



Figure can vary

**Part no.: 50133590**  
**HT3C/4-M8.3**  
**Diffuse sensor with background suppression**



## Contents

- Technical data
- Dimensioned drawings
- Electrical connection
- Diagrams
- Operation and display
- Part number code
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## Technical data

| <b>Basic data</b>                   |  |
|-------------------------------------|--|
| Series                              | 3C   |
| Operating principle                 | Diffuse reflection principle with background suppression |
| <b>Optical data</b>                 |  |
| Black-white error                   | < 10% up to 220 mm                                       |
| Operating range                     | Guaranteed operating range                               |
| Operating range, white 90%          | 0.005 ... 0.45 m   |
| Operating range, gray 18%           | 0.01 ... 0.34 m  |
| Operating range, black 6%           | 0.015 ... 0.22 m   |
| Operating range limit               | Typical operating range                                  |
| Operating range limit               | 0.005 ... 0.45 m   |
| Adjustment range                    | 15 ... 450 mm  |
| Beam profile                        | Focused  |
| Light source                        | LED, Red   |
| LED light wavelength                | 633 nm   |
| Transmitted-signal shape            | Pulsed   |
| LED protection class                | Exempt group (in acc. with EN 62471)                     |
| Type of light-spot geometry         | Round  |
| Focus                               | Fixed  |
| Focal distance                      | 200 mm   |
| <b>Electrical data</b>              |  |
| Protective circuit                  | Short circuit protected<br>Polarity reversal protection  |
| <b>Performance data</b>             |  |
| Supply voltage                      | 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 | 1 Piece(s)   |
| <b>Switching outputs</b>            |  |
| Voltage type                        | DC   |
| Switching current, max.             | 100 mA   |
| Switching voltage                   | Low: $\leq 2V$<br>High: $\geq (U_B - 2V)$                |
| <b>Switching output 1</b>           |  |
| Assignment                          | Connection 1, pin 4                                      |
| Switching element                   | Transistor, PNP  |
| Switching principle                 | Light switching  |
| <b>Timing</b>                       |  |
| Switching frequency                 | 1,000 Hz   |
| Response time                       | 0.5 ms   |
| Readiness delay                     | 300 ms   |
| Response jitter                     | 166 $\mu$ s  |
| <b>Connection</b>                   |  |

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### Connection 1

|                    |                              |
|--------------------|------------------------------|
| Type of connection | Connector                    |
| Function           | Voltage supply<br>Signal OUT |
| Thread size        | M8                           |
| Type               | Male                         |
| Material           | Metal                        |
| No. of pins        | 3 -pin                       |

### 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                 | 10 g  |
| Housing color              | Red   |
| Type of fastening          | Via optional mounting device<br>Through-hole mounting |
| Compatibility of materials | ECOLAB  |

### Operation and display

|                                     |                         |
|-------------------------------------|-------------------------|
| Type of display                     | LED                     |
| Number of LEDs                      | 2 Piece(s)              |
| Operational controls                | Multiturn potentiometer |
| Function of the operational control | Range adjustment        |

### Environmental data

|                                |               |
|--------------------------------|---------------|
| Ambient temperature, operation | -40 ... 60 °C |
| Ambient temperature, storage   | -40 ... 70 °C |

