

## Technical data sheet

### Distance diffuse sensor with background suppression

Part no.: 50148168

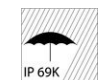
ODT53C.S3/L6-M8



For illustration purposes only

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Technical data

Basic data

|                     |                                                     |
|---------------------|-----------------------------------------------------|
| Series              | 53C                                                 |
| Operating principle | Distance diffuse sensor with background suppression |

Special version

|                 |                                 |
|-----------------|---------------------------------|
| Special version | 2 independent switching outputs |
|                 | HYGIENE design                  |
|                 | Measurement value output        |
|                 | Small light spot (S)            |

Optical data

|                                      |                                              |
|--------------------------------------|----------------------------------------------|
| Black-white error                    | < ± 2 mm                                     |
| Operating range                      | 0.01 ... 0.08 m (guaranteed operating range) |
| Adjustment range                     | 30 ... 80 mm                                 |
| Beam path                            | Focused                                      |
| Light source                         | LED, Red                                     |
| Wavelength                           | 645 nm                                       |
| Transmitted-signal shape             | Pulsed                                       |
| LED group                            | Exempt group (in acc. with EN 62471)         |
| Light spot size [at sensor distance] | 4 mm [60 mm]                                 |
| Type of light spot geometry          | Round                                        |
| Focus                                | Fixed                                        |
| Focal distance                       | 60 mm                                        |

Measurement data

|                                        |               |
|----------------------------------------|---------------|
| Measurement range                      | 30 ... 80 mm  |
| Resolution                             | 1.0 mm        |
| Accuracy                               | -2 ... 2 mm   |
| Reproducibility (1 sigma)              | 1 ... 1.4 mm  |
| Measurement value output               | via IO-Link   |
| Optical distance measurement principle | Triangulation |

Electrical data

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

Performance data

|                               |                                        |
|-------------------------------|----------------------------------------|
| Supply voltage U <sub>B</sub> | 12 ... 30 V, DC, Incl. residual ripple |
| Residual ripple               | 0 ... 15 %, From U <sub>B</sub>        |
| Open-circuit current          | 0 ... 25 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: ≥(U <sub>B</sub> -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 | 750 Hz  |
| Response time       | 0.66 ms |
| Readiness delay     | 300 ms  |
| Response jitter     | 170 µs  |

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        | 2211                 |
| SIO-mode support | Yes                  |

Connection

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

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          |

Mechanical data

|                                 |                                                                          |
|---------------------------------|--------------------------------------------------------------------------|
| Dimension (W x H x L)           | 14 mm x 35.4 mm x 20.4 mm                                                |
| Housing material                | Stainless steel                                                          |
| Material of operational control | Plastic (POM Hostaform C9021, copoly-ester 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                      | 48 g                                                                     |
| Housing color                   | Silver                                                                   |
| Type of fastening               | Housing fit                                                              |
| Compatibility of materials      | CleanProof+                                                              |
|                                 | ECOLAB                                                                   |
|                                 | Johnson Diversey                                                         |

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     |

## Technical data

### Environmental data

|                                |                               |
|--------------------------------|-------------------------------|
| Ambient temperature, operation | -40 ... 60 °C, (70 °C ≤15min) |
| Ambient temperature, storage   | -40 ... 70 °C                 |

