

## Technical data sheet

### Polarized retro-reflective photoelectric sensor

Part no.: 50138472

PRK23/4X-200-M12

#### Contents

- Technical data
- Dimensioned drawings
- Electrical connection
- Diagrams
- Operation and display
- Reflectors & reflective tapes
- Part number code
- Notes
- Accessories



For illustration purposes only



Technical data

Basic data

|                     |                      |
|---------------------|----------------------|
| Series              | 23                   |
| Operating principle | Reflection principle |

Optical data

|                          |                                           |
|--------------------------|-------------------------------------------|
| Operating range          | 0.1 ... 4.5 m                             |
| Operating range          | Guaranteed operating range                |
| Reference reflector      | With reflector TK(S) 100x100              |
| Operating range limit    | Typical operating range                   |
| Operating range limit    | 0.1 ... 6 m, With reflector TK(S) 100x100 |
| Light source             | LED, Red                                  |
| Wavelength               | 645 nm                                    |
| Transmitted-signal shape | Pulsed                                    |
| LED group                | Exempt group (in acc. with EN 62471)      |

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 ... 20 mA                            |

Outputs

|                                     |            |
|-------------------------------------|------------|
| Number of digital switching outputs | 1 Piece(s) |
|-------------------------------------|------------|

Switching outputs

|                         |                                             |
|-------------------------|---------------------------------------------|
| 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

|                     |                 |
|---------------------|-----------------|
| Switching element   | Transistor, PNP |
| Switching principle | Light switching |

Time behavior

|                     |        |
|---------------------|--------|
| Switching frequency | 500 Hz |
| Response time       | 1 ms   |
| Readiness delay     | 300 ms |

Connection

Connection 1

|                      |                      |
|----------------------|----------------------|
| Function             | Signal OUT           |
|                      | Voltage supply       |
| Type of connection   | Cable with connector |
| Cable length         | 200 mm               |
| Sheathing material   | PUR                  |
| Cable color          | Black                |
| Number of conductors | 4 -wire              |
| Wire cross section   | 0.2 mm <sup>2</sup>  |
| Thread size          | M12                  |
| Type                 | Male                 |
| Material             | Plastic              |
| No. of pins          | 4 -pin               |
| Encoding             | A-coded              |

Mechanical data

|                       |                             |
|-----------------------|-----------------------------|
| Dimension (W x H x L) | 11.4 mm x 34.2 mm x 18.3 mm |
| Housing material      | Plastic                     |
| Plastic housing       | PC-ABS                      |
| Lens cover material   | Plastic / PMMA              |
| Net weight            | 50 g                        |
| Housing color         | Black                       |
|                       | Red                         |

Operation and display

|                 |            |
|-----------------|------------|
| Type of display | LED        |
| Number of LEDs  | 2 Piece(s) |

Environmental data

|                                |               |
|--------------------------------|---------------|
| Ambient temperature, operation | -40 ... 60 °C |
| Ambient temperature, storage   | -40 ... 70 °C |

Certifications

|                      |               |
|----------------------|---------------|
| Degree of protection | IP 67         |
| Protection class     | III           |
| Certifications       | c UL US       |
| Standards applied    | IEC 60947-5-2 |

Classification

|                       |          |
|-----------------------|----------|
| 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 |
| ETIM 5.0              | EC002717 |
| ETIM 6.0              | EC002717 |
| ETIM 7.0              | EC002717 |
| ETIM 8.0              | EC002717 |
| ETIM 9.0              | EC002717 |

Dimensioned drawings

All dimensions in millimeters



Electrical connection

Connection 1

|                      |                      |
|----------------------|----------------------|
| Function             | Signal OUT           |
|                      | Voltage supply       |
| Type of connection   | Cable with connector |
| Cable length         | 200 mm               |
| Sheathing material   | PUR                  |
| Cable color          | Black                |
| Number of conductors | 4 -wire              |
| Wire cross section   | 0.2 mm²              |
| Thread size          | M12                  |
| Type                 | Male                 |
| Material             | Plastic              |
| No. of pins          | 4 -pin               |
| Encoding             | A-coded              |

| Pin | Pin assignment |
|-----|----------------|
| 1   | V+             |
| 2   | n.c.           |
| 3   | GND            |
| 4   | OUT 1          |

Diagrams

Typ. response behavior



Operation and display

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

Reflectors & reflective tapes

|                                                                                     | Part no. | Designation   | Operating range<br>Operating range<br>limit | Description                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------|----------|---------------|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50108300 | REF 4-A-50x50 | 0.1 ... 1.2 m<br>0.1 ... 1.6 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                                                                     |
|  | 50003192 | TK 100x100    | 0.1 ... 4.5 m<br>0.1 ... 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: Rear side can be glued |
|  | 50003189 | TK 30x50      | 0.1 ... 1.2 m<br>0.1 ... 1.6 m              | Design: Rectangular<br>Triple reflector size: 4 mm<br>Reflective surface: 29 mm x 45 mm<br>Material: Plastic<br>Base material: Plastic<br>Chemical designation of the material: PMMA8N<br>Fastening: Rear side can be glued |

