# Technical data sheet

# Distance diffuse sensor with background suppression

Part no.: 50153162

ODT3CL1-2M.3/L6-1000-M12



For Illustration purposes only

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# Technical data

## Basic data

| | |
|---|---|
| **Series** | 3C |
| **Operating principle** | Distance diffuse sensor with background suppression |
| **Type of scanning system** | Against object |

## Special version

| | |
|---|---|
| **Special version** | 2 independent switching outputs |
| | Measurement value output |

## Optical data

| | |
|---|---|
| **Black-white error** | ±20 mm |
| **Operating range** | 0.07 ... 2 m (guaranteed operating range) |
| **Adjustment range** | 50 ... 2,500 mm |
| **Beam path** | Focused |
| **Light source** | Laser, Red |
| **Wavelength** | 680 nm |
| **Laser class** | 1, IEC 60825-1:2014 / EN 60825-1:2014+A11:2021 |
| **Transmitted-signal shape** | Pulsed |
| **Type of light spot geometry** | Round |
| **Shift angle** | Typ. ± 1.5° |

## Measurement data

| | |
|---|---|
| **Measurement range** | 50 ... 2,500 mm |
| **Resolution** | 1.0 mm |
| **Accuracy** | -20 ... 20 mm |
| **Reproducibility (1 sigma)** | 0 ... 8 mm |
| **Measurement value output** | via IO-Link |
| **Optical distance measurement principle** | Time of flight |

## Electrical data

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

### Performance data

| | |
|---|---|
| **Supply voltage $U_B$** | 10 ... 30 V, DC, Incl. residual ripple |
| **Residual ripple** | 0 ... 15 %, From $U_B$ |
| **Open-circuit current** | 0 ... 35 mA |

### Outputs

| | |
|---|---|
| **Number of digital switching outputs** | 2 Piece(s) |

#### Switching outputs

| | |
|---|---|
| **Type** | Digital switching output |
| **Voltage type** | DC |
| **Switching current, max.** | 90 mA |
| **Switching voltage** | high: ≥($U_B$-2V) |
| | low: ≤ 2 V |

##### Switching output 1

| | |
|---|---|
| **Assignment** | Connection 1, pin 4 |
| **Switching element** | Transistor, Push-pull |
| **Switching principle** | IO-Link / light switching (PNP)/dark switching (NPN) |

##### Switching output 2

| | |
|---|---|
| **Assignment** | Connection 1, pin 2 |
| **Switching element** | Transistor, Push-pull |
| **Switching principle** | Light switching (PNP)/dark switching (NPN) |

## Time behavior

| | |
|---|---|
| **Switching frequency** | 7 ... 15 Hz, depending on diffuse reflectance |
| **Response time** | 33 ... 70 ms, depending on diffuse reflectance |
| **Readiness delay** | 300 ms |

## Interface

| | |
|---|---|
| **Type** | IO-Link |

### IO-Link

| | |
|---|---|
| **COM mode** | COM3 |
| **Profile** | Smart sensor profile |
| **Min. cycle time** | COM3 = 0.6 ms |
| **Frame type** | 2.V |
| **Specification** | V1.1 |
| **Device ID** | 2220 |
| **SIO-mode support** | Yes |

## Connection

| | |
|---|---|
| **Number of connections** | 1 Piece(s) |

### Connection 1

| | |
|---|---|
| **Function** | Signal IN |
| | Signal OUT |
| | Voltage supply |
| **Type of connection** | Cable with connector |
| **Cable length** | 1,000 mm |
| **Sheathing material** | PUR |
| **Cable color** | Black |
| **Number of conductors** | 4 -wire |
| **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 |
| **Plastic housing** | PC-ABS |
| **Lens cover material** | Plastic / PMMA |
| **Net weight** | 30 g |
| **Housing color** | Red |
| **Type of fastening** | Through-hole mounting |
| | Via optional mounting device |
| **Recommended tightening torque for M3 fastening** | 0.9 N·m |
| **Compatibility of materials** | ECOLAB |

# Technical data

## Operation and display

| | |
|---|---|
| **Type of display** | LED |
| **Number of LEDs** | 2 Piece(s) |
| **Operational controls** | Teach button |
| **Function of the operational control** | Light/dark switching |
| | Range adjustment |

## Environmental data

| | |
|---|---|
| **Ambient temperature, operation** | -30 ... 50 °C |
| **Ambient temperature, storage** | -40 ... 70 °C |

