

## Technical data sheet

### Polarized retro-reflective photoelectric sensor

Part no.: 50150359

PRK33CPP.TT3/LG-M8



For illustration purposes only

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## Technical data

### Basic data

|                     |                                                                           |
|---------------------|---------------------------------------------------------------------------|
| Series              | 33C                                                                       |
| Operating principle | Reflection principle                                                      |
| Application         | Detection of highly transparent bottles<br>Detection of transparent films |

### Special version

|                 |                                      |
|-----------------|--------------------------------------|
| Special version | Autocollimation<br>Tracking function |
|-----------------|--------------------------------------|

### Optical data

|                          |                                                                      |
|--------------------------|----------------------------------------------------------------------|
| Operating range          | 0 ... 3 m (guaranteed operating range), With reflector TK(S) 100x100 |
| Operating range limit    | 0 ... 3.6 m (typical operating range), With reflector TK(S) 100x100  |
| Light source             | Power PinPoint® LED, Red                                             |
| Wavelength               | 660 nm                                                               |
| Transmitted-signal shape | Pulsed                                                               |
| LED group                | Exempt group (in acc. with EN 62471)                                 |

### 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 | 1,500 Hz |
| Response time       | 0.33 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        | 6138                 |
| 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, copoly-ester 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                | Teach button           |
| Function of the operational control | Sensitivity adjustment |

### Environmental data

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

### Certifications

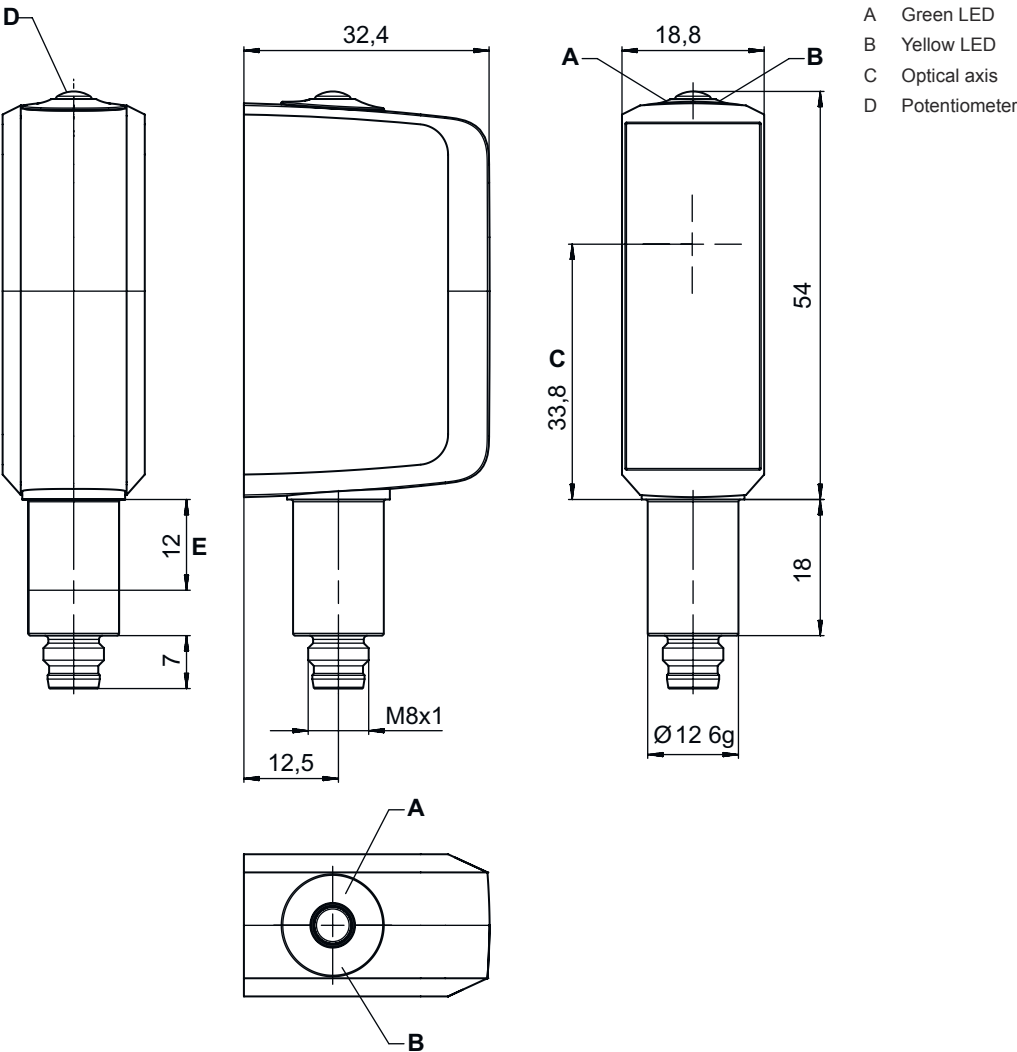
|                      |                          |
|----------------------|--------------------------|
| Degree of protection | IP 67<br>IP 68<br>IP 69K |
| Protection class     | III                      |
| Approvals            | c UL US                  |
| Standards applied    | IEC 60947-5-2  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

