# Technical data sheet
# Energetic diffuse sensor
Part no.: 50122596
ET28.3/4P-M12



For Illustration purposes only

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# Technical data

## Basic data

| | |
|---|---|
| **Series** | 28 |
| **Operating principle** | Diffuse reflection principle |

## Optical data

| | |
|---|---|
| **Operating range** | Guaranteed operating range |
| **Operating range, white 90%** | 0.001 ... 0.65 m |
| **Operating range, gray 50%** | 0.002 ... 0.54 m |
| **Operating range, gray 18%** | 0.01 ... 0.35 m |
| **Operating range, black 6%** | 0.012 ... 0.25 m |
| **Operating range limit, white 90%** | 0.001 ... 0.85 m |
| **Operating range limit, gray 50%** | 0.002 ... 0.74 m |
| **Operating range limit, gray 18%** | 0.01 ... 0.43 m |
| **Operating range limit, black 6%** | 0.012 ... 0.35 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 |
| | 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

| | |
|---|---|
| **Voltage type** | DC |
| **Switching current, max.** | 100 mA |
| **Switching voltage** | high: ≥($U_B$-2.5V) |
| | low: ≤ 2.5 V |

##### Switching output 1

| | |
|---|---|
| **Assignment** | Connection 1, pin 4 |
| **Switching element** | Transistor, PNP |
| **Switching principle** | Light switching |

##### Switching output 2

| | |
|---|---|
| **Assignment** | Connection 1, pin 2 |
| **Switching element** | Transistor, PNP |
| **Switching principle** | Dark switching |

## Time behavior

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

### Connection 1

| | |
|---|---|
| **Function** | Signal OUT |
| | Voltage supply |
| **Type of connection** | Connector |
| **Thread size** | M12 |
| **Type** | Male |
| **Material** | Plastic |
| **No. of pins** | 4 -pin |
| **Encoding** | A-coded |

## Mechanical data

| | |
|---|---|
| **Dimension (W x H x L)** | 15 mm x 46.5 mm x 31.8 mm |
| **Thread size** | M18 |
| **Housing material** | Plastic |
| **Plastic housing** | ABS |
| **Lens cover material** | Plastic |
| **Net weight** | 25 g |
| **Housing color** | Black |
| | Red |

## 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

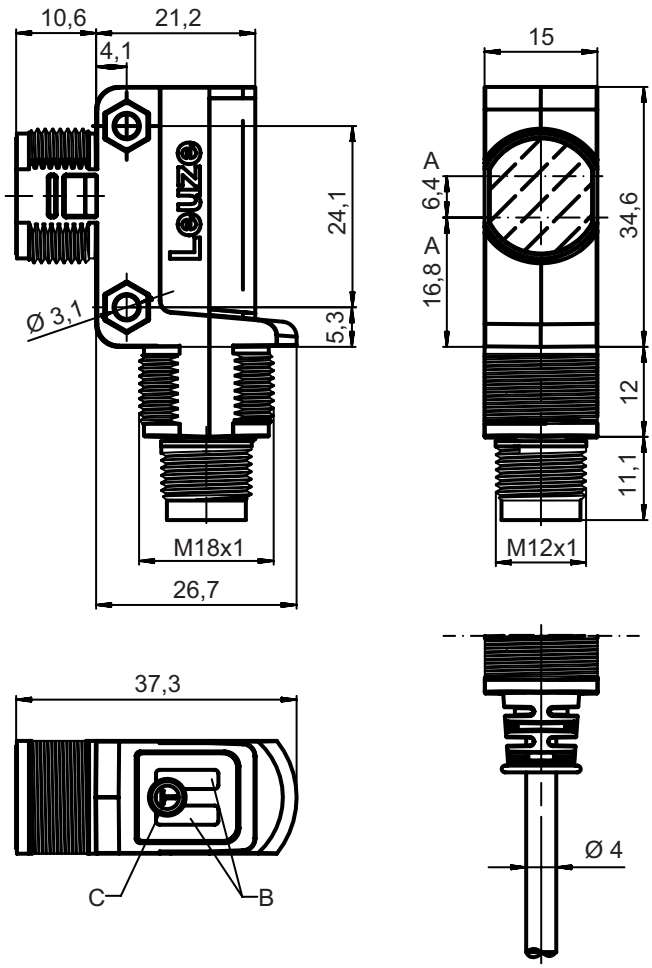
| | |
|---|---|
| **Degree of protection** | IP 67 |
| **Protection class** | III |
| **Approvals** | c UL US |
| **Standards applied** | IEC 60947-5-2 |

