# Technical data sheet
# Polarized retro-reflective photoelectric
Part no.: 50133749
PRK3CL1.BA3/4T-200-M12

Figure can vary

**Contents**

# Technical data

## Basic data

| | |
|---|---|
| **Series** | 3C |
| **Operating principle** | Reflection principle |

## Special version

| | |
|---|---|
| **Special version** | Autocollimation |
| | Teach input |

## Optical data

| | |
|---|---|
| **Operating range** | Guaranteed operating range |
| **Operating range** | 0 ... 2 m, With reflector MTKS 50x50.1 |
| **Operating range limit** | Typical operating range |
| **Operating range limit** | 0 ... 3 m, With reflector MTKS 50x50.1 |
| **Beam path** | 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 µs |
| **Light spot size [at sensor distance]** | 1 mm [3,000 mm] |
| **Type of light spot geometry** | Round |
| **Shift angle** | Typ. ± 2° |

## Electrical data

| | |
|---|---|
| **Protective circuit** | Polarity reversal protection |
| | Short circuit protected |

### Performance data

| | |
|---|---|
| **Supply voltage $U_B$** | 10 ... 30 V, DC, Incl. residual ripple |
| **Residual ripple** | 0 ... 15 %, From $U_B$ |
| **Open-circuit current** | 0 ... 15 mA |

### Inputs

| | |
|---|---|
| **Number of teach inputs** | 1 Piece(s) |

#### Teach inputs

| | |
|---|---|
| **Voltage type** | DC |
| **Switching voltage** | high: ≥ 0.65 x $U_B$ |
| | low: ≤ 0.35 x $U_B$ |
| **Delay** | 1 ms |
| **Input resistance** | 20,000 Ω |

##### Teach input 1

| | |
|---|---|
| **Assignment** | Connection 1, pin 2 |
| **Function** | Keyboard lockout |
| | Light/dark switching |
| | Sensitivity adjustment |
| **Active switching state** | High |

### Outputs

| | |
|---|---|
| **Number of digital switching outputs** | 1 Piece(s) |

#### Switching outputs

| | |
|---|---|
| **Voltage type** | DC |
| **Switching current, max.** | 100 mA |
| **Switching voltage** | high: ≥($U_B$-2V) |
| | Low: ≤2V |

##### Switching output 1

| | |
|---|---|
| **Assignment** | Connection 1, pin 4 |
| **Switching element** | Transistor, PNP |
| **Switching principle** | Light switching |

## Timing

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

## Connection

### Connection 1

| | |
|---|---|
| **Function** | Signal IN |
| | Signal OUT |
| | Voltage supply |
| **Type of connection** | Cable with connector |
| **Cable length** | 200 mm |
| **Sheathing material** | PUR |
| **Cable color** | Black |
| **Wire cross section** | 0.2 mm² |
| **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** | Two M3 threaded sleeves |
| | 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** | -40 ... 55 °C |
| **Ambient temperature, storage** | -40 ... 70 °C |

