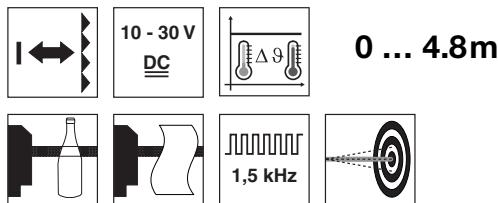


## PRK18B / RK18B

## Retro-reflective sensors for bottles and tape

en 02-2014/01 5 0121193-01



- Retro-reflective photoelectric sensors with autocollimation optics for reliable detection of highly transparent bottles and tape
- User-controlled sensitivity adjustment via 11-turn potentiometer or teach button
- Temperature compensation  $\pm 20^\circ\text{C}$
- High optical accuracy through calibrated optical system

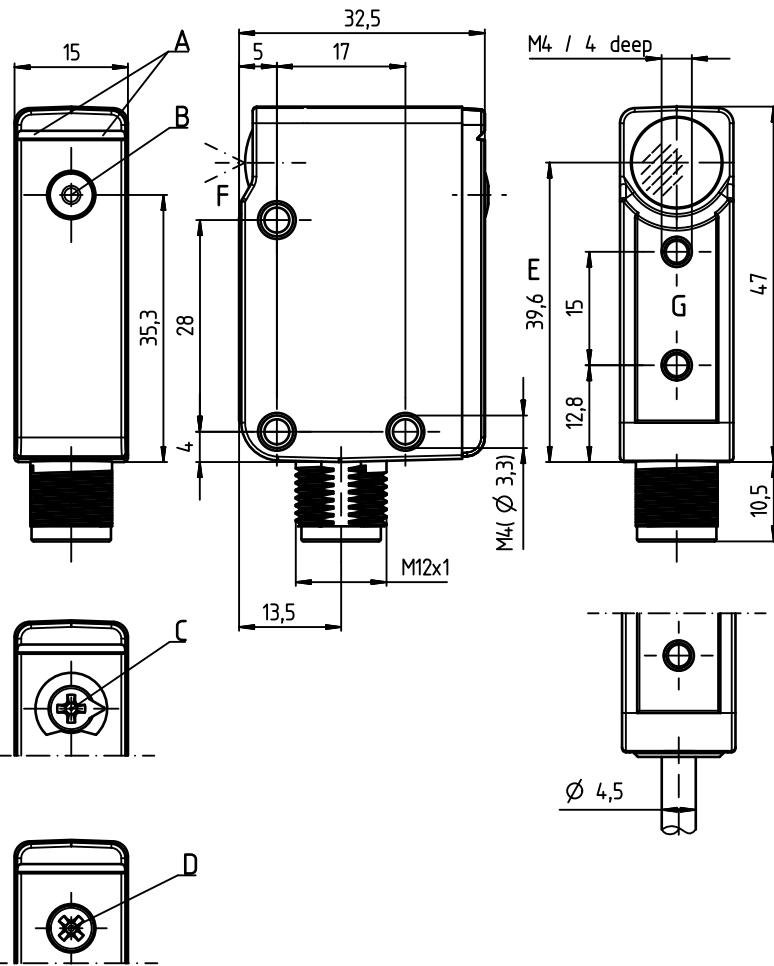


## Accessories:

(available separately)

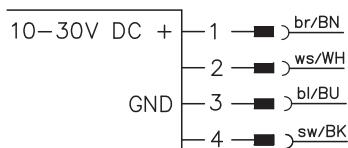
- Mounting system (BTU 200, BT 95)
- M12 connection technology (K-D M12)
- Reflectors (TK, MTK)
- Reflective tape (REF)
- Deflecting mirrors (US18B)

## Dimensioned drawing



**A** Display  
**B** Teach button  
**C** 270° potentiometer  
**D** 11-turn potentiometer  
**E** Optical axis  
**F** Optical accuracy  
**G** Reference plane for F

