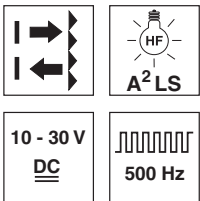


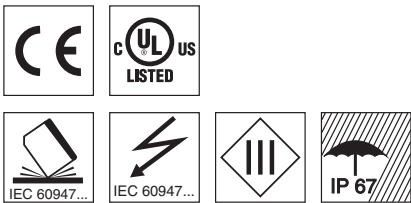
**PRK 28** Retro-reflective photoelectric sensors for semi-transparent media

en 01-2015/11 50130115



0.02 ... 6.0m

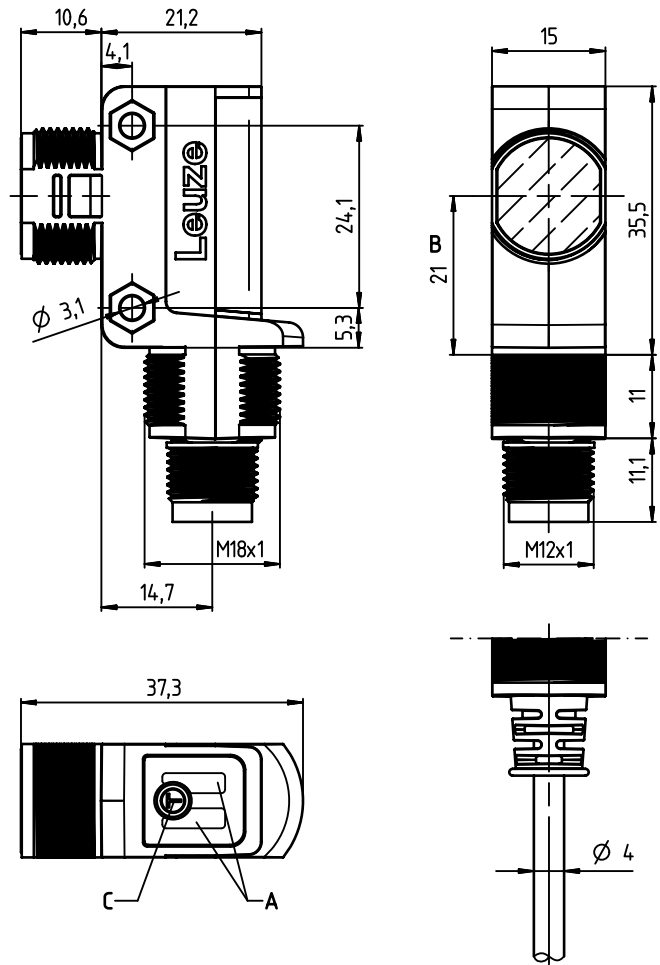
- Polarized retro-reflective photoelectric sensor using visible red light
- Easy adjustment via teach button
- Active suppression of extraneous light A²LS
- Fast alignment through *brightVision*®
- Universal option for M18 hole mounting at the front and connector side
- Easy through-hole assembly with anti-rotation protection for mounting nuts on the housing
- Full control through green and yellow indicator LEDs
- Robust, glass fiber reinforced plastic housing acc. to IP 67 for industrial application
- Complementary outputs for light/dark switching



**Accessories:**

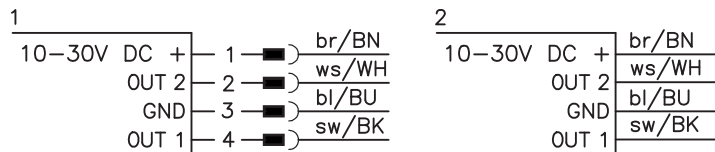
- (available separately)
- Mounting systems (BTU 200 ..., BT 200..., BTU D18...)
  - M12 connectors (KD ...)
  - Ready-made cables (K-D ...)
  - Reflectors
  - Reflective tape

**Dimensioned drawing**



- A** Indicator diodes
- B** Optical axis
- C** Teach button

**Electrical connection**



Änderungen vorbehalten • DS\_PRK28\_3\_en\_50130115.fm

## Specifications

### Optical data

|  |                                      |
|--|--------------------------------------|
| Typ. op. range limit (TK(S) 100x100) <sup>1)</sup> | 0.02 ... 6.0m                        |
| Operating range <sup>2)</sup>                      | see tables                           |
| Light source                                       | LED (modulated light)                |
| Wavelength   | 620nm (visible red light, polarised) |

### Timing

|                       |         |
|-----------------------|---------|
| Switching frequency   | 500Hz   |
| Response time         | 1ms     |
| Delay before start-up | ≤ 300ms |

