

## Technical data sheet

### Diffuse sensor with background suppression

Part no.: 50150357

HT33C.XL/LG-M8



For illustration purposes only

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## Technical data

### Basic data

|                     |                                                          |
|---------------------|----------------------------------------------------------|
| Series              | 33C                                                      |
| Operating principle | Diffuse reflection principle with background suppression |

### Special version

|                 |                            |
|-----------------|----------------------------|
| Special version | Extra long light spot (XL) |
|-----------------|----------------------------|

### Optical data

|                                      |                                       |
|--------------------------------------|---------------------------------------|
| Black-white error                    | < 10% up to 350 mm                    |
| Operating range                      | Guaranteed operating range            |
| Operating range, white 90%           | 0 ... 0.6 m                           |
| Operating range, gray 18%            | 0.005 ... 0.5 m                       |
| Operating range, black 6%            | 0.005 ... 0.45 m                      |
| Operating range limit                | 0 ... 0.6 m (typical operating range) |
| Adjustment range                     | 50 ... 600 mm                         |
| Beam path                            | Divergent                             |
| Light source                         | LED, Red                              |
| Wavelength                           | 640 nm                                |
| Transmitted-signal shape             | Pulsed                                |
| LED group                            | Exempt group (in acc. with EN 62471)  |
| Light spot size [at sensor distance] | 15 mm x 40 mm [300 mm]                |
| Type of light spot geometry          | Rectangular                           |
| Shift angle                          | Typ. $\pm 2^\circ$                    |

### Electrical data

|                    |                                                         |
|--------------------|---------------------------------------------------------|
| Protective circuit | Polarity reversal protection<br>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 ... 20 mA                            |

### Outputs

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

### Switching outputs

|                         |                                                |
|-------------------------|------------------------------------------------|
| Type                    | Digital switching output                       |
| Voltage type            | DC                                             |
| Switching current, max. | 100 mA                                         |
| Switching voltage       | high: $\geq (U_B - 2.5V)$<br>low: $\leq 2.5 V$ |

### 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 | Dark switching (PNP)/light switching (NPN) |

### Time behavior

|                     |          |
|---------------------|----------|
| Switching frequency | 1,000 Hz |
| Response time       | 0.5 ms   |
| Readiness delay     | 300 ms   |

### 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        | 6104                 |
| SIO-mode support | Yes                  |

### Connection

|                       |                                           |
|-----------------------|-------------------------------------------|
| Number of connections | 1 Piece(s)                                |
| Connection 1          |                                           |
| Function              | Signal IN<br>Signal OUT<br>Voltage supply |
| Type of connection    | Connector                                 |
| Thread size           | M8                                        |
| Type                  | Male                                      |
| Material              | Stainless steel                           |
| No. of pins           | 4 -pin                                    |

### Mechanical data

|                                 |                                                                         |
|---------------------------------|-------------------------------------------------------------------------|
| Dimension (W x H x L)           | 18.8 mm x 52.8 mm x 32.4 mm                                             |
| Housing material                | Stainless steel                                                         |
| Material of operational control | Plastic (POM Hostaform C9021, copolyester Tritan TX1001), non-diffusive |
| Housing roughness               | $R_a \leq 0.8$ , 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                      | 120 g                                                                   |
| Housing color                   | Silver                                                                  |
| Type of fastening               | Housing fit                                                             |
| Compatibility of materials      | CleanProof+<br>ECOLAB<br>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 ... 60 °C, (70 °C $\leq 15$ min) |
| Ambient temperature, storage   | -40 ... 70 °C                        |

