

## Technical data sheet

### Polarized retro-reflective photoelectric sensor

Part no.: 50150260

PRK53CL1.XA3/LG-M8



For illustration purposes only

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## Technical data

### Basic data

|                     |                      |
|---------------------|----------------------|
| Series              | 53C                  |
| Operating principle | Reflection principle |

### Special version

|                 |                                             |
|-----------------|---------------------------------------------|
| Special version | Autocollimation                             |
|                 | Calibrated Y-axis for optimized shift angle |
|                 | HYGIENE design                              |

### Optical data

|                                      |                                          |
|--------------------------------------|------------------------------------------|
| Operating range                      | 0 ... 2 m, With reflector MTKS 50x50.1   |
| Operating range                      | Guaranteed operating range               |
| Operating range limit                | 0 ... 3 m, With reflector MTKS 50x50.1   |
| Operating range limit                | Typical operating range                  |
| Beam path                            | Collimated                               |
| Light source                         | Laser, Red                               |
| Wavelength                           | 650 nm                                   |
| Laser class                          | 1, IEC/EN 60825-1:2014                   |
| Max. laser power                     | 0.0017 W                                 |
| Transmitted-signal shape             | Pulsed                                   |
| Pulse duration                       | 5.3 µs                                   |
| Light spot size [at sensor distance] | 3 mm [1,000 mm]                          |
| Type of light spot geometry          | Round                                    |
| Shift angle                          | Y-axis: < 0.2°<br>X-axis: not calibrated |

### 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 ... 15 %, From $U_B$                 |
| Open-circuit current | 0 ... 15 mA                            |

#### Outputs

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

#### Switching outputs

|                         |                                            |
|-------------------------|--------------------------------------------|
| Voltage type            | DC                                         |
| Switching current, max. | 100 mA                                     |
| Switching voltage       | high: $\geq (U_B - 2V)$<br>low: $\leq 2 V$ |

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

### Time behavior

|                     |          |
|---------------------|----------|
| Switching frequency | 3,000 Hz |
| Response time       | 0.17 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        | 6026                 |
| SIO-mode support | Yes                  |

### 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          |

### 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+<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 | Light/dark switching<br>Sensitivity adjustment |

### Environmental data

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

### Certifications

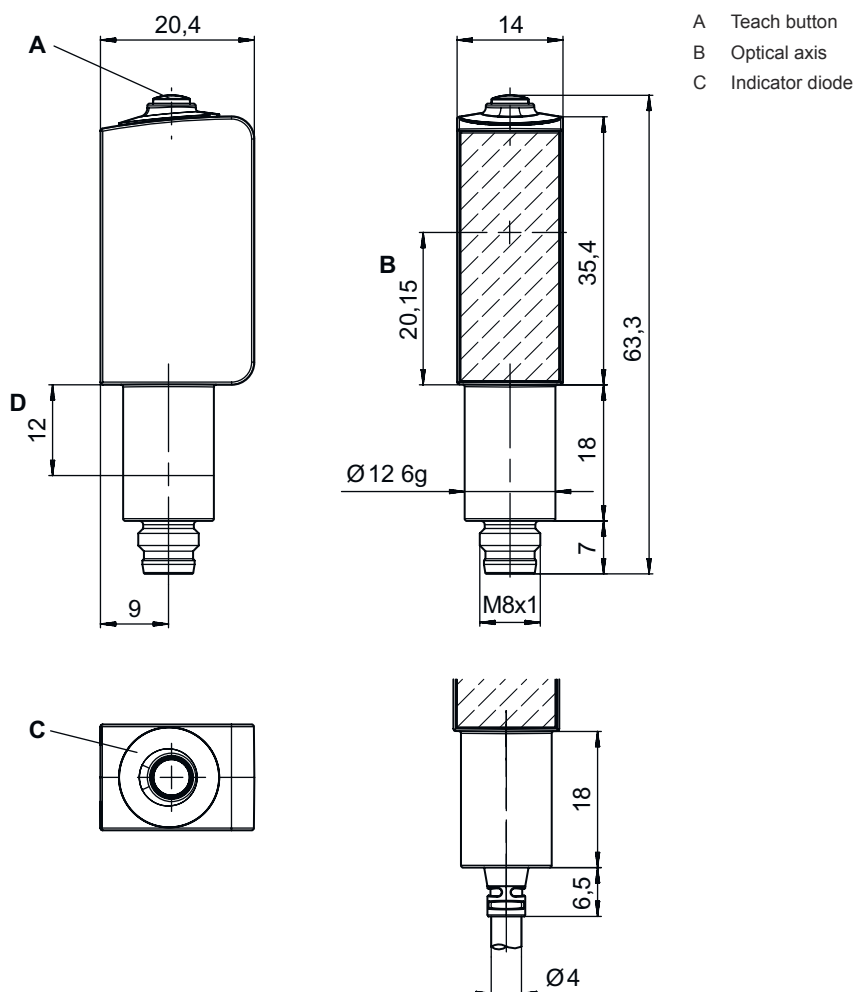
|                      |               |
|----------------------|---------------|
| Degree of protection | IP 67         |
|                      | IP 68         |
|                      | IP 69K        |
| Protection class     | III           |
| Approvals            | c UL US       |
| Standards applied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