## 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



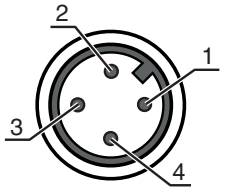

A Optical axis
B Indicator diode
C Teach button

# Electrical connection

## Connection 1

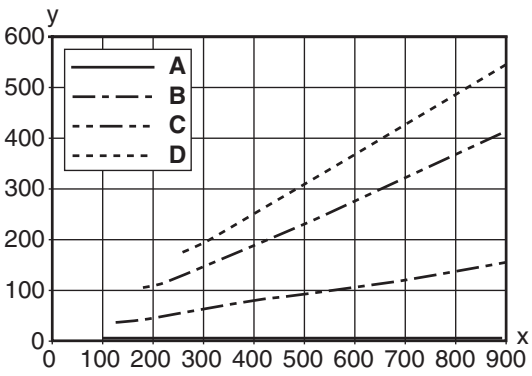
| | |
|---|---|
| **Function** | Signal OUT |
| | Voltage supply |
| **Type of connection** | Connector |
| **Thread size** | M12 |
| **Type** | Male |
| **Material** | Plastic |
| **No. of pins** | 4 -pin |
| **Encoding** | A-coded |

| Pin | Pin assignment |
|---|---|
| **1** | V+ |
| **2** | OUT 2 |
| **3** | GND |
| **4** | OUT 1 |



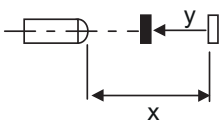
# Diagrams

## Typ. black/white behavior

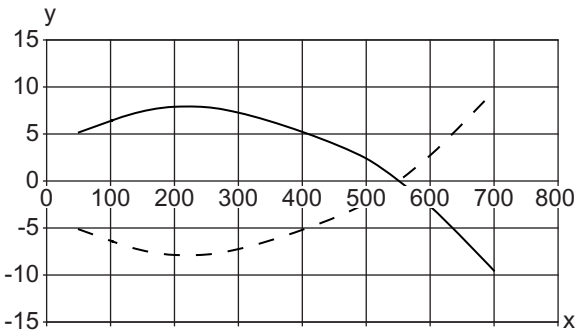



x Range [mm]
y Reduction of range [mm]

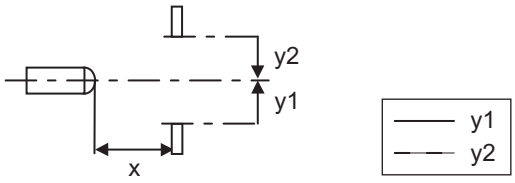
A White 90%
B Gray 50%
C Gray 18%
D Black 6%




## Typ. response behavior (white 90 %)




x Distance [mm]
y Misalignment [mm]







# Operation and display

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

# Part number code

Part designation: **AAA28D-E.F/GG-HH**

| | |
|---|---|
| **AAA28** | **Operating principle / construction**<br>LS28: throughbeam photoelectric sensor transmitter<br>LE28: throughbeam photoelectric sensor receiver<br>ET28: energetic diffuse reflection sensor<br>FT28: diffuse reflection sensor with fading<br>PRK28: retro-reflective photoelectric sensor with polarization filter |
| **d** | **Light type**<br>n/a: red light<br>I: infrared light |
| **E** | **Preset range (optional)**<br>n/a: operating range acc. to data sheet<br>xxxF: Preset range [mm] |
| **F** | **Equipment**<br>3: teach-in via button |
| **GG** | **Switching output / function (OUT1 = pin 4, OUT2 = pin 2):**<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>D: Input for transmitter deactivation (deactivation with LOW signal)<br>X: pin not used |
| **HH** | **Electrical connection**<br>n/a: cable, standard length 2000 mm, 4-wire<br>200-M8: cable, length 200 mm with M8 connector, 4-pin, axial (plug)<br>200-M12: cable, length 200 mm with M12 connector, 4-pin, axial (plug) |

**Note**

- A list with all available device types can be found on the Leuze website at 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:**

- For UL applications, use is only permitted in Class 2 circuits in accordance with the NEC (National Electric Code).
- 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

- 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

## 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 |
|  | 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 |
|---|---|---|---|---|
|  | 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 |
|---|---|---|---|---|
|  | 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 |
|  | 50117490 | BTU D18M-D12 | Mounting system | Design of mounting device: Mounting system<br>Fastening, at system: Through-hole mounting<br>Mounting bracket, at device: Screw type<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.