# Technical data sheet
# Diffuse sensor with background suppression
Part no.: 50148211
HT55CL1/LG-5000

For Illustration purposes only

**Contents**

# Technical data

## Basic data

| | |
|---|---|
| **Series** | 55C |
| **Operating principle** | Diffuse reflection principle with background suppression |

## Special version

| | |
|---|---|
| **Special version** | Wash-Down design |

## Optical data

| | |
|---|---|
| **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** | 0.015 ... 0.4 m |
| **Operating range limit** | Typical operating range |
| **Adjustment range** | 20 ... 400 mm |
| **Beam path** | Collimated |
| **Light source** | Laser, Red |
| **Wavelength** | 650 nm |
| **Laser class** | 1, in accordance with IEC 60825-1:2014 (EN 60825-1:2014) |
| **Max. laser power** | 0.0018 W |
| **Transmitted-signal shape** | Pulsed |
| **Pulse duration** | 5.1 µs |
| **Light spot size [at sensor distance]** | 1 mm [400 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 ... 10 %, From $U_B$ |
| **Open-circuit current** | 0 ... 20 mA |

### Outputs

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

#### Switching outputs

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

##### Switching output 1

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

##### Switching output 2

| | |
|---|---|
| **Switching element** | Transistor, Push-pull |
| **Switching principle** | Dark switching (PNP)/light switching (NPN) |

## Time behavior

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

## Interface

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

### IO-Link

| | |
|---|---|
| **COM mode** | COM2 |
| **Profile** | Smart sensor profile |
| **Min. cycle time** | COM2 = 2.3 ms |
| **Frame type** | 2.5 |
| **Specification** | V1.1 |
| **Device ID** | 6005 |
| **SIO-mode support** | Yes |

## Connection

### Connection 1

| | |
|---|---|
| **Function** | Signal IN |
| | Signal OUT |
| | Voltage supply |
| **Type of connection** | Cable |
| **Cable length** | 5,000 mm |
| **Sheathing material** | PVC |
| **Cable color** | Black |
| **Number of conductors** | 4 -wire |
| **Wire cross section** | 0.2 mm² |

## Mechanical data

| | |
|---|---|
| **Dimension (W x H x L)** | 14 mm x 35.4 mm x 25 mm |
| **Housing material** | Stainless steel |
| **Material of operational control** | Plastic (POM Hostaform C9021, copolyester Tritan TX1001), non-diffusive |
| **Housing roughness** | Ra ≤ 0,8, Typical value for the stainless steel housing |
| **Stainless steel housing** | AISI 316L, DIN X2CrNiMo17132, W. No1.4404 |
| **Lens cover material** | Plastic (PMMA+) with scratch-resistant Indium protective coating |
| **Net weight** | 210 g |
| **Housing color** | Silver |
| **Type of fastening** | Through-hole mounting |
| | Via optional mounting device |
| **Compatibility of materials** | CleanProof+ |
| | ECOLAB |
| | Johnson Diversey |

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

# Technical data

## Certifications

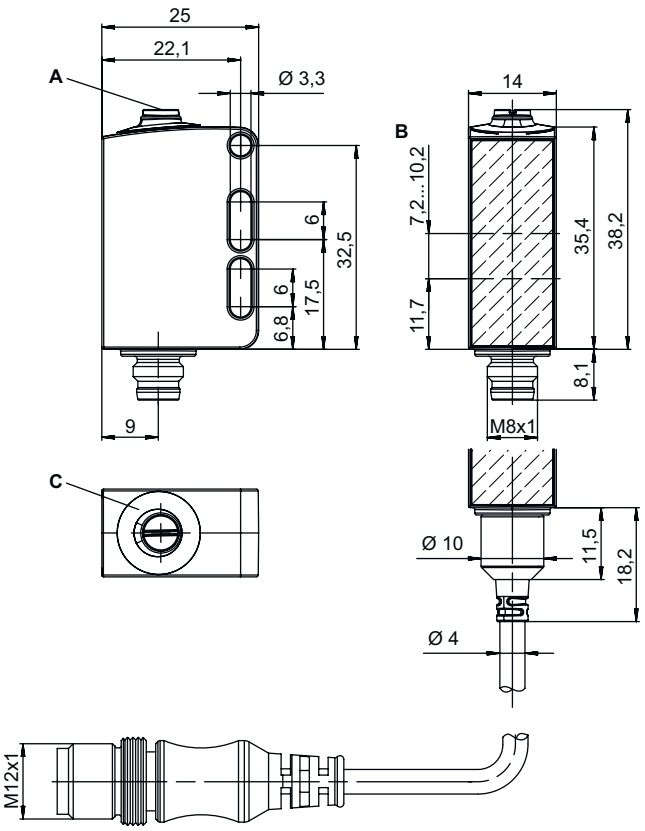
| | |
|---|---|
| **Degree of protection** | IP 67 |
| | IP 68 |
| | IP 69K |
| **Protection class** | III |
| **Approvals** | c UL US |
| **Standards applied** | IEC 60947-5-2 |

