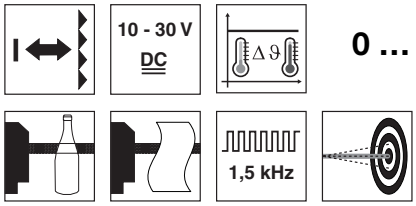
PRK18B / RK18B — Retro-reflective sensors for bottles and tape

en 02-2014/01 50121193-01

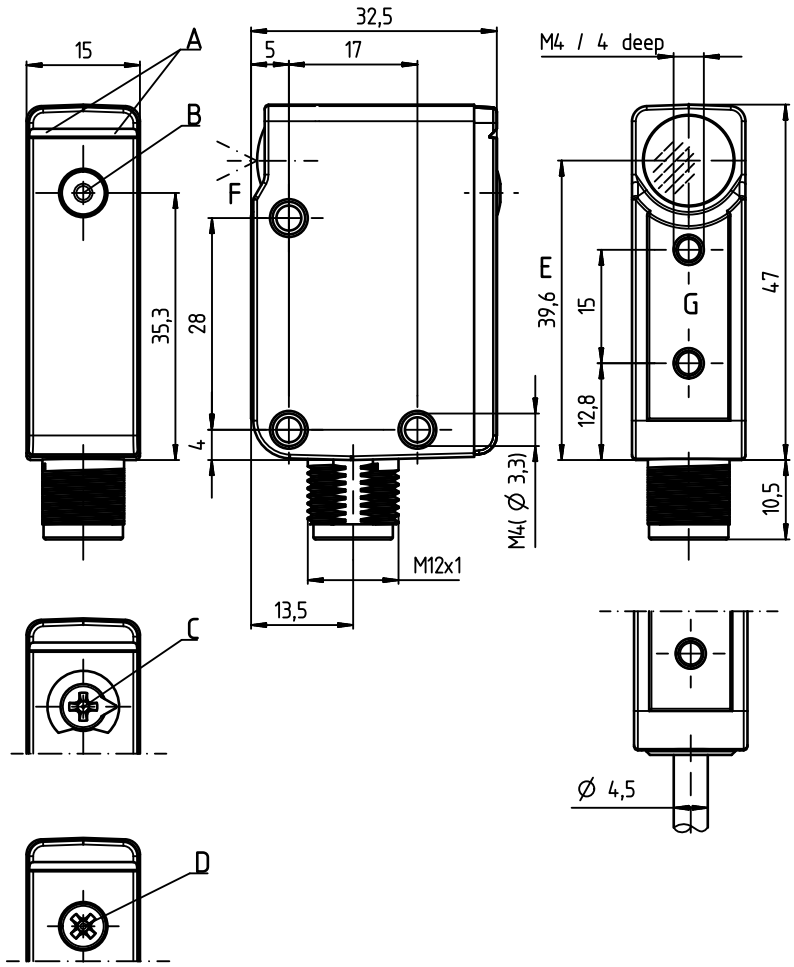




0 ... 4.8m

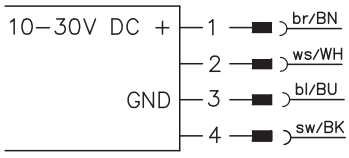
- Retro-reflective photoelectric sensors with autocollimation optics for reliable detection of highly transparent bottles and tape
- User-controlled sensitivity adjustment via 11-turn potentiometer or teach button
- Temperature compensation ±20°C
- High optical accuracy through calibrated optical system

Dimensioned drawing

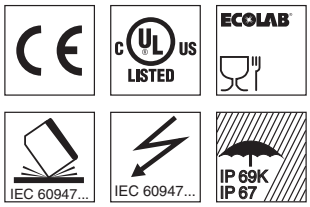


A Display
B Teach button
C 270° potentiometer
D 11-turn potentiometer
E Optical axis
F Optical accuracy
G Reference plane for **F**

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



Accessories:

(available separately)

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

We reserve the right to make changes • DS_PRK18BRK18B_en_50121193_01.fm

Specifications

Optical data

Typ. op. range limit (TK(S) 100x100) [1]		0 … 4.8m
Operating ranges [2]		see tables
Light source [3]		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 [4]		10 … 30VDC (incl. residual ripple)
Residual ripple		≤ 15% of UB
Open-circuit current		≤ 18mA
Switching outputs/functions	/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
Signal voltage high/low		≥ (UB-2V)/≤ 2V
Output current		max. 100mA
Sensitivity		adjustable via 11-turn potentiometer or teach button (see order guide)

Indicators

Green LED	ready
Sensors with 11-turn potentiometer:	
Yellow LED, flashing slowly (6Hz)	operating pt. 11%: clear glass, tape > 20µm
Yellow LED, flashing quickly (15Hz)	operating pt. 35%: colored glass
Yellow LED, continuous light	operating pt. > 35%: non transparent media
Sensors with teach button:	
Yellow LED, continuous light	light path free (during operation)

Mechanical data

Housing [5]	diecast zinc, chemically nickel-plated
Connector	diecast zinc, chemically nickel-plated
Optics	glass
Operation	11-turn potentiometer or teach button
Weight	with M12 connector: 60g with 6000mm cable: 240g
Connection type	M12 connector, 4-pin cable 6000mm, 4 x 0.20mm²