## Certifications

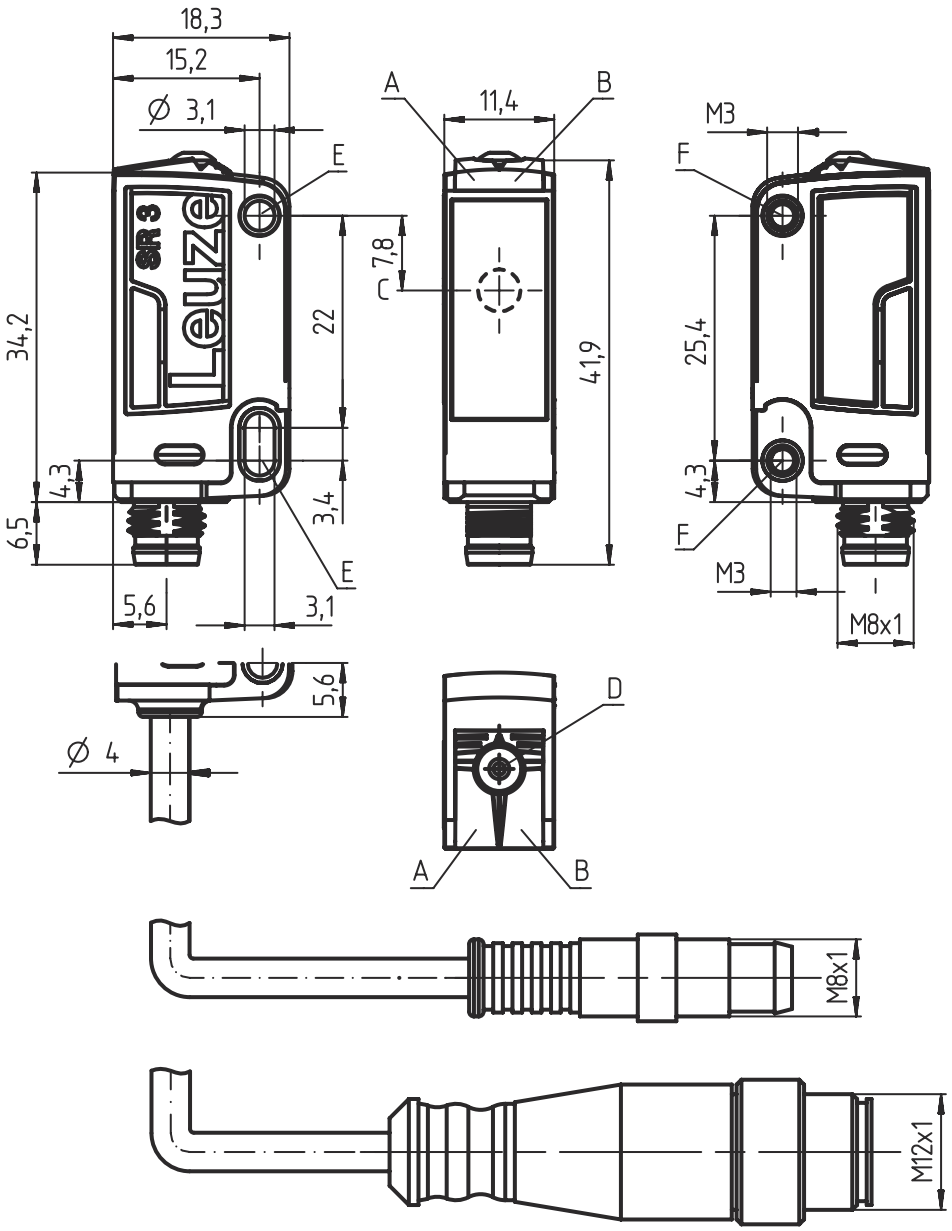
| | |
|---|---|
| **Degree of protection** | IP 67 |
| | IP 69K |
| **Protection class** | III |
| **Certifications** | c UL US |
| **Standards applied** | IEC 60947-5-2 |

# Technical data

| | |
|---|---|
| **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



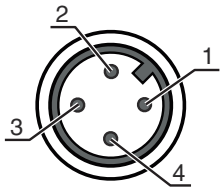

A Green LED
B Yellow LED
C Optical axis
D Teach button
E Mounting sleeve (standard)
F Threaded sleeve (3C.B series)

# Electrical connection

## Connection 1

| | |
|---|---|
| **Function** | Signal IN |
| | Signal OUT |
| | Voltage supply |
| **Type of connection** | Cable with connector |
| **Cable length** | 200 mm |
| **Sheathing material** | PUR |
| **Cable color** | Black |
| **Wire cross section** | 0.2 mm² |
| **Thread size** | M12 |
| **Type** | Male |
| **Material** | Metal |
| **No. of pins** | 4 -pin |
| **Encoding** | A-coded |

| Pin | Pin assignment |
|---|---|
| **1** | V+ |
| **2** | Teach-in |
| **3** | GND |
| **4** | OUT 1 |