### Certifications

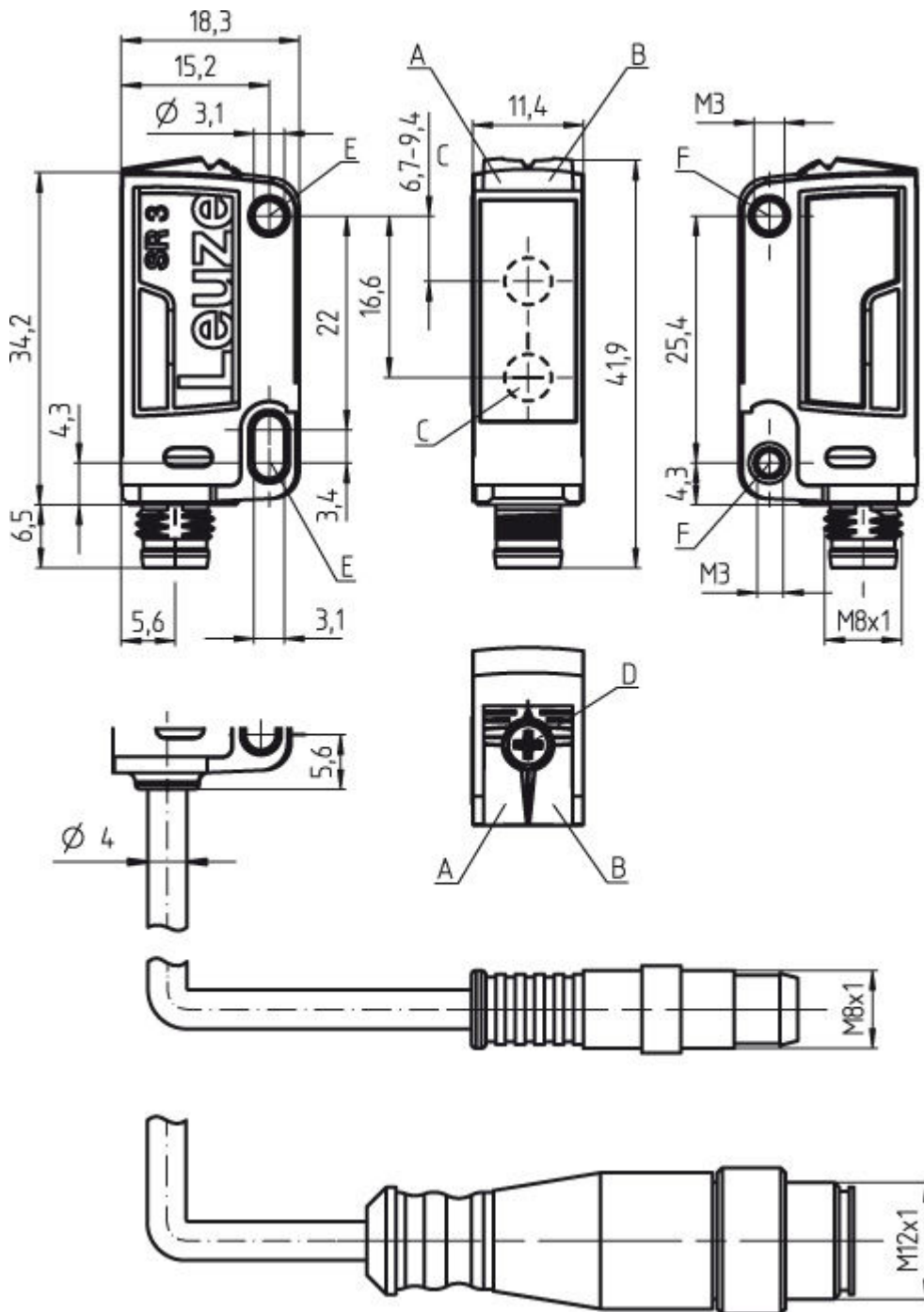
|                      |                 |
|----------------------|-----------------|
| Degree of protection | IP 67<br>IP 69K |
| Protection class     | III             |
| Certifications       | c UL US         |
| Standards applied    | IEC 60947-5-2   |

### Classification

|            |          |
|------------|----------|
| eCl@ss 8.0 | 27270904 |
| eCl@ss 9.0 | 27270904 |
| ETIM 5.0   | EC002719 |

## Dimensioned drawings

All dimensions in millimeters



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

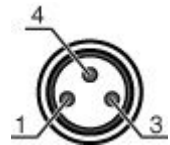
## Electrical connection

|                    |           |
|--------------------|-----------|
| Connection 1       |           |
| Type of connection | Connector |

