

## Technical data sheet

### Energetic diffuse sensor

Part no.: 50122576  
FT5.3/2N

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For illustration purposes only



## Technical data

### Basic data

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

### Optical data

|                                  |                                      |
|----------------------------------|--------------------------------------|
| Operating range                  | Guaranteed operating range           |
| Operating range, white 90%       | 0.001 ... 0.215 m                    |
| Operating range, gray 50%        | 0.001 ... 0.19 m                     |
| Operating range, gray 18%        | 0.003 ... 0.15 m                     |
| Operating range, black 6%        | 0.003 ... 0.125 m                    |
| Operating range limit, white 90% | 0 ... 0.28 m                         |
| Operating range limit, gray 50%  | 0.001 ... 0.245 m                    |
| Operating range limit, gray 18%  | 0.003 ... 0.19 m                     |
| Operating range limit, black 6%  | 0.001 ... 0.16 m                     |
| Operating range limit            | Typical operating range              |
| Light source                     | LED, Red                             |
| Wavelength                       | 620 nm                               |
| Transmitted-signal shape         | Pulsed                               |
| LED group                        | Exempt group (in acc. with EN 62471) |

### 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 ... 20 mA                            |

### Outputs

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

### Switching outputs

|                         |                                                |
|-------------------------|------------------------------------------------|
| Type                    | Digital switching output                       |
| 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, NPN |
| Switching principle | Light switching |

### Switching output 2

|                     |                 |
|---------------------|-----------------|
| Switching element   | Transistor, NPN |
| Switching principle | Dark switching  |

### 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<br>Voltage supply |
| Type of connection   | Cable                        |
| Cable length         | 2,000 mm                     |
| Sheathing material   | PUR                          |
| Cable color          | Black                        |
| Number of conductors | 4 -wire                      |
| Wire cross section   | 0.2 mm <sup>2</sup>          |

### Mechanical data

|                                                |                           |
|------------------------------------------------|---------------------------|
| Dimension (W x H x L)                          | 14 mm x 32.5 mm x 20.2 mm |
| Housing material                               | Plastic                   |
| Plastic housing                                | ABS                       |
| Lens cover material                            | Plastic                   |
| Net weight                                     | 70 g                      |
| Housing color                                  | Black<br>Red              |
| Recommended tightening torque for M3 fastening | 0.9 N·m                   |

### Operation and display

|                      |              |
|----------------------|--------------|
| Type of display      | LED          |
| Number of LEDs       | 2 Piece(s)   |
| Operational controls | Teach button |

### Environmental data

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

### Certifications

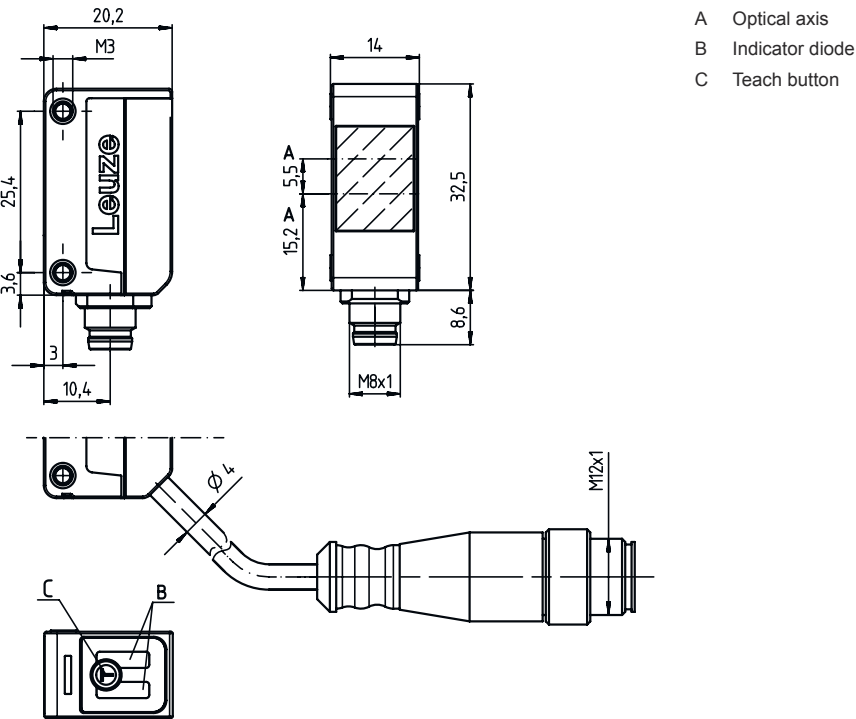
|                      |               |
|----------------------|---------------|
| Degree of protection | IP 67         |
| Protection class     | III           |
| Approvals            | c UL US       |
| Standards applied    | IEC 60947-5-2 |

