



Figure can vary

**Part no.: 50133720**  
**PRK3CL1.TT3/LP-200-M12**  
**Polarized retro-reflective photoelectric sensor**



## Contents

- Technical data
- Dimensioned drawings
- Electrical connection
- Operation and display
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## Technical data

| <b>Basic data</b>                    |   |
|--------------------------------------|---|
| Series                               | 3C  |
| Operating principle                  | Reflection principle  |
| Application                          | Detection of highly transparent bottles<br>Detection of transparent films |
| <b>Special design</b>                |   |
| Special design                       | Autocollimation<br>Tracking function                                      |
| <b>Optical data</b>                  |   |
| Operating range                      | Guaranteed operating range  |
| Operating range                      | 0 ... 0.4 m   |
| Operating range limit                | Typical operating range   |
| Operating range limit                | 0 ... 0.5 m   |
| Beam profile                         | Collimated  |
| Light source                         | Laser , Red   |
| Laser light wavelength               | 655 nm  |
| Laser class                          | 1 , IEC/EN 60825-1:2007   |
| Max. laser power                     | 0.0017 W  |
| Transmitted-signal shape             | Pulsed  |
| Pulse duration                       | 5.3 $\mu$ s   |
| Light-spot size [at sensor distance] | 1 mm [500 mm]   |
| Type of light-spot geometry          | Round   |
| Shift angle                          | Typ. $\pm$ 2°   |
| <b>Electrical data</b>               |   |
| Protective circuit                   | Polarity reversal protection<br>Short circuit protected                   |
| <b>Performance data</b>              |   |
| Supply voltage $U_B$                 | 10 ... 30 V , DC , Incl. residual ripple                                  |
| Residual ripple                      | 0 ... 15 % , From $U_B$   |
| Open-circuit current                 | 0 ... 15 mA   |
| <b>Outputs</b>                       |   |
| Number of digital switching outputs  | 2 Piece(s)  |
| <b>Switching outputs</b>             |   |
| Voltage type                         | DC  |
| Switching current, max.              | 100 mA  |
| Switching voltage                    | High: $\geq(U_B-2V)$<br>Low: $\leq 2V$                                    |
| <b>Switching output 1</b>            |   |
| Assignment                           | Connection 1, pin 4   |
| Switching element                    | Transistor , Push-pull  |
| Switching principle                  | IO-Link / light switching (PNP)/dark switching (NPN)                      |
| <b>Switching output 2</b>            |   |
| Assignment                           | Connection 1, pin 2   |
| Switching element                    | Transistor , PNP  |
| Switching principle                  | Dark switching  |

**Timing**

|                     |          |
|---------------------|----------|
| Switching frequency | 3,000 Hz |
| Response time       | 0.17 ms  |
| Readiness delay     | 300 ms   |

**Interface**

|                  |               |
|------------------|---------------|
| Type             | IO-Link       |
| <b>IO-Link</b>   |               |
| COM mode         | COM2          |
| Frame type       | 2.5           |
| Specification    | V1.1          |
| SIO-mode support | Yes           |
| Min. cycle time  | COM2 = 2.3 ms |

**Connection**
**Connection 1**

|                    |   |
|--------------------|---|
| Type of connection | Cable with connector                      |
| Function           | Signal IN<br>Signal OUT<br>Voltage supply |
| Cable length       | 200 mm                                    |
| Sheathing material | PUR                                       |
| Cable color        | Black                                     |
| Wire cross section | 0.2 mm <sup>2</sup>                       |
| Thread size        | M12                                       |
| Type               | Male                                      |
| Material           | Metal                                     |
| No. of pins        | 4 -pin                                    |
| Encoding           | A-coded                                   |

**Mechanical data**

|                            |   |
|----------------------------|---|
| Dimension (W x H x L)      | 11.4 mm x 34.2 mm x 18.3 mm                           |
| Housing material           | Plastic , PC-ABS                                      |
| Lens cover material        | Plastic / PMMA  |
| Net weight                 | 20 g  |
| Housing color              | Red   |
| Type of fastening          | Through-hole mounting<br>Via optional mounting device |
| Compatibility of materials | ECOLAB  |

**Operation and display**

|                                     |                        |
|-------------------------------------|------------------------|
| Type of display                     | LED                    |
| Number of LEDs                      | 2 Piece(s)             |
| Operational controls                | Teach button           |
| Function of the operational control | Sensitivity adjustment |

**Environmental data**

|                                |               |
|--------------------------------|---------------|
| Ambient temperature, operation | -10 ... 55 °C |
| Ambient temperature, storage   | -40 ... 70 °C |

