

## Technical data sheet

### Energetic diffuse sensor

Part no.: 50133928  
FT5I.X3/2N

#### Contents

- Technical data
- Dimensioned drawings
- Electrical connection
- Diagrams
- Operation and display
- Part number code
- Notes
- Further information
- Accessories



Figure can vary



## Technical data

### Basic data

Series	5
Operating principle	Diffuse reflection principle
Application	Detection of dark objects at short range Detection of high-gloss or polished surfaces

### Special version

Special version	V-optics
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### Optical data

Operating range	Guaranteed operating range
Operating range, white 90%	0.001 ... 0.1 m
Operating range, gray 50%	0.001 ... 0.09 m
Operating range, gray 18%	0.003 ... 0.07 m
Operating range, black 6%	0.005 ... 0.06 m
Operating range limit	Typical operating range
Operating range limit, white 90%	0.001 ... 0.13 m
Operating range limit, gray 50%	0.001 ... 0.12 m
Operating range limit, gray 18%	0.003 ... 0.1 m
Operating range limit, black 6%	0.005 ... 0.085 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
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#### 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)
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#### Switching outputs

Voltage type	DC
Switching current, max.	100 mA
Switching voltage	high: $\geq(U_B - 2.5V)$ low: $\leq 2.5V$

#### Switching output 1

Switching element	Transistor, NPN
Switching principle	Light switching

#### Switching output 2

Switching element	Transistor, NPN
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
Cable length	2,000 mm
Sheathing material	PUR
Cable color	Black
Number of conductors	4 -wire
Wire cross section	0.2 mm <sup>2</sup>

### 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	70 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

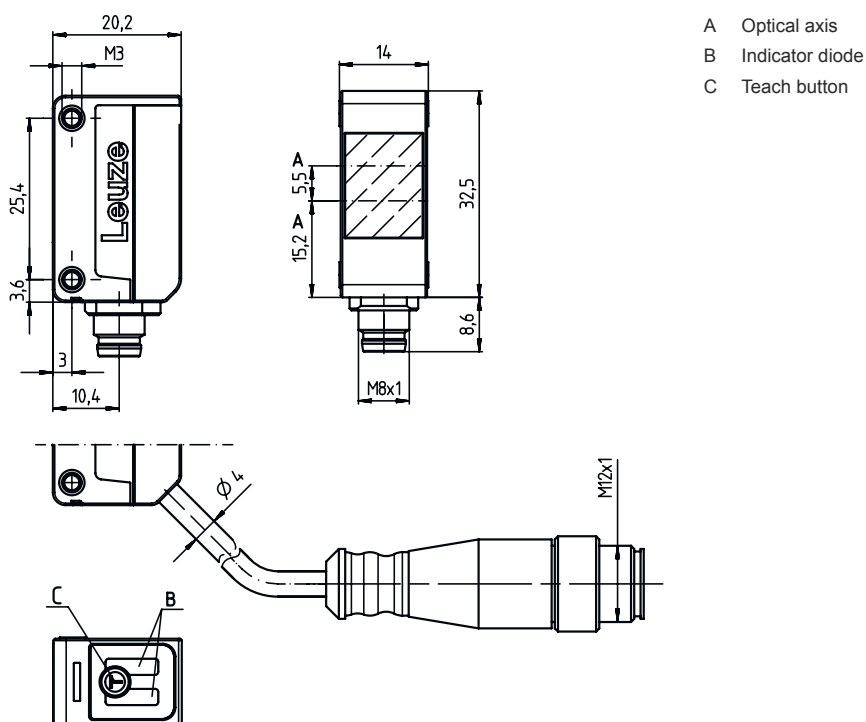
Degree of protection	IP 67
Protection class	III
Certifications	c UL US
Standards applied	IEC 60947-5-2

### 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

## 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	Cable
Cable length	2,000 mm
Sheathing material	PUR
Cable color	Black
Number of conductors	4 -wire
Wire cross section	0.2 mm <sup>2</sup>

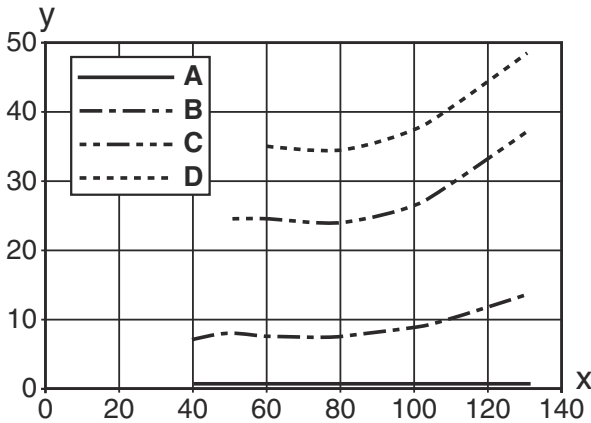
### Conductor color

### Conductor assignment

Brown	V+
White	OUT 2
Blue	GND
Black	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%

**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-l**

<b>AAA5</b>	<p><b>Operating principle / construction</b></p> <p>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</p>
<b>d</b>	<p><b>Light type</b></p> <p>n/a: red light            l: infrared light</p>
<b>EE</b>	<p><b>Equipment</b></p> <p>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</p>
<b>ff</b>	<p><b>Switching output / function / OUT1OUT2 (OUT1 = pin 4, OUT2 = pin 2)</b></p> <p>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)</p>
<b>GG</b>	<p><b>Version</b></p> <p>P1: narrow light beam</p>



## Part number code

hh	<b>Electrical connection</b> n/a: cable, standard length 2000 mm, 4-wire M8: M8 connector, 4-pin (plug) M8.3: M8 connector, 3-pin (plug) 200-M8: cable, length 200 mm with M8 connector, 4-pin, axial (plug) 200-M8.3: cable, length 200 mm with M8 connector, 3-pin, axial (plug) 200-M12: cable, length 200 mm with M12 connector, 4-pin, axial (plug) M8.1: Snap-in, M8 connector, 4-pin (plug)
I	<b>Configuration</b> P1: different configuration


### Note

	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> .
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## Notes

 <b>Observe intended use!</b>	
	<ul style="list-style-type: none"> <li>⌘ This product is not a safety sensor and is not intended as personnel protection.</li> <li>⌘ The product may only be put into operation by competent persons.</li> <li>⌘ Only use the product in accordance with its intended use.</li> </ul>

### For UL applications:


	<ul style="list-style-type: none"> <li>⌘ Only for use in "class 2" circuits</li> <li>⌘ 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)</li> </ul>
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## 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

### Mounting technology - Mounting brackets

	Part no.	Designation	Article	Description
	50124651	BT 205M-10SET	Mounting device set	Design of mounting device: Angle, L-shape Fastening, at system: Through-hole mounting Mounting bracket, at device: Screw type Type of mounting device: Rigid Material: Metal

## Accessories

### Mounting technology - Rod mounts

	Part no.	Designation	Article	Description
	50117826	BTP 300M-D12	Mounting system	Design of mounting device: Protection hood Fastening, at system: For 12 mm rod Mounting bracket, at device: Screw type Type of mounting device: Clampable, Adjustable, Turning, 360° Material: Metal
	50117252	BTU 300M-D12	Mounting system	Design of mounting device: Mounting system Fastening, at system: For 12 mm rod, Sheet-metal mounting Mounting bracket, at device: Screw type, Suited for M4 screws Type of mounting device: Clampable, Adjustable, Turning, 360° 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.