by means of fast and simultaneous flashing of the green and yellow LEDs. Please check the alignment, operating range, and soiling and carry out another teaching.

**Teaching for increased sensor sensitivity for foil detection**



After the delay before start-up ( $\leq 300$ ms) has elapsed, the teach button on the device can be operated.

The teach button is disabled after the 1st edge.

**Teach for increased sensor operating range:**  
 $t_{Teach2} = 1,000 \dots 2,000$  ms

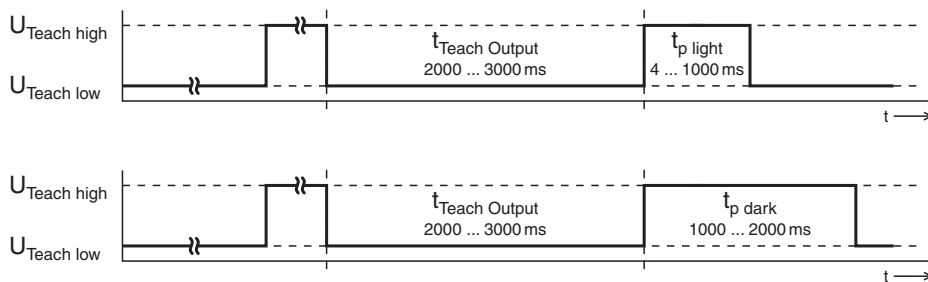
After about 4ms, the current teach value is applied, teach process completed. The button remains disabled until the next signal change.

Teach button may now be operated again.



If the receive signal from the reflector is too weak, the sensor indicates the error status by means of fast and simultaneous flashing of the green and yellow LEDs. Please check the alignment, operating range, and soiling and carry out another teaching.

**Adjusting the switching behavior of the switching output – light/dark switching**



After the delay before start-up ( $\leq 300$ ms) has elapsed, the teach button on the device can be operated.

The teach button is disabled after the 1st edge.

**Setting the switching behavior of the switching output:**  
 $t_{Teach Output} = 2,000 \dots 3,000$  ms

**Switching output switches on light:**  
 $t_{p light} = 4 \dots 1,000$  ms

**Switching output switches on dark:**  
 $t_{p dark} = 1,000 \dots 2,000$  ms

The button remains disabled until the next signal change.