



**Specifications (not valid for RKL 3B/6.22 !)**

**Optical data**

Typ. op. range limit (MTKS 50 x 50) <sup>1)</sup>	0 ... 3m
Operating range <sup>2)</sup>	see tables
Light beam characteristic	collimated, ≤ 3mrad
Light spot diameter	approx. 2mm at light beam gate
Light source <sup>3)</sup>	laser (pulsed)
Wavelength	655nm (visible red light, polarised)
Max. output power	0.29mW
Pulse duration	≤ 5.5µs

**Timing**

Switching frequency	2,000Hz
Response time	0.25ms
Delay before start-up	≤ 300ms

**Electrical data**

Operating voltage U <sub>B</sub> <sup>4)</sup>	10 ... 30VDC (incl. residual ripple)
Residual ripple	≤ 15% of U <sub>B</sub>
Open-circuit current	≤ 15mA
Switching output <sup>5)</sup>	.../6.22 1 push-pull switching output
	pin 4: PNP light switching, NPN dark switching
	pin 2: teach input
	.../6.2...-S8.3 1 push-pull switching output
	pin 4: PNP light switching, NPN dark switching
	.../4.28 1 PNP switching output, light switching,
	pin 2: activation input
	light/dark reversible
Function characteristics	≥ (U <sub>B</sub> -2V)/≤ 2V
Signal voltage high/low	max. 100mA
Output current	setting via teach-in
Operating range	

**Indicators**

Green LED	ready
Yellow LED	light path free
Yellow LED, flashing	light path free, no performance reserve <sup>6)</sup>

**Mechanical data**

Housing	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
Connection type	2m cable (cross section 4x0.20mm <sup>2</sup> ), connector M8 metal, 0.2m cable with connector M8 or M12

**Environmental data**

Ambient temp. (operation/storage)	-10°C ... +55°C <sup>7)</sup> / -30°C ... +70°C
Protective circuit <sup>8)</sup>	2, 3
VDE safety class	II for cable <sup>9)</sup> , III for metal plug
Protection class	IP 67, IP 69K
Laser class	1 (acc. to EN 60825-1)
Standards applied	IEC 60947-5-2
Certifications	CDRH 21 CFR 1040, UL 508 <sup>4)</sup>

**Options**

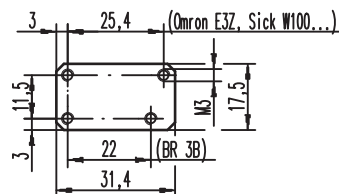
<b>Teach-in input/activation input</b>	
Transmitter active/not active	≥ 8V/≤ 2V
Activation/disable delay	≤ 1ms
Input resistance	30kΩ

- 1) Typ. operating range limit: max. attainable range without performance reserve
- 2) Operating range: recommended range with performance reserve
- 3) Average life expectancy 50,000h 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) Display "no performance reserve" as yellow flashing LED is only available in standard teach setting
- 7) Without mounting max. +50°C, with screw mounting on metal part up to +55°C permissible
- 8) 2=polarity reversal protection, 3=short-circuit protection for all transistor outputs
- 9) Rating voltage 50V

**Remarks**

Adapter plate:

BT 3.2 (Part No. 501 03844) for alternate mounting on 25.4mm hole spacing (Omron E3Z, Sick W100...)



**Tables**

Reflectors		Operating range	
1	MTKS 50x50	0 ... 2.0m	
2	MTKS 20x30	0 ... 1.6m	
3	MTKS 20x40.1	0 ... 1.0m	
4	Tape 6 50x50	0 ... 1.0m	
5	Tape 4 25x20	0 ... 0.3m	

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

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

MTKS ... = micro triple, screw type

**Diagrams**

**Remarks**

Leuze electronic  
 PO Box 1111 D-73277 Owen/Teck  
 Type: PRKL ...  
 Ord.no.: 50 ...  
 Ser.no.: 0602-1812197402 Qty: 1 Stück  
 Laser Class 1  
 Complies with 21 CFR 1040.10 except for deviations pursuant to laser notice 50

- **Approved purpose:**  
 The retro-reflective photo-electric sensors are optical electronic sensors for optical, contactless detection of objects.

Mounting system:



- ① = BT 3 (Part No. 500 60511)
- ②+③ = BT 3.1 <sup>1)</sup> (Part No. 501 05585)
- ①+②+③ = BT 3B (Part No. 501 05546)

1) Packaging unit: PU = 10 pcs.