### Certifications

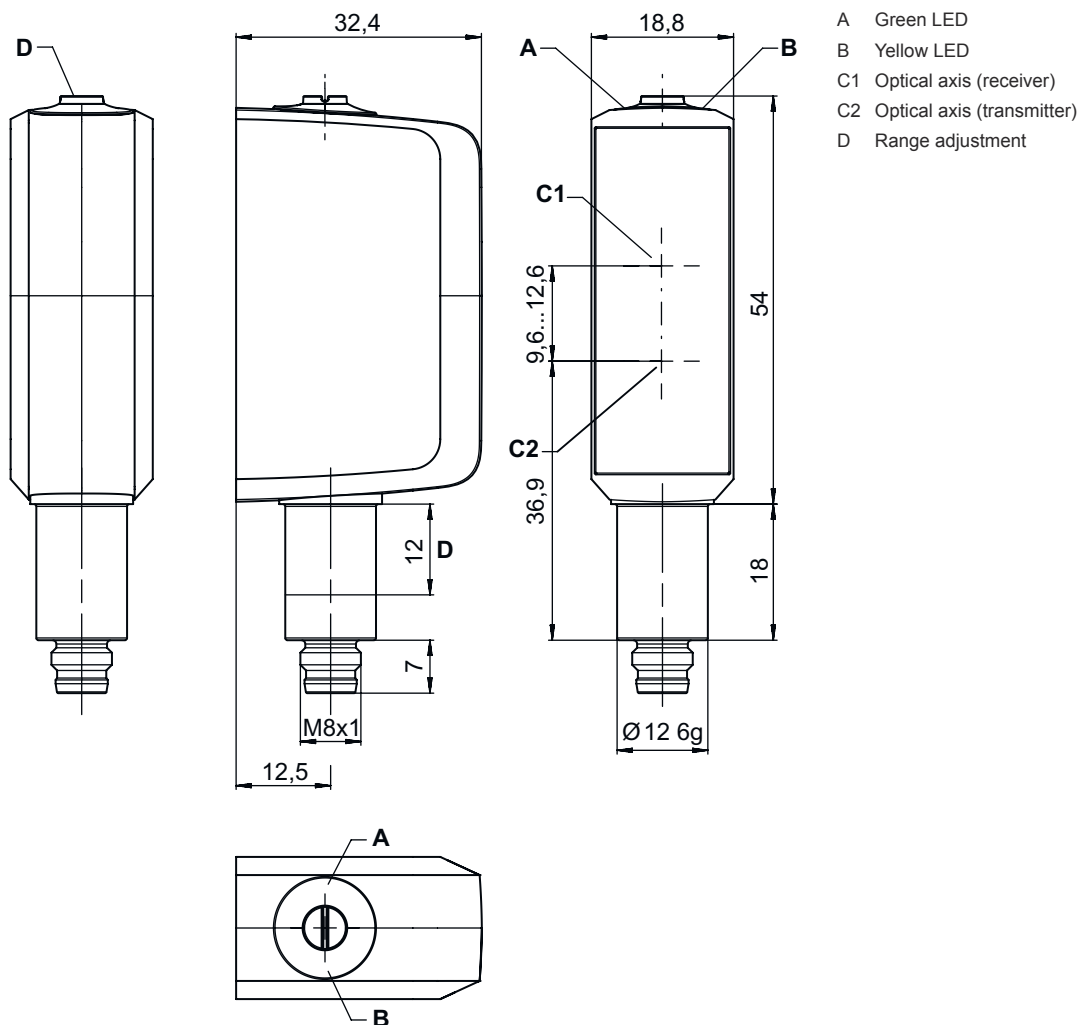
|                      |                          |
|----------------------|--------------------------|
| Degree of protection | IP 67<br>IP 68<br>IP 69K |
| Protection class     | III                      |
| Approvals            | c UL US                  |
| Standards applied    | IEC 60947-5-2  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

## Technical data

|                       |          |
|-----------------------|----------|
| 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              | EC002719 |
| ETIM 9.0              | EC002719 |
| ETIM 10.0             | EC002719 |

