

## Technical data sheet

### Diffuse sensor with background suppression

Part no.: 50148005

HT5B/4X-M8

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For illustration purposes only



## 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 (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<br>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

|                         |   |
|-------------------------|---|
| Type                    | Digital switching output                      |
| Voltage type            | DC  |
| Switching current, max. | 50 mA   |
| Switching voltage       | high: $\geq(U_B - 2.5V)$<br>low: $\leq 2.5 V$ |

#### 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

|                       |            |
|-----------------------|------------|
| Number of connections | 1 Piece(s) |
|-----------------------|------------|

### Connection 1

|                    |                              |
|--------------------|------------------------------|
| Function           | Signal OUT<br>Voltage supply |
| Type of connection | Connector                    |
| 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                                     | 20 g  |
| Housing color                                  | Black<br>Red  |
| Type of fastening                              | Two M3 threaded sleeves<br>Via optional mounting device |
| Recommended tightening torque for M3 fastening | 0.9 N·m   |
| 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

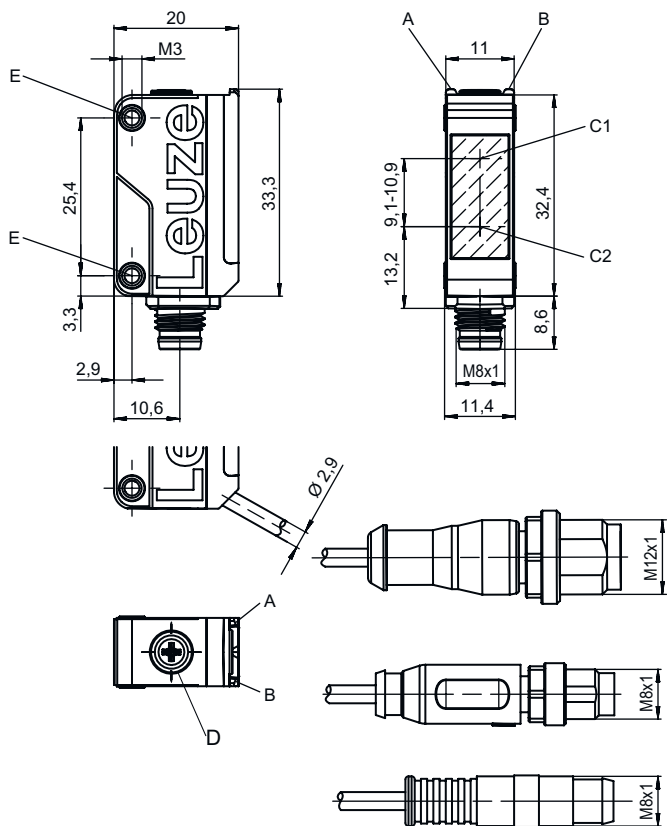
|                      |  |
|----------------------|--|
| Degree of protection | IP 67                                      |
| Protection class     | III  |
| Approvals            | c UL US                                    |
| Standards applied    | IEC 60947-5-2                              |
| US patents           | Patent Pending Publ.No. US-2024-0027191-A1 |

### 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 |
| ECLASS 16.0           | 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 |
| UNSPSC 26.08          | 39121528 |

# 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

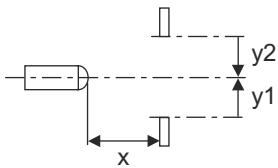
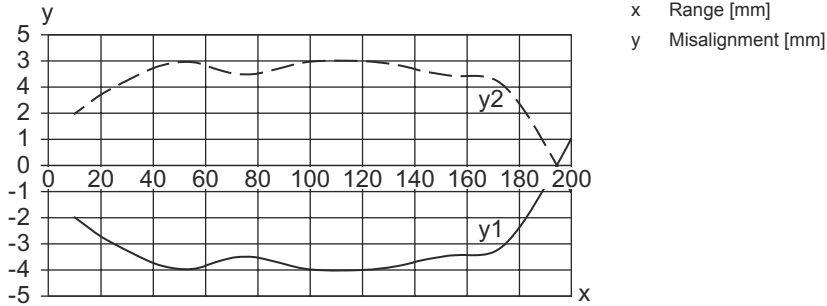
|                    |                              |
|--------------------|------------------------------|
| Function           | Signal OUT<br>Voltage supply |
| Type of connection | Connector                    |
| Thread size        | M8                           |
| Type               | Male                         |
| Material           | Plastic                      |
| No. of pins        | 4 -pin                       |