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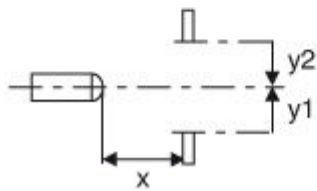
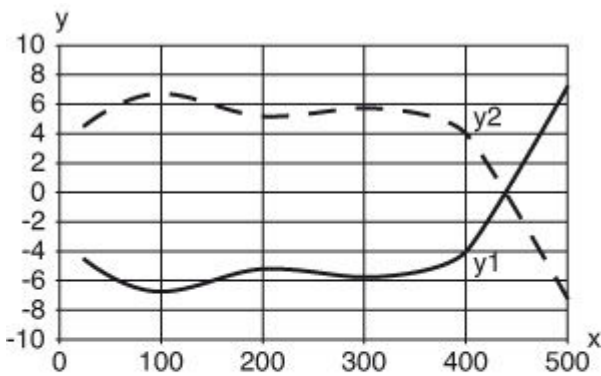
| Connection 1 |                              |
|--------------|------------------------------|
| Function     | Voltage supply<br>Signal OUT |
| Thread size  | M8                           |
| Type         | Male                         |
| Material     | Metal                        |
| No. of pins  | 3 -pin                       |
| Encoding     |                              |

| Pin | Pin assignment |
|-----|----------------|
| 1   | V+             |
| 3   | GND            |
| 4   | OUT 1          |



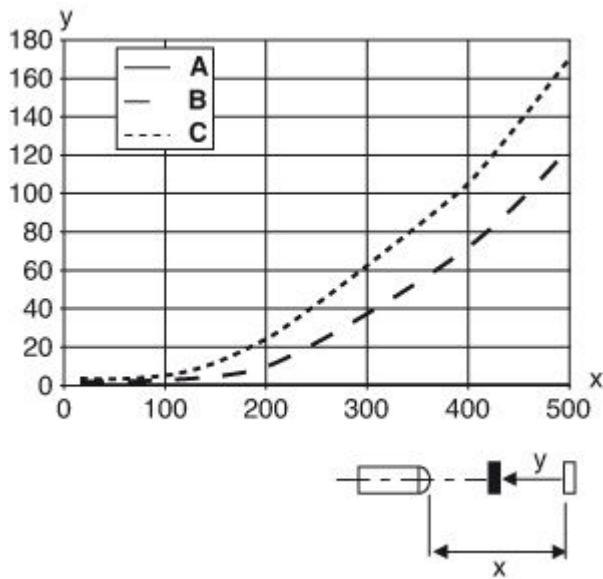
**Diagrams**

Typ. response behavior (white 90 %)



x Distance [mm]  
y Misalignment [mm]

Typ. black/white behavior



- x Range [mm]
- y Reduction of range [mm]
- A White 90%
- B Gray 18%
- C Black 6%

**Operation and display**

LEDs

| LED | Display                  | Meaning         |
|-----|--------------------------|-----------------|
| 1   | Green, continuous light  | Ready           |
| 2   | Yellow, continuous light | Object detected |

**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>I: 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]   |

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|    |  |
|----|--|
| 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: not connected (n. c.)<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, PVC, standard length 2000 mm, 4-wire<br>5000: cable, PVC, 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, PVC, length 200 mm with M8 connector, 4-pin, axial (plug)<br>200-M8.3: cable, PVC, length 200 mm with M8 connector, 3-pin, axial (plug)<br>200-M12: cable, PVC, length 200 mm with M12 connector, 4-pin, axial (plug)   |

## Accessories



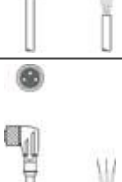
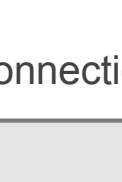
### Connection technology - Connection cables

|   | Part no. | Designation       | Article          | Description  |
|---|----------|-------------------|------------------|--|
|  | 50130842 | KD U-M8-3A-P1-020 | Connection cable | Connection 1: Connector, M8, Axial, Female, 3 -pin<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 2,000 mm<br>Sheathing material: PUR  |
|  | 50130844 | KD U-M8-3A-P1-050 | Connection cable | Connection 1: Connector, M8, Axial, Female, 3 -pin<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 5,000 mm<br>Sheathing material: PUR  |
|  | 50130845 | KD U-M8-3A-P1-100 | Connection cable | Connection 1: Connector, M8, Axial, Female, 3 -pin<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 10,000 mm<br>Sheathing material: PUR |