Technical data

|                       |          |
|-----------------------|----------|
| Customs tariff number | 85365019 |
| ECLASS 5.1.4          | 27270902 |
| ECLASS 8.0            | 27270902 |
| ECLASS 9.0            | 27270902 |
| ECLASS 10.0           | 27270902 |
| ECLASS 11.0           | 27270902 |
| ECLASS 12.0           | 27270902 |
| ECLASS 13.0           | 27270902 |
| ECLASS 14.0           | 27270902 |
| ECLASS 15.0           | 27270902 |
| ETIM 5.0              | EC002717 |
| ETIM 6.0              | EC002717 |
| ETIM 7.0              | EC002717 |
| ETIM 8.0              | EC002717 |
| ETIM 9.0              | EC002717 |
| ETIM 10.0             | EC002717 |

Dimensioned drawings

All dimensions in millimeters



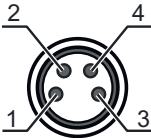
Electrical connection

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          |

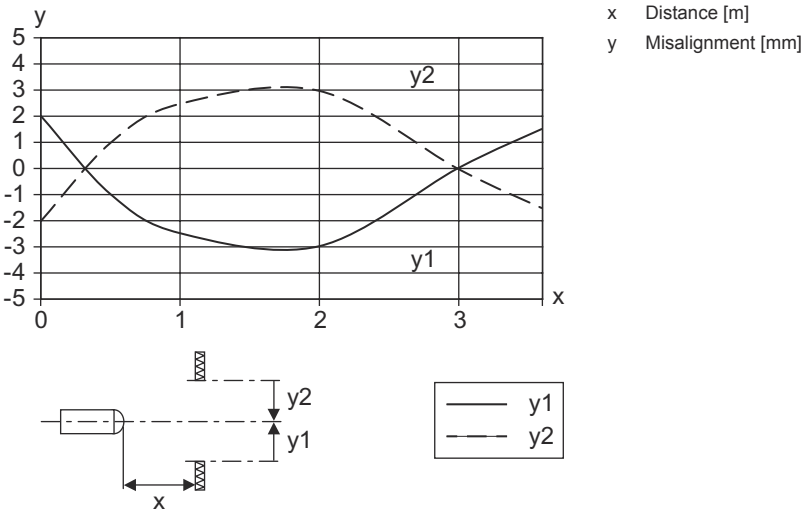
Pin Pin assignment

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



Diagrams

Typ. response behavior (TKS100x100)



Operation and display

| LED | Display                  | Meaning               |
|-----|--------------------------|-----------------------|
| 1   | Green, continuous light  | Operational readiness |
| 2   | Yellow, continuous light | Light path free       |