**Certifications**

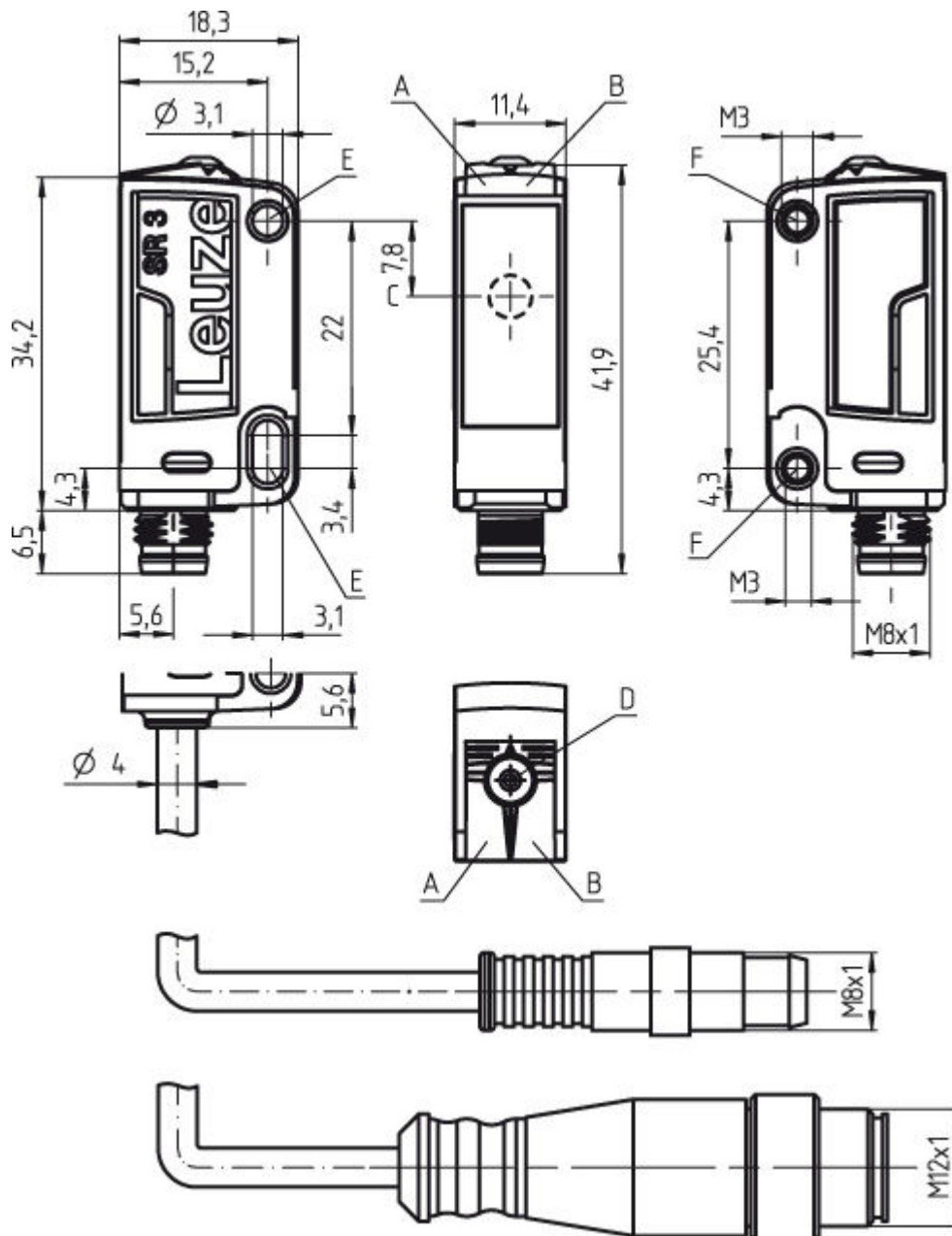
|                      |                 |
|----------------------|-----------------|
| Degree of protection | IP 67<br>IP 69K |
| Protection class     | III             |
| Certifications       | c UL US         |
| Standards applied    | IEC 60947-5-2   |

**Classification**

|                       |          |
|-----------------------|----------|
| Customs tariff number | 85365019 |
| eCl@ss 8.0            | 27270902 |
| eCl@ss 9.0            | 27270902 |
| ETIM 5.0              | EC002717 |
| ETIM 6.0              | EC002717 |

## Dimensioned drawings

All dimensions in millimeters



- A Green LED
- B Yellow LED
- C Optical axis
- D Teach button
- E Mounting sleeve (standard)
- F Threaded sleeve (3C.B series)

