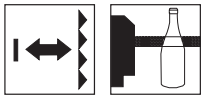
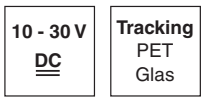
(I)PRK 18 Retro-reflective photoelectric sensors with polarization filter

en 07-2012/06 50109446-01

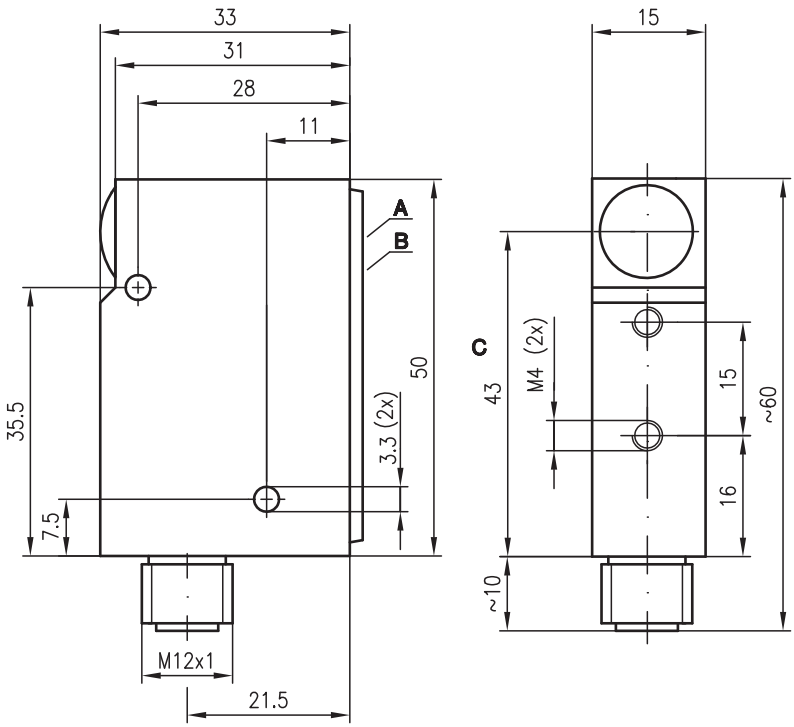


0 ... 4m



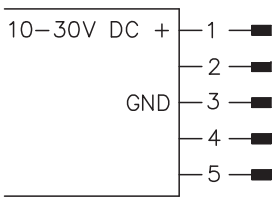
- Intelligent sensor for detection of transparent objects (e.g. clear glass, PET, foil)
- Automatic contamination compensation (tracking function) for longer intervals between cleanings
- Adjustment via teach-in

Dimensioned drawing



A Step switch for object adjustment
B Indicator diodes
C Optical axis

Electrical connection



	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5
PRK 18/24 DL.46	+	NPN	GND	PNP	L/D
PRK 18/24 DL.42	+	NPN	GND	PNP	Teach
PRK 18/44 L.43	+	PNP	GND	PNP	Teach
IPRK 18/4 DL.41	+	Warn	GND	PNP	L/D
IPRK 18/2 DL.41	+	Warn	GND	NPN	L/D
IPRK 18/4 DL.43	+	Warn	GND	PNP	Teach

Accessories:

(available separately)

- Mounting system (BT 95)
- M12 connectors (KD ...)
- Reflectors

We reserve the right to make changes • DS_IPRK18xxDL4x_en_50109446-01.fm

Specifications

Optical data

Typ. operating range limit (TK(S) 100x100)[1]	0 … 4m
Operating range [2]	see tables
Recommended reflector	MTKS 50x50.1
Light source	LED (modulated light)
Wavelength	660nm (visible red light, polarized)

Timing

Switching frequency	1kHz
Response time	0.5ms
Delay before start-up	≤ 300ms

Electrical data

Operating voltage U_B	10 … 30VDC (incl. residual ripple)
Residual ripple	≤ 15% of UB
Open-circuit current	≤ 35mA
Switching output	see section **6. Preferred types**
Warning output	see section **6. Preferred types**
Function characteristics	see section **6. Preferred types**
Signal voltage high/low [3]	≥ (U_B-2V)/≤ 2V
Output current	max. 2x100mA
Sensitivity	see section **6. Preferred types**

Switch positions

Position **teach-in**	activation of the teach event
Position **1** (PET bottle)	operating point PET bottle
Position **2** (clear glass bottle)	operating point clear glass bottle
Position **3** (colored glass bottle)	operating point colored glass bottle
Position **Auto**	Tracking ON/OFF

