

## Technical data sheet

### Polarized retro-reflective photoelectric sensor

Part no.: 50145247

PRK5B/2X-200-M12

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For illustration purposes only



## Technical data

### Basic data

|                     |                      |
|---------------------|----------------------|
| Series              | 5B                   |
| Operating principle | Reflection principle |

### Optical data

|                          |                                                                         |
|--------------------------|-------------------------------------------------------------------------|
| Operating range          | 0.02 ... 5 m (guaranteed operating range), With reflector TK(S) 100x100 |
| Operating range limit    | 0.02 ... 6.5 m (typical operating range), 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

|                         |                                               |
|-------------------------|-----------------------------------------------|
| Type                    | Digital switching output                      |
| Voltage type            | DC                                            |
| Switching current, max. | 50 mA                                         |
| Switching voltage       | high: $\geq(U_B - 2.5V)$<br>low: $\leq 2.5 V$ |

### Switching output 1

|                     |                                                                     |
|---------------------|---------------------------------------------------------------------|
| Switching element   | Transistor, NPN                                                     |
| Switching principle | Light switching<br>(dark switching by reversing polarity of $U_B$ ) |

### Time behavior

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

### Connection

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

### Connection 1

|                      |                      |
|----------------------|----------------------|
| Function             | Signal OUT           |
|                      | Voltage supply       |
| Type of connection   | Cable with connector |
| Cable length         | 200 mm               |
| Sheathing material   | PVC                  |
| Cable color          | Black                |
| Number of conductors | 3 -wire              |
| Wire cross section   | 0.14 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 mm x 32.4 mm x 20 mm      |
| Housing material                               | Plastic                      |
| Plastic housing                                | PC-ABS                       |
| Lens cover material                            | Plastic                      |
| Net weight                                     | 40 g                         |
| Housing color                                  | Black                        |
|                                                | Red                          |
| Type of fastening                              | Two M3 threaded sleeves      |
|                                                | Via optional mounting device |
| Recommended tightening torque for M3 fastening | 0.9 N·m                      |
| Compatibility of materials                     | ECOLAB                       |

### 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           |
| Approvals            | 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 |
| 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 OUT           |
|                      | Voltage supply       |
| Type of connection   | Cable with connector |
| Cable length         | 200 mm               |
| Sheathing material   | PVC                  |
| Cable color          | Black                |
| Number of conductors | 3 -wire              |
| Wire cross section   | 0.14 mm <sup>2</sup> |
| Thread size          | M12                  |
| Type                 | Male                 |
| Material             | Plastic              |
| No. of pins          | 4 -pin               |
| Encoding             | A-coded              |

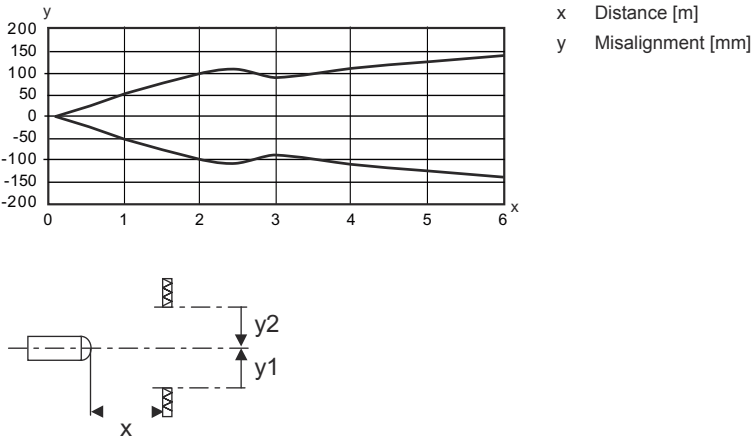
Pin Pin assignment

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

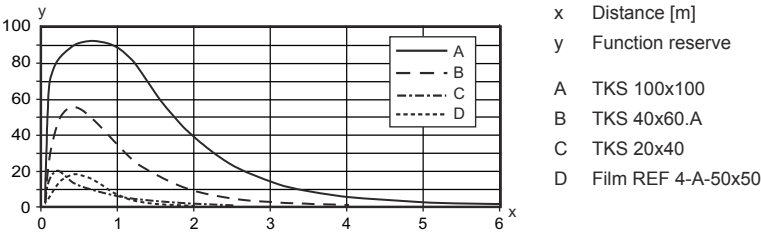


Diagrams

Typ. response behavior (TKS100x100)