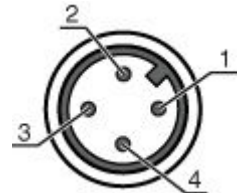
## Electrical connection

| Connection 1       |   |
|--------------------|---|
| Type of connection | Cable with connector                      |
| Function           | Signal IN<br>Signal OUT<br>Voltage supply |
| Cable length       | 200 mm                                    |
| Sheathing material | PUR                                       |

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| Connection 1       |                     |
|--------------------|---------------------|
| Cable color        | Black               |
| Wire cross section | 0.2 mm <sup>2</sup> |
| Thread size        | M12                 |
| Type               | Male                |
| Material           | Metal               |
| No. of pins        | 4 -pin              |
| Encoding           | A-coded             |

| Pin | Pin assignment  |
|-----|-----------------|
| 1   | V+              |
| 2   | OUT 2           |
| 3   | GND             |
| 4   | IO-Link / OUT 1 |






## Operation and display

### LEDs

| LED | Display                  | Meaning                              |
|-----|--------------------------|--------------------------------------|
| 1   | Green, continuous light  | Operational readiness                |
| 2   | Yellow, continuous light | Light path free                      |
|     | Yellow, flashing         | Light path free, no function reserve |

## Reflectors & reflective tapes

|   | Part no. | Designation   | Operating range/<br>Operating range limit | Description   |
|---|----------|---------------|---|---|
|  | 50110191 | REF 6-A-25x25 | 0 ... 0.4 m<br>0 ... 0.5 m                | Design: Rectangular<br>Reflective surface: 25 mm x 25 mm<br>Triple reflector size: 0.3 mm<br>Material: Plastic<br>Chemical designation of the material: PMMA<br>Fastening: Self-adhesive  |
|  | 50114185 | REF 6-S-20x40 | 0 ... 0.4 m<br>0 ... 0.5 m                | Design: Rectangular<br>Reflective surface: 16 mm x 38 mm<br>Triple reflector size: 0.3 mm<br>Material: Plastic<br>Base material: Plastic<br>Chemical designation of the material: PMMA8N<br>Fastening: Screw type                   |
|  | 50112142 | TK BR 53      | 0 ... 0.4 m<br>0 ... 0.5 m                | Design: Rectangular<br>Reflective surface: 29 mm x 10 mm<br>Triple reflector size: 0.3 mm<br>Material: Plastic<br>Base material: Stainless steel<br>Chemical designation of the material: Stainless steel<br>Fastening: Housing fit |

## Part number code

Part designation: AAA 3C d EE-f.GG H/i J-K

|       |   |
|-------|---|
| AAA3C | <b>Operating principle / construction:</b><br>HT3C: diffuse reflection sensor with background suppression<br>LS3C: throughbeam photoelectric sensor transmitter<br>LE3C: throughbeam photoelectric sensor receiver<br>PRK3C: retro-reflective photoelectric sensor with polarization filter   |
| d     | <b>Light type:</b><br>n/a: red light<br>l: infrared light   |
| EE    | <b>Light source:</b><br>n/a: LED<br>L1: laser class 1<br>L2: laser class 2  |
| f     | <b>Pre-set range (optional):</b><br>n/a: operating range acc. to data sheet<br>XXXX: pre-set range [mm]   |
| GG    | <b>Equipment:</b><br>n/a: standard<br>A: autocollimation principle (single lens) for positioning tasks<br>B: housing model with two M3 threaded sleeves, brass<br>F: permanently set range<br>L: long light spot<br>S: small light spot<br>T: autocollimation principle (single lens) for highly transparent bottles without tracking<br>TT: autocollimation principle (single lens) for highly transparent bottles with tracking<br>V: V-optics<br>XL: extra long light spot   |
| H     | <b>Operating range adjustment:</b><br>n/a with HT: range adjustable via 8-turn potentiometer<br>n/a with retro-reflective photoelectric sensors (PRK): operating range not adjustable<br>1: 270° potentiometer<br>3: teach-in via button<br>6: auto-teach   |
| i     | <b>Switching output/function OUT 1/IN: Pin 4 or black conductor:</b><br>2: NPN transistor output, light switching<br>N: NPN transistor output, dark switching<br>4: PNP transistor output, light switching<br>P: PNP transistor output, dark switching<br>6: push-pull switching output, PNP light switching, NPN dark switching<br>G: push-pull switching output, PNP dark switching, NPN light switching<br>/L: IO-Link<br>8: activation input (activation with high signal)<br>X: pin not used   |
| J     | <b>Switching output / function OUT 2/IN: pin 2 or white conductor:</b><br>2: NPN transistor output, light switching<br>N: NPN transistor output, dark switching<br>4: PNP transistor output, light switching<br>P: PNP transistor output, dark switching<br>6: push-pull switching output, PNP light switching, NPN dark switching<br>G: push-pull switching output, PNP dark switching, NPN light switching<br>W: warning output<br>X: pin not used<br>8: activation input (activation with high signal)<br>9: deactivation input (deactivation with high signal)<br>T: teach-in via cable |
| K     | <b>Electrical connection:</b><br>n/a: cable, standard length 2000 mm, 4-wire<br>5000: cable, standard length 5000 mm, 4-wire<br>M8: M8 connector, 4-pin (plug)<br>M8.3: M8 connector, 3-pin (plug)<br>200-M8: cable, length 200 mm with M8 connector, 4-pin, axial (plug)<br>200-M8.3: cable, length 200 mm with M8 connector, 3-pin, axial (plug)<br>200-M12: cable, length 200 mm with M12 connector, 4-pin, axial (plug)   |