### Electrical data

|                                       |  |
|---------------------------------------|--|
| Operating voltage $U_B$ <sup>3)</sup> | 10 ... 30VDC   |
| Residual ripple                       | ≤ 15% of $U_B$   |
| Open-circuit current                  | ≤ 20mA   |
| Switching output                      | .../4P... 2 PNP transistor outputs<br>pin 2: PNP dark switching, pin 4: PNP light switching<br>2 NPN transistor outputs<br>pin 2: NPN dark switching, pin 4: NPN light switching |
|                                       | .../2N... $\geq (U_B - 2.5V) / \leq 2.5V$<br>max. 100mA <sup>4)</sup>  |
| Signal voltage high/low               |  |
| Output current                        |  |

### Indicators

|                      |   |
|----------------------|---|
| Green LED            | ready                                   |
| Yellow LED           | light path free                         |
| Yellow LED, flashing | light path free, no performance reserve |

### Mechanical data

|                 |  |
|-----------------|--|
| Housing         | plastic, glass fiber reinforced  |
| Optics cover    | plastic  |
| Weight          | 25g with M12 connector<br>45g with 200mm cable and M12 connector<br>75g with 2m cable            |
| Connection type | M12 connector, 4-pin<br>cable 200mm with M12 connector, 4-pin<br>cable 2m, 4x0.20mm <sup>2</sup> |

### Environmental data

|                                   |   |
|-----------------------------------|---|
| Ambient temp. (operation/storage) | -40°C ... +60°C/-40°C ... +70°C         |
| Protective circuit <sup>5)</sup>  | 2, 3                                    |
| VDE safety class                  | III                                     |
| Protection class                  | IP 67                                   |
| Light source                      | free group (in acc. with EN 62471)      |
| Standards applied                 | IEC 60947-5-2                           |
| Certifications                    | UL 508, C22.2 No.14-13 <sup>3) 6)</sup> |

- 1) Typ. operating range limit: max. attainable range without performance reserve
- 2) Operating range: recommended range with performance reserve
- 3) For UL applications: for use in class 2 circuits according to NEC only
- 4) Sum of the output currents for both outputs, 50mA when ambient temperatures > 40°C
- 5) 2=polarity reversal protection, 3=short circuit protection for all outputs
- 6) These proximity switches shall be used with UL Listed Cable assemblies rated 30V, 0.5A min, in the field installation, or equivalent (categories: CYJV/CYJV7 or PVVA/PVVA7)

## Tables

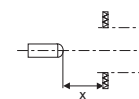
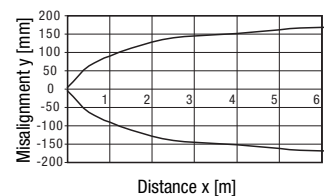
| Reflectors      | Operating range |
|-----------------|-----------------|
| 1 TK(S) 100x100 | 0.02 ... 4.5m   |
| 2 TKS 40x60     | 0.02 ... 3.0m   |
| 3 TKS 82.2      | 0.05 ... 3.6m   |
| 4 TKS 30x50     | 0.03 ... 1.9m   |
| 5 TKS 20x40     | 0.04 ... 1.6m   |
| 6 Tape 4 50x50  | 0.08 ... 1.4m   |

|   |      |     |     |
|---|------|-----|-----|
| 1 | 0.02 | 4.5 | 6.0 |
| 2 | 0.02 | 3.0 | 4.0 |
| 3 | 0.05 | 3.6 | 4.5 |
| 4 | 0.03 | 1.9 | 2.5 |
| 5 | 0.04 | 1.6 | 2.2 |
| 6 | 0.08 | 1.4 | 2.0 |

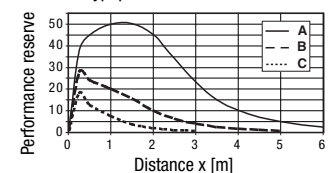
□ Operating range [m]  
 □ Typ. operating range limit [m]

## Diagrams

Typ. response behavior (TK 100x100)



Typ. performance reserve



- A TKS 100x100
- B TKS 40x60
- C TKS 20x40

## Remarks

### Operate in accordance with intended use!

- ⚠ This product is not a safety sensor and is not intended as personnel protection.
- ⚠ The product may only be put into operation by competent persons.
- ⚠ Only use the product in accordance with the intended use.

**PRK 28 Retro-reflective photoelectric sensors for semi-transparent media**

**Order guide**

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

|   |   | Designation         | Part no. |
|---|---|---------------------|----------|
| <b>With 4-pin M12 connector</b>           | Pin 4: PNP light switching, pin 2: PNP dark switching | PRK 28.3/4P-M12     | 50122585 |
|   | Pin 4: NPN light switching, pin 2: NPN dark switching | PRK 28.3/2N-M12     | 50122587 |
| <b>With 200mm cable and M12 connector</b> | Pin 4: PNP light switching, pin 2: PNP dark switching | PRK 28.3/4P-200-M12 | 50130047 |
|   | Pin 4: NPN light switching, pin 2: NPN dark switching | PRK 28.3/2N-200-M12 | 50130049 |
| <b>With cable, cable length 2m</b>        | Pin 4: PNP light switching, pin 2: PNP dark switching | PRK 28.3/4P         | 50122586 |
|   | Pin 4: NPN light switching, pin 2: NPN dark switching | PRK 28.3/2N         | 50122588 |

