

**PRK 55 Ex Retro-reflective photoelectric sensors with polarization filter for bottles**

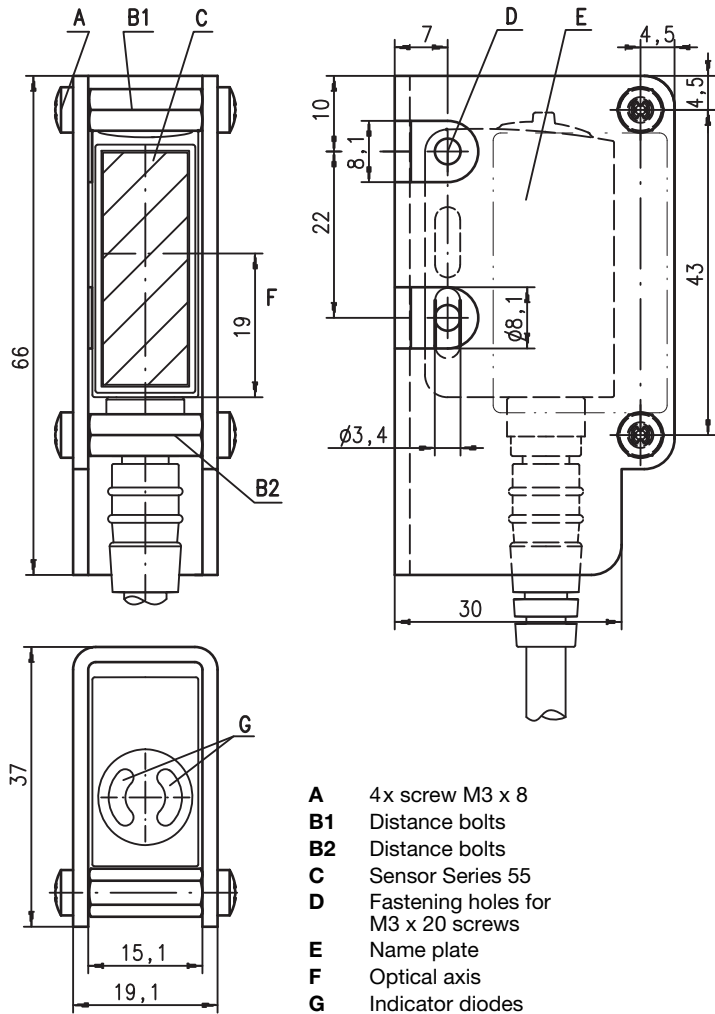
en 02-2012/09 50113749



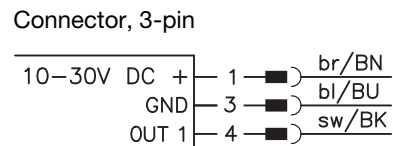
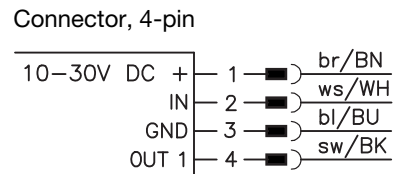
			<b>0 ... 3.5m</b>
<b>10 - 30 V</b> DC		<b>stainless steel</b> <b>316 L</b>	

- Polarized retro-reflective photoelectric sensor, autocollimation optics with visible red light
- Particularly suited for highly transparent bottles (PET and glass)
- 316L stainless steel housing in WASH-DOWN-Design
- Scratch resistant and non-diffusive plastic front cover
- Easy adjustment via lockable teach button or teach input
- Certification
  - II 3G Ex nA op is IIB T4 Gc X
  - II 3D Ex tc IIIC T70°C Dc IP67 X

**Dimensioned drawing**



**Electrical connection**



- Observe the notices for installation and commissioning!
- Do not disconnect the sensor connection within the potentially explosive area while under voltage!

We reserve the right to make changes • DS\_PRK55\_Ex\_en\_50113749.fm

**Accessories:**  
(available separately)

- Cables with M8 connector

**Attention!**  
Only use cables with axial (straight) plug outlet (see dimensioned drawing).

## Specifications

### Optical data

Typ. op. range limit (TK(S) 100x100) <sup>1)</sup>	0 ... 3.5m
Operating range <sup>2)</sup>	see tables
Light source <sup>3)</sup>	LED (modulated light)
Wavelength	620nm (visible red light, polarized)

