

## Technical data sheet

### Energetic diffuse sensor

Part no.: 50140141  
ET412B.1/N

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Figure can vary



## Technical data

### Basic data

|                     |                              |
|---------------------|------------------------------|
| Series              | 412B                         |
| Operating principle | Diffuse reflection principle |

### Optical data

|                                  |                                      |
|----------------------------------|--------------------------------------|
| Operating range                  | Guaranteed operating range           |
| Operating range, white 90%       | 0.004 ... 0.54 m                     |
| Operating range, gray 50%        | 0.007 ... 0.46 m                     |
| Operating range, gray 18%        | 0.008 ... 0.3 m                      |
| Operating range, black 6%        | 0.01 ... 0.22 m                      |
| Operating range limit            | Typical operating range              |
| Operating range limit, white 90% | 0.004 ... 0.66 m                     |
| Operating range limit, gray 50%  | 0.007 ... 0.57 m                     |
| Operating range limit, gray 18%  | 0.008 ... 0.37 m                     |
| Operating range limit, black 6%  | 0.01 ... 0.285 m                     |
| Light source                     | LED, Red                             |
| LED light wavelength             | 660 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 ... 36 V, DC, Incl. residual ripple |
| Residual ripple      | 0 ... 20 %, From $U_B$                 |
| Open-circuit current | 0 ... 15 mA                            |

### Outputs

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

### Switching outputs

|                         |        |
|-------------------------|--------|
| Voltage type            | DC     |
| Switching current, max. | 200 mA |

### Switching output 1

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

### Timing

|                     |          |
|---------------------|----------|
| Switching frequency | 1,000 Hz |
| Response time       | 0.5 ms   |
| Readiness delay     | 60 ms    |

### 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   | 0.34 mm <sup>2</sup>         |

### Mechanical data

|                     |                      |
|---------------------|----------------------|
| Thread size         | M12 x 1 mm           |
| Dimension (Ø x L)   | 12 mm x 51 mm        |
| Housing material    | Metal, Chromed brass |
| Lens cover material | Glass                |
| Net weight          | 100 g                |
| Housing color       | Silver               |

### Operation and display

|                                     |                        |
|-------------------------------------|------------------------|
| Type of display                     | LED                    |
| Number of LEDs                      | 2 Piece(s)             |
| Operational controls                | 270° potentiometer     |
| Function of the operational control | Sensitivity adjustment |

### Environmental data

|                                |               |
|--------------------------------|---------------|
| Ambient temperature, operation | -25 ... 55 °C |
|--------------------------------|---------------|

### Certifications

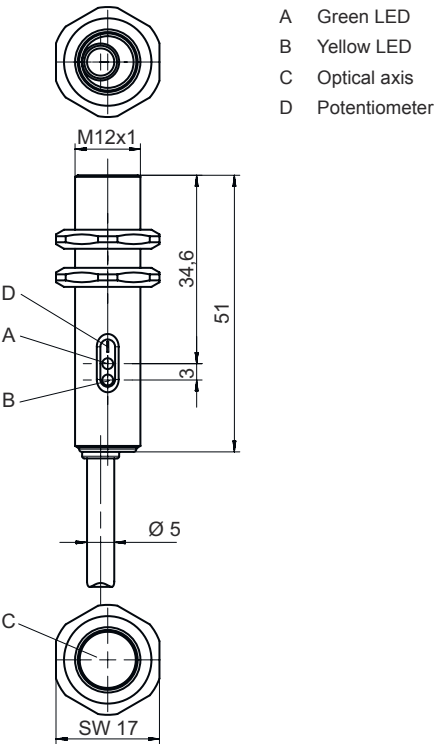
|                      |               |
|----------------------|---------------|
| Degree of protection | IP 67         |
| Protection class     | III           |
| Certifications       | c UL US       |
| Standards applied    | IEC 60947-5-2 |

### Classification

|                       |          |
|-----------------------|----------|
| Customs tariff number | 85365019 |
| eCl@ss 8.0            | 27270903 |
| eCl@ss 9.0            | 27270903 |
| ETIM 5.0              | EC001821 |
| ETIM 6.0              | 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   | PVC            |
| Cable color          | Black          |
| Number of conductors | 3 -wire        |
| Wire cross section   | 0.34 mm²       |

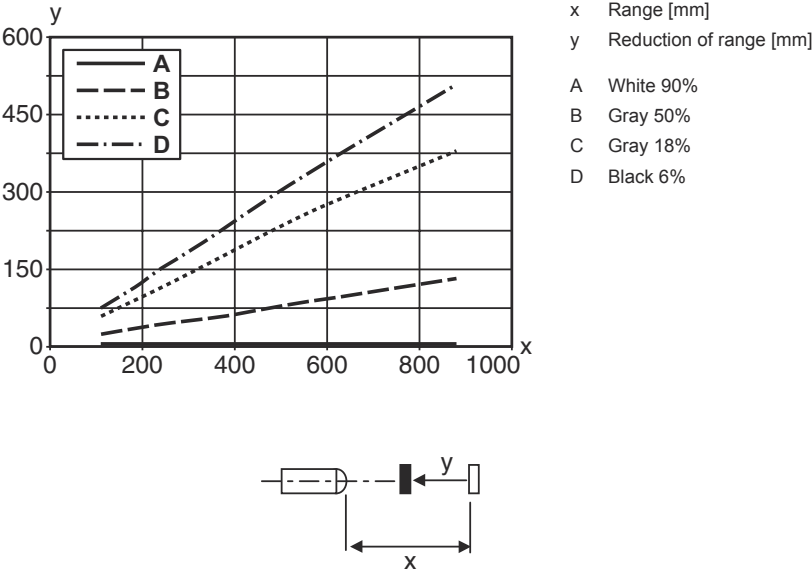
Conductor color

Conductor assignment

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

Diagrams

Typ. black/white behavior



Operation and display

| LED | Display                  | Meaning                                 |
|-----|--------------------------|-----------------------------------------|
| 1   | Green, continuous light  | Function reserve                        |
| 2   | Yellow, continuous light | Switching output/switching state active |

Part number code

Part designation: AAA412BGG.H/ii-K

|         |                                                                                                                                                                                                                                                                                                                                         |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AAA412B | <b>Operating principle / construction</b><br>LS412B: throughbeam photoelectric sensor transmitter<br>LE412B: throughbeam photoelectric sensor receiver<br>ET412B: energetic diffuse reflection sensor<br>PRK412B: retro-reflective photoelectric sensor with polarization filter                                                        |
| GG      | <b>Light source</b><br>n/a: LED<br>L2: laser class 2                                                                                                                                                                                                                                                                                    |
| H       | <b>Operating range adjustment</b><br>1: 270° potentiometer                                                                                                                                                                                                                                                                              |
| ii      | <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>D: deactivation input (deactivation with low signal)<br>X: pin not used |
| K       | <b>Electrical connection</b><br>n/a: cable, standard length 2000 mm, 3-wire<br>M12: M12 connector, 4-pin (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.

Accessories

Mounting technology - Mounting brackets

|                                                                                  | Part no. | Designation | Article          | Description                                                                                                                                                                                                                  |
|----------------------------------------------------------------------------------|----------|-------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50113549 | BT D12M.5   | Mounting bracket | Diameter, inner: 12 mm<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: 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.