**PRKL 3B Laser retro-reflective photoelectric sensor with polarisation filter**

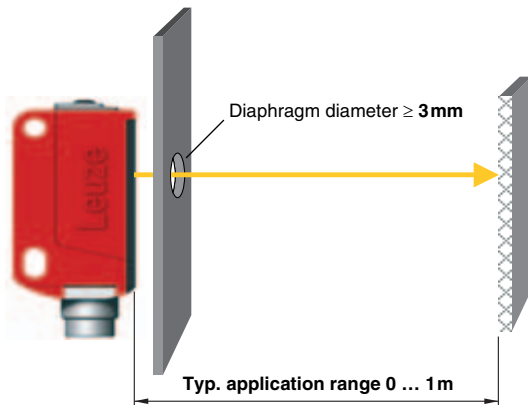
**Order guide**

Selection table			Order code →									
Equipment ↓			PRKL 3B/6.22 Part No. 501 04705	PRKL 3B/6.22-S8 Part No. 501 04706	PRKL 3B/6D.22-S8 Part No. 501 06475	PRKL 3B/6.22. 200-S8 Part No. 501 04707	PRKL 3B/6.22. 200-S12 Part No. 501 05764	PRKL 3B/6.2-S8.3 on request	PRKL 3B/6.2. 200-S8.3 Part No. 501 09484	PRKL 3B/4.28-S8 on request	PRKL 3B/6.22 1) Part No. 501 06854	
Output 1 (OUT 1)	push-pull switching output, configurable	light switching ○	● <sup>2)</sup>	● <sup>2)</sup>	●	● <sup>2)</sup>	● <sup>2)</sup>	● <sup>2)</sup>	● <sup>2)</sup>		● <sup>2)</sup>	
		dark switching ●	●	●	● <sup>2)</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							●	●	●		

1) Special type, prior to use, consult with the head office!  
2) Presetting

**General information**

- The laser retro-reflective photoelectric sensors PRKL 3B/... have an optimised light beam propagation in the typical range of 0 ... 1 m (not to be confused with the operating range, which is 0 ... 3m in combination with a reflector MTKS 50x50). This permits the reliable recognition of the smallest of parts or the positioning of objects with maximum precision across the entire area.
- The sensor is constructed on the basis of the autocollimation principle, i.e., light being transmitted and light being received propagate along the same light axis. This permits the photoelectric sensor to be installed directly behind small holes or diaphragms. The smallest permissible diaphragm diameter for secure functioning is 3mm.



- The achievable resolution depends significantly on the unit's configuration. Depending on the teach mode, the following values are possible:

Setting	Detection from object size <sup>1)</sup>	Sensor switches at a light occlusion of
max. operating range (factory setting)	1.5mm	50%
normal sensor sensitivity (standard teaching)	1 mm	25%
maximum sensor sensitivity (dynamic teaching)	0.1 ... 0.2mm	5%

1) All specifications are typical values and may vary by a small amount for each unit.

- For safety reasons, the laser transmitter is equipped with a monitor, which automatically switches off the transmitter in case of a component defect. In case of failure, the yellow LED flashes rapidly and the green LED is off. The state is irreversible and the sensor must be exchanged.

## 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 reconfiguration following voltage interruption or switch-off is thus not required.



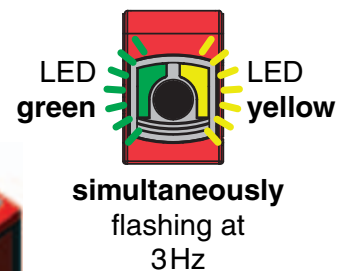
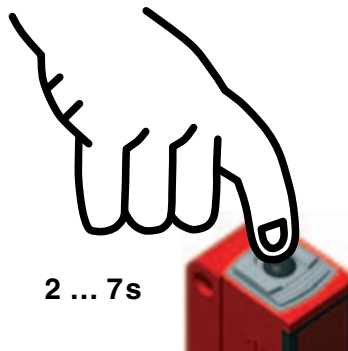
### Standard teaching for average sensor sensitivity

- Press teach button until both LEDs flash **simultaneously**.
- Release teach button.
- Ready.



After standard teaching, the sensor switches for objects with a minimum size of 1 mm (see table under "General Information").

If both LEDs flash rapidly after the teaching event, a teaching error has happened. Please check the alignment of the light beam onto the reflector and carry out another teaching event.