### Timing

Switching frequency	1000Hz
Response time	0.5ms
Delay before start-up	≤ 300ms

### Electrical data

Operating voltage $U_B$	10 ... 30VDC (incl. residual ripple)
Residual ripple	≤ 15% of $U_B$
Open-circuit current	≤ 18mA
Switching output	.../6D.42 <sup>4)</sup> 1 push-pull switching output OUT1 (pin 4): PNP dark switching, NPN light switching .../6.42 <sup>4)</sup> 1 push-pull switching output OUT1 (pin 4): PNP light switching, NPN dark switching IN (pin 2): teach input light/dark reversible
Function characteristics	
Signal voltage high/low	≥ ( $U_B - 2V$ ) / ≤ 2V
Output current	max. 100mA
Operating range	setting via teach-in

### Indicators

Green LED	ready
Yellow LED	light path free
Yellow LED, flashing	light path free, no performance reserve <sup>5)</sup>

### Mechanical data

Housing	AISI 316L stainless steel, DIN X2CrNiMo17132, W.No 1.4404
Protective housing	stainless steel AISI 303, DIN X8CrNiS18-9, W.Nr 1.4305
Optics cover	coated plastic (PMMA), scratch resistant and non-diffusive
Operation	plastic (TPV-PE), non-diffusive
Weight	with M8 connector: 130g
Connection type	M8 connector, 3-pin

### Environmental data

Ambient temp. (operation/storage)	-20°C ... +50°C / -30°C ... +70°C
Protective circuit <sup>6)</sup>	2, 3
VDE safety class <sup>7)</sup>	III
Protection class	IP 67
Light source	exempt group (in accordance with EN 62471)
Standards applied	IEC 60947-5-2

### Explosion protection

Certification (CENELEC)	⊕ II 3G Ex nA op is IIB T4 Gc X ⊕ II 3D Ex tc IIIC T70 °C Dc IP67 X
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- 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) The push-pull switching outputs must not be connected in parallel
- 5) Display "no performance reserve" as yellow flashing LED is only available in standard teach setting
- 6) 2=polarity reversal protection, 3=short circuit protection for all transistor outputs
- 7) Rating voltage 50V

## 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.

## Order guide

	Designation	Part no.
With M8 connector, 3-pin	PRK 55/6D.42-S8.3 Ex	50115207
With M8 connector, 4-pin	PRK 55/6.42-S8 Ex	50119364

## Tables

Reflectors in food quality		Operating range
1	TK(S) 100x100	0 ... 3.0m
2	TK 40x60	0 ... 2.0m
3	Tape 6 50x50	0 ... 1.2m
4	TK 20x40	0 ... 1.0m
5	Tape 4 50x50	0 ... 0.5m

1	0	3	3.6
2	0	2.0	2.4
3	0	1.2	1.4
4	0	1.0	1.2
5	0	0.5	0.6

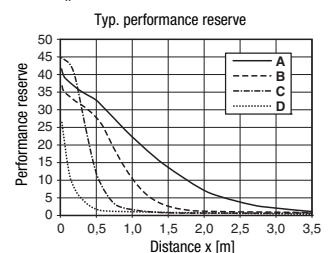
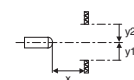
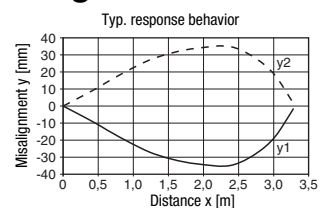
Pharmaceutical reflectors		Operating range
1	TK(S) 40x60.P	0 ... 1.2m
2	TK BR53	0 ... 1.0m
3	TK(S) 20x40.P	0 ... 0.7m
4	TK(S) 20.P	0 ... 0.5m
5	MTK(S) 14x23.P	0 ... 0.25m
6	TK 10.P	0 ... 0.2m

1	0	1.2	1.4
2	0	1.0	1.2
3	0	0.7	0.8
4	0	0.5	0.6
5	0	0.25	0.3
6	0	0.2	0.25

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

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

## Diagrams



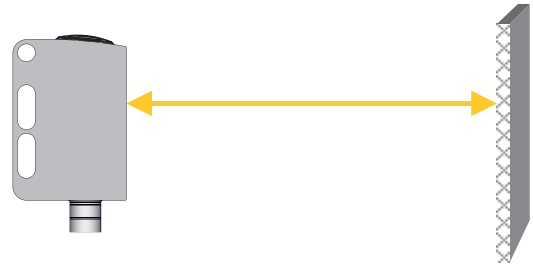
- A TK 100x100
- B TKS 40x60
- C TKS 20x40
- D Tape 4: 50x50

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**Sensor adjustment (teach) 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.

