



Figure can vary

**Part no.: 50129392**  
**HT3CL1/4P**  
**Diffuse sensor with background suppression**



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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 170 mm  |
| Operating range                      | Guaranteed operating range  |
| Operating range, white 90%           | 0.015 ... 0.4 m   |
| Operating range, gray 18%            | 0.015 ... 0.25 m  |
| Operating range, black 6%            | 0.015 ... 0.17 m  |
| Operating range limit                | Typical operating range   |
| Operating range limit                | 0.015 ... 0.4 m   |
| Adjustment range                     | 20 ... 400 mm   |
| Beam profile                         | Collimated  |
| Light source                         | Laser, Red  |
| Laser light wavelength               | 650 nm  |
| Laser class                          | 1, IEC/EN 60825-1:2007  |
| Max. laser power                     | 0.0018 W  |
| Transmitted-signal shape             | Pulsed  |
| Pulse duration                       | 5.1 $\mu$ s   |
| Light-spot size [at sensor distance] | 1 mm [400 mm]   |
| Type of light-spot geometry          | Round   |
| Shift angle                          | Typ. $\pm$ 2°   |
| <b>Electrical data</b>               |   |
| Protective circuit                   | Overvoltage protection<br>Short circuit protected<br>Polarity reversal protection |
| <b>Performance data</b>              |   |
| Supply voltage                       | 10 ... 30 V, DC, Incl. residual ripple  |
| Residual ripple                      | 0 ... 10 %, From $U_B$  |
| Open-circuit current                 | 0 ... 20 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                    | Low: $\leq$ 2V<br>High: $\geq(U_B-2V)$  |
| <b>Switching output 1</b>            |   |
| Assignment                           | Connection 1, conductor 4   |
| Switching element                    | Transistor, PNP   |
| Switching principle                  | Light switching   |
| <b>Switching output 2</b>            |   |
| Assignment                           | Connection 1, conductor 2   |
| Switching element                    | Transistor, PNP   |
| Switching principle                  | Dark switching  |
| <b>Timing</b>                        |   |

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|                     |          |
|---------------------|----------|
| Switching frequency | 3,000 Hz |
| Response time       | 0.16 ms  |
| Decay time          | 0.16 ms  |
| Readiness delay     | 300 ms   |
| Response jitter     | 55 µs    |

### Connection

#### Connection 1

|                      |                              |
|----------------------|------------------------------|
| Type of connection   | Cable                        |
| Function             | Signal OUT<br>Voltage supply |
| Cable length         | 2,000 mm                     |
| Sheathing material   | PUR                          |
| Cable color          | Black                        |
| Number of conductors | 4 -wire                      |
| Wire cross section   | 0.2 mm <sup>2</sup>          |

### 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                 | 50 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 ... 55 °C |
| Ambient temperature, storage   | -40 ... 70 °C |