## 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

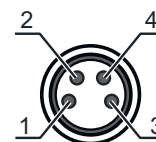


## Electrical connection

### 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 |



## Operation and display

| LED | Display                  | Meaning                              |
|-----|--------------------------|--------------------------------------|
| 1   | Green, continuous light  | Operational readiness                |
| 2   | Yellow, continuous light | Light path free                      |
|     | Yellow, flashing         | Light path free, no function reserve |

## Reflectors & reflective tapes

|                                                                                     | Part no. | Designation   | Operating range<br>Operating range<br>limit | Description                                                                                                                                                                                                                                                              |
|-------------------------------------------------------------------------------------|----------|---------------|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50136824 | MTKS 12x20M.5 | 0 ... 1 m<br>0 ... 1.2 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 ... 0.2 m<br>0 ... 0.25 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 |
|  | 50040894 | MTKS 20x30    | 0 ... 1.6 m<br>0 ... 2.2 m                  | Design: Rectangular<br>Triple reflector size: 1.2 mm<br>Reflective surface: 19 mm x 29 mm<br>Material: Plastic<br>Base material: Plastic<br>Chemical designation of the material: PMMA8N<br>Fastening: Through-hole mounting, Adhesive                                   |
|  | 50104130 | MTKS 20x40.1  | 0 ... 1 m<br>0 ... 1.5 m                    | Design: Rectangular<br>Triple reflector size: 12 mm<br>Reflective surface: 17 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                                                                                                                                                                                                                                          |
|------------------------------------------------------------------------------------|----------|---------------|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   | 50117583 | MTKS 50x50.1  | 0 ... 2 m<br>0 ... 3 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 ... 0.8 m<br>0 ... 1 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 |
|    | 50110192 | REF 6-A-50x50 | 0 ... 1 m<br>0 ... 1.2 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                                                             |
|  | 50112142 | TK BR 53      | 0 ... 1 m<br>0 ... 1.2 m                    | Design: Rectangular<br>Triple reflector size: 0.3 mm<br>Reflective surface: 29 mm x 10 mm<br>Material: Plastic<br>Base material: Stainless steel<br>Chemical designation of the material: Stainless steel<br>Fastening: Housing fit                  |

## 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                                                                                                                                                                                                                                           |

## Part number code

|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <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)



### 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.
- ⚠ Observe the applicable statutory and local laser protection regulations.
  - ⚠ The device must not be tampered with and must not be changed in any way.  
There are no user-serviceable parts inside the device.  
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. 5kOhm 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
- IP 69K only with internal tube installation of M8 connector
- 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 |

### Connection technology - Connection cables

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

Accessories

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