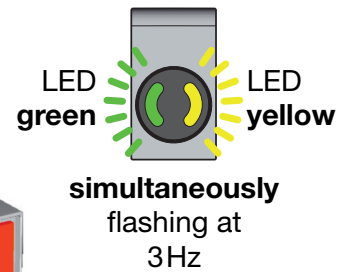
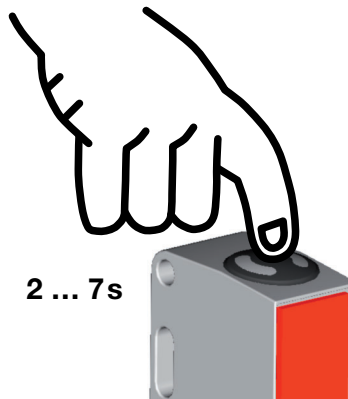


**Teach for 11% sensor sensitivity (highly transparent bottles and foils with thickness > 20µm)**

- 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.

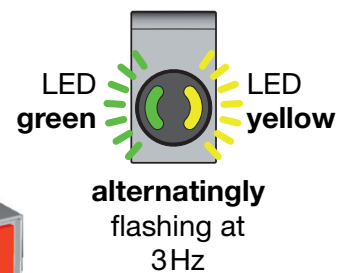
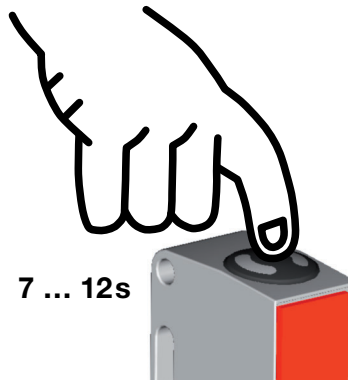


**Teach for 18% sensor sensitivity (standard bottles)**

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

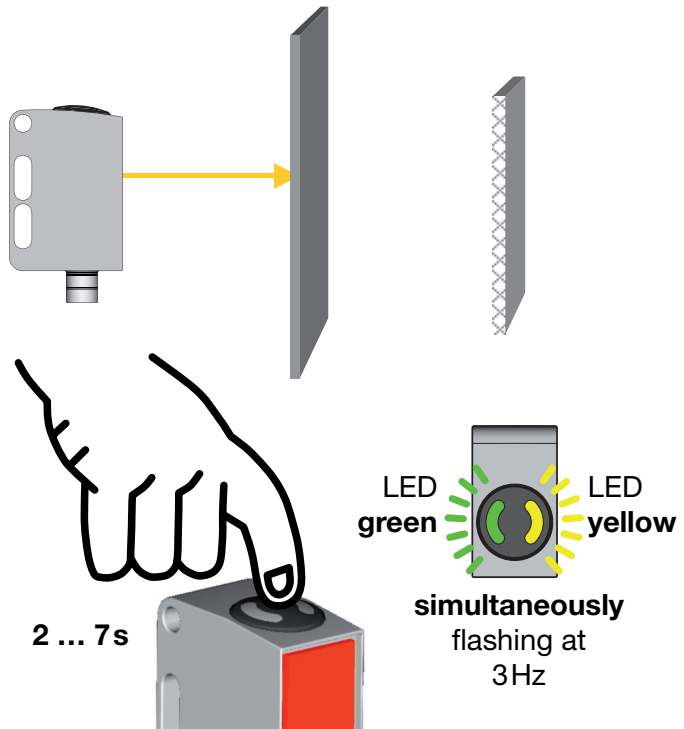


After the teaching, the sensor switches when about 18% of the light beam are covered by the object.



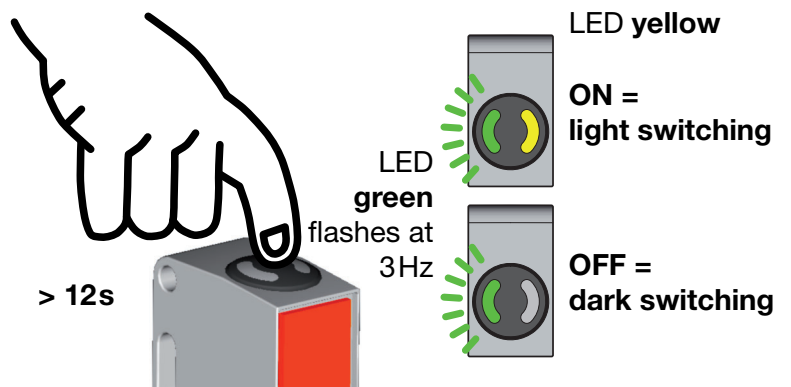
***Teaching for maximum operating range (factory setting at delivery)***

- Prior to teaching:  
Cover 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 the green LED flashes. The yellow LED displays the current setting of the switching output:  
ON = output light switching  
OFF = output dark switching
- Continue to press the teach button in order to change the switching behavior.
- Release teach button.
- Ready.