## Certifications

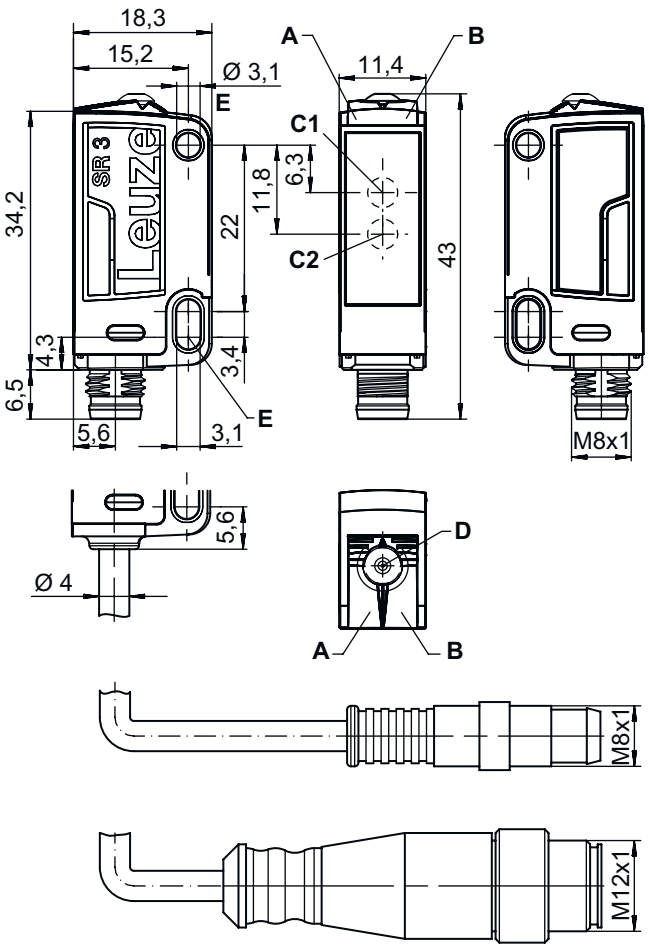
| | |
|---|---|
| **Degree of protection** | IP 67 |
| | IP 69K |
| **Protection class** | III |
| **Approvals** | c UL US |
| **Standards applied** | IEC 60947-5-2 |

## Classification

| | |
|---|---|
| **Customs tariff number** | 85365019 |
| **ECLASS 5.1.4** | 27270904 |
| **ECLASS 8.0** | 27270904 |
| **ECLASS 9.0** | 27270904 |
| **ECLASS 10.0** | 27270904 |
| **ECLASS 11.0** | 27270904 |
| **ECLASS 12.0** | 27270903 |
| **ECLASS 13.0** | 27270903 |
| **ECLASS 14.0** | 27270903 |
| **ECLASS 15.0** | 27270903 |
| **ECLASS 16.0** | 27270903 |
| **ETIM 5.0** | EC002719 |
| **ETIM 6.0** | EC002719 |
| **ETIM 7.0** | EC002719 |
| **ETIM 8.0** | EC002719 |
| **ETIM 9.0** | EC002719 |
| **ETIM 10.0** | EC002719 |
| **UNSPSC 26.08** | 39121528 |

# Dimensioned drawings

All dimensions in millimeters




A Green LED
B Yellow LED
C1 Receiver
C2 Transmitter
D Teach button
E Mounting sleeve

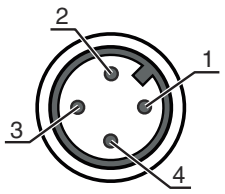
# Electrical connection

## Connection 1

| | |
|---|---|
| **Function** | Signal IN |
| | Signal OUT |
| | Voltage supply |
| **Type of connection** | Cable with connector |
| **Cable length** | 1,000 mm |
| **Sheathing material** | PUR |
| **Cable color** | Black |
| **Number of conductors** | 4 -wire |
| **Wire cross section** | 0.2 mm² |
| **Thread size** | M12 |
| **Type** | Male |
| **Material** | Metal |
| **No. of pins** | 4 -pin |
| **Encoding** | A-coded |