### Certifications

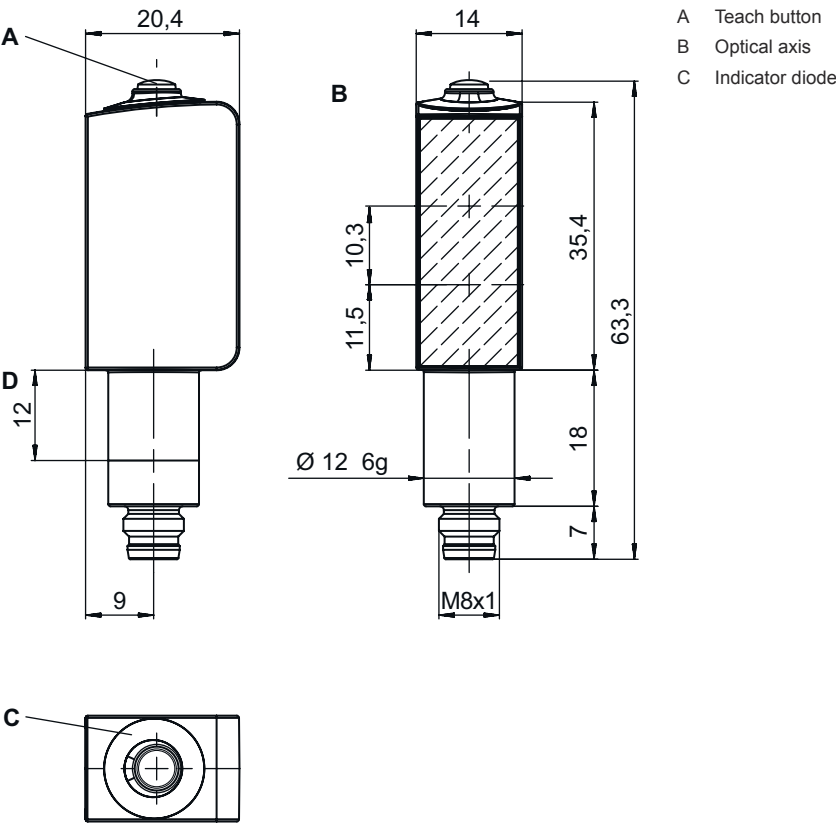
|                      |               |
|----------------------|---------------|
| Degree of protection | IP 67         |
|                      | IP 68         |
|                      | IP 69K        |
| Protection class     | III           |
| Approvals            | c UL US       |
| Standards applied    | 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              | EC002719 |
| ETIM 9.0              | EC002719 |
| ETIM 10.0             | EC002719 |

Dimensioned drawings

All dimensions in millimeters

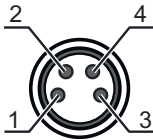


Electrical connection

Connection 1

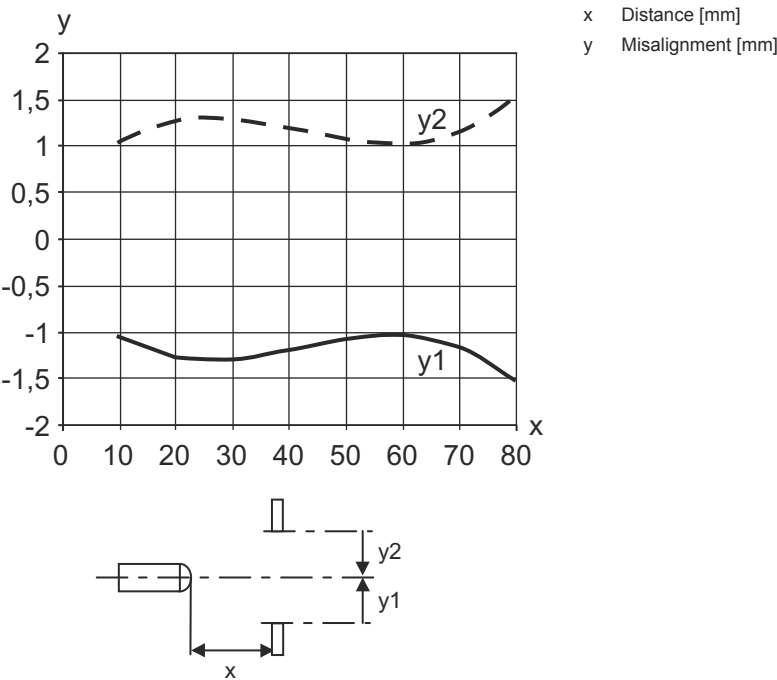
|                    |                 |
|--------------------|-----------------|
| Function           | Signal IN       |
|                    | Signal OUT      |
|                    | Voltage supply  |
| Type of connection | Connector       |
| Thread size        | M8              |
| Type       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