### Note

A list with all available device types can be found on the Leuze electronic website at [www.leuze.com](http://www.leuze.com).

## Notes

### Observe 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 its intended use.

### For UL applications:

- For UL applications, use is only permitted in Class 2 circuits in accordance with the NEC (National Electric Code).
- 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)

### WARNING! LASER RADIATION – LASER CLASS 1



The device satisfies the requirements of IEC 60825-1:2007 (EN 60825-1:2007) safety regulations for a product of **laser class 1** as well as the U.S. 21 CFR 1040.10 regulations with deviations corresponding to "Laser Notice No. 50" from June 24, 2007.

- Observe the applicable statutory and local laser protection regulations.
- The device must not be tampered with and must not be changed in any way. There are no user-serviceable parts inside the device. Repairs must only be performed by Leuze electronic GmbH + Co. KG.

- Light source: Average life expectancy 50,000 h at an ambient temperature of 25 °C
- Response time: For short decay times, an ohmic load of approx. 5 kOhm is recommended
- Sum of the output currents for both outputs, 50 mA for ambient temperatures > 40 °C
- Permissible operating temperature range during IO-Link operation: -10 °C to +40 °C


## Accessories

### Connection technology - Connection cables


|   | Part no. | Designation        | Article          | Description  |
|---|----------|--------------------|------------------|--|
|  | 50130652 | KD U-M12-4A-V1-050 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 4 -pin<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 5,000 mm<br>Sheathing material: PVC  |
|  | 50130690 | KD U-M12-4W-V1-050 | Connection cable | Connection 1: Connector, M12, Angled, Female, A-coded, 4 -pin<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 5,000 mm<br>Sheathing material: PVC |

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## Mounting technology - Mounting brackets

|   | Part no. | Designation | Article         | Description  |
|---|----------|-------------|-----------------|--|
|  | 50060511 | BT 3        | Mounting device | Design of mounting device: Angle, L-shape<br>Fastening, at system: Through-hole mounting<br>Mounting bracket, at device: Screw type<br>Type of mounting device: Rigid<br>Material: Metal |


## Mounting technology - Rod mounts

|   | Part no. | Designation  | Article         | Description   |
|---|----------|--------------|-----------------|---|
|  | 50117255 | BTU 200M-D12 | Mounting system | Contains: 2x M3 x 16 screw, 2x M3 x 20 screw, 2x position washers<br>Design of mounting device: Mounting system<br>Fastening, at system: For 12 mm rod, Sheet-metal mounting<br>Mounting bracket, at device: Screw type<br>Type of mounting device: Clampable, Adjustable, Turning, 360°<br>Material: Metal |

## Micro-triad-type reflectors

|   | Part no. | Designation   | Article   | Description   |
|---|----------|---------------|-----------|---|
|  | 50114185 | REF 6-S-20x40 | Reflector | Design: Rectangular<br>Reflective surface: 16 mm x 38 mm<br>Triple reflector size: 0.3 mm<br>Material: Plastic<br>Base material: Plastic<br>Chemical designation of the material: PMMA8N<br>Fastening: Screw type |

## Reflective tapes for laser and clear-glass applications

|   | Part no. | Designation   | Article         | Description  |
|---|----------|---------------|-----------------|--|
|  | 50110191 | REF 6-A-25x25 | Reflective tape | Design: Rectangular<br>Reflective surface: 25 mm x 25 mm<br>Triple reflector size: 0.3 mm<br>Material: Plastic<br>Chemical designation of the material: PMMA<br>Fastening: Self-adhesive |