## Electrical connection



	Pin 1	Pin 2	Pin 3	Pin 4
PRK18B.T2/4P-M12	+	PNP dark	GND	PNP light
PRK18B.XT2/4P-M12	+	PNP dark	GND	PNP light
PRK18B.T2/4X-M12	+	NC	GND	PNP light
PRK18B.T2/PX-M12	+	NC	GND	PNP dark
PRK18B.T2/NX-M12	+	NC	GND	NPN dark
PRK18B.T2/4P-6000	+	PNP dark	GND	PNP light
PRK18B.T2/2N-6000	+	NPN dark	GND	NPN light
PRK18B.T3/4P-M12	+	PNP dark	GND	PNP light
PRK18B.XT3/4P-M12	+	PNP dark	GND	PNP light
PRK18B.T3/2N-M12	+	NPN dark	GND	NPN light
RK18B.T2/4P-M12	+	PNP dark	GND	PNP light
RK18B.T2/2N-M12	+	NPN dark	GND	NPN light

## Specifications

### Optical data

Typ. op. range limit (TK(S) 100x100) <sup>1)</sup>	0 ... 4.8m
Operating ranges <sup>2)</sup>	see tables
Light source <sup>3)</sup>	LED (modulated light)
Wavelength	620nm (visible red light)
Optical accuracy	type dependent (see order guide)

### Timing

Switching frequency	1500Hz
Response time	0.333ms
Jitter time	110µs
Delay before start-up	< 300ms

### Electrical data

Operating voltage UB <sup>4)</sup>	10 ... 30VDC (incl. residual ripple)												
Residual ripple	≤ 15% of UB												
Open-circuit current	≤ 18mA												
Switching outputs/functions	<table border="1"> <tr> <td>/4P</td> <td>2 PNP switching outputs, antivalent</td> </tr> <tr> <td>/4X</td> <td>1 PNP switching output, light switching</td> </tr> <tr> <td>/PX</td> <td>1 PNP switching output, dark switching</td> </tr> <tr> <td>/2N</td> <td>2 NPN switching outputs, antivalent</td> </tr> <tr> <td>/2X</td> <td>1 NPN switching output, light switching</td> </tr> <tr> <td>/NX</td> <td>1 NPN switching output, dark switching ≥ (UB-2V)/≤ 2V max. 100mA adjustable via 11-turn potentiometer or teach button (see order guide)</td> </tr> </table>	/4P	2 PNP switching outputs, antivalent	/4X	1 PNP switching output, light switching	/PX	1 PNP switching output, dark switching	/2N	2 NPN switching outputs, antivalent	/2X	1 NPN switching output, light switching	/NX	1 NPN switching output, dark switching ≥ (UB-2V)/≤ 2V max. 100mA adjustable via 11-turn potentiometer or teach button (see order guide)
/4P	2 PNP switching outputs, antivalent												
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/PX	1 PNP switching output, dark switching												
/2N	2 NPN switching outputs, antivalent												
/2X	1 NPN switching output, light switching												
/NX	1 NPN switching output, dark switching ≥ (UB-2V)/≤ 2V max. 100mA adjustable via 11-turn potentiometer or teach button (see order guide)												
Signal voltage high/low													
Output current													
Sensitivity													

### Indicators

Green LED

#### Sensors with 11-turn potentiometer:

Yellow LED, flashing slowly (6Hz)  
Yellow LED, flashing quickly (15Hz)

Yellow LED, continuous light

#### Sensors with teach button:

Yellow LED, continuous light

### Mechanical data

Housing <sup>5)</sup>

Connector

Optics

Operation

Weight

Connection type

ready

operating pt. 11%: clear glass, tape > 20µm  
operating pt. 35%: colored glass  
operating pt. > 35%: non transparent media

light path free (during operation)

diecast zinc, chemically nickel-plated  
diecast zinc, chemically nickel-plated  
glass  
11-turn potentiometer or teach button  
with M12 connector: 60g  
with 6000mm cable: 240g  
M12 connector, 4-pin  
cable 6000mm, 4 x 0.20mm<sup>2</sup>

### Environmental data

Ambient temp. (operation/storage)

Protective circuit <sup>6)</sup>

VDE safety class <sup>7)</sup>

Protection class

Light source

Standards applied

Certifications

Chemical resistance

-40°C ... +60°C/-40°C ... +70°C

2, 3

III

IP67, IP 69K

exempt group (in acc. with EN 62471)

