

## Technical data sheet

### Energetic diffuse sensor

Part no.: 50147993

ET5B/4



For illustration purposes only

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## Technical data

### Basic data

|                     |                              |
|---------------------|------------------------------|
| Series              | 5B                           |
| Operating principle | Diffuse reflection principle |

### Optical data

|                             |                                         |
|-----------------------------|-----------------------------------------|
| Operating range             | Guaranteed operating range              |
| Operating range, white 90%  | 0.002 ... 0.7 m                         |
| Operating range, gray 18%   | 0.005 ... 0.4 m                         |
| Operating range, black 6%   | 0.01 ... 0.3 m                          |
| Operating range limit       | 0.001 ... 1 m (typical operating range) |
| Adjustment range            | 40 ... 700 mm                           |
| Light source                | LED, Red                                |
| Wavelength                  | 645 nm                                  |
| Transmitted-signal shape    | Pulsed                                  |
| LED group                   | Exempt group (in acc. with EN 62471)    |
| Type of light spot geometry | Round                                   |

### 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 ... 15 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, PNP                                                     |
| Switching principle | Light switching<br>(dark switching by reversing polarity of $U_B$ ) |

### Time behavior

|                     |         |
|---------------------|---------|
| Switching frequency | 900 Hz  |
| Response time       | 0.56 ms |
| Readiness delay     | 300 ms  |

### Connection

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

### Connection 1

|                      |                              |
|----------------------|------------------------------|
| Function             | Signal OUT<br>Voltage supply |
| Type of connection   | Cable                        |
| Cable length         | 2,000 mm                     |
| Sheathing material   | PVC                          |
| Cable color          | Black                        |
| Number of conductors | 3 -wire                      |
| Wire cross section   | 0.14 mm <sup>2</sup>         |

### 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 / PMMA                                          |
| Net weight                                     | 44 g                                                    |
| Housing color                                  | Black<br>Red                                            |
| Type of fastening                              | Two M3 threaded sleeves<br>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)              |
| Operational controls                | Multiturn potentiometer |
| Function of the operational control | Range adjustment        |

### Environmental data

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

### Certifications

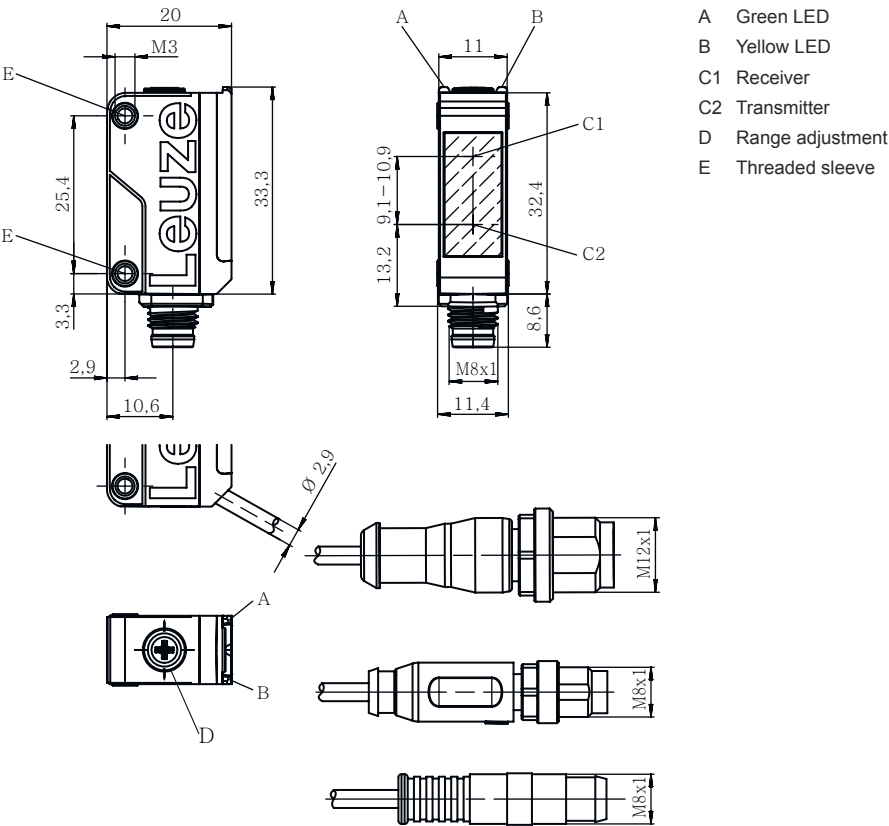
|                      |               |
|----------------------|---------------|
| Degree of protection | IP 67         |
| Protection class     | III           |
| Approvals            | c UL US       |
| Standards applied    | IEC 60947-5-2 |