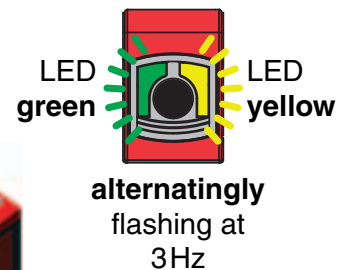
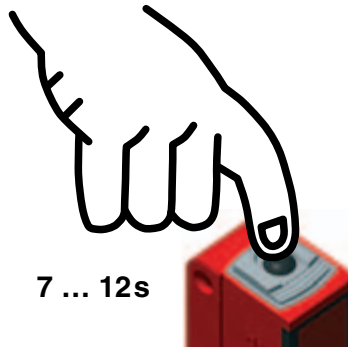
### Teaching for maximal sensor sensitivity (dynamic teaching)

- Press teach button until both LEDs flash **alternatingly**. Sensor remains in teaching mode even after the teach button has been released.
- Move some objects through the light path or swing a single object slowly back and forth through the light path.
- Briefly press the teach button to terminate the teach event.
- Ready.



After teaching for maximum sensor sensitivity, the sensor switches for objects with a minimum size of 0.1 ... 0.2mm (see table under "General Information").

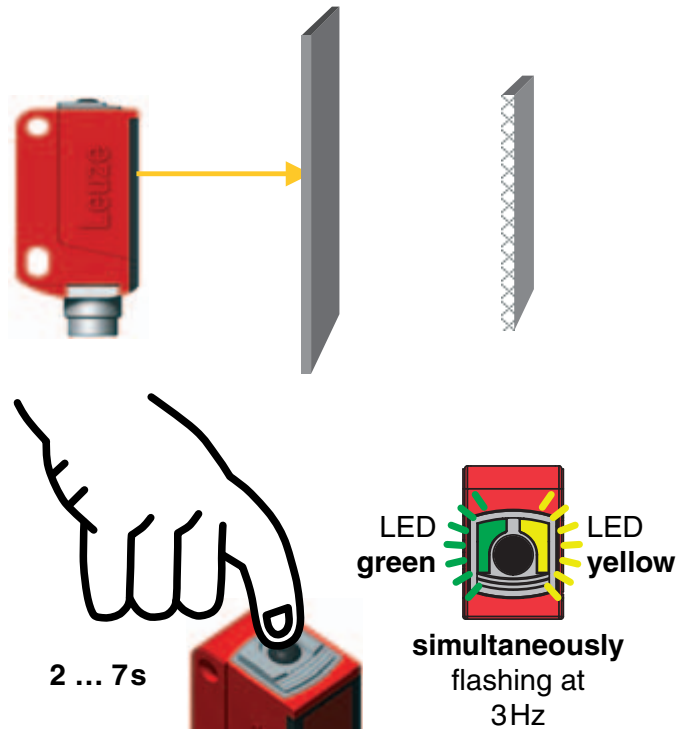
If both LEDs flash rapidly after the teaching event, a teaching error has happened. Please check the alignment of the light beam onto the reflector and carry out another teaching event.



**PRKL 3B Laser retro-reflective photoelectric sensor with polarisation filter**

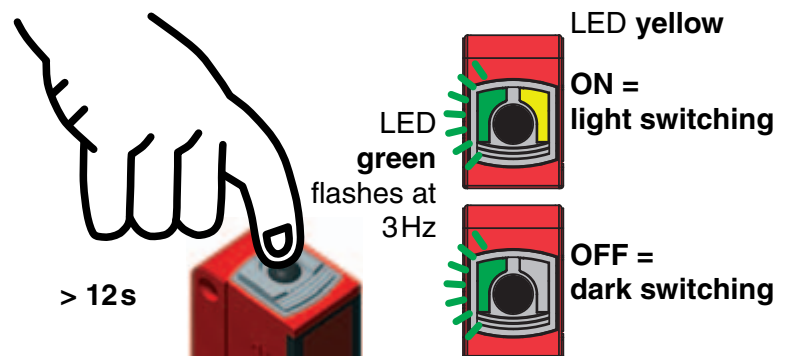
***Teaching for maximum operating range (factory setting at delivery)***

- Prior to teaching:  
Cover the light path to the reflector!
- Procedure as for standard teaching.



***Adjusting the switching behaviour 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 behaviour.
- Release teach button.
- Ready.

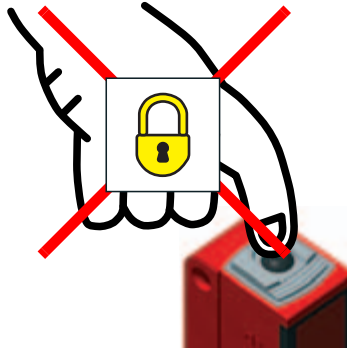


## Locking the teach button via the teach input



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!