## PRK 55 ExRetro-reflective photoelectric sensors with polarization filter for bottles

### Notices for the safe use of sensors in potentially explosive areas

The valid range encompasses devices of Group II, Category 3, Zones 2 ("Gas Ex") and 22 ("Dust Ex").



- Check whether the equipment classification corresponds to the requirements of the application.
- A safe operation is only possible if the equipment is used properly and for its intended purpose.
- Electrical equipment may endanger humans and (where applicable) animal health, and may threaten the safety of goods if used incorrectly or under unfavorable conditions in potentially explosive areas.
- The applicable national regulations (e.g. EN 60079-14) for the configuration and installation of explosion-proof systems must be observed.

### Installation and Commissioning

- The devices must only be installed and commissioned by trained electricians. They must be aware of the regulations and operation of explosion-proof equipment.
- Static charge on plastic surfaces must be avoided.
- To prevent unintentional separation under voltage, devices with connector (e.g. Series 46B) must be equipped with a safeguard or a mechanical interlocking guard (e.g. K-V M12-Ex, part no. 50109217). The warning sign "Do not disconnect under voltage" that is supplied with the device must be attached to the sensor or its mounting bracket so that it is clearly visible.
- Devices with terminal compartment lid (e.g. Series 96) must only be commissioned if the terminal compartment lid of the device is properly sealed.
- Connection cables and connectors must be protected from excessive or unintended pulling or pushing strain.
- Prevent dust deposits from forming on the devices.
- Metallic parts (e.g. housing, mounting devices) are to be integrated into the potential equalization to prevent electrostatic charge.

### Maintenance

- No changes may be made to explosion-proof devices.
- Repairs may only be performed by persons trained for such work or by the manufacturer.
- Defective devices must be replaced immediately.
- Cyclical maintenance is generally not necessary.
- Depending on the environmental conditions, it may occasionally be necessary to clean the optical surfaces of the sensors. This cleaning must only be performed by persons trained for this task. We recommend using a soft, damp cloth. Cleaning agents that contain solvents must not be used.

## Chemical resistance

- The sensors demonstrate good resistance against diluted (weak) acids and bases.
- Exposure to organic solvents is possible only under certain circumstances and only for short periods of time.
- Resistance to chemicals must be examined on a case by case basis.

## Special conditions

- The sensor must be removed from the protective housing in order to connect the M8 connector. After the connection has been established, the sensor must be installed back into the protective housing properly. Operation without protective housing is not permitted.
- If the sensor is connected to the M8 connector and installed properly in the protective housing, the connector can no longer be unintentionally separated. Further mechanical protective measures are therefore not necessary.
- The devices must be installed in such a way that they are protected from direct exposure to UV rays (sunlight).

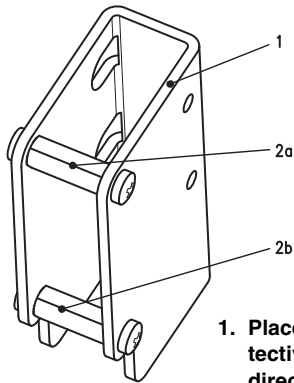
## Application notes



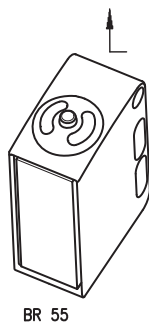
- For glossy surfaces (e.g. metals), the light beam should not be incident on the object surface at a right angle. A slight inclination is sufficient for preventing undesired direct reflections. This may result in a reduction in the scanning range.
- Objects should only be moved in laterally from the right or left. Moving in objects from the connector side or operating side is to be avoided.
- Outside of the scanning range, the sensor operates as an energetic diffuse reflection light scanner. Light objects can still be reliably detected up to the scanning range limit.
- The sensors are equipped with effective measures for the maximum avoidance of mutual interference should they be mounted opposite one another. Opposite mounting of multiple sensors of the same type should, however, absolutely be avoided.