IEC 60947-5-2

UL 508, C22.2 No.14-13 <sup>4)</sup> <sup>8)</sup>

tested in accordance with ECOLAB

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) Color changes due to cleaning agents do not adversely affect the coating

6) 2=polarity reversal protection, 3=short circuit protection for all transistor outputs

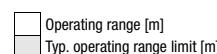
7) Rating voltage 50V

8) These proximity switches shall be used with UL Listed Cable assemblies rated 30V, 0.24A min, in the field installation, or equivalent (categories: CYJV/CYJV7 or PVVA/PVVA7)

## Tables

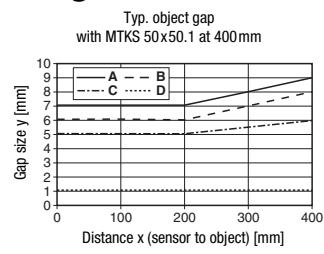
Reflectors		Operating range
1	TK(S)	100x100 0 ... 4.0m
2	MTKS	50x50.1 0 ... 3.5m
3	TK(S)	40x60 0 ... 3.0m
4	TK(S)	30x50 0 ... 1.7m
5	TK(S)	20x40 0 ... 1.4m
6	Tape 6	50x50 0 ... 1.4m

1	0	4.0	4.8
2	0	3.5	4.2
3	0	3.0	3.6
4	0	1.7	2.0
5	0	1.4	1.7
6	0	1.4	1.7



TK ... = adhesive  
TKS ... = screw type  
Tape 6 = adhesive

## Diagrams



## Remarks

### ● 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.

### ● RK18B models:

In case of reflective objects, these models must be mounted approx. 5° inclined vis-à-vis the object in order to avoid direct reflections.

### ● Reflectors:

The light spot may not extend beyond the reflector. Preferably use MTK(S) reflectors or reflective tape 6.

## PRK18B / RK18B

## Part number code

P	R	K	1	8	B	.	F	X	T	T	3	/	4	P	-	M	1	2
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## Operating principle

**PRK** Retro-reflective photoelectric sensor for bottles

**RK** Retro-reflective photoelectric sensor for tape  
(Function against any reflective tapes and glass triple reflectors)

## Series

**18B** 18B series

## Timing

**F** High speed  
**free** Standard

## Optical accuracy

**X** Optical axis aligned, shift angle  $\leq \pm 0.25^\circ$   
**free** Standard

## Detection properties

**T** Setting of 11% is possible  
**free** Setting of 11% is not possible

## Tracking function available

**T 1)** Tracking function/contamination compensation  
**free** No tracking function

## Setting

**1** 270° potentiometer  
**2** 11-turn potentiometer  
**3** Teach button  
**free** No setting

## Pin assignment of connector pin 4 / black cable wire

**2** NPN, light switching  
**N** NPN, dark switching  
**4** PNP, light switching  
**P** PNP, dark switching  
**L** IO-Link

## Pin assignment of connector pin 2 / white cable wire

**X** Not assigned  
**2** NPN, light switching  
**N** NPN, dark switching  
**4** PNP, light switching  
**P** PNP, dark switching  
**T** Teach input

## Connection technology

**M12** M12 connector, 4-pin  
**6000** Cable 6 m

1) Only possible in conjunction with the detection property "T".

## Order guide

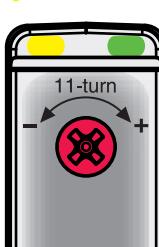
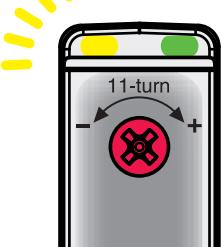
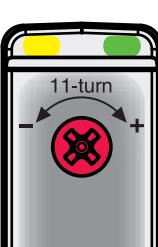
The sensors listed here are preferred types; current information at [www.leuze.com](http://www.leuze.com).