Reflectors & reflective tapes

|                                                                                     | Part no. | Designation   | Operating range<br>Operating range<br>limit | Description                                                                                                                                                                                                                                                                                    |
|-------------------------------------------------------------------------------------|----------|---------------|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50136824 | MTKS 12x20M.5 | 0 ... 0.7 m<br>0 ... 0.85 m                 | Design: Rectangular<br>Triple reflector size: 0.3 mm<br>Reflective surface: 12 mm x 20 mm<br>Material: Plastic<br>Base material: Stainless steel<br>Fastening: Through-hole mounting<br>Compatibility of materials: Alcohol, CleanProof+, ECOLAB, H2O2                                         |
|  | 50106961 | MTKS 14x23.P  | 0 ... 0.6 m<br>0 ... 0.7 m                  | Design: Rectangular<br>Triple reflector size: 12 mm<br>Reflective surface: 11 mm x 21 mm<br>Material: Plastic<br>Base material: Plastic<br>Chemical designation of the material: PES<br>Fastening: Through-hole mounting, Adhesive<br>Compatibility of materials: ECOLAB                       |
|  | 50151449 | MTKS 20x20.SC | 0 ... 0.15 m<br>0 ... 0.2 m                 | Design: Rectangular<br>Triple reflector size: 1.1 mm<br>Reflective surface: 20 mm x 20 mm<br>Material: Plastic<br>Base material: Plastic<br>Chemical designation of the material: Solidchem<br>Fastening: Through-hole mounting, Adhesive<br>Compatibility of materials: Alcohol, ECOLAB, H2O2 |

## Reflectors & reflective tapes

|                                                                                     | Part no. | Designation   | Operating range<br>Operating range<br>limit | Description                                                                                                                                                                                                                                                   |
|-------------------------------------------------------------------------------------|----------|---------------|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | 50117583 | MTKS 50x50.1  | 0 ... 2 m<br>0 ... 2.4 m                    | Design: Rectangular<br>Triple reflector size: 1.2 mm<br>Reflective surface: 50 mm x 50 mm<br>Material: Plastic<br>Base material: Plastic<br>Chemical designation of the material: PMMA8N<br>Fastening: Through-hole mounting, Adhesive                        |
|    | 50136823 | MTKS 7x7M.5   | 0 ... 0.4 m<br>0 ... 0.5 m                  | Design: Rectangular<br>Triple reflector size: 0.3 mm<br>Reflective surface: 7 mm x 7 mm<br>Material: Plastic<br>Base material: Stainless steel<br>Fastening: Through-hole mounting<br>Compatibility of materials: Alcohol, CleanProof+, ECOLAB, H2O2          |
|    | 50108300 | REF 4-A-50x50 | 0 ... 0.5 m<br>0 ... 0.6 m                  | Design: Rectangular<br>Reflective surface: 50 mm x 50 mm<br>Material: Plastic<br>Chemical designation of the material: PMMA<br>Fastening: Self-adhesive                                                                                                       |
|    | 50110192 | REF 6-A-50x50 | 0 ... 1.3 m<br>0 ... 1.5 m                  | Design: Rectangular<br>Triple reflector size: 0.3 mm<br>Reflective surface: 50 mm x 50 mm<br>Material: Plastic<br>Chemical designation of the material: PMMA<br>Fastening: Self-adhesive                                                                      |
|  | 50116939 | TK 10.P       | 0 ... 0.3 m<br>0 ... 0.4 m                  | Design: Round<br>Triple reflector size: 1.5 mm<br>Reflective surface, diameter: 8.5 mm<br>Material: Plastic<br>Base material: Plastic<br>Chemical designation of the material: PES<br>Fastening: Rear side can be glued<br>Compatibility of materials: ECOLAB |
|  | 50022816 | TKS 100X100   | 0 ... 3 m<br>0 ... 3.6 m                    | Design: Rectangular<br>Triple reflector size: 4 mm<br>Reflective surface: 96 mm x 96 mm<br>Material: Plastic<br>Base material: Plastic<br>Chemical designation of the material: PMMA8N<br>Fastening: Through-hole mounting, Adhesive                          |
|  | 50106958 | TKS 20.P      | 0 ... 0.55 m<br>0 ... 0.7 m                 | Design: Round<br>Triple reflector size: 2.3 mm<br>Reflective surface, diameter: 17 mm<br>Material: Plastic<br>Base material: Plastic<br>Chemical designation of the material: PES<br>Fastening: M4 threaded pin<br>Compatibility of materials: ECOLAB         |
|  | 50081283 | TKS 20X40     | 0 ... 1.1 m<br>0 ... 1.3 m                  | Design: Rectangular<br>Triple reflector size: 2.3 mm<br>Reflective surface: 16 mm x 38 mm<br>Material: Plastic<br>Base material: Plastic<br>Chemical designation of the material: PMMA8N<br>Fastening: Through-hole mounting, Adhesive                        |