### Certifications

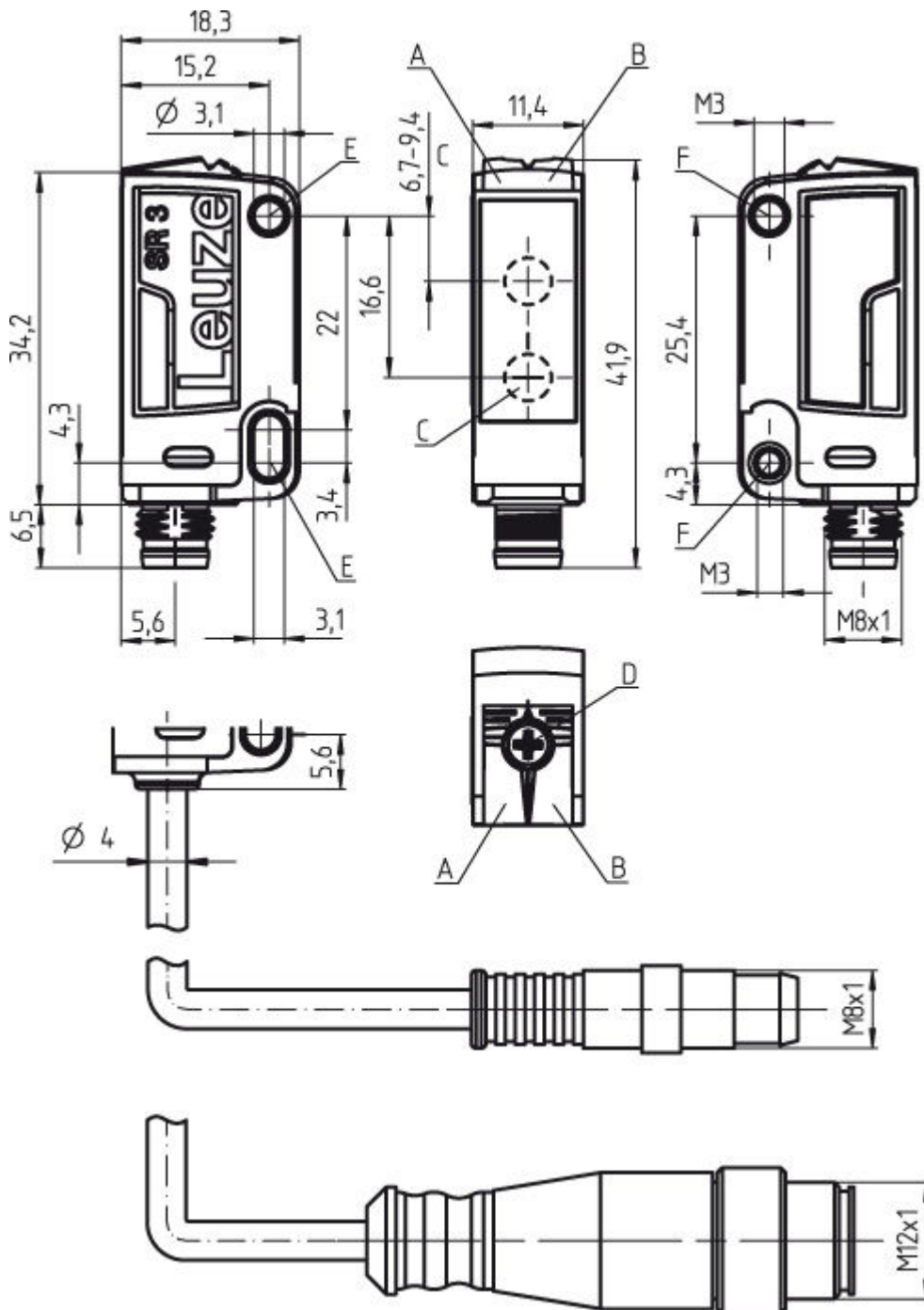
|                      |                 |
|----------------------|-----------------|
| Degree of protection | IP 67<br>IP 69K |
| Protection class     | III             |
| Certifications       | c UL US         |
| Standards applied    | IEC 60947-5-2   |

### Classification

|            |          |
|------------|----------|
| 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)

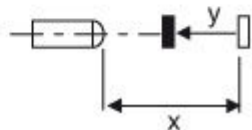
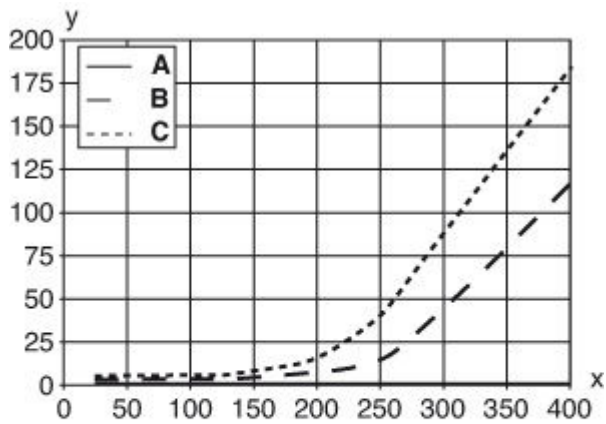
## Electrical connection

| Connection 1         |                              |
|----------------------|------------------------------|
| Type of connection   | Cable                        |
| Function             | Signal OUT<br>Voltage supply |
| Cable length         | 2,000 mm                     |
| Sheathing material   | PUR                          |
| Cable color          | Black                        |
| Number of conductors | 4 -wire                      |
| Wire cross section   | 0.2 mm <sup>2</sup>          |

| Conductor color | Conductor assignment |
|-----------------|----------------------|
| Brown           | V+                   |
| White           | OUT 2                |
| Blue            | GND                  |
| Black           | OUT 1                |

## Diagrams

Typ. black/white behavior



- x Distance [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  | Operational readiness |
| 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]  |
| 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)   |




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## Accessories


### 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 |
|  | 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 |

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|   | Part no. | Designation    | Article         | Description   |
|---|----------|----------------|-----------------|---|
|  | 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)

### 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