

## Technical data sheet

### Energetic diffuse sensor

Part no.: 50140140  
ET412B.1/2

#### Contents

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



For illustration purposes only



## 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, 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                     |
| Operating range limit            | Typical operating range              |
| Light source                     | LED, Red                             |
| 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          |
| <b>Switching output 1</b> |                 |
| Switching element         | Transistor, NPN |
| Switching principle       | Light switching |

### Time behavior

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

### Connection

|                      |                              |
|----------------------|------------------------------|
| <b>Connection 1</b>  |                              |
| 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

|                     |               |
|---------------------|---------------|
| Dimension (Ø x L)   | 12 mm x 51 mm |
| Thread size         | M12 x 1 mm    |
| Housing material    | Metal         |
| Metal housing       | 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

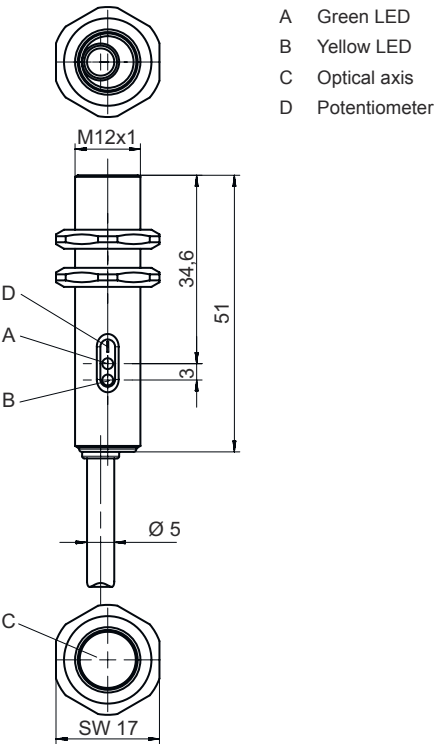
|                      |               |
|----------------------|---------------|
| Degree of protection | IP 67         |
| Protection class     | III           |
| Approvals            | c UL US       |
| Standards applied    | IEC 60947-5-2 |

### 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   | PVC            |
| Cable color          | Black          |
| Number of conductors | 3 -wire        |
| Wire cross section   | 0.34 mm²       |

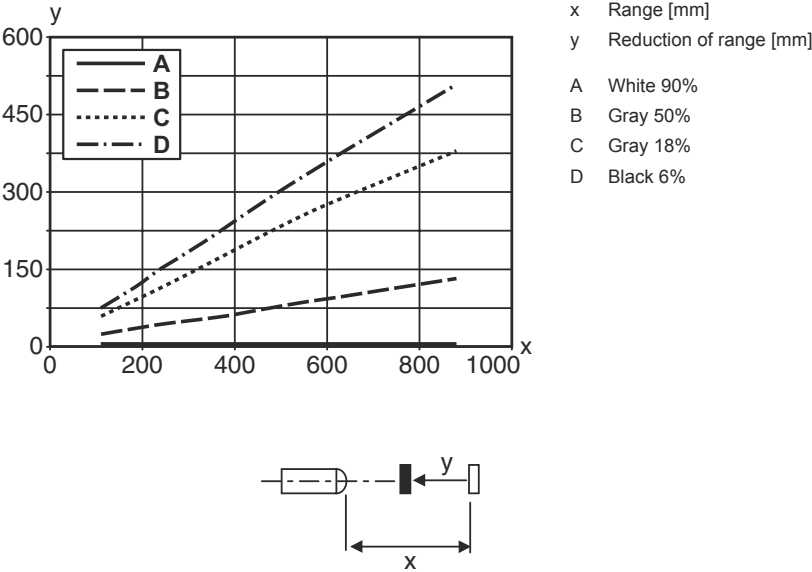
Conductor color

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.