### Classification

|                       |          |
|-----------------------|----------|
| Customs tariff number | 85365019 |
| ECLASS 5.1.4          | 27270904 |
| ECLASS 8.0            | 27270904 |
| ECLASS 9.0            | 27270904 |
| ECLASS 10.0           | 27270904 |
| ECLASS 11.0           | 27270904 |
| ECLASS 12.0           | 27270903 |
| ECLASS 13.0           | 27270903 |
| ECLASS 14.0           | 27270903 |
| ECLASS 15.0           | 27270903 |
| ETIM 5.0              | EC002719 |
| ETIM 6.0              | EC002719 |
| ETIM 7.0              | EC002719 |
| ETIM 8.0              | EC002719 |
| ETIM 9.0              | EC002719 |
| ETIM 10.0             | EC002719 |

Dimensioned drawings

All dimensions in millimeters



Electrical connection

Connection 1

|                      |                |
|----------------------|----------------|
| Function             | Signal OUT     |
|                      | Voltage supply |
| Type of connection   | Cable          |
| Cable length         | 2,000 mm       |
| Sheathing material   | PVC            |
| Cable color          | Black          |
| Number of conductors | 3 -wire        |
| Wire cross section   | 0.14 mm²       |

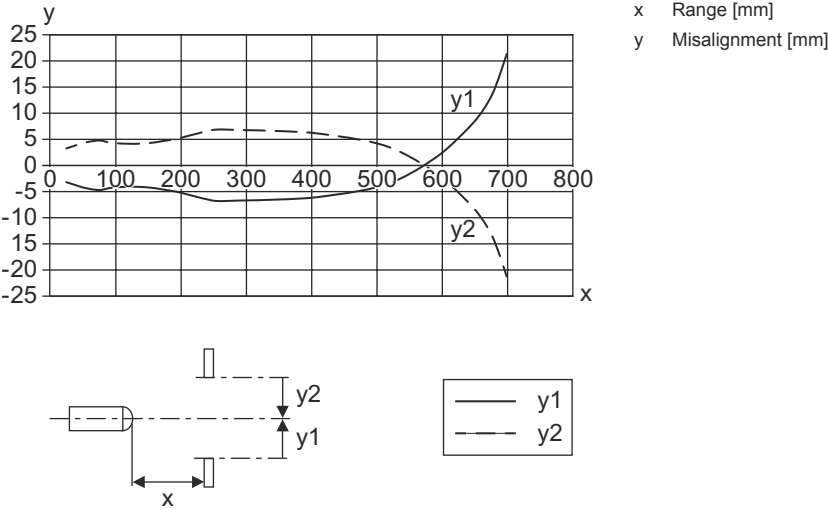
Conductor color

Conductor assignment

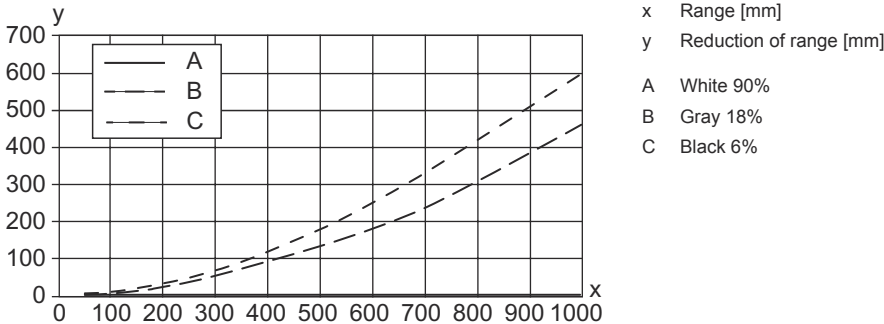
|       |       |
|-------|-------|
| Brown | V+    |
| Blue  | GND   |
| Black | OUT 1 |

Diagrams

Typ. response behavior at 90% diffuse reflection (focusing distance 200 mm)



Typ. black/white behavior



Operation and display

| LED | Display                  | Meaning               |
|-----|--------------------------|-----------------------|
| 1   | Yellow, continuous light | Object detected       |
| 2   | Green, continuous light  | Operational readiness |

Part number code

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

|       |                                                                                                                                                                                                                                                                                                                                         |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AAA5B | <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 |
| D     | <b>Light type</b><br>n/a: red light<br>I: infrared light<br>PP: Power PinPoint® LED                                                                                                                                                                                                                                                     |
| E     | <b>Preset range (optional)</b><br>n/a: operating range acc. to data sheet<br>xxxF: Preset range [mm]                                                                                                                                                                                                                                    |

## Part number code

|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <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                                                                                                            |
| <b>GG</b> | <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                                                                                                                                                     |
| <b>HH</b> | <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) |
| <b>JJ</b> | <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)

## Further information

- With the set scanning range, a tolerance of the operating range is possible depending on the reflection properties of the material surface.
- Response time: For short decay times, an ohmic load of approx. 5kOhm is recommended
- Light source: Average life expectancy 100,000 h at an ambient temperature of 25 °C

## 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 | Contains: 10x<br>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 | Contains: 2x M3 x 16 screw, 2 M3 x 20 screws, 2x position washers<br>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.