



Figure can vary

**Part no.: 50138487**  
**HT23/4X-200-M12**  
**Diffuse sensor with background suppression**



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## Technical data

| <b>Basic data</b>                   |  |
|-------------------------------------|--|
| Series                              | 23   |
| Operating principle                 | Diffuse reflection principle with background suppression |
| <b>Optical data</b>                 |  |
| Black-white error                   | < 15% up to 200 mm                                       |
| Operating range                     | Guaranteed operating range                               |
| Operating range, white 90%          | 0.005 ... 0.4 m  |
| Operating range, gray 18%           | 0.01 ... 0.3 m   |
| Operating range, black 6%           | 0.015 ... 0.2 m  |
| Operating range limit               | Typical operating range                                  |
| Operating range limit               | 0.005 ... 0.4 m  |
| Adjustment range                    | 15 ... 400 mm  |
| Beam profile                        | Focused  |
| Light source                        | LED , Red  |
| LED light 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   |
| <b>Electrical data</b>              |  |
| Protective circuit                  | Polarity reversal protection<br>Short circuit protected  |
| <b>Performance data</b>             |  |
| Supply voltage $U_B$                | 10 ... 30 V , DC , Incl. residual ripple                 |
| Residual ripple                     | 0 ... 15 % , From $U_B$                                  |
| Open-circuit current                | 0 ... 15 mA  |
| <b>Outputs</b>                      |  |
| Number of digital switching outputs | 1 Piece(s)   |
| <b>Switching outputs</b>            |  |
| Voltage type                        | DC   |
| Switching current, max.             | 100 mA   |
| Switching voltage                   | High: $\geq(U_B-2V)$<br>Low: $\leq 2V$                   |
| <b>Switching output 1</b>           |  |
| Assignment                          | Connection 1, pin 4                                      |
| Switching element                   | Transistor , PNP   |
| Switching principle                 | Light switching  |
| <b>Timing</b>                       |  |
| Switching frequency                 | 1,000 Hz   |
| Response time                       | 0.5 ms   |
| Readiness delay                     | 300 ms   |
| <b>Connection</b>                   |  |

**Part no.: 50138487 – HT23/4X-200-M12 – Diffuse sensor with background**
**Connection 1**

|                      |                              |
|----------------------|------------------------------|
| Type of connection   | Cable with connector         |
| Function             | Signal OUT<br>Voltage supply |
| Cable length         | 200 mm                       |
| Sheathing material   | PUR                          |
| Cable color          | Black                        |
| Number of conductors | 4 -wire                      |
| Wire cross section   | 0.2 mm <sup>2</sup>          |
| Thread size          | M12                          |
| Type                 | Male                         |
| Material             | Plastic                      |
| No. of pins          | 4 -pin                       |
| Encoding             | A-coded                      |

**Mechanical data**

|                       |                              |
|-----------------------|------------------------------|
| Dimension (W x H x L) | 11.4 mm x 34.2 mm x 18.3 mm  |
| Housing material      | Plastic , PC-ABS             |
| Lens cover material   | Plastic / PMMA               |
| Net weight            | 20 g                         |
| Housing color         | Black<br>Red                 |
| Type of fastening     | Via optional mounting device |

**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**

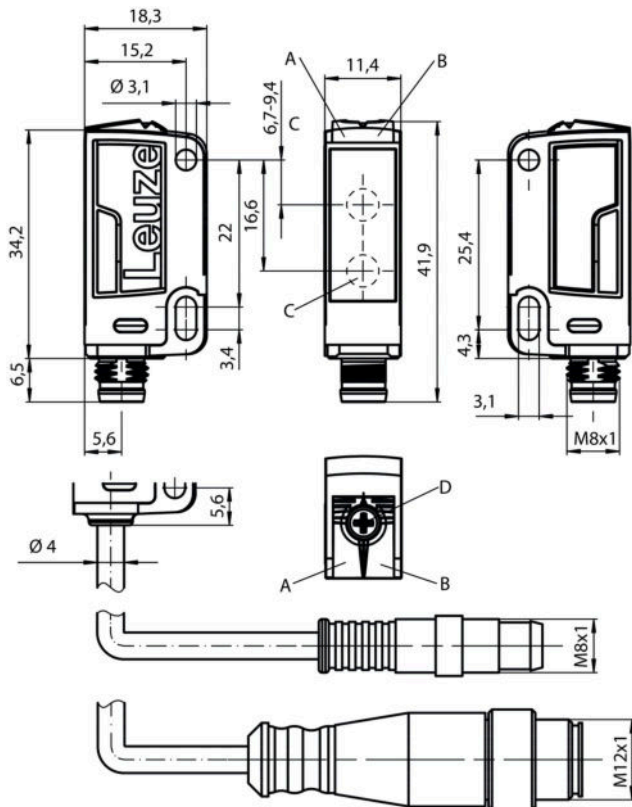
|                      |               |
|----------------------|---------------|
| Degree of protection | IP 67         |
| Protection class     | III           |
| Certifications       | c UL US       |
| Standards applied    | IEC 60947-5-2 |