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

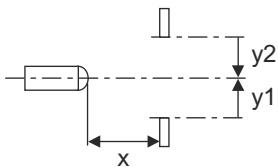
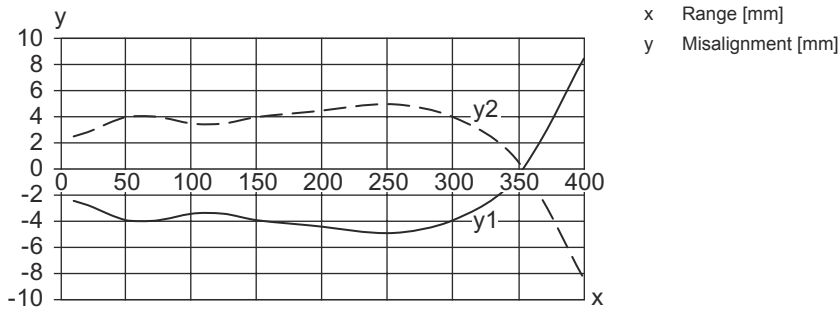


# Diagrams

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

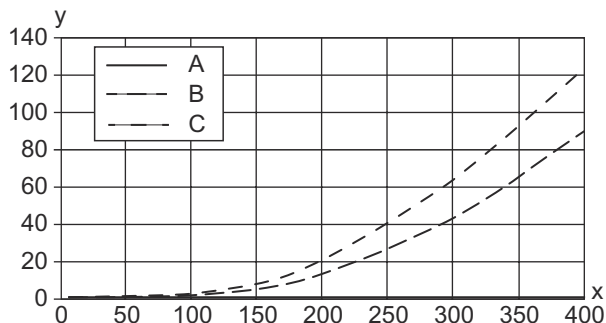


Typ. response behavior at 90% diffuse reflection (focusing distance 400 mm)

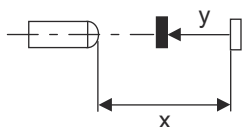


# Diagrams

## 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**

|              |  |
|--------------|--|
| <b>AAA5B</b> | <p><b>Operating principle / construction</b><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</p>                         |
| <b>D</b>     | <p><b>Light type</b><br/>                     n/a: red light<br/>                     I: infrared light<br/>                     PP: Power PinPoint® LED</p>   |
| <b>E</b>     | <p><b>Preset range (optional)</b><br/>                     n/a: operating range acc. to data sheet<br/>                     xxxF: Preset range [mm]</p>  |
| <b>FF</b>    | <p><b>Equipment</b><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</p> |
| <b>GG</b>    | <p><b>Switching output / Function</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/>                     9: deactivation input (deactivation with high signal)<br/>                     X: pin not used</p>  |

## Part number code

|           |  |
|-----------|--|
| <b>HH</b> | <b>Electrical connection</b><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) |
| <b>JJ</b> | <b>Version</b><br>Y1: mounting holes without threaded sleeve   |


### Note

|  |  |
|--|--|
|  | <p>↪ A list with all available device types can be found on the Leuze website at <a href="http://www.leuze.com">www.leuze.com</a>.</p> |
|--|--|


## Notes



### Observe intended use!

|   |  |
|---|--|
|  | <p>↪ This product is not a safety sensor and is not intended as personnel protection.</p> <p>↪ The product may only be put into operation by competent persons.</p> <p>↪ Only use the product in accordance with its intended use.</p> |
|---|--|

### For UL applications:



|  |   |
|--|---|
|  | <p>↪ Only for use in "class 2" circuits</p> <p>↪ 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)</p> |
|--|---|

## 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 100,000h at an ambient temperature of 25 °C
- Response time: For short decay times, an ohmic load of approx. 5kOhm is recommended

## Accessories



### Connection technology - Connection cables

|   | Part no. | Designation       | Article          | Description   |
|---|----------|-------------------|------------------|---|
|  | 50130850 | KD U-M8-4A-V1-050 | Connection cable | Application: Chemical resistant<br>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: PVC  |
|  | 50130871 | KD U-M8-4W-V1-050 | Connection cable | Application: Chemical resistant<br>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: 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 | Contains: 10x<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: 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 | Contains: 2x M3 x 16 screw, 2 M3 x 20 screws, 2x position washers<br>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.