

PRK 3B AutoTeach Retro-reflective photoelectric sensors with polarization filter

en 07-2012/06 50107259



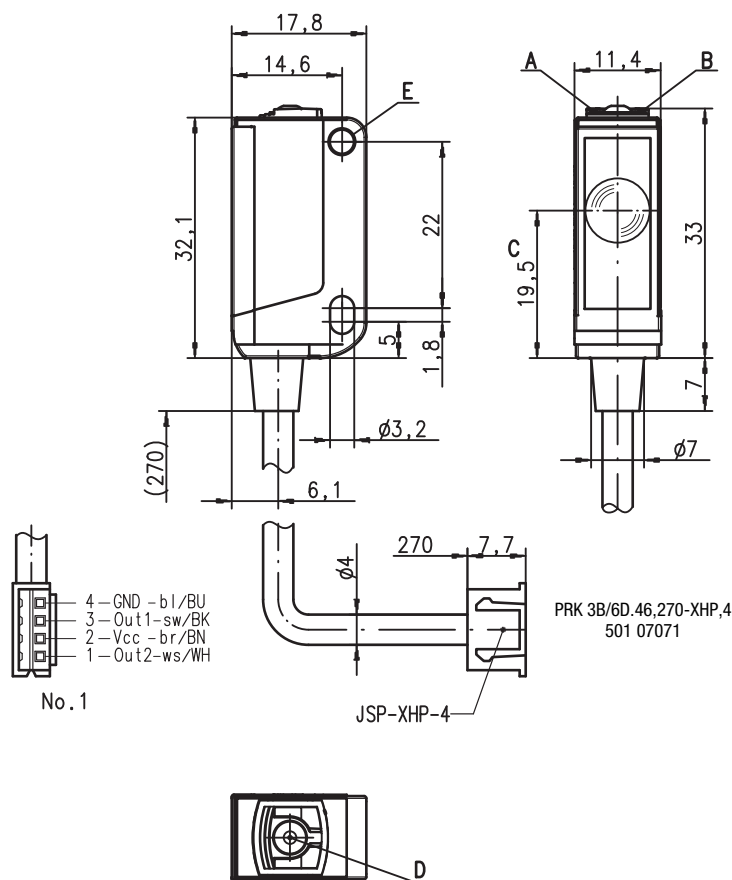
		AutoTeach PET Glas	0 ... 5m
10 - 30 V DC			

- Polarized retro-reflective photoelectric sensor with visible red light
- Especially for transparent PET and glass bottles
- AutoTeach (cyclic automatic teach event) for contamination compensation
- A²LS- Active Ambient Light Suppression
- Push-pull switching output
- High switching frequency for detection of fast events
- Autocollimation principle

Accessories:
(available separately)

- Mounting systems (BT 3...)
- Reflectors
- Reflective tapes

Dimensioned drawing



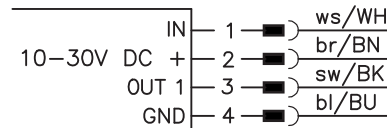
No. 1

PRK 3B/6D.46.270-XHP,4
501 07071

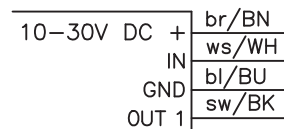
- A Green indicator diode
- B Yellow indicator diode
- C Optical axis
- D Teach button
- E Mounting sleeve

Electrical connection

XHP plug connection, 4-pin



Cable, 4-wire



We reserve the right to make changes • DS_PRK3BAutoTeach_en_50107259.fm

Specifications

Optical data

Typ. operating range limit (TK(S) 100x100) ¹⁾ 0 ... 5m
 Operating range ²⁾ see tables
 Light source ³⁾ LED (modulated light)
 Wavelength 620nm (visible red light, polarized)

Timing

Object frequency max. 100Hz with gap duration ≥ 10ms
 Response time 0.5ms
 Delay before start-up ≤ 300ms

Electrical data

Operating voltage U_B ⁴⁾ 10 ... 30VDC (incl. residual ripple)
 Residual ripple ≤ 15% of U_B
 Open-circuit current ≤ 18mA
 Switching output/warning output ⁵⁾.../6D.46 1 push-pull output
 pin 3: PNP dark switching, NPN light switching
 pin 1: teach input
 Switching function dark switching
 Warning function change signal of 2Hz at the switching output (see remarks)
 Signal voltage high/low ≥ ($U_B - 2V$) / ≤ 2V
 Output current max. 100mA
 Operating range ⁶⁾ automatic setting cyclically performed by AutoTeach every 60s or manual teach-in