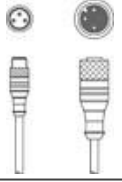
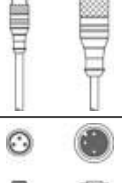
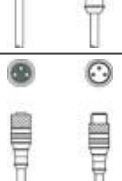


**Part no.: 50133590 – HT3C/4-M8.3 – Diffuse sensor with background**

|   | Part no. | Designation       | Article          | Description   |
|---|----------|-------------------|------------------|---|
|    | 50130846 | KD U-M8-3A-P1-150 | Connection cable | Connection 1: Connector, M8, Axial, Female, 3 -pin<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 15,000 mm<br>Sheathing material: PUR  |
|    | 50130847 | KD U-M8-3A-P1-200 | Connection cable | Connection 1: Connector, M8, Axial, Female, 3 -pin<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 20,000 mm<br>Sheathing material: PUR  |
|    | 50130837 | KD U-M8-3A-V1-020 | Connection cable | Connection 1: Connector, M8, Axial, Female, 3 -pin<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 2,000 mm<br>Sheathing material: PVC   |
|    | 50130832 | KD U-M8-3A-V1-050 | Connection cable | Connection 1: Connector, M8, Axial, Female, 3 -pin<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 5,000 mm<br>Sheathing material: PVC   |
|   | 50130839 | KD U-M8-3A-V1-100 | Connection cable | Connection 1: Connector, M8, Axial, Female, 3 -pin<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 10,000 mm<br>Sheathing material: PVC  |
|  | 50130840 | KD U-M8-3A-V1-150 | Connection cable | Connection 1: Connector, M8, Axial, Female, 3 -pin<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 15,000 mm<br>Sheathing material: PVC  |
|  | 50130841 | KD U-M8-3A-V1-200 | Connection cable | Connection 1: Connector, M8, Axial, Female, 3 -pin<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 20,000 mm<br>Sheathing material: PVC  |
|  | 50130865 | KD U-M8-3W-P1-020 | Connection cable | Connection 1: Connector, M8, Angled, Female, 3 -pin<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 2,000 mm<br>Sheathing material: PUR  |
|  | 50130867 | KD U-M8-3W-P1-050 | Connection cable | Connection 1: Connector, M8, Angled, Female, 3 -pin<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 5,000 mm<br>Sheathing material: PUR  |
|  | 50130868 | KD U-M8-3W-P1-100 | Connection cable | Connection 1: Connector, M8, Angled, Female, 3 -pin<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 10,000 mm<br>Sheathing material: PUR |











**Part no.: 50133590 – HT3C/4-M8.3 – Diffuse sensor with background**

|  | Part no. | Designation       | Article          | Description   |
|--|----------|-------------------|------------------|---|
|   | 50130860 | KD U-M8-3W-V1-020 | Connection cable | Connection 1: Connector, M8, Angled, Female, 3 -pin<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 2,000 mm<br>Sheathing material: PVC  |
|   | 50130862 | KD U-M8-3W-V1-050 | Connection cable | Connection 1: Connector, M8, Angled, Female, 3 -pin<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 5,000 mm<br>Sheathing material: PVC  |
|   | 50130863 | KD U-M8-3W-V1-100 | Connection cable | Connection 1: Connector, M8, Angled, Female, 3 -pin<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 10,000 mm<br>Sheathing material: PVC |
|  | 50130864 | KD U-M8-3W-V1-200 | Connection cable | Connection 1: Connector, M8, Angled, Female, 3 -pin<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 20,000 mm<br>Sheathing material: PVC |


