

Technical data sheet

Polarized retro-reflective photoelectric sensor

Part no.: 50152111

PRK53CL1.A3/LG-5000



For illustration purposes only

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Technical data

Basic data

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

Special version

| | |
|-----------------|-----------------------------------|
| Special version | Autocollimation 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 | Typ. ± 2° |

Electrical data

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

Performance data

| | |
|----------------------|--|
| Supply voltage U_B | 10 ... 30 V, DC, Incl. residual ripple |
| Residual ripple | 0 ... 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: $\geq(U_B - 2V)$ low: $\leq 2 V$ |

Switching output 1

| | |
|---------------------|--|
| Assignment | Connection 1, conductor 4 |
| Switching element | Transistor, Push-pull |
| Switching principle | IO-Link / light switching (PNP)/dark switching (NPN) |

Switching output 2

| | |
|---------------------|--|
| Assignment | Connection 1, conductor 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 | Cable |
| Cable length | 5,000 mm |
| Sheathing material | PUR |
| Cable color | Black |
| Number of conductors | 4 -wire |
| Wire cross section | 0.2 mm ² |

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, copolyester Tritan TX1001), non-diffusive |
| Housing roughness | Ra ≤ 0,8, Typical value for the stainless steel housing |
| Stainless steel housing | AISI 316L, DIN X2CrNiMo17132, W. No1.4404 |
| Lens cover material | Plastic (PMMA+) with scratch-resistant Indium protective coating |
| Net weight | 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 Sensitivity adjustment |

Environmental data

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

Certifications

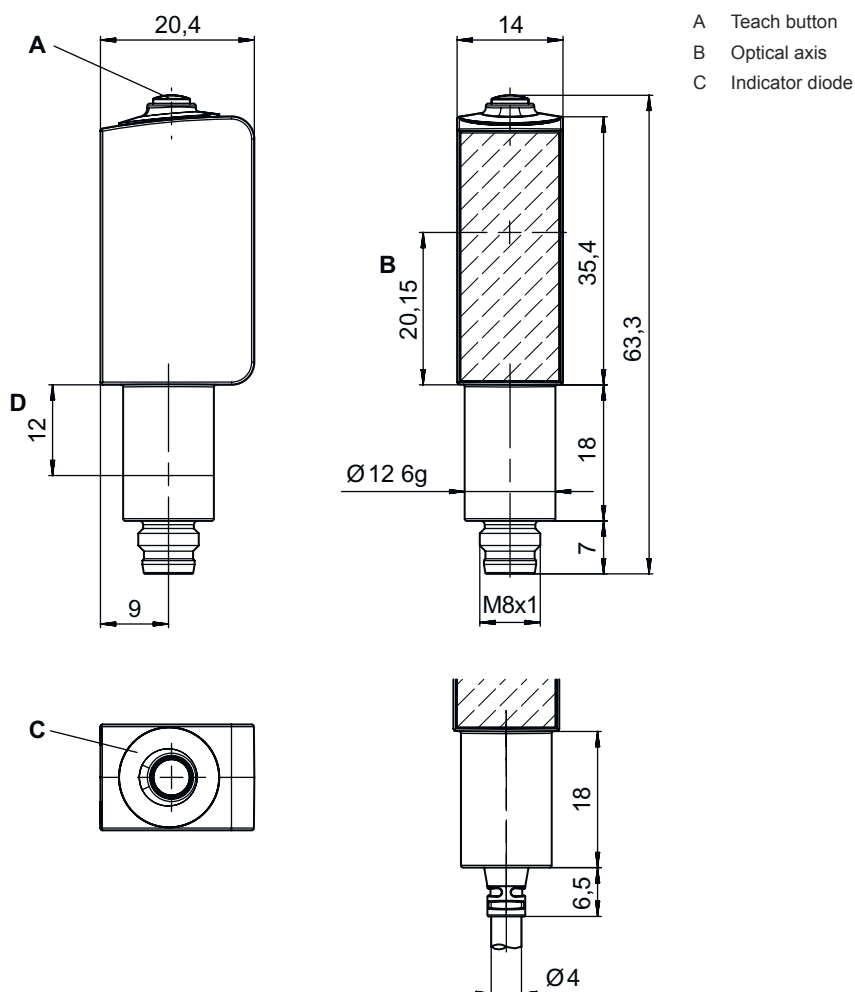
| | |
|----------------------|--------------------------|
| Degree of protection | IP 67 IP 68 IP 69K |
| Protection class | III |
| Approvals | c UL US |
| Standards applied | IEC 60947-5-2 |