## Reflectors & reflective tapes

|                                                                                     | Part no. | Designation    | Operating range<br>Operating range<br>limit | Description                                                                                                                                                                                                                                                                                      |
|-------------------------------------------------------------------------------------|----------|----------------|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | 50106960 | TKS 20x40.P    | 0 ... 0.8 m<br>0 ... 1 m                    | Design: Rectangular<br>Triple reflector size: 2.3 mm<br>Reflective surface: 16 mm x 38 mm<br>Material: Plastic<br>Base material: Plastic<br>Chemical designation of the material: PES<br>Fastening: Through-hole mounting, Adhesive<br>Compatibility of materials: ECOLAB                        |
|    | 50040820 | TKS 40X60      | 0 ... 2 m<br>0 ... 2.4 m                    | Design: Rectangular<br>Triple reflector size: 4 mm<br>Reflective surface: 37 mm x 56 mm<br>Material: Plastic<br>Base material: Plastic<br>Chemical designation of the material: PMMA8N<br>Fastening: Through-hole mounting, Adhesive                                                             |
|    | 50120538 | TKS 40x60.1.AF | 0 ... 1.9 m<br>0 ... 2.3 m                  | Special version: Anti-fog coating<br>Design: Rectangular<br>Triple reflector size: 2.3 mm<br>Reflective surface: 37 mm x 56 mm<br>Material: Plastic<br>Base material: Plastic<br>Chemical designation of the material: PMMA8N<br>Fastening: Through-hole mounting, Adhesive                      |
|   | 50136383 | TKS 40x60.Chem | 0 ... 1.5 m<br>0 ... 1.8 m                  | Design: Rectangular<br>Triple reflector size: 4 mm<br>Reflective surface: 37 mm x 56 mm<br>Material: Plastic<br>Base material: Plastic<br>Chemical designation of the material: PET<br>Fastening: Through-hole mounting, Adhesive<br>Compatibility of materials: Alcohol, ECOLAB, H2O2           |
|  | 50106957 | TKS 40x60.P    | 0 ... 1.5 m<br>0 ... 1.8 m                  | Design: Rectangular<br>Triple reflector size: 4 mm<br>Reflective surface: 37 mm x 56 mm<br>Material: Plastic<br>Base material: Plastic<br>Chemical designation of the material: PES<br>Fastening: Through-hole mounting, Adhesive<br>Compatibility of materials: ECOLAB                          |
|  | 50151448 | TKS 50x50.1.SC | 0 ... 0.8 m<br>0 ... 1 m                    | Design: Rectangular<br>Triple reflector size: 4 mm<br>Reflective surface: 51.3 mm x 51.2 mm<br>Material: Plastic<br>Base material: Plastic<br>Chemical designation of the material: Solidchem<br>Fastening: Adhesive, Through-hole mounting<br>Compatibility of materials: Alcohol, ECOLAB, H2O2 |

## Part number code

Part designation: AAA33C d EE.GGH/IJ-K

|        |                                                                                                                                                                                                                                                                                                                             |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AAA33C | <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 |
| d      | <b>Light type</b><br>n/a: red light<br>I: infrared light                                                                                                                                                                                                                                                                    |
| EE     | <b>Light source</b><br>n/a: LED<br>PP: Power PinPoint® LED<br>L1: laser class 1                                                                                                                                                                                                                                             |

## Part number code

|           |                                                                                                                                                                                                                                                                                                                       |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <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 100,000h 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 | 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 |
|                                                                                  |          |                       |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

### Connection technology - Connection cables

|                                                                                    | Part no. | Designation           | Article          | Description                                                                                                                                                                      |
|------------------------------------------------------------------------------------|----------|-----------------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50106153 | K-D M8A-4P-5m-FAB     | Connection cable | 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          |
|                                                                                    | 50148347 | KD U-M8-4A-T0-050 F+B | Connection cable | 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 | 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 |

#### Note



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