Indicators

Green LED, continuous light	ready
Green LED, flashing	teach mode active with performance reserve
Red LED, continuous light	operation without performance reserve
Red LED, flashing	teaching without performance reserve
Green/red LED flashing	device defective, no performance reserve
LED 1, yellow	light path free
LED 2, yellow	tracking ON

Mechanical data

Housing	diecast zinc
Optics cover	glass
Weight	150g
Connection type	M12 connector, 5-pin, stainless steel

Environmental data

Ambient temp. (operation/storage)	-25°C … +55°C/-40°C … +70°C
Protective circuit [4]	2, 3
VDE safety class	III
Protection class	IP 67, IP 69K [5]
LED class	1 (acc. to EN 62471)
Standards applied	IEC 60947-5-2

Options

Teach input	see section **6. Preferred types**
Active/not active	edge from 0V to U_B/0V or not connected
Teach delay	< 500ms
L/D input	see section **6. Preferred types**
Dark/light switching	U_B/0V or not connected
L/D delay	< 500ms
Warning output warn	see section **6. Preferred types**
Signal voltage high/low	≥ (U_B-2V)/≤ 2V
Output current	max. 100mA

1) Typ. operating range limit: max. attainable range without performance reserve
2) Operating range: recommended range with performance reserve
3) Functional extra-low voltage with reliable disconnection or protective extra-low voltage (VDE 0100/T 410)
4) 2=polarity reversal protection, 3=short circuit protection for all outputs
5) IP 69K test acc. to DIN 40050 part 9 simulated, high pressure cleaning conditions without the use of additives, acids and bases are not part of the test

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.

Order guide

See section **6. Preferred types**

Tables

Reflectors			Operating range
1	TK(S)	100x100	0 … 3.0m
2	MTKS	50x50.1	0 … 2.4m
3	TK(S)	30x50	0 … 1.6m
4	TK(S)	20x40	0 … 1.4m
5	Tape 6	50x50	0 … 2.0m

1	0			3.0	4.0
2	0			2.4	3.0
3	0		1.6		2.0
4	0	1.4		1.8	
5	0		2.0		2.2

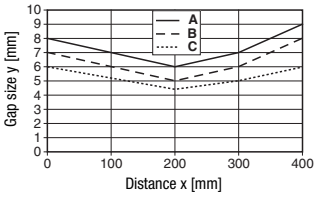
Operating range [m] *)
Typ. operating range limit [m] *)

*) for sensitivity setting at switch position 3

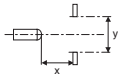
TK … = adhesive
TKS … = screw type
Tape 6 = adhesive

Diagrams

Typ. object gap
(MTKS 50x50.1 at 400mm)



A Switch position 1
B Switch position 2
C Switch position 3



Remarks

Objects	Switch position
Multilayer foil, PET bottles, transparent glass pane	1
Clear glass bottle	2
Colored glass bottle	3

- Teach event may only be performed with free light path.
- A change of the operating point is always possible and does not require a new teach-in.
- The red LED signalizes an insecure operating state. The warning output is set.
- For activation of the single functions you have to remain in the respective switch position for approx. 2ms.
- In switch positions "Teach" and "Auto" the switching outputs are active.
- Warning output: static signal for control limit reached.
- 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.

(I)PRK 18

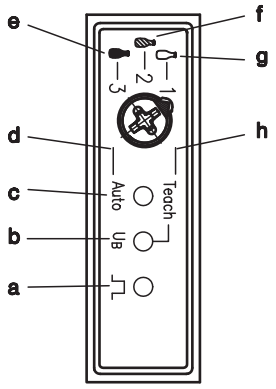
1. Operating principle of contamination compensation (tracking function)

This transparency sensor (clear glass sensor) is a device which automatically compensates system contamination at the reflector and sensor by means of continuous measurement of the receiving level. The control rate depends on the number of gaps in the process. This tracking function increases the interval between cleaning sessions considerably.

The control limit is indicated by a warning output. The sensor does not need to be re-calibrated after the system has been cleaned. In typical applications, cleaning can be performed during system operation. This means higher system efficiency.

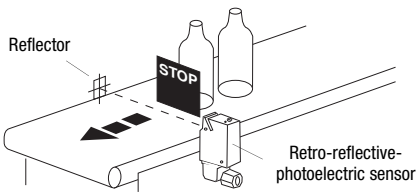
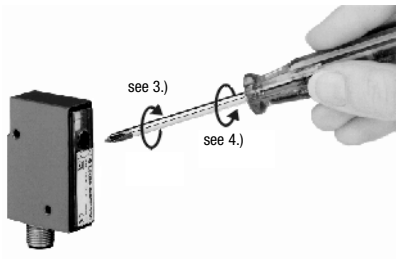
The system is calibrated ("teach-in") once only at initial commissioning. The appropriate object is then selected (PET, clear glass or colored glass). The "teach-in" process does not have to be performed again if a different object is selected.