## Dimensioned drawings

All dimensions in millimeters

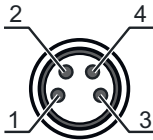


Electrical connection

Connection 1

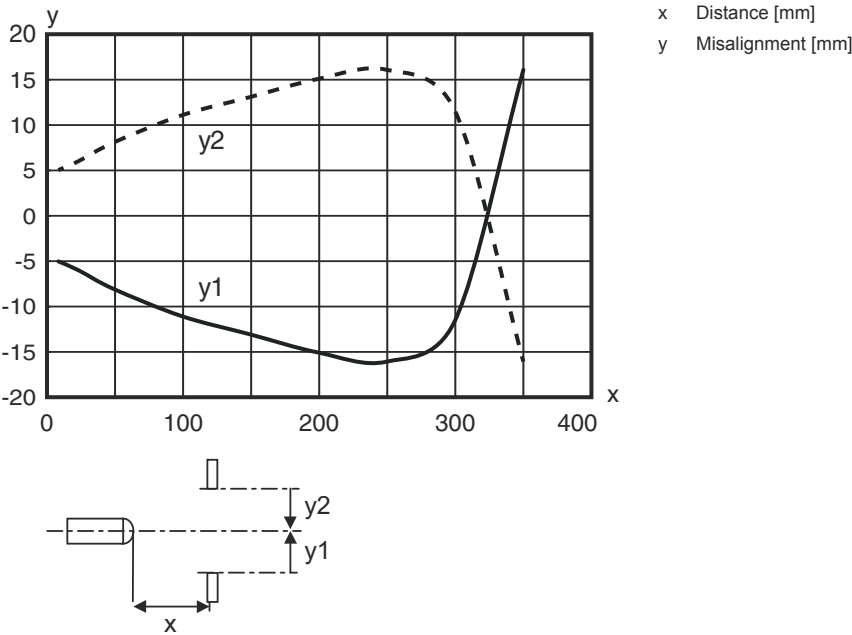
|                    |                 |
|--------------------|-----------------|
| Function           | Signal IN       |
|                    | Signal OUT      |
|                    | Voltage supply  |
|                    |                 |
| Type of connection | Connector       |
| Thread size        | M8              |
| Type               | Male            |
| Material           | Stainless steel |
| No. of pins        | 4 -pin          |

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



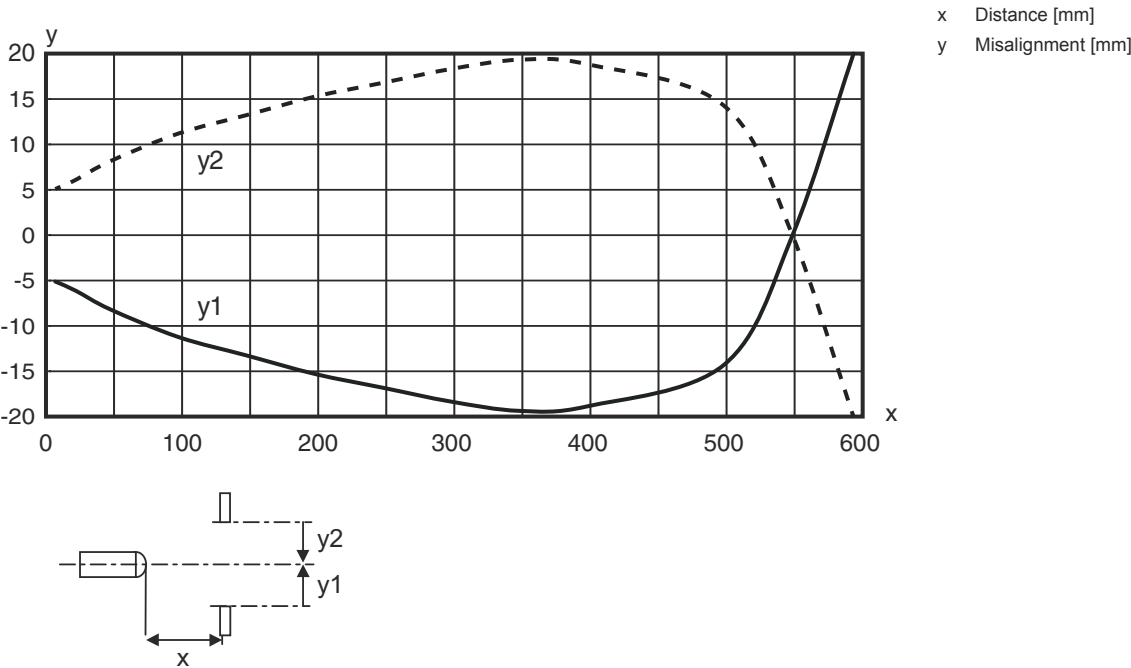
Diagrams

Typ. response behavior (focusing distance 350 mm)