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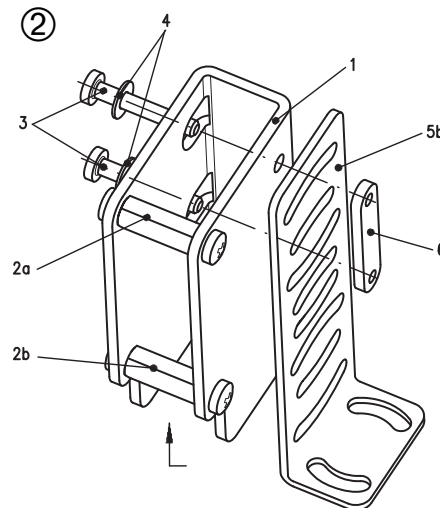
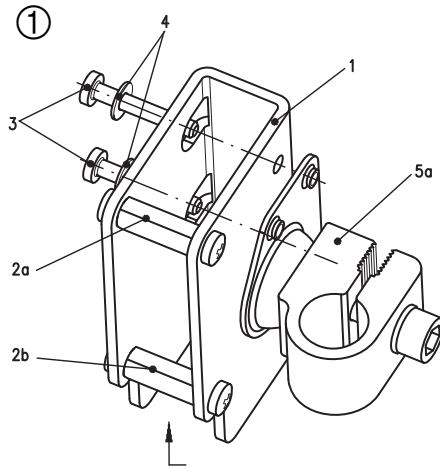
**Mounting instructions**



**1. Place device in the protective housing in the direction of the arrow.**



BR 55



**2. Fit fastening screws (item 3) with washers (item 4) according to diagrams ①, ②, ③ depending on the installation situation, push through the device and securely tighten.**

- 1** Protective housing
- 2a, 2b** Distance bolts (mounted)
- 3** Screw M3
- 4** Washer
- 5a, 5b** Mounting devices (e.g. UMS 25, BT 25, ...)
- 6** Plate BT 3

**Declaration of Conformity**

 the **sensor** people

**EG-KONFORMITÄTS-  
ERKLÄRUNG**
**EC DECLARATION  
OF CONFORMITY**
**DECLARATION CE  
DE CONFORMITE**

Der Hersteller

The Manufacturer

Le constructeur

**Leuze electronic GmbH + Co. KG**  
 In der Braike 1, PO Box 1111  
 73277 Owen, Germany

erklärt, dass die nachfolgend aufgeführten Produkte den einschlägigen Anforderungen der genannten EG-Richtlinien und Normen für die Gerätegruppe II und die Geräte-kategorie 3 entsprechen.

declares that the following listed products fulfil the relevant provisions of the mentioned EC Directives and standards for equipment group II and equipment category 3.

déclare que les produits identifiés suivants sont conformes aux directives CE et normes mentionnées pour les appareils du groupe II et catégorie 3.

Produktbeschreibung:

Description of product:

Description de produit:

**Optische Sensoren**  
**HRTR/PRK 55/...-S8..Ex**
**Optical sensors**  
**HRTR/PRK 55/...-S8..Ex**
**Détecteurs optiques**  
**HRTR/PRK 55/...-S8..Ex**

Kennzeichnung Gas / Staub:

Marking for gas / dust:

Marquage gaz / poussière:

 II 3G Ex nA op is IIB T4 Gc X

/

 II 3D Ex tc IIIC T 70°C Dc IP67 x

Angewandte EG-Richtlinie(n):

Applied EC Directive(s):

Directive(s) CE appliquées:

**94/9 EG**  
**2004/108/EG**
**94/9EC**  
**2004/108/EC**
**94/9CE**  
**2004/108/CE**


Angewandte Normen:

Applied standards:

Normes appliquées:

**EN 60947-5-2:2007**  
**EN 60079-15:2005**  
**EN 60079-31:2009**
**EN 60079-0:2009**  
**EN 60079-28:2007**

22.7.2011  
 Datum / Date / Date

  
 Dr. Harald Grübel, Geschäftsführer / Director / Directeur

Leuze electronic GmbH + Co. KG  
 In der Braike 1  
 D-73277 Owen  
 Telefon +49 (0) 7021 573-0  
 Telefax +49 (0) 7021 573-199  
 info@leuze.de  
 www.leuze.com

Leuze electronic GmbH + Co. KG, Sitz Owen, Registergericht Stuttgart, HRA 230712  
 Persönlich haftende Gesellschafterin Leuze electronic Geschäftsführungs-GmbH,  
 Sitz Owen, Registergericht Stuttgart, HRB 230550  
 Geschäftsführer: Dr. Harald Grübel (Vorsitzender), Karsten Just  
 USt-IdNr. DE 145912521 | Zollnummer 2554232  
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 Only our current Terms and Conditions of Sale and Delivery shall apply

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