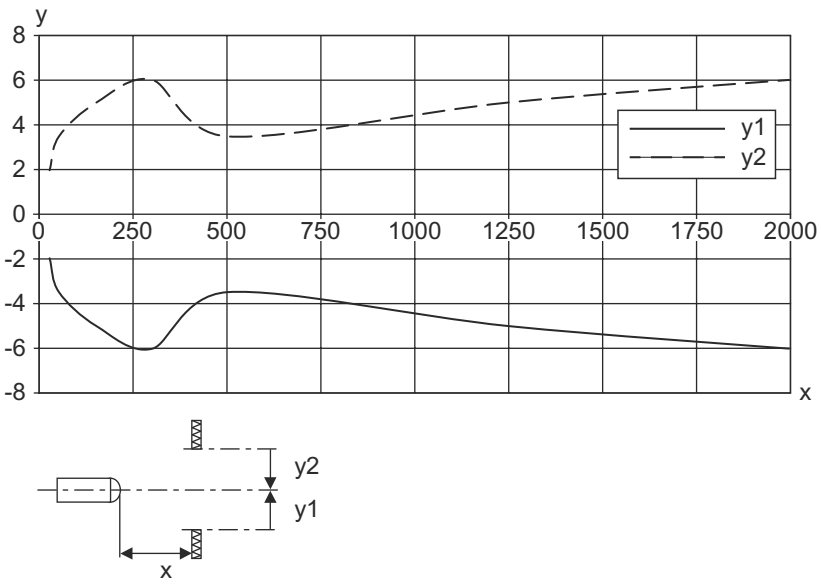
# Electrical connection

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



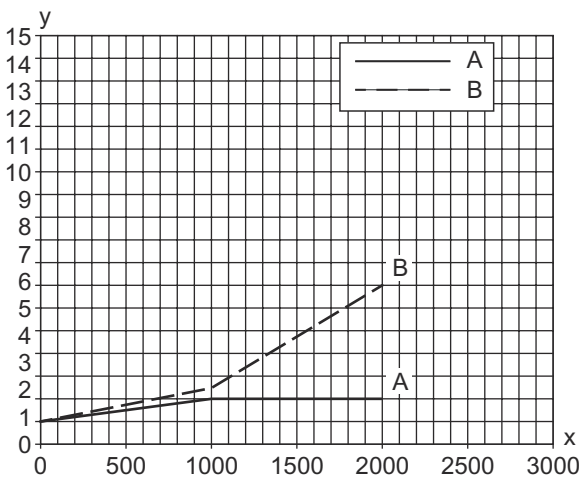

# Diagrams

## Typ. response behavior (white 90 %)




x Distance [mm]
y Misalignment [mm]

## Typical reproducibility (1 Sigma / 25°C)

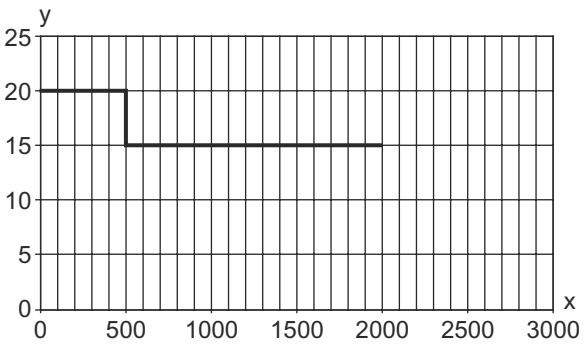



x Distance [mm]
y Reproducibility 1 (Sigma) [mm]

A Target 90% remission
B Target 6% remission

# Diagrams

## S/W Error Diagram




x Distance [mm]
y S/W Error

# Operation and display

| 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** | **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<br>ODT3C: Distance diffuse sensor with background suppression |
| **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<br>PP: Power PinPoint® LED |
| **f** | **Preset range (optional)**<br>n/a: operating range acc. to data sheet<br>xxxF: Preset range [mm]<br>2M: operating range of 2 meters |
| **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<br>HF: Suppression of HF illumination (LED) |
| **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 |

# Part number code

| | |
|---|---|
| **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 |
| **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)

# Notes

| ATTENTION! LASER RADIATION – CLASS 1 LASER PRODUCT |
|---|
| The device satisfies the requirements of IEC 60825-1:2014 / EN 60825-1:2014+A11:2021 safety regulations for a product of **laser class 1** and complies with 21 CFR 1040.10 except for conformance with IEC 60825-1 Ed. 3., as described in Laser Notice No. 56, dated May 8, 2019.<br>↳ Observe the applicable statutory and local laser protection regulations.<br>↳ The device must not be tampered with and must not be changed in any way.<br>There are no user-serviceable parts inside the device.<br>There are no user-serviceable parts inside the device.<br>Repairs must only be performed by Leuze electronic GmbH + Co. KG. |

# Further information

- Sum of the output currents for both outputs, 50 mA for ambient temperatures > 40 °C
- With a supply voltage >18 V and an ambient temperature <40 °C, the maximum switching current is 100 mA per switching output.
- When starting the sensor below -20°C, a warmup time of one minute is required until the first teach-in

# Accessories

## Connection technology - Connection cables

| | Part no. | Designation | Article | Description |
|---|---|---|---|---|
|  | 50130850 | KD U-M8-4A-V1-050 | Connection cable | Application: Chemical resistant<br>Connection 1: Connector, M8, Axial, Female, 4 -pin<br>Connector, LED: No<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 5,000 mm<br>Sheathing material: PVC |
|  | 50130871 | KD U-M8-4W-V1-050 | Connection cable | Application: Chemical resistant<br>Connection 1: Connector, M8, Angled, Female, 4 -pin<br>Connector, LED: No<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 |

# Accessories

## Mounting technology - Rod mounts

| | Part no. | Designation | Article | Description |
|---|---|---|---|---|
|  | 50117255 | BTU 200M-D12 | Mounting system | Contains: 2x M3 x 16 screw, 2 M3 x 20 screws, 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, Suited for M3 screws<br>Type of mounting device: Clampable, Adjustable, Turning, 360°<br>Material: Metal |

**Note**

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