**Connection technology - Interconnection cables**

|   | Part no. | Designation               | Article               | Description   |
|---|----------|---------------------------|-----------------------|---|
|  | 50130929 | KDS U-M8-3A-M12-3A-P1-010 | Interconnection cable | Connection 1: Connector, M8, Axial, Female, 3 -pin<br>Connection 2: Connector, M12, Axial, Male, A-coded, 3 -pin<br>Shielded: No<br>Cable length: 1,000 mm<br>Sheathing material: PUR |
|  | 50130931 | KDS U-M8-3A-M12-3A-P1-020 | Interconnection cable | Connection 1: Connector, M8, Axial, Female, 3 -pin<br>Connection 2: Connector, M12, Axial, Male, A-coded, 3 -pin<br>Shielded: No<br>Cable length: 2,000 mm<br>Sheathing material: PUR |
|  | 50130932 | KDS U-M8-3A-M12-3A-P1-050 | Interconnection cable | Connection 1: Connector, M8, Axial, Female, 3 -pin<br>Connection 2: Connector, M12, Axial, Male, A-coded, 3 -pin<br>Shielded: No<br>Cable length: 5,000 mm<br>Sheathing material: PUR |
|  | 50130901 | KDS U-M8-3A-M8-3A-P1-003  | Interconnection cable | Connection 1: Connector, M8, Axial, Female, 3 -pin<br>Connection 2: Connector, M8, Axial, Male, 3 -pin<br>Shielded: No<br>Cable length: 300 mm<br>Sheathing material: PUR             |
|  | 50130902 | KDS U-M8-3A-M8-3A-P1-006  | Interconnection cable | Connection 1: Connector, M8, Axial, Female, 3 -pin<br>Connection 2: Connector, M8, Axial, Male, 3 -pin<br>Shielded: No<br>Cable length: 600 mm<br>Sheathing material: PUR             |






**Part no.: 50133590 – HT3C/4-M8.3 – Diffuse sensor with background**

|   | Part no. | Designation              | Article               | Description  |
|---|----------|--------------------------|-----------------------|--|
|    | 50130903 | KDS U-M8-3A-M8-3A-P1-010 | Interconnection cable | Connection 1: Connector, M8, Axial, Female, 3 -pin<br>Connection 2: Connector, M8, Axial, Male, 3 -pin<br>Shielded: No<br>Cable length: 1,000 mm<br>Sheathing material: PUR  |
|    | 50130905 | KDS U-M8-3A-M8-3A-P1-020 | Interconnection cable | Connection 1: Connector, M8, Axial, Female, 3 -pin<br>Connection 2: Connector, M8, Axial, Male, 3 -pin<br>Shielded: No<br>Cable length: 2,000 mm<br>Sheathing material: PUR  |
|    | 50130907 | KDS U-M8-3A-M8-3A-P1-050 | Interconnection cable | Connection 1: Connector, M8, Axial, Female, 3 -pin<br>Connection 2: Connector, M8, Axial, Male, 3 -pin<br>Shielded: No<br>Cable length: 5,000 mm<br>Sheathing material: PUR  |
|    | 50130897 | KDS U-M8-3A-M8-3A-V1-003 | Interconnection cable | Connection 1: Connector, M8, Axial, Female, 3 -pin<br>Connection 2: Connector, M8, Axial, Male, 3 -pin<br>Shielded: No<br>Cable length: 300 mm<br>Sheathing material: PVC    |
|   | 50130898 | KDS U-M8-3A-M8-3A-V1-006 | Interconnection cable | Connection 1: Connector, M8, Axial, Female, 3 -pin<br>Connection 2: Connector, M8, Axial, Male, 3 -pin<br>Shielded: No<br>Cable length: 600 mm<br>Sheathing material: PVC    |
|  | 50130899 | KDS U-M8-3A-M8-3A-V1-010 | Interconnection cable | Connection 1: Connector, M8, Axial, Female, 3 -pin<br>Connection 2: Connector, M8, Axial, Male, 3 -pin<br>Shielded: No<br>Cable length: 1,000 mm<br>Sheathing material: PVC  |
|  | 50130900 | KDS U-M8-3A-M8-3A-V1-020 | Interconnection cable | Connection 1: Connector, M8, Axial, Female, 3 -pin<br>Connection 2: Connector, M8, Axial, Male, 3 -pin<br>Shielded: No<br>Cable length: 2,000 mm<br>Sheathing material: PVC  |
|  | 50130917 | KDS U-M8-3W-M8-3A-P1-003 | Interconnection cable | Connection 1: Connector, M8, Angled, Female, 3 -pin<br>Connection 2: Connector, M8, Axial, Male, 3 -pin<br>Shielded: No<br>Cable length: 300 mm<br>Sheathing material: PUR   |
|  | 50130918 | KDS U-M8-3W-M8-3A-P1-006 | Interconnection cable | Connection 1: Connector, M8, Angled, Female, 3 -pin<br>Connection 2: Connector, M8, Axial, Male, 3 -pin<br>Shielded: No<br>Cable length: 600 mm<br>Sheathing material: PUR   |
|  | 50130919 | KDS U-M8-3W-M8-3A-P1-010 | Interconnection cable | Connection 1: Connector, M8, Angled, Female, 3 -pin<br>Connection 2: Connector, M8, Axial, Male, 3 -pin<br>Shielded: No<br>Cable length: 1,000 mm<br>Sheathing material: PUR |