Typ. function reserve



Operation and display

| LED | Display                  | Meaning                              |
|-----|--------------------------|--------------------------------------|
| 1   | Yellow, continuous light | Light path free                      |
|     | Yellow, flashing         | Light path free, 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 | 0.08 ... 1.4 m<br>0.08 ... 2 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                                                                                        |
|  | 50024127 | TK 82.2       | 0.05 ... 4 m<br>0.05 ... 5 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 |

## Reflectors & reflective tapes

|                                                                                    | Part no. | Designation | Operating range<br>Operating range<br>limit | Description                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------------|----------|-------------|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   | 50022816 | TKS 100X100 | 0.02 ... 5 m<br>0.02 ... 6.5 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   | 0.04 ... 1.6 m<br>0.04 ... 2.2 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   | 0.03 ... 1.9 m<br>0.03 ... 2.5 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   |
|  | 50040820 | TKS 40X60   | 0.02 ... 3 m<br>0.02 ... 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   |
|  | 50125455 | TKS 40x60.A | 0.02 ... 2.8 m<br>0.02 ... 4.2 m            | Design: Rectangular<br>Triple reflector size: 2.3 mm<br>Reflective surface: 36.8 mm x 55.8 mm<br>Material: Plastic<br>Base material: Plastic<br>Chemical designation of the material: PMMA8N<br>Fastening: Screw type, Adhesive        |

## Part number code

Part designation: **AAA5B D-E.FF/GG.HH-JJ**

|              |                                                                                                                                                                                                                                                                                                                                           |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>AAA5B</b> | <b>Operating principle / construction</b><br>LS5B: Throughbeam photoelectric sensor transmitter<br>LE5B: Throughbeam photoelectric sensor receiver<br>PRK5B: Retro-reflective photoelectric sensor with polarization filter<br>HT5B: Diffuse reflection sensor with background suppression<br>ET5B: Energetic diffuse reflection sensor   |
| <b>D</b>     | <b>Light type</b><br>n/a: red light<br>I: infrared light<br>PP: Power PinPoint® LED                                                                                                                                                                                                                                                       |
| <b>E</b>     | <b>Preset range (optional)</b><br>n/a: operating range acc. to data sheet<br>xxxF: Preset range [mm]                                                                                                                                                                                                                                      |
| <b>FF</b>    | <b>Equipment</b><br>1: 270° potentiometer<br>D: Detection of stretch-wrapped objects<br>M: Detection of semi-transparent media and transparent films<br>XL: Extra long light spot<br>n/a with retro-reflective photoelectric sensors (PRK): operating range not adjustable<br>n/a with ET / HT: range adjustable via 8-turn potentiometer |

## Part number code

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GG | <b>Switching output / Function</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>9: deactivation input (deactivation with high signal)<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>200-M8: cable, length 200 mm with M8 connector, 4-pin, axial (plug)<br>200-M8.3: cable, length 200 mm with M8 connector, 3-pin, axial (plug)<br>200-M8.1: Cable, length 200 mm with snap-in M8 connector, 4-pin (plug)<br>M8.3: M8 connector, 3-pin (plug) |
| JJ | <b>Version</b><br>Y1: mounting holes without threaded sleeve                                                                                                                                                                                                                                                                                                                                                                                         |

### 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 |

## Accessories

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

## 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 |

### Note



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