## 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 |
| **ETIM 5.0** | EC002719 |
| **ETIM 6.0** | EC002719 |
| **ETIM 7.0** | EC002719 |
| **ETIM 8.0** | EC001821 |
| **ETIM 9.0** | EC001821 |
| **ETIM 10.0** | EC001821 |

# Dimensioned drawings

All dimensions in millimeters




A Multiturn potentiometer
B Optical axis
C Indicator diode

# Electrical connection

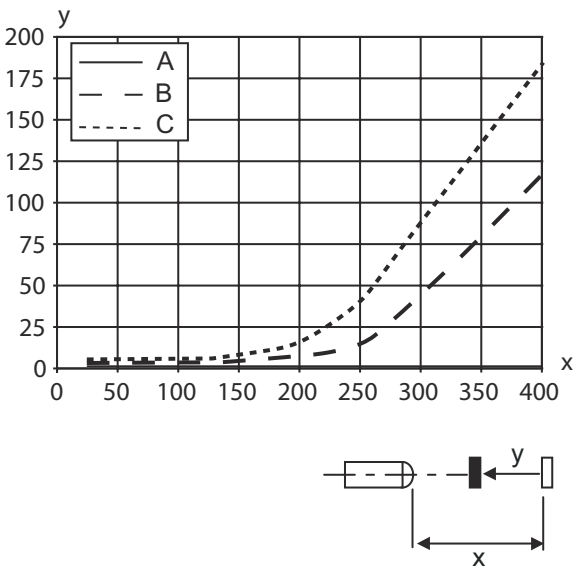
## Connection 1

| | |
|---|---|
| **Function** | Signal IN |
| | Signal OUT |
| | Voltage supply |
| **Type of connection** | Cable |
| **Cable length** | 5,000 mm |
| **Sheathing material** | PVC |
| **Cable color** | Black |
| **Number of conductors** | 4 -wire |
| **Wire cross section** | 0.2 mm² |

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

# Diagrams

## Typ. black/white behavior




x Range [mm]
y Reduction of range [mm]

A White 90%
B Gray 18%
C Black 6%

# Operation and display

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

# Part number code

Part designation: **AAA55C d EE-f.GGGG H/i J-K**

| | |
|---|---|
| **AAA55C** | **Operating principle / construction**<br>HT55C: Diffuse reflection sensor with background suppression<br>LS55C: Throughbeam photoelectric sensor transmitter<br>LE55C: Throughbeam photoelectric sensor receiver<br>PRK55C: Retro-reflective photoelectric sensor with polarization filter<br>ODT55C: 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 |
| **f** | **Preset range (optional)**<br>n/a: operating range acc. to data sheet<br>xxxF: Preset range [mm] |
| **GGGG** | **Equipment**<br>n/a: standard<br>A: Autocollimation principle (single lens) for positioning tasks<br>F: Permanently set range<br>H2O: Detection of aqueous liquids<br>Fill-level monitoring<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 |

# Part number code

| | |
|---|---|
| **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 |
| **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)<br>7: Input for sensitivity adjustment |
| **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>T: teach-in via cable<br>X: pin not used<br>8: activation input (activation with high signal)<br>9: deactivation input (deactivation with high signal)<br>7: Input for sensitivity adjustment |
| **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-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/EN 60825-1:2014 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>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
- Permissible operating temperature range during IO-Link operation: -10 °C to +60 °C
- Ambient temperature, operation: +70 °C permissible only briefly (≤ 15min)

# Accessories

## Connection technology - Connection unit

| | Part no. | Designation | Article | Description |
|---|---|---|---|---|
|  | 50144900 | MD 798i-11-82/L5-2222 | IO-Link master | Type: IO-Link master<br>Current consumption, max.: 11,000 mA<br>Switching outputs for each sensor connection: 1 Piece(s)<br>Switching output: Transistor, PNP<br>Interface: IO-Link, Automatic protocol detection, EtherNet IP, Modbus TCP, PROFINET<br>Connections: 12 Piece(s)<br>Sensor connections: 8 Piece(s)<br>Connections for voltage supply: 2 Piece(s)<br>Interface connections: 2 Piece(s)<br>Degree of protection: IP 67, IP 65, IP 69K |

## 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, Suited for M3 screws<br>Type of mounting device: Adjustable<br>Material: Stainless steel |
|  | 50040269 | BT 25 | 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 | 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 |
|  | 50120426 | BTU 200M.5-D12 | Mounting system | Design of mounting device: Mounting system<br>Fastening, at system: For 12 mm rod<br>Mounting bracket, at device: Screw type, Suited for M3 screws<br>Type of mounting device: Turning, 360°, Adjustable, Clampable<br>Material: Stainless steel |

**Note**

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