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 | Cable |
| Cable length | 5,000 mm |
| Sheathing material | PUR |
| Cable color | Black |
| Number of conductors | 4 -wire |
| Wire cross section | 0.2 mm ² |

Conductor color

| | |
|-------|-----------------|
| Brown | V+ |
| White | OUT 2 |
| Blue | GND |
| Black | IO-Link / OUT 1 |





Conductor assignment







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 Operating range limit | Description |
|---|----------|---------------|---|--|
|  | 50136824 | MTKS 12x20M.5 | 0 ... 1 m 0 ... 1.2 m | Design: Rectangular Triple reflector size: 0.3 mm Reflective surface: 12 mm x 20 mm Material: Plastic Base material: Stainless steel Fastening: Through-hole mounting Compatibility of materials: Alcohol, CleanProof+, ECOLAB, H2O2 |
|  | 50106961 | MTKS 14x23.P | 0 ... 0.2 m 0 ... 0.25 m | Design: Rectangular Triple reflector size: 12 mm Reflective surface: 11 mm x 21 mm Material: Plastic Base material: Plastic Chemical designation of the material: PES Fastening: Through-hole mounting, Adhesive Compatibility of materials: ECOLAB |
|  | 50040894 | MTKS 20x30 | 0 ... 1.6 m 0 ... 2.2 m | Design: Rectangular Triple reflector size: 1.2 mm Reflective surface: 19 mm x 29 mm Material: Plastic Base material: Plastic Chemical designation of the material: PMMA8N Fastening: Through-hole mounting, Adhesive |
|  | 50104130 | MTKS 20x40.1 | 0 ... 1 m 0 ... 1.5 m | Design: Rectangular Triple reflector size: 12 mm Reflective surface: 17 mm x 38 mm Material: Plastic Base material: Plastic Chemical designation of the material: PMMA8N Fastening: Through-hole mounting, Adhesive |

Reflectors & reflective tapes

| | Part no. | Designation | Operating range Operating range limit | Description |
|--|----------|---------------|---|--|
|  | 50117583 | MTKS 50x50.1 | 0 ... 2 m 0 ... 3 m | Design: Rectangular Triple reflector size: 1.2 mm Reflective surface: 50 mm x 50 mm Material: Plastic Base material: Plastic Chemical designation of the material: PMMA8N Fastening: Through-hole mounting, Adhesive |
|  | 50136823 | MTKS 7x7M.5 | 0 ... 0.8 m 0 ... 1 m | Design: Rectangular Triple reflector size: 0.3 mm Reflective surface: 7 mm x 7 mm Material: Plastic Base material: Stainless steel Fastening: Through-hole mounting Compatibility of materials: Alcohol, CleanProof+, ECOLAB, H2O2 |
|  | 50110192 | REF 6-A-50x50 | 0 ... 1 m 0 ... 1.2 m | Design: Rectangular Triple reflector size: 0.3 mm Reflective surface: 50 mm x 50 mm Material: Plastic Chemical designation of the material: PMMA Fastening: Self-adhesive |
|  | 50112142 | TK BR 53 | 0 ... 1 m 0 ... 1.2 m | Design: Rectangular Triple reflector size: 0.3 mm Reflective surface: 29 mm x 10 mm Material: Plastic Base material: Stainless steel Chemical designation of the material: Stainless steel Fastening: Housing fit |