Indicators

Green LED ready
 Yellow LED light path free
 Yellow and green LEDs flash error: reflector not present during teach-in or prefailure message for AutoTeach

Mechanical data

Housing ⁷⁾ plastic (PC-ABS); 1 attachment sleeve, nickel-plated steel
 Optics cover plastic (PMMA)
 Weight 20g
 Connection type 270mm cable with XHP plug connection, 4-pin
 2m cable (cross section 4x0.20mm²)

Environmental data

Ambient temp. (operation/storage) -30°C ... +55°C / -30°C ... +70°C
 Protective circuit ⁸⁾ 2, 3
 VDE safety class III
 Protection class IP 67
 Light source Free group (in acc. with EN 62471)
 Standards applied IEC 60947-5-2
 Certifications UL 508 ⁴⁾

Options

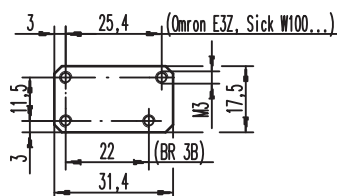
Teach-in input/activation input
 Transmitter active/not active ≥ 8V / ≤ 2V
 Activation/disable delay ≤ 1ms
 Input resistance 30kΩ

- 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) Life expectancy typically 100,000 storage cycles
- 7) Patent Pending Publ. No. US 7,476,848 B2
- 8) 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 25.4 mm hole spacing (Omron E3Z, Sick W100...)



Tables

Reflectors		Operating range
1	TK(S) 100x100	0 ... 4.0m
2	MTKS 50x50.1	0 ... 3.5m
3	Tape 6 50x50	0 ... 3.0m
4	TK 40x60	0 ... 2.6m
5	TK 20x40	0 ... 1.3m

1	0	4	5
2	0	3.5	4.2
3	0	3.0	3.6
4	0	2.6	3.2
5	0	1.3	1.5

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

TK ... = adhesive
 TKS ... = screw type

Diagrams

Remarks

- 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 as well as by a change signal of 2Hz at the switching output. Please check the alignment, operating range, and soiling and carry out another teaching.
- Mounting system:




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

1) Packaging unit: PU = 10 pcs.

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Order guide

Selection table		Order code →		PRK 3B/6D.46, 270-XHP.4 Part no. 50107071	PRK 3B/6D.46 Part no. 50108026		
Output 1 (OUT 1)	Push-pull switching output		PNP, dark switching ●	●	●		
			NPN, light-switching ○	●	●		
Function characteristics	Switching output		●	●			
	warning output (change signal of 2 Hz at the switching output)		●	●			
Input (IN)	teach input		●	●			
Connection	270mm cable with XHP plug connection, 4-pin		●				
	2,000mm cable, 4-pin			●			
Configuration	AutoTeach, cyclic every 60s		●	●			
	Teach-in via button (lockable) and teach input		●	●			

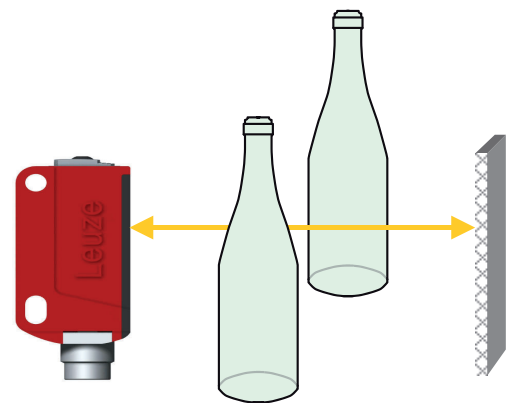
General information

- **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.
- After power-on, an **automatic teach-in** occurs **every 60s (AutoTeach)**.
- The light spot may not exceed the reflector.
- Preferably use MTK(S) or tape 6.
- For foil 6, the sensor's side edge must be aligned parallel to the side edge of the reflective tape.
- Following an AutoTeach, the device setting is only saved if contamination differences > 8% were detected. Therefore, the typical life expectancy of the device is not affected in practical use.