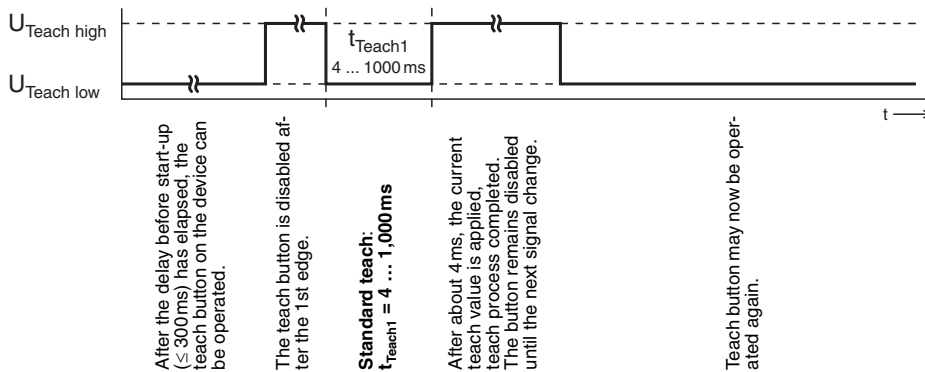
$$U_{\text{Teach low}} \leq 2V$$

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

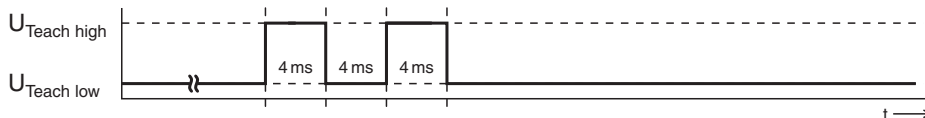
**Prior to teaching: Clear the light path to the reflector!**

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



### Quick standard teach



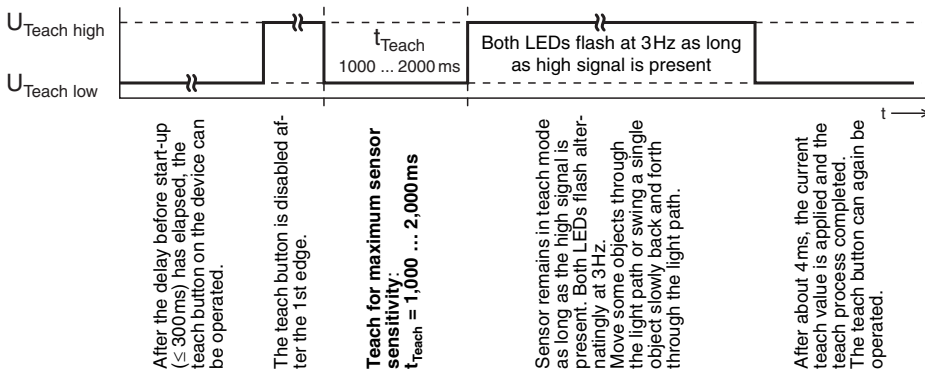
shortest teaching duration for standard teaching: approx. 12ms



After standard teaching, the sensor switches for objects with a minimum size of 1 mm (see table under "General Information").

**PRKL 3B Laser retro-reflective photoelectric sensor with polarisation filter**

***Teaching for maximal sensor sensitivity (dynamic teaching)***



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

The teach button is disabled after the 1st edge.

**Teach for maximum sensor sensitivity:**  
 $t_{\text{Teach}} = 1,000 \dots 2,000\text{ms}$

Sensor remains in teach mode as long as the high signal is present. Both LEDs flash alternately at 3Hz. Move some objects through the light path or swing a single object slowly back and forth through the light path.

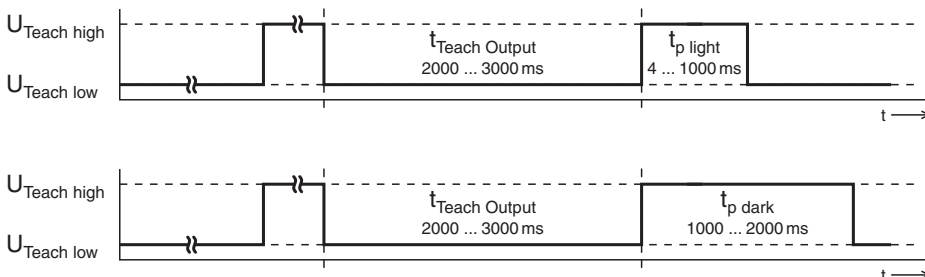
After about 4ms, the current teach value is applied and the teach process completed. The teach button can again be operated.

In the event of a teach error (e.g. no teach object or a teach object which is too small or too transparent is moved through the light path), the two LEDs flash at the same rate. Check the system, repeat the teach process, if necessary use a larger or less transparent teach object.



After teaching for maximum sensor sensitivity, the sensor switches for objects with a minimum size of 0.1 ... 0.2mm (see table under "General Information").

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



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

The teach button is disabled after the 1st edge.

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

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

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

The button remains disabled until the next signal change.