Part number code

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

| | |
|---------------|---|
| AAA53C | Operating principle / construction HT53C: Diffuse reflection sensor with background suppression LS53C: Throughbeam photoelectric sensor transmitter LE53C: Throughbeam photoelectric sensor receiver PRK53C: Retro-reflective photoelectric sensor with polarization filter ODT53C: Distance diffuse sensor with background suppression |
| d | Light type n/a: red light I: infrared light |
| EE | Light source n/a: LED L1: laser class 1 L2: laser class 2 |
| f | Preset range (optional) n/a: operating range acc. to data sheet xxxF: Preset range [mm] |
| GGGG | Equipment n/a: standard A: Autocollimation principle (single lens) for positioning tasks F: Permanently set range H2O: Detection of aqueous liquids Fill-level monitoring S: small light spot T: autocollimation principle (single lens) for highly transparent bottles without tracking TT: autocollimation principle (single lens) for highly transparent bottles with tracking V: V-optics XL: Extra long light spot X: extended model |
| H | Operating range adjustment n/a with HT: range adjustable via 8-turn potentiometer n/a with retro-reflective photoelectric sensors (PRK): operating range not adjustable 1: 270° potentiometer 3: teach-in via button |

Part number code

| | |
|-----------|---|
| i | Switching output/function OUT 1/IN: Pin 4 or black conductor 2: NPN transistor output, light switching N: NPN transistor output, dark switching 4: PNP transistor output, light switching P: PNP transistor output, dark switching 6: push-pull switching output, PNP light switching, NPN dark switching G: Push-pull switching output, PNP dark switching, NPN light switching L: IO-Link interface (SIO mode: PNP light switching, NPN dark switching) 8: activation input (activation with high signal) X: pin not used 1: IO-Link / light switching (NPN) / dark switching (PNP) 7: Input for sensitivity adjustment |
| J | Switching output / function OUT 2/IN: pin 2 or white conductor 2: NPN transistor output, light switching N: NPN transistor output, dark switching 4: PNP transistor output, light switching P: PNP transistor output, dark switching 6: push-pull switching output, PNP light switching, NPN dark switching G: Push-pull switching output, PNP dark switching, NPN light switching T: teach-in via cable X: pin not used 8: activation input (activation with high signal) 9: deactivation input (deactivation with high signal) |
| K | Electrical connection M8: M8 connector, 4-pin (plug) 5000: cable, standard length 5000 mm, 4-wire |
| LL | Parameterization P1: different configuration |

Note

| | |
|--|--|
| | ↪ A list with all available device types can be found on the Leuze website at www.leuze.com . |
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Notes

Observe intended use!

| | |
|--|---|
| | ↪ This product is not a safety sensor and is not intended as personnel protection. ↪ The product may only be put into operation by competent persons. ↪ Only use the product in accordance with its intended use. |
|--|---|

For UL applications:

| | |
|--|---|
| | ↪ For UL applications, use is only permitted in Class 2 circuits in accordance with the NEC (National Electric Code). ↪ These proximity switches shall be used with UL Listed Cable assemblies rated 30V, 0.5A min, in the field installation, or equivalent (categories: CYJV/ CYJV7 or PVVA/PVVA7) |
|--|---|

Notes



ATTENTION! LASER RADIATION – CLASS 1 LASER PRODUCT



The device satisfies the requirements of IEC/EN 60825-1:2014 safety regulations for a product of **laser class 1** and complies with 21 CFR 1040.10 except for conformance with IEC 60825-1 Ed. 3., as described in Laser Notice No. 56, dated May 8, 2019.

↳ 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 Current consumption, max.: 11,000 mA Switching outputs for each sensor connection: 1 Piece(s) Switching output: Transistor, PNP Interface: IO-Link, Automatic protocol detection, EtherNet IP, Modbus TCP, PROFINET Connections: 12 Piece(s) Sensor connections: 8 Piece(s) Connections for voltage supply: 2 Piece(s) Interface connections: 2 Piece(s) 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 Connector, LED: No Connection 2: Open end Shielded: No Cable length: 5.000 mm Sheathing material: TPE |
|  | 50130850 | KD U-M8-4A-V1-050 | Connection cable | Connection 1: Connector, M8, Axial, Female, 4 -pin Connector, LED: No Connection 2: Open end Shielded: No Cable length: 5.000 mm Sheathing material: PVC |

Accessories

Mounting technology - Other

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