# Technical data sheet
# Diffuse sensor with background suppression
Part no.: 50152119
HT5B/4X-200-M8

For Illustration purposes only

**Contents**

# Technical data

## Basic data

| | |
|---|---|
| **Series** | 5B |
| **Operating principle** | Diffuse reflection principle with background suppression |

## Optical data

| | |
|---|---|
| **Black-white error** | < 15% up to 200 mm |
| **Operating range** | Guaranteed operating range |
| **Operating range, white 90%** | 0.002 ... 0.4 m |
| **Operating range, gray 18%** | 0.005 ... 0.3 m |
| **Operating range, black 6%** | 0.01 ... 0.2 m |
| **Operating range limit** | 0.002 ... 0.4 m |
| **Operating range limit** | Typical operating range |
| **Adjustment range** | 20 ... 400 mm |
| **Beam path** | Focused |
| **Light source** | LED, Red |
| **Wavelength** | 645 nm |
| **Transmitted-signal shape** | Pulsed |
| **LED group** | Exempt group (in acc. with EN 62471) |
| **Type of light spot geometry** | Round |
| **Focus** | Fixed |
| **Focal distance** | 200 mm |

## 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 ... 15 mA |

### Outputs

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

#### Switching outputs

| | |
|---|---|
| **Voltage type** | DC |
| **Switching current, max.** | 50 mA |
| **Switching voltage** | high: ≥($U_B$-2.5V) |
| | low: ≤ 2.5 V |

##### Switching output 1

| | |
|---|---|
| **Switching element** | Transistor, PNP |
| **Switching principle** | Light switching<br>(dark switching by reversing polarity of $U_B$) |

## Time behavior

| | |
|---|---|
| **Switching frequency** | 1,000 Hz |
| **Response time** | 0.5 ms |
| **Readiness delay** | 300 ms |

### Connection 1

| | |
|---|---|
| **Function** | Signal OUT |
| | Voltage supply |
| **Type of connection** | Cable with connector |
| **Cable length** | 200 mm |
| **Sheathing material** | PVC |
| **Cable color** | Black |
| **Number of conductors** | 3 -wire |
| **Wire cross section** | 0.14 mm² |
| **Thread size** | M8 |
| **Type** | Male |
| **Material** | Plastic |
| **No. of pins** | 4 -pin |

## Mechanical data

| | |
|---|---|
| **Dimension (W x H x L)** | 11 mm x 32.4 mm x 20 mm |
| **Housing material** | Plastic |
| **Plastic housing** | PC-ABS |
| **Lens cover material** | Plastic / PMMA |
| **Net weight** | 40 g |
| **Housing color** | Black |
| | Red |
| **Type of fastening** | Two M3 threaded sleeves |
| | Via optional mounting device |
| **Compatibility of materials** | ECOLAB |

## Operation and display

| | |
|---|---|
| **Type of display** | LED |
| **Number of LEDs** | 2 Piece(s) |
| **Operational controls** | Multiturn potentiometer |
| **Function of the operational control** | Range adjustment |

## Environmental data

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

## Certifications

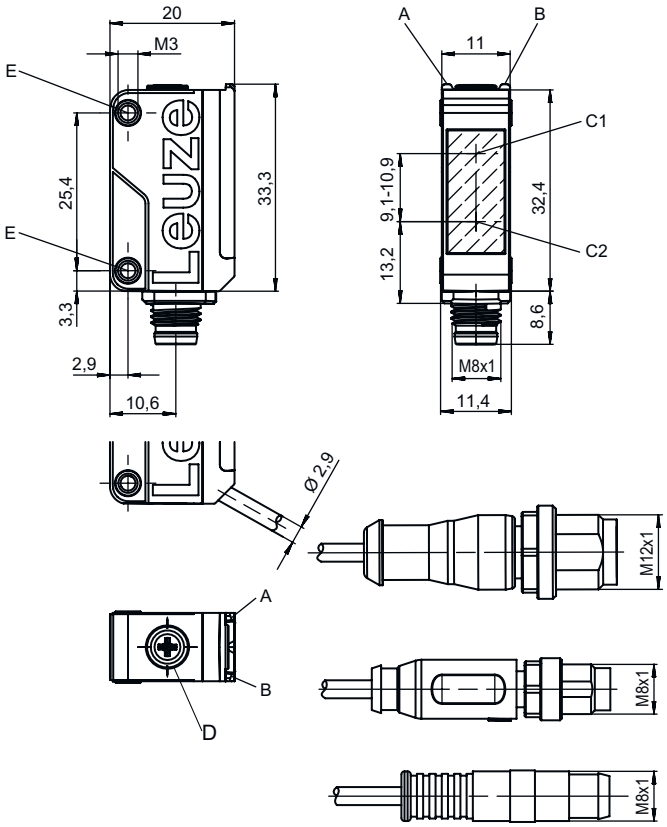
| | |
|---|---|
| **Degree of protection** | IP 67 |
| **Protection class** | III |
| **Approvals** | c UL US |
| **Standards applied** | IEC 60947-5-2 |