2. Controls and indicators

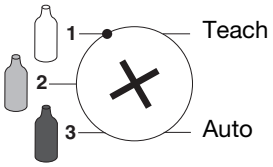
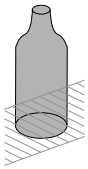
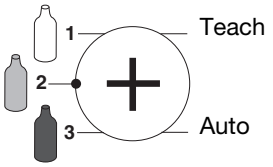
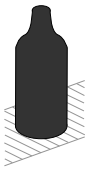
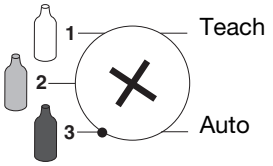


a Light path free (LED 1 yellow)
b Operation and teach indicator (LED green/red)
c Tracking ON (LED 2 yellow)
d Switch position tracking
e Switch position 3 (colored-glass bottle)
f Switch position 2 (clear-glass bottle)
g Switch position 1 (PET bottle, glass pane, foil)
h Switch position Teach

3. Adjustment procedure (teach-in) via step switch

	Correct adjustment procedure:	Important to note:
 **Important during teach-in: free light path!**	**1.** There must be no objects in the beam path between the retro-reflective photo-electric sensor and the reflector during the adjustment procedure.	The teach-in procedure must be conducted without any objects!
	2. Align the sensor with the reflector so that the light spot is visible in the middle of the reflector.	The light spot must not fall outside the reflector area. The mounted reflector should always be larger than the visible light spot!
	**3.** Turn the step switch to the "Teach" switch position for about 2 s. **4.** Turn the step switch back to switch positions 1, 2 or 3.	The adjustment procedure must be conducted without objects!
	5. To turn the tracking function on/off, turn the step switch to the "Auto" switch position for about 2 s. **6.** Turn the step switch back to switch positions 1, 2 or 3.	The step switch must be turned to switch positions 1, 2 or 3 during operation!

4. Setting operating mode

Object to be detected	Material, e.g.:	Switch position	Correct adjustment procedure:
① Transparent objects 	● PET bottle ● PEN bottle ● Clear plate glass ● Foil		**1.** Turn the step switch to the "Teach" switch position for about 2 s. **2.** Turn the step switch back to switch position 1. Tracking can be turned on or off by switching to the "Auto" switch position.
✍ Less transparent objects 	● Clear glass bottle ● Colored plate glass		**1.** Turn the step switch to the "Teach" switch position for about 2 s. **2.** Turn the step switch back to switch position 2. Tracking can be turned on or off by switching to the "Auto" switch position.
✍ Opaque objects 	● Colored glass bottle ● Opaque objects		**1.** Turn the step switch to the "Teach" switch position for about 2 s. **2.** Turn the step switch back to switch position 3. Tracking can be turned on or off by switching to the "Auto" switch position.

5. Calibration procedure (teach-in) by cable

1. Set step switch to desired operating mode (PET, clear-glass or colored-glass bottle).
2. Activate teach-in cable (pin 5) (high active). Teach event takes max. 1 s.
3. Deactivate teach-in cable (pin 5).

6. Preferred types

Selection table **Equipment ↓**	**Order code →**	**PRK 18/24 DL.46** Part no. 50032798	**PRK 18/24 DL.42** Part no. 50033554	**PRK 18/44 L.43** Part no. 50115193	**IPRK 18/4 DL.41** Part no. 50033552	**IPRK 18/2 DL.41** Part no. 50033553	**IPRK 18/4 DL.43** Part no. 50109415	
Application	PET	●	●	●	●	●	●	
	clear glass	●	●	●	●	●	●	
	colored glass	●	●	●	●	●	●	
Switching outputs	2 PNP transistors			●	●		●	
	2 NPN transistors					●		
	1 NPN + 1 PNP transistor	●	●					
Function characteristics	antivalent			●				
	light switching	●			●	●		
	dark switching	●	●		●	●	●	
Configuration	step switch	●	●	●	●	●	●	
Options	contamination compensation (step tracking)	●	●	●	●	●	●	
	cleaning compensation (peak tracking)	●	●	●	●	●	●	
	tracking ON/OFF	●	●	●	●	●	●	
	warning output				●	●	●	
	Teach-in via step switch	●	●	●	●	●	●	
	Teach via control cable		●	●			●	
	light/dark switching via control cable	●			●	●		
	UL	●	●		●	●	●	