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

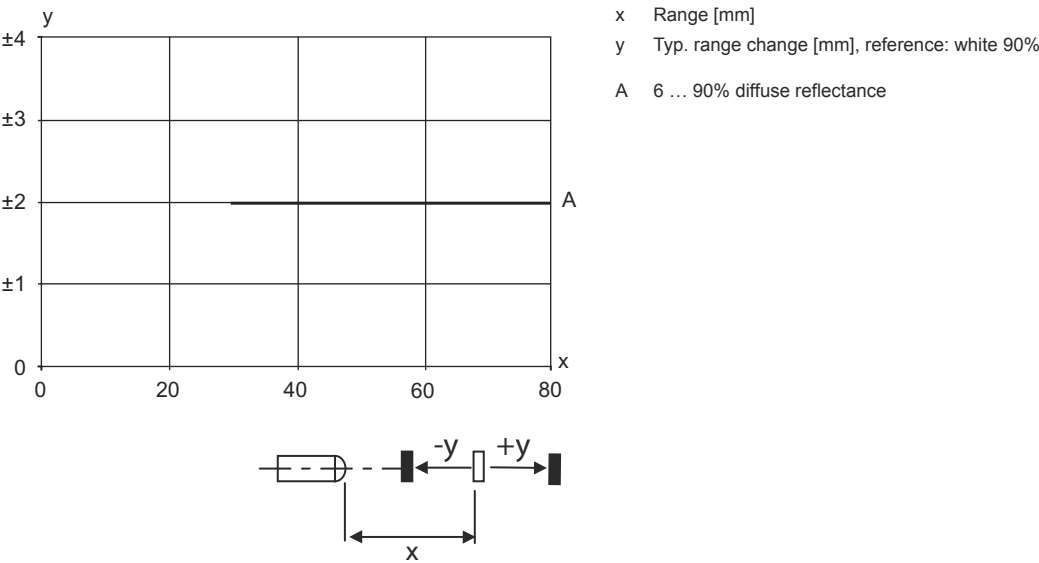


Diagrams

Typ. response behavior (white 90 %)



Typ. black/white behavior / measurement accuracy



Operation and display

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

## Part number code

Part designation: **AAA53C d EE-f.GGGG H/i J-K.LL**

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>AAA53C</b> | <b>Operating principle / construction</b><br>HT53C: Diffuse reflection sensor with background suppression<br>LS53C: Throughbeam photoelectric sensor transmitter<br>LE53C: Throughbeam photoelectric sensor receiver<br>PRK53C: Retro-reflective photoelectric sensor with polarization filter<br>ODT53C: Distance diffuse sensor with background suppression                                                                                                                                                                                                                                                                                                     |
| <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>L1: laser class 1<br>L2: laser class 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>f</b>      | <b>Preset range (optional)</b><br>n/a: operating range acc. to data sheet<br>xxxF: Preset range [mm]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>GGGG</b>   | <b>Equipment</b><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<br>X: extended model                                                                                                                                                                                 |
| <b>H</b>      | <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                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>i</b>      | <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 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 |
| <b>J</b>      | <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>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)                                                                                             |
| <b>K</b>      | <b>Electrical connection</b><br>M8: M8 connector, 4-pin (plug)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>LL</b>     | <b>Parameterization</b><br>P1: different configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

### 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.

### 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)

## Further information

- Light source: Average life expectancy 100,000 h at an ambient temperature of 25 °C
- Sum of the output currents for both outputs, 50 mA for ambient temperatures > 40 °C
- Ambient temperature, operation: +70 °C permissible only briefly (≤ 15min)
- Permissible operating temperature range during IO-Link operation: -10 °C to +60 °C
- IP 69K only with internal tube installation of M8 connector

## 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                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------|----------|-----------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 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                                  |

## Accessories

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

### Note



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