## Classification

| | |
|---|---|
| **Customs tariff number** | 85365019 |
| **ECLASS 5.1.4** | 27270904 |
| **ECLASS 8.0** | 27270904 |
| **ECLASS 9.0** | 27270904 |
| **ECLASS 10.0** | 27270904 |
| **ECLASS 11.0** | 27270904 |
| **ECLASS 12.0** | 27270903 |
| **ECLASS 13.0** | 27270903 |
| **ECLASS 14.0** | 27270903 |
| **ECLASS 15.0** | 27270903 |
| **ETIM 5.0** | EC002719 |
| **ETIM 6.0** | EC002719 |
| **ETIM 7.0** | EC002719 |
| **ETIM 8.0** | EC002719 |
| **ETIM 9.0** | EC002719 |
| **ETIM 10.0** | EC002719 |

# Dimensioned drawings

All dimensions in millimeters



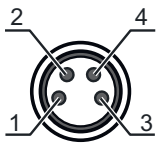

A Green LED
B Yellow LED
C1 Receiver
C2 Transmitter
D Range adjustment
E Threaded sleeve

# Electrical connection

## Connection 1

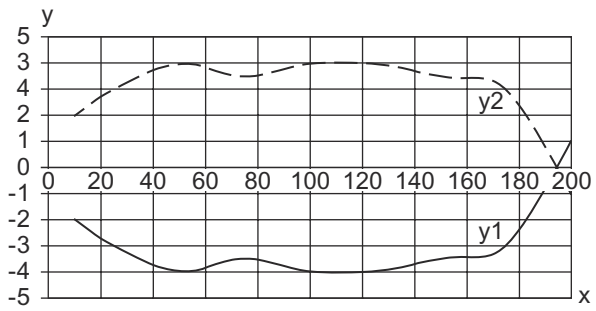
| | |
|---|---|
| **Function** | Signal OUT |
| | Voltage supply |
| **Type of connection** | Cable with connector |
| **Cable length** | 200 mm |
| **Sheathing material** | PVC |
| **Cable color** | Black |
| **Number of conductors** | 3 -wire |
| **Wire cross section** | 0.14 mm² |
| **Thread size** | M8 |
| **Type** | Male |
| **Material** | Plastic |
| **No. of pins** | 4 -pin |

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

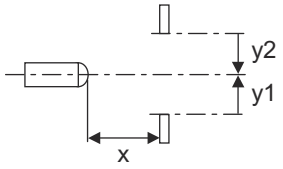


# Diagrams

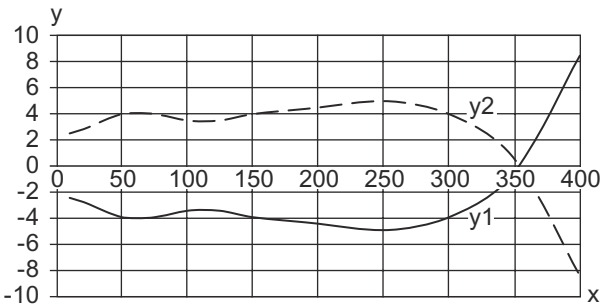
## Typ. response behavior at 90% diffuse reflection (focusing distance 200 mm)