### Classification

|                       |          |
|-----------------------|----------|
| Customs tariff number | 85365019 |
| ECLASS 5.1.4          | 27270903 |
| ECLASS 8.0            | 27270903 |
| ECLASS 9.0            | 27270903 |
| ECLASS 10.0           | 27270903 |
| ECLASS 11.0           | 27270903 |
| ECLASS 12.0           | 27270903 |
| ECLASS 13.0           | 27270903 |
| ECLASS 14.0           | 27270903 |
| ECLASS 15.0           | 27270903 |
| ETIM 5.0              | EC001821 |
| ETIM 6.0              | EC001821 |
| ETIM 7.0              | EC001821 |
| ETIM 8.0              | EC001821 |
| ETIM 9.0              | EC001821 |
| ETIM 10.0             | EC001821 |

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   | PUR            |
| Cable color          | Black          |
| Number of conductors | 4 -wire        |
| Wire cross section   | 0.2 mm²        |

Conductor color

Conductor assignment

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

Diagrams

Typ. black/white behavior



x Range [mm]  
y Reduction of range [mm]

- A White 90%
- B Gray 50%
- C Gray 18%
- D Black 6%

**Fading: black/white error < 50 %**  
The black/white error is calculated from the operating range against white and the reduction of the operating range against black:  
**black/white error = reduction of the operating range against black / operating range against white x 100%**



Operation and display

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

Part number code

Part designation: AAA5d.EE/ ff-GG-hh-l

|      |                                                                                                                                                                                                                                                                                                                                                                                                  |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AAA5 | <b>Operating principle / construction</b><br>HT5: diffuse reflection sensor with background suppression<br>LS5: throughbeam photoelectric sensor transmitter<br>LE5: throughbeam photoelectric sensor receiver<br>ET5: energetic diffuse reflection sensor<br>FT5: diffuse reflection sensor with fading<br>PRK5: retro-reflective photoelectric sensor with polarization filter                 |
| d    | <b>Light type</b><br>n/a: red light<br>l: infrared light                                                                                                                                                                                                                                                                                                                                         |
| EE   | <b>Equipment</b><br>1: adjustable range<br>M: for semi-transparent objects<br>H: For the detection of transparent films<br>X: reinforced fading<br>3: teach-in via button<br>R: combination product for reflector DTKS 30x50                                                                                                                                                                     |
| 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<br>9: deactivation input (deactivation with high signal)<br>D: Deactivation input (deactivation with low signal) |
| GG   | <b>Version</b><br>P1: narrow light beam                                                                                                                                                                                                                                                                                                                                                          |

Part number code

|    |                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| hh | <b>Electrical connection</b><br>n/a: cable, standard length 2000 mm, 4-wire<br>M8: M8 connector, 4-pin (plug)<br>M8.3: M8 connector, 3-pin (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-M12: cable, length 200 mm with M12 connector, 4-pin, axial (plug)<br>M8.1: Snap-in, M8 connector, 4-pin (plug) |
| I  | <b>Parameterization</b><br>P1: different configuration                                                                                                                                                                                                                                                                                                                                                                  |

| Note                                                                             |                                                                                                                                |
|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
|  | A list with all available device types can be found on the Leuze website at <a href="http://www.leuze.com">www.leuze.com</a> . |

Notes

|  Observe intended use! |                                                                                                                                                                                                                                                                             |
|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                        | <ul style="list-style-type: none"><li>This product is not a safety sensor and is not intended as personnel protection.</li><li>The product may only be put into operation by competent persons.</li><li>Only use the product in accordance with its intended use.</li></ul> |

| For UL applications:                                                               |                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"><li>Only for use in "class 2" circuits</li><li>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)</li></ul> |

Further information

- Sum of the output currents for both outputs, 50 mA for ambient temperatures > 40 °C
- With the set scanning range, a tolerance of the operating range is possible depending on the reflection properties of the material surface.

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 |

## Accessories

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