**Classification**

|                       |          |
|-----------------------|----------|
| Customs tariff number | 85365019 |
| eCl@ss 8.0            | 27270904 |
| eCl@ss 9.0            | 27270904 |
| ETIM 5.0              | EC002719 |
| ETIM 6.0              | EC002719 |

## Dimensioned drawings

All dimensions in millimeters

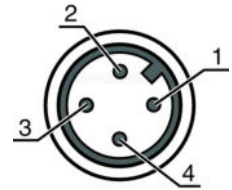


- A Green LED
- B Yellow LED
- C Optical axis
- D Multiturn potentiometer

## Electrical connection

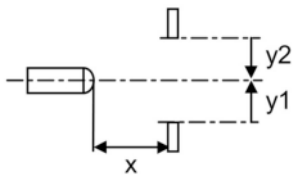
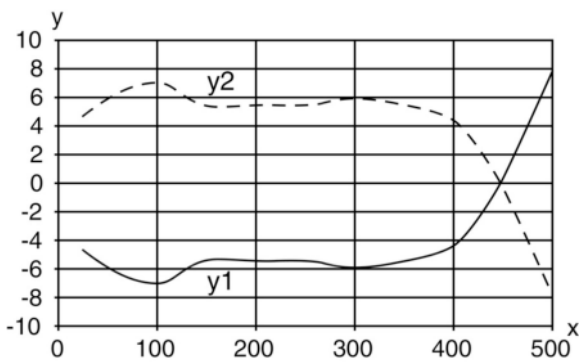
| Connection 1         |                              |
|----------------------|------------------------------|
| Type of connection   | Cable with connector         |
| Function             | Signal OUT<br>Voltage supply |
| Cable length         | 200 mm                       |
| Sheathing material   | PUR                          |
| Cable color          | Black                        |
| Number of conductors | 4 -wire                      |
| Wire cross section   | 0.2 mm <sup>2</sup>          |
| Thread size          | M12                          |
| Type                 | Male                         |
| Material             | Plastic                      |
| No. of pins          | 4 -pin                       |
| Encoding             | A-coded                      |

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



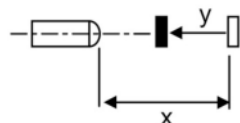
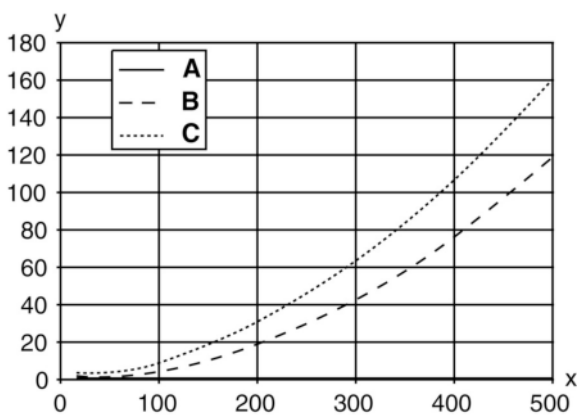
## Diagrams

Typ. response behavior (white 90 %)



x Range [mm]  
y Misalignment [mm]

Typ. black/white behavior



|   |                         |
|---|-------------------------|
| x | Range [mm]              |
| y | Reduction of range [mm] |
| A | White 90%               |
| B | Gray 18%                |
| C | Black 6%                |

## Operation and display

### LEDs

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

## Part number code

Part designation: **AAA23.GJ/ ff-HH**

|       |   |
|-------|---|
| AAA23 | <b>Operating principle / construction:</b><br>HT23: diffuse reflection sensor with background suppression<br>PRK23: retro-reflective photoelectric sensor with polarization filter<br>LS23: throughbeam photoelectric sensor transmitter<br>LE23: throughbeam photoelectric sensor receiver<br>ET23: energetic diffuse reflection sensor<br>FT23: diffuse reflection sensor with fading |
| G     | <b>Equipment:</b><br>T: autocollimation principle (single lens) for highly transparent bottles without tracking   |
| J     | <b>Operating range adjustment:</b><br>3: teach-in via button  |
| ff    | <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>X: pin not used  |
| HH    | <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>M12: M12 connector, 4-pin (plug)<br>200-M8: cable, length 200 mm with M8 connector, 4-pin, axial (plug)  |

### Note

A list with all available device types can be found on the Leuze electronic 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.

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### 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)




- 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

## 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  |
|  | 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 | 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                     |
|  | 50060511 | BT 3          | Mounting device     | 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                                      |

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## 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 |

### Note

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