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|   | Part no. | Designation              | Article               | Description  |
|---|----------|--------------------------|-----------------------|--|
|  | 50130920 | KDS U-M8-3W-M8-3A-P1-020 | Interconnection cable | Connection 1: Connector, M8, Angled, Female, 3 -pin<br>Connection 2: Connector, M8, Axial, Male, 3 -pin<br>Shielded: No<br>Cable length: 2,000 mm<br>Sheathing material: PUR |



**Mounting technology - Mounting brackets**

|   | Part no. | Designation   | Article             | Description   |
|---|----------|---------------|---------------------|---|
|    | 50118542 | BT 200M.5     | Mounting bracket    | 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: Adjustable<br>Material: Stainless steel   |
|    | 50124651 | BT 205M-10SET | Mounting device set | Contains: 10x<br>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 |
|   | 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                  |
|  | 50105585 | BT 3.1        | Mounting strap set  | Contains: 10x<br>Design of mounting device: Retaining clip<br>Fastening, at system: Through-hole mounting<br>Mounting bracket, at device: Screw type<br>Type of mounting device: Rigid<br>Material: Metal |
|  | 50105546 | BT 3B         | 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   |
|---|----------|--------------|-----------------|---|
|  | 50117256 | BTU 200M-D10 | Mounting system | Contains: 2x M3 x 18 screw, 2x position washers<br>Design of mounting device: Mounting system<br>Fastening, at system: For 10 mm rod, Sheet-metal mounting<br>Mounting bracket, at device: Screw type<br>Type of mounting device: Clampable, Adjustable, Turning, 360°<br>Material: Metal |
|  | 50117255 | BTU 200M-D12 | Mounting system | Contains: 2x M3 x 18 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 |

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|   | Part no. | Designation    | Article         | Description   |
|---|----------|----------------|-----------------|---|
|  | 50117254 | BTU 200M-D14   | Mounting system | Contains: 2x M3 x 18 screw, 2x position washers<br>Design of mounting device: Mounting system<br>Fastening, at system: For 14 mm rod, Sheet-metal mounting<br>Mounting bracket, at device: Screw type<br>Type of mounting device: Clampable, Adjustable, Turning, 360°<br>Material: Metal         |
|  | 50120426 | BTU 200M.5-D12 | Mounting system | Contains: 2x M3 x 18 screw, 2x M3 mounting nut, 2x position washers<br>Design of mounting device: Mounting system<br>Fastening, at system: For 12 mm rod<br>Mounting bracket, at device: Screw type<br>Type of mounting device: Turning, 360°, Clampable, Adjustable<br>Material: Stainless steel |

## 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)

- Light source: Average life expectancy 100,000 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