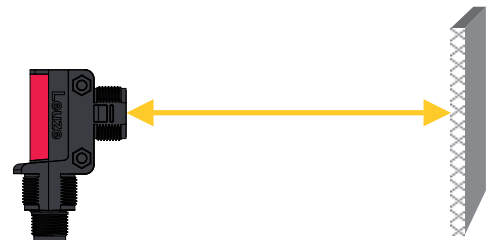
**Part number code**

|  |                                | P   | R | K | 2 | 8 | . | 3 | / | 4 | P | - | 2 | 0 | 0 | - | M | 1 | 2 |  |
|--|--------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| <b>Operating principle</b>   |                                | Polarized retro-reflective photoelectric sensor |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| <b>Series</b>  |                                | 28 Series                                       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| <b>Equipment</b>   |                                | Teach-in via teach button                       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| <b>Switching output/function /OUT1/OUT2 (OUT1 = Pin 4, OUT2 = Pin 2)</b> |                                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| <b>4</b>   | PNP, light switching           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| <b>P</b>   | PNP, dark switching            |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| <b>2</b>   | NPN, light switching           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| <b>N</b>   | NPN, dark switching            |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| <b>X</b>   | Pin not used                   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| <b>Electrical connection</b>   |                                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| <b>-M12</b>  | M12 connector, 4-pin           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| <b>N/A</b>   | Cable, standard length 2m      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| <b>-200-M12</b>  | 200mm cable with M12 connector |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |

**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.

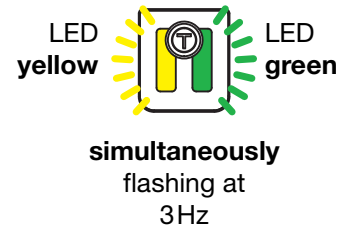
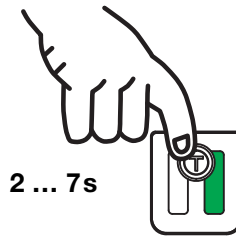


**Standard teaching for average sensor sensitivity**

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



After the standard teaching, the sensor switches when half of the light beam is covered by the object.

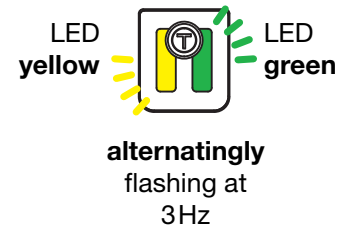
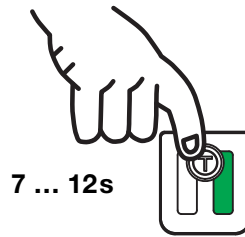


**Teaching for increased sensor sensitivity**

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

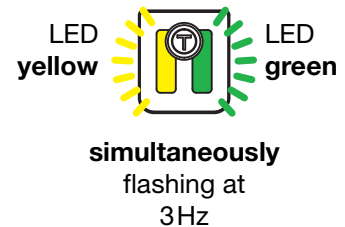
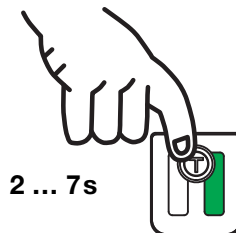
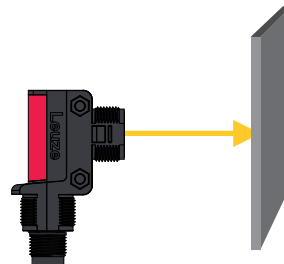


After the teaching for increased sensor sensitivity, the sensor switches when about 25 % of the light beam are covered by the object.



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

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

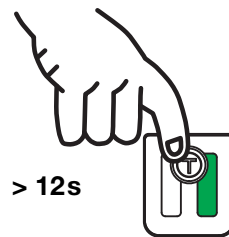


**Adjusting the switching behavior of the switching output – light/dark switching**

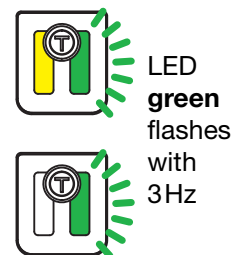
This function permits inversion of the sensors' switching logic.

- Press the teach button until only the green LED flashes. The yellow LED then shows the inverted switching logic:

- ON** = switching outputs light switching (in the case of complementary sensors, Q1 (pin 4) light switching, Q2 (pin 2) dark switching), this means output active when object is detected.
- OFF** = switching outputs dark switching (in the case of complementary sensors, Q1 (pin 4) dark switching, Q2 (pin 2) light switching), this means output inactive when object is detected.



LED yellow  
ON = light switching  
OFF = dark switching



- Release teach button.
- Ready.