Selection table		Order code →									
Equipment ↓											
Switching output	1 x PNP, light switching					<b>PRK18B.T2/4P-M12</b> Part no. 50117363					
	1 x PNP, dark switching					<b>PRK18B.XT2/4P-M12</b> Part no. 50124945					
	2 x PNP, antivalent	●	●			<b>PRK18B.T2/4X-M12</b> Part no. 50117365					
	1 x NPN, dark switching					<b>PRK18B.T2/PX-M12</b> Part no. 50117361					
	2 x NPN, antivalent					<b>PRK18B.T2/NX-M12</b> Part no. 50117364					
	1 x IO-Link, 1 x PNP, dark switching					<b>PRK18B.T2/4P-6000</b> Part no. 50117362					
	1 x IO-Link, 1 x NPN, dark switching					<b>PRK18B.T2/2N-6000</b> Part no. 50117360					
Optical accuracy	calibrated $\leq \pm 0.25^\circ$		●			<b>PRK18B.T3/4P-M12</b> Part no. 50117367			●		
Switching frequency/ response time/jitter	500Hz/1ms/320μs					<b>PRK18B.XT3/4P-M12</b> Part no. 50124944					
	1500Hz/333μs/110μs	●	●	●	●	<b>PRK18B.T3/2N-M12</b> Part no. 50117366					
	5000Hz/100μs/32μs					<b>RK18B.T2/4P-M12</b> Part no. 50117379					
Detection properties	highly transparent bottles and glasses	●	●	●	●	<b>RK18B.T2/2N-M12</b> Part no. 50117377					
	highly transparent tape $< 20\mu\text{m}$ thick										
	transparent containers	●	●	●	●					●	●
Tracking function	exists										
Setting	270° potentiometer										
	11-turn potentiometer	●	●	●	●	●	●	●	●	●	●
	teach button										
Connection technology	M12 connector	●	●	●	●	●	●	●	●	●	●
	cable, 6000 mm					●	●	●	●	●	●

## Sensor setting via 11-turn potentiometer (user guidance)

The sensor is factory-adjusted for maximum operating range (potentiometer on right limit stop).

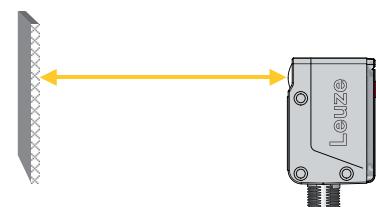
- Before making adjustments: ensure that the light path to the reflector is clear!
- Set the desired sensor sensitivity according to the following table, via the 11-turn potentiometer on the back of the housing:

	Operating point		
	clear glass, tape > 20µm	colored glass	non transparent media
<b>Sensor sensitivity</b>	11%	35%	> 35%
<b>Setting / yellow LED</b>	Transition flash 15Hz / flash 6Hz 	Transition continuous light / flash 15Hz 	continuous light 
<b>Flashing diagram</b>	Operating points:  flash 6Hz	11%  flash 15Hz	35%  continuous light

## Sensor setting via teach button



- The sensor is factory-adjusted for maximum operating range.  
Recommendation: teach only if the desired objects are not reliably detected.
- 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.



### Teaching for 11% sensor sensitivity (clear glass, tape > 20µm)

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



After the teaching, the sensor switches when about 11% of the light beam are covered by the object.

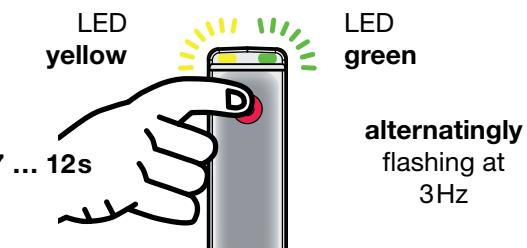


### Teaching for 18% sensor sensitivity (colored glass)

- Press teach button until both LEDs flash alternately.
- Release teach button.
- Ready.

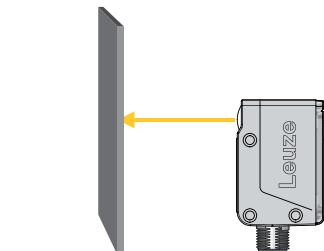


After the teaching, the sensor switches when about 18% of the light beam are covered by the object.



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

- Prior to teaching:  
Interrupt the light path to the reflector!



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



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

- Press teach button until only the green LED flashes
- Release the teach button. The yellow LED displays the light/dark switching status for 2s:
  - Yellow LED ON = switching outputs inverted
  - Yellow LED OFF = switching outputs not inverted (factory settings)
- After 2s: ready