AutoTeach (cyclic automatic teach event)



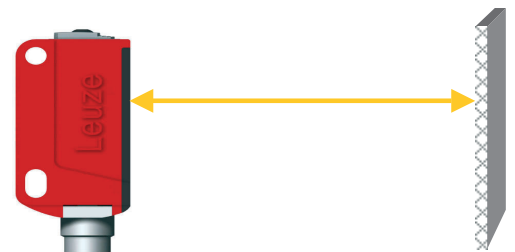
- **The sensor performs a cyclic AutoTeach every 60s.**
The sensor waits until the light path is free (e.g. between two bottles). An appropriate safety window is taken into account. Afterwards, an AutoTeach occurs and the sensor compensates for all contamination parameters. The new teach value is only saved if a system contamination > 8% was 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 as well as by a change signal of 2Hz at the switching output. Please check the alignment, operating range, and soiling and carry out another teaching.



Teach via teach button for PET and glass bottles



- **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.

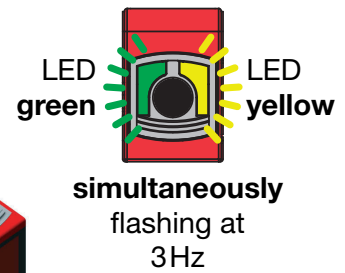
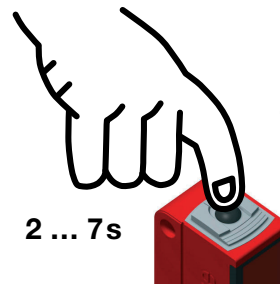


Teach process (teach button) for PET and glass bottles

- Press teach button until both LEDs flash **simultaneously**.
- Release teach button.
- Finished - AutoTeach remains active.



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 as well as by a change signal of 2Hz at the switching output. Please check the alignment, operating range, and soiling and carry out another teaching.

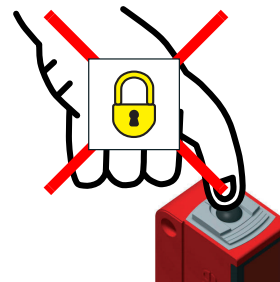


Locking the teach button via the teach input



A **static high signal** (≥ 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.



Teach via teach input for PET and glass bottles



The following description applies to PNP switching logic!

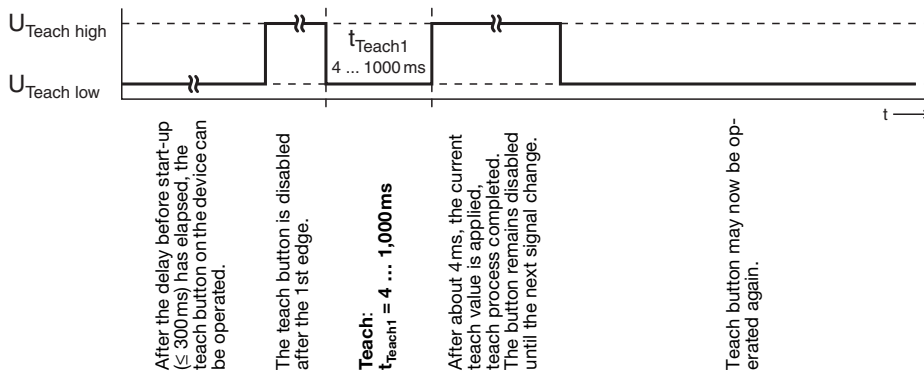
$$U_{\text{Teach low}} \leq 2V$$

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

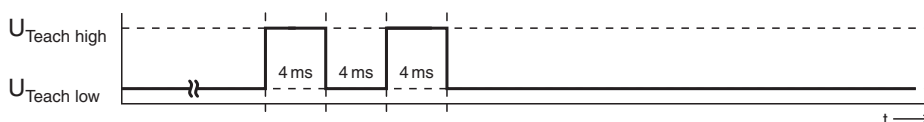
Prior to teaching: Clear the light path to the reflector!

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

Teach process (teach input) for PET and glass bottles



Quick 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 as well as by a change signal of 2Hz at the switching output. Please check the alignment, operating range, and soiling and carry out another teaching.