Environmental data

Ambient temp. (operation/storage)	-40°C … +60°C/-40°C … +70°C
Protective circuit [6]	2, 3
VDE safety class [7]	III
Protection class	IP67, IP 69K
Light source	exempt group (in acc. with EN 62471)
Standards applied	IEC 60947-5-2
Certifications	UL 508, C22.2 No.14-13 [4] [8]
Chemical resistance	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

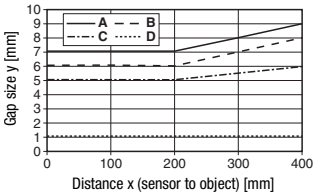
1	0	4.0	4.8
2	0	3.5	4.2
3	0	3.0	3.6
4	0	1.7	2.0
5	0	1.4	1.7
6	0	1.4	1.7

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

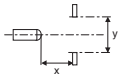
TK … = adhesive
TKS … = screw type
Tape 6 = adhesive

Diagrams

Typ. object gap
with MTKS 50x50.1 at 400mm



A 11% sensor sensitivity
B 18% sensor sensitivity
C 35% sensor sensitivity
D 100% sensor sensitivity



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 — Retro-reflective sensors for bottles and tape

Part number code

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

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 ≤ ±0.25°
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**.

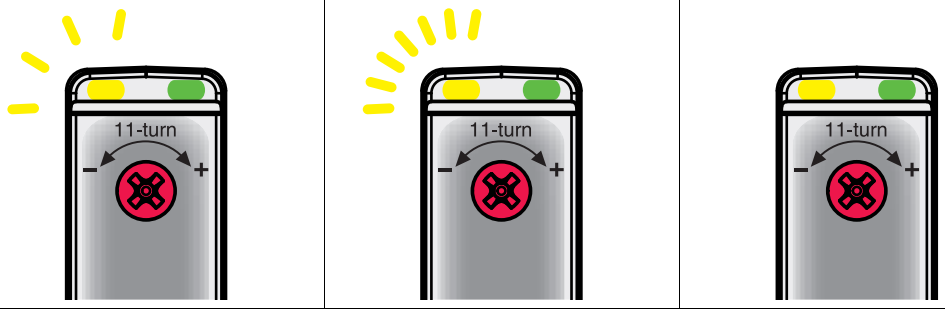
Selection table **Equipment ↓**	**Order code →**	**PRK18B.T2/4P-M12** Part no. 50117363	**PRK18B.XT2/4P-M12** Part no. 50124945	**PRK18B.T2/4X-M12** Part no. 50117365	**PRK18B.T2/PX-M12** Part no. 50117361	**PRK18B.T2/NX-M12** Part no. 50117364	**PRK18B.T2/4P-6000** Part no. 50117362	**PRK18B.T2/2N-6000** Part no. 50117360	**PRK18B.T3/4P-M12** Part no. 50117367	**PRK18B.XT3/4P-M12** Part no. 50124944	**PRK18B.T3/2N-M12** Part no. 50117366	**RK18B.T2/4P-M12** Part no. 50117379	**RK18B.T2/2N-M12** Part no. 50117377
Switching output	1 x PNP, light switching			●									
	1 x PNP, dark switching				●								
	2 x PNP, antivalent	●	●				●		●	●		●	
	1 x NPN, dark switching					●							
	2 x NPN, antivalent							●			●		●
	1 x IO-Link, 1 x PNP, dark switching												
	1 x IO-Link, 1 x NPN, dark switching												
Optical accuracy	calibrated ≤ ±0.25°		●							●			
Switching frequency/ response time/jitter	500 Hz/1 ms/320 µs												
	1500 Hz/333 µs/110 µs	●	●	●	●	●	●	●	●	●	●	●	●
	5000 Hz/100 µs/32 µs												
Detection properties	highly transparent bottles and glasses	●	●	●	●	●	●	●	●	●	●		
	highly transparent tape < 20 µm 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).

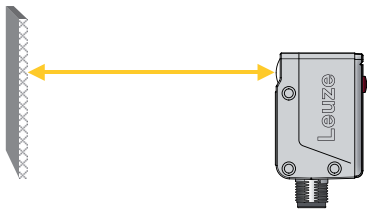
- **Before making adjustments: ensure that the light path to the reflector is clear!**
- **Set the desired sensor sensitivity according to the following table, via the 11-turn potentiometer on the back of the housing:**

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



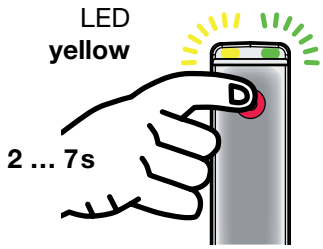
Sensor setting via teach button

- **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)

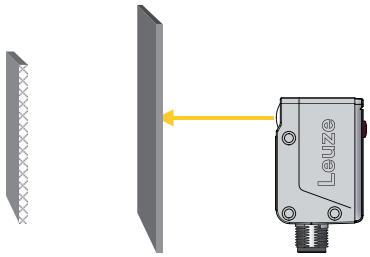
- **Press teach button until both LEDs flash alternatingly.**
- **Release teach button.**
- **Ready.**

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

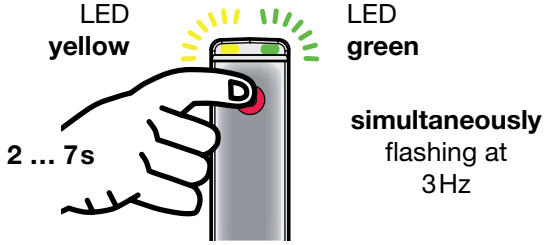


Teaching for maximum operating range (factory setting at delivery)

- **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**