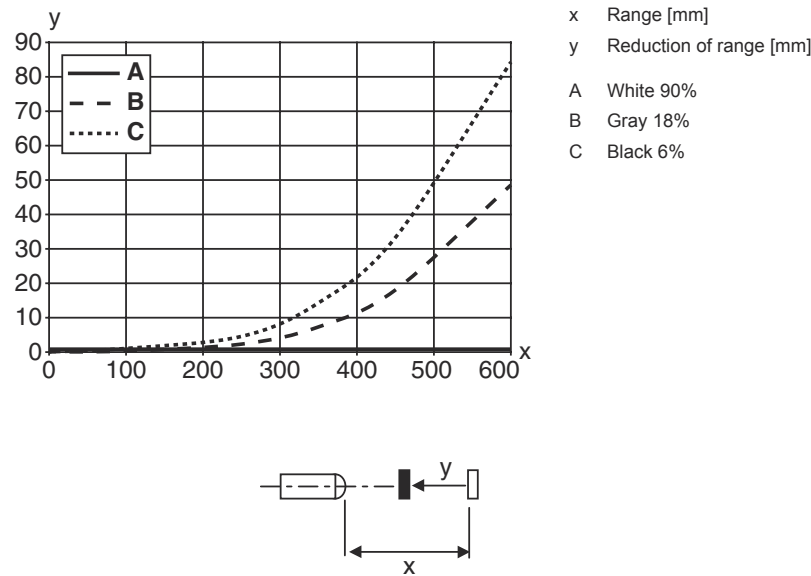


Diagrams

Typ. response behavior (focusing distance 600 mm)



Typ. black/white behavior



Operation and display

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

## Part number code

Part designation: **AAA33C d EE.GGH/iJ-K**

|               |                                                                                                                                                                                                                                                                                                                             |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>AAA33C</b> | <b>Operating principle</b><br>LS33C: Throughbeam photoelectric sensor transmitter<br>LE33C: Throughbeam photoelectric sensor receiver<br>PRK33C: Retro-reflective photoelectric sensor with polarization filter<br>HT33C: Diffuse reflection sensor with background suppression<br>DRT33C: Dynamic reference diffuse sensor |
| <b>d</b>      | <b>Light type</b><br>n/a: red light<br>I: infrared light                                                                                                                                                                                                                                                                    |
| <b>EE</b>     | <b>Light source</b><br>n/a: LED<br>PP: Power PinPoint® LED<br>L1: laser class 1                                                                                                                                                                                                                                             |
| <b>GG</b>     | <b>Equipment</b><br>A: Autocollimation principle (single lens)<br>D: Detection of stretch-wrapped objects<br>X: extended model<br>XL: Extra long light spot<br>TT: autocollimation principle (single lens) for highly transparent bottles with tracking<br>R: greater operating range<br>XXR: super power transmitter       |
| <b>H</b>      | <b>Operating range adjustment</b><br>1: 270° potentiometer<br>2: multiturn potentiometer<br>3: teach-in via button                                                                                                                                                                                                          |
| <b>i</b>      | <b>Switching output/function OUT 1/IN: Pin 4 or black conductor</b><br>X: pin not used<br>8: activation input (activation with high signal)<br>L: IO-Link interface (SIO mode: PNP light switching, NPN dark switching)                                                                                                     |
| <b>J</b>      | <b>Switching output / function OUT 2/IN: pin 2 or white conductor</b><br>T: teach-in via cable<br>G: Push-pull switching output, PNP dark switching, NPN light switching<br>X: pin not used                                                                                                                                 |
| <b>K</b>      | <b>Electrical connection</b><br>M8: M8 connector, 4-pin (plug)                                                                                                                                                                                                                                                              |

### Note



↗ A list with all available device types can be found on the Leuze website at [www.leuze.com](http://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.