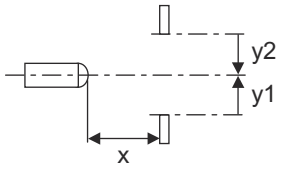

x Range [mm]
y Misalignment [mm]




## Typ. response behavior at 90% diffuse reflection (focusing distance 400 mm)

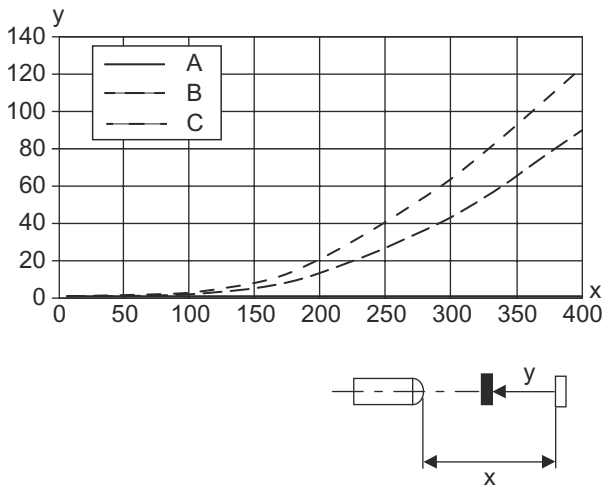



x Range [mm]
y Misalignment [mm]



# Diagrams

## Typ. black/white behavior




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

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




# Operation and display

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

# Part number code

Part designation: **AAA5B D-E.FF/GG.HH-JJ**

| | |
|---|---|
| **AAA5B** | **Operating principle / construction**<br>LS5B: Throughbeam photoelectric sensor transmitter<br>LE5B: Throughbeam photoelectric sensor receiver<br>PRK5B: Retro-reflective photoelectric sensor with polarization filter<br>HT5B: Diffuse reflection sensor with background suppression<br>ET5B: Energetic diffuse reflection sensor |
| **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] |
| **FF** | **Equipment**<br>1: 270° potentiometer<br>D: Detection of stretch-wrapped objects<br>M: Detection of semi-transparent media and transparent films<br>XL: Extra long light spot<br>n/a with retro-reflective photoelectric sensors (PRK): operating range not adjustable<br>n/a with ET / HT: range adjustable via 8-turn potentiometer |
| **GG** | **Switching output / Function**<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>X: pin not used |

# Part number code

| | |
|---|---|
| **HH** | **Electrical connection**<br>n/a: cable, standard length 2000 mm, 3-wire<br>M8: M8 connector, 4-pin (plug)<br>200-M12: cable, length 200 mm with M12 connector, 4-pin, axial (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-M8.1: Cable, length 200 mm with snap-in M8 connector, 4-pin (plug)<br>M8.3: M8 connector, 3-pin (plug) |
| **JJ** | **Version**<br>Y1: mounting holes without threaded sleeve |

**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:**

- Only for use in "class 2" circuits
- 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

- Typ. operating range limit/adjustment range: max. achievable operating range/adjustment range for light objects (white 90%)
- Operating range: recommended operating range for objects with different diffuse reflection
- Light source: Average life expectancy 100,000 h at an ambient temperature of 25 °C
- Response time: For short decay times, an ohmic load of approx. 5 kOhm is recommended

# Accessories

## Connection technology - Connection cables

| | Part no. | Designation | Article | Description |
|---|---|---|---|---|
|  | 50130856 | KD U-M8-4A-P1-050 | Connection cable | Connection 1: Connector, M8, Axial, Female, 4 -pin<br>Connector, LED: No<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 5.000 mm<br>Sheathing material: PUR |
|  | 50130875 | KD U-M8-4W-P1-050 | Connection cable | Connection 1: Connector, M8, Angled, Female, 4 -pin<br>Connector, LED: No<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 5.000 mm<br>Sheathing material: PUR |

## 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 |

# Accessories

| | Note |
|---|---|
|  | A list with all available accessories can be found on the Leuze website in the Download tab of the article detailed page. |