# Operation and display

| 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 | Description |
|---|---|---|---|---|
|  | 50040894 | MTKS 20x30 | 0 ... 1.6 m<br>0 ... 2.2 m | Design: Rectangular<br>Reflective surface: 19 mm x 29 mm<br>Triple reflector size: 1.2 mm<br>Material: Plastic<br>Base material: Plastic<br>Chemical designation of the material: PMMA8N<br>Fastening: Through-hole mounting, Adhesive |
|  | 50104130 | MTKS 20x40.1 | 0 ... 1 m<br>0 ... 1.5 m | Design: Rectangular<br>Reflective surface: 17 mm x 38 mm<br>Triple reflector size: 12 mm<br>Material: Plastic<br>Base material: Plastic<br>Chemical designation of the material: PMMA8N<br>Fastening: Through-hole mounting, Adhesive |
|  | 50117583 | MTKS 50x50.1 | 0 ... 2 m<br>0 ... 3 m | Design: Rectangular<br>Reflective surface: 50 mm x 50 mm<br>Triple reflector size: 1.2 mm<br>Material: Plastic<br>Base material: Plastic<br>Chemical designation of the material: PMMA8N<br>Fastening: Through-hole mounting, Adhesive |

# Reflectors & reflective tapes

| | Part no. | Designation | Operating range<br>Operating range | Description |
|---|---|---|---|---|
|  | 50110192 | REF 6-A-50x50 | 0 ... 1 m<br>0 ... 1.4 m | Design: Rectangular<br>Reflective surface: 50 mm x 50 mm<br>Triple reflector size: 0.3 mm<br>Material: Plastic<br>Chemical designation of the material: PMMA<br>Fastening: Self-adhesive |

# Part number code

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

| | |
|---|---|
| **AAA3C** | **Operating principle / construction**<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** | **Light type**<br>n/a: red light<br>I: infrared light |
| **EE** | **Light source**<br>n/a: LED<br>L1: laser class 1<br>L2: laser class 2 |
| **f** | **Preset range (optional)**<br>n/a: operating range acc. to data sheet<br>xxxF: preset range [mm] |
| **GG** | **Equipment**<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<br>X: extended model |
| **H** | **Operating range adjustment**<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** | **Switching output/function OUT 1/IN: Pin 4 or black conductor**<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 interface (SIO mode: PNP light switching, NPN dark switching)<br>8: activation input (activation with high signal)<br>X: pin not used<br>1: IO-Link / light switching (NPN) / dark switching (PNP) |
| **J** | **Switching output / function OUT 2/IN: pin 2 or white conductor**<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 |

# Part number code

| | |
|---|---|
| **K** | **Electrical connection**<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 website at 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 – CLASS 1 LASER PRODUCT**

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.

# Further information

- 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

# 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 |

## 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 | Design of mounting device: Mounting system<br>Fastening, at system: For 12 mm rod, Sheet-metal mounting<br>Mounting bracket, at device: Screw type, Suited for M3 screws<br>Type of mounting device: Clampable, Adjustable, Turning, 360°<br>Material: Metal |

## Micro-triad-type reflectors

| | Part no. | Designation | Article | Description |
|---|---|---|---|---|
|  | 50104130 | MTKS 20x40.1 | Reflector | Design: Rectangular<br>Reflective surface: 17 mm x 38 mm<br>Triple reflector size: 12 mm<br>Material: Plastic<br>Base material: Plastic<br>Chemical designation of the material: PMMA8N<br>Fastening: Through-hole mounting, Adhesive |
|  | 50117583 | MTKS 50x50.1 | Reflector | Design: Rectangular<br>Reflective surface: 50 mm x 50 mm<br>Triple reflector size: 1.2 mm<br>Material: Plastic<br>Base material: Plastic<br>Chemical designation of the material: PMMA8N<br>Fastening: Through-hole mounting, Adhesive |

# Accessories

| | Note |
|---|---|
|  | A list with all available accessories can be found on the Leuze website in the Download tab of the article detailed page. |