## Further information

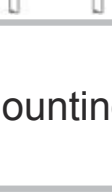
- Ambient temperature, operation: +70 °C permissible only briefly (≤ 15min)
- IP 69K only with internal tube installation of M8 connector
- Light source: Average life expectancy 100,000 h at an ambient temperature of 25 °C
- Sum of the output currents for both outputs 100 mA

## Accessories

### Connection technology - Connection unit

|                                                                                  | Part no. | Designation           | Article        | Description                                                                                                                                                                                                                             |
|----------------------------------------------------------------------------------|----------|-----------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50144900 | MD 798i-11-82/L5-2222 | IO-Link master | Current consumption, max.: 11,000 mA<br>Interface: IO-Link, Automatic protocol detection, EtherNet IP, Modbus TCP, PROFINET<br>Connections: 12 Piece(s)<br>Sensor connections: 8 Piece(s)<br>Degree of protection: IP 67, IP 65, IP 69K |
|                                                                                  |          |                       |                |                                                                                                                                                                                                                                         |
|                                                                                  |          |                       |                |                                                                                                                                                                                                                                         |
|                                                                                  |          |                       |                |                                                                                                                                                                                                                                         |
|                                                                                  |          |                       |                |                                                                                                                                                                                                                                         |

### Connection technology - Connection cables

|                                                                                     | Part no. | Designation           | Article          | Description                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------|----------|-----------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | 50106153 | K-D M8A-4P-5m-FAB     | Connection cable | Application: Hygienic and wet areas<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                              |
|                                                                                     |          |                       |                  |                                                                                                                                                                                                                                             |
|                                                                                     |          |                       |                  |                                                                                                                                                                                                                                             |
|                                                                                     |          |                       |                  |                                                                                                                                                                                                                                             |
|                                                                                     |          |                       |                  |                                                                                                                                                                                                                                             |
|   | 50148346 | KD U-M8-4A-T0-020 F+B | Connection cable | Application: Chemical resistant, Hygienic and wet areas<br>Connection 1: Connector, M8, Axial, Female, A-coded, 4 -pin<br>Connector, LED: No<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 2,000 mm<br>Sheathing material: TPE |
|                                                                                     |          |                       |                  |                                                                                                                                                                                                                                             |
|                                                                                     |          |                       |                  |                                                                                                                                                                                                                                             |
|                                                                                     |          |                       |                  |                                                                                                                                                                                                                                             |
|                                                                                     |          |                       |                  |                                                                                                                                                                                                                                             |
|  | 50148347 | KD U-M8-4A-T0-050 F+B | Connection cable | Application: Chemical resistant, Hygienic and wet areas<br>Connection 1: Connector, M8, Axial, Female, A-coded, 4 -pin<br>Connector, LED: No<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 5,000 mm<br>Sheathing material: TPE |
|                                                                                     |          |                       |                  |                                                                                                                                                                                                                                             |
|                                                                                     |          |                       |                  |                                                                                                                                                                                                                                             |
|                                                                                     |          |                       |                  |                                                                                                                                                                                                                                             |
|                                                                                     |          |                       |                  |                                                                                                                                                                                                                                             |
|  | 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                                  |
|                                                                                     |          |                       |                  |                                                                                                                                                                                                                                             |
|                                                                                     |          |                       |                  |                                                                                                                                                                                                                                             |
|                                                                                     |          |                       |                  |                                                                                                                                                                                                                                             |
|                                                                                     |          |                       |                  |                                                                                                                                                                                                                                             |

### Mounting technology - Other

|                                                                                     | Part no. | Designation       | Article         | Description                                                                                                                                                                                                     |
|-------------------------------------------------------------------------------------|----------|-------------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50145361 | BTU 053M.5F-D12-T | Mounting system | Design of mounting device: Mounting system<br>Fastening, at system: Screw type<br>Mounting bracket, at device: For 12 mm rod<br>Type of mounting device: Turning, 360°, Adjustable<br>Material: Stainless steel |
|                                                                                     |          |                   |                 |                                                                                                                                                                                                                 |
|                                                                                     |          |                   |                 |                                                                                                                                                                                                                 |
|                                                                                     |          |                   |                 |                                                                                                                                                                                                                 |
|                                                                                     |          |                   |                 |                                                                                                                                                                                                                 |

Accessories

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