Reflectors & reflective tapes

|                                                                                     | Part no. | Designation  | Operating range<br>Operating range<br>limit | Description                                                                                                                                                                                                                                    |
|-------------------------------------------------------------------------------------|----------|--------------|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | 50024127 | TK 82.2      | 0.1 ... 1.2 m<br>0.1 ... 1.6 m              | Design: Round<br>Triple reflector size: 4 mm<br>Reflective surface, diameter: 79 mm<br>Material: Plastic<br>Base material: Plastic<br>Chemical designation of the material: PMMA8N<br>Fastening: Through-hole mounting, Rear side can be glued |
|    | 50022816 | TKS 100X100  | 0.1 ... 4.5 m<br>0.1 ... 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           |
|    | 50081283 | TKS 20X40    | 0.1 ... 1.5 m<br>0.1 ... 2 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         |
|   | 50023525 | TKS 30X50    | 0.1 ... 1.2 m<br>0.1 ... 1.6 m              | Design: Rectangular<br>Triple reflector size: 3 mm<br>Reflective surface: 27 mm x 44 mm<br>Material: Plastic<br>Base material: Plastic<br>Chemical designation of the material: PMMA8N<br>Fastening: Through-hole mounting, Adhesive           |
|  | 50109506 | TKS 30x50.UV | 0.1 ... 1.2 m<br>0.1 ... 1.6 m              | Design: Rectangular<br>Triple reflector size: 3 mm<br>Reflective surface: 44 mm x 27 mm<br>Material: Plastic<br>Base material: Plastic<br>Chemical designation of the material: PMMA8N<br>Fastening: Through-hole mounting, Adhesive           |
|  | 50040820 | TKS 40X60    | 0.1 ... 2.5 m<br>0.1 ... 3.3 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           |

Part number code

Part designation: AAA23.GJ/ ff-HH

|       |                                                                                                                                                                                                                                                                                                                                                                                        |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AAA23 | <b>Operating principle / construction</b><br>HT23: diffuse reflection sensor with background suppression<br>PRK23: retro-reflective photoelectric sensor with polarization filter<br>LS23: throughbeam photoelectric sensor transmitter<br>LE23: throughbeam photoelectric sensor receiver<br>ET23: energetic diffuse reflection sensor<br>FT23: diffuse reflection sensor with fading |
| G     | <b>Equipment</b><br>T: autocollimation principle (single lens) for highly transparent bottles without tracking                                                                                                                                                                                                                                                                         |
| J     | <b>Operating range adjustment</b><br>3: teach-in via button                                                                                                                                                                                                                                                                                                                            |

Part number code

|    |                                                                                                                                                                                                                                                                                                   |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ff | <b>Switching output / function / OUT1OUT2 (OUT1 = pin 4, OUT2 = pin 2)</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>X: pin not used                   |
| HH | <b>Electrical connection</b><br>n/a: cable, standard length 2000 mm, 3-wire<br>M8: M8 connector, 4-pin (plug)<br>200-M12: cable, length 200 mm with M12 connector, 4-pin, axial (plug)<br>M12: M12 connector, 4-pin (plug)<br>200-M8: cable, length 200 mm with M8 connector, 4-pin, axial (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.

For UL applications:



- Only for use in "class 2" circuits
- 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)

Accessories

Connection technology - Connection cables

|                                                                                     | Part no. | Designation        | Article          | Description                                                                                                                                                                        |
|-------------------------------------------------------------------------------------|----------|--------------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50130652 | KD U-M12-4A-V1-050 | Connection cable | Connection 1: Connector, M12, 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: PVC  |
|  | 50130690 | KD U-M12-4W-V1-050 | Connection cable | Connection 1: Connector, M12, Angled, 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: PVC |

## Accessories

### Mounting technology - Mounting brackets

|                                                                                   | Part no. | Designation   | Article             | Description                                                                                                                                                                                                                   |
|-----------------------------------------------------------------------------------|----------|---------------|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50118542 | BT 200M.5     | Mounting bracket    | Design of mounting device: Angle, L-shape<br>Fastening, at system: Through-hole mounting<br>Mounting bracket, at device: Screw type, Suited for M3 screws<br>Type of mounting device: Adjustable<br>Material: Stainless steel |
|   | 50124651 | BT 205M-10SET | Mounting device set | Design of mounting device: Angle, L-shape<br>Fastening, at system: Through-hole mounting<br>Mounting bracket, at device: Screw type<br>Type of mounting device: Rigid<br>Material: Metal                                      |

### Mounting technology - Rod mounts

|                                                                                     | Part no. | Designation  | Article         | Description                                                                                                                                                                                                                                                  |
|-------------------------------------------------------------------------------------|----------|--------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   | 50117829 | BTP 200M-D12 | Mounting system | Design of mounting device: Protection hood<br>Fastening, at system: For 12 mm rod<br>Mounting bracket, at device: Screw type<br>Type of mounting device: Clampable, Adjustable, Turning, 360°<br>Material: Metal                                             |
|  | 50117255 | BTU 200M-D12 | Mounting system | Design of mounting device: Mounting system<br>Fastening, at system: For 12 mm rod, Sheet-metal mounting<br>Mounting bracket, at device: Screw type, Suited for M3 screws<br>Type of mounting device: Clampable, Adjustable, Turning, 360°<br>Material: Metal |

### Standard reflectors

|                                                                                     | Part no. | Designation | Article   | Description                                                                                                                                                                                                                            |
|-------------------------------------------------------------------------------------|----------|-------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50081283 | TKS 20X40   | Reflector | 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 |
|  | 50040820 | TKS 40X60   | Reflector | 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   |

Accessories

Reflective tapes for standard applications

|                                                                                   | Part no. | Designation   | Article         | Description                                                                                                                                             |
|-----------------------------------------------------------------------------------|----------|---------------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50108300 | REF 4-A-50x50 | Reflective tape | Design: Rectangular<br>Reflective surface: 50 mm x 50 mm<br>Material: Plastic<br>Chemical designation of the material: PMMA<br>Fastening: Self-adhesive |

Note



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