# Technical data sheet

# Energetic diffuse sensor

## Part no.: 50130280

## FT5I.3/4P-200-M12P1



Figure can vary

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**Leuze**

# Technical data

**Leuze**

## Basic data

| | |
|---|---|
| Series | 5 |
| Operating principle | Diffuse reflection principle |
| Application | Detection of labels on bottles |

## Special version

## Optical data

| | |
|---|---|
| Operating range | Guaranteed operating range |
| Operating range | 0.08 ... 0.12 m |
| Operating range limit | Typical operating range |
| Operating range limit | 0.08 ... 0.15 m |
| Light source | LED, Infrared |
| LED light wavelength | 850 nm |
| LED group | Exempt group (in acc. with EN 62471) |
| Transmitted-signal shape | Pulsed |

## 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: ≤2.5V |

#### 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 |

## Timing

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

## Connection 1

| | |
|---|---|
| Function | Signal OUT |
| | Voltage supply |
| Type of connection | Cable with connector |
| Cable length | 200 mm |
| Sheathing material | PUR |
| Cable color | Black |
| Wire cross section | 0.2 mm² |
| Thread size | M12 |
| Type | Male |
| Material | Plastic |
| No. of pins | 4 -pin |
| Encoding | A-coded |

## 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 | 40 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 |
| Certifications | c UL US |
| Standards applied | IEC 60947-5-2 |

## Classification

| | |
|---|---|
| Customs tariff number | 85365019 |
| eCl@ss 5.1.4 | 27270903 |
| eCl@ss 8.0 | 27270903 |
| eCl@ss 9.0 | 27270903 |
| eCl@ss 10.0 | 27270903 |
| eCl@ss 11.0 | 27270903 |
| ETIM 5.0 | EC001821 |
| ETIM 6.0 | EC001821 |
| ETIM 7.0 | EC001821 |

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eng • 2021-05-12

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# Dimensioned drawings

All dimensions in millimeters
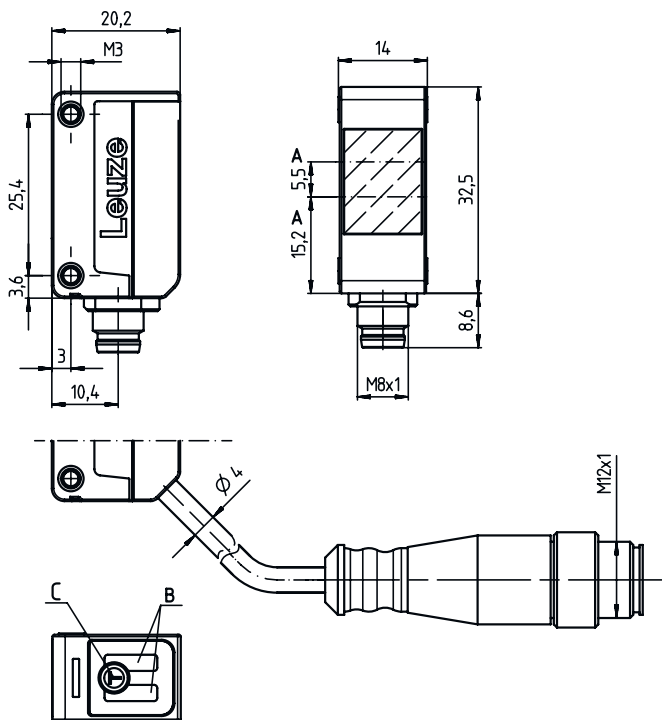
A   Optical axis
B   Indicator diode
C   Teach button

# Electrical connection

| | |
|---|---|
| **Function** | Signal OUT |
| | Voltage supply |
| **Type of connection** | Cable with connector |
| **Cable length** | 200 mm |
| **Sheathing material** | PUR |
| **Cable color** | Black |
| **Wire cross section** | 0.2 mm² |
| **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

**Leuze**
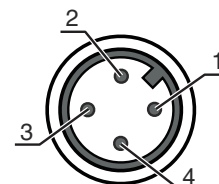
## Typ. black/white behavior
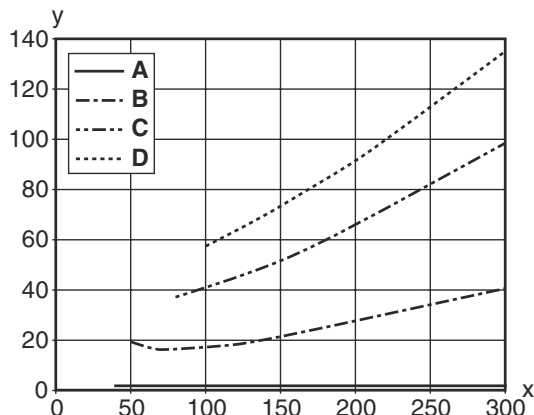


- x    Range [mm]
- y    Reduction of range [mm]

- 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%**
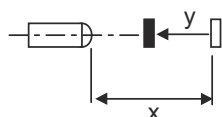
## Operation and display

| 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-I**

| | | |
|---|---|---|
| **AAA5** | **Operating principle / construction** | |
| | HT5: diffuse reflection sensor with background suppression | |
| | LS5: throughbeam photoelectric sensor transmitter | |
| | LE5: throughbeam photoelectric sensor receiver | |
| | ET5: energetic diffuse reflection sensor | |
| | FT5: diffuse reflection sensor with fading | |
| | PRK5: retro-reflective photoelectric sensor with polarization filter | |
| **d** | **Light type** | |
| | n/a: red light | |
| | I: infrared light | |
| **EE** | **Equipment** | |
| | 1: adjustable range | |
| | M: for semi-transparent objects | |
| | H: for the detection of transparent films | |
| | X: reinforced fading | |
| | 3: teach-in via button | |
| | R: combination product for reflector DTKS 30x50 | |
| **ff** | **Switching output / function / OUT1OUT2 (OUT1 = pin 4, OUT2 = pin 2)** | |
| | 2: NPN transistor output, light switching | |
| | N: NPN transistor output, dark switching | |
| | 4: PNP transistor output, light switching | |
| | P: PNP transistor output, dark switching | |
| | X: pin not used | |
| | 9: deactivation input (deactivation with high signal) | |
| | D: deactivation input (deactivation with low signal) | |
| **GG** | **Version** | |
| | P1: narrow light beam | |

# Part number code

# Leuze

| hh | **Electrical connection**<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 | **Configuration**<br>P1: different configuration |

| | **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.<br>✎ The product may only be put into operation by competent persons.<br>✎ Only use the product in accordance with its intended use. |

| | **For UL applications:** |
|---|---|
| | ✎ Only for use in "class 2" circuits<br>✎ 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>Connection 2: Open end<br>Shielded: No<br>Cable length: 5,000 mm<br>Sheathing material: PVC |

# Accessories

| | Part no. | Designation | Article | Description |
|---|---|---|---|---|
| | 50130690 | KD U-M12-4W-V1-050 | Connection cable | Connection 1: Connector, M12, Angled, Female, A-coded, 4 -pin<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 |
|---|---|---|---|---|
| | 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 | 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. |