



**Part no.: 50133929**  
**FT5I.X3/4P**  
**Energetic diffuse sensor**



Figure can vary

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## Technical data

<b>Basic data</b>	
Series	5
Operating principle	Diffuse reflection principle
Application	Detection of dark objects at short range Detection of high-gloss or polished surfaces
<b>Special design</b>	
Special design	V-optics
<b>Optical data</b>	
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
Transmitted-signal shape	Pulsed
LED group	Exempt group (in acc. with EN 62471)
<b>Electrical data</b>	
Protective circuit	Polarity reversal protection 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 ... 20 mA
<b>Outputs</b>	
Number of digital switching outputs	2 Piece(s)
<b>Switching outputs</b>	
Voltage type	DC
Switching current, max.	100 mA
Switching voltage	high: $\geq(U_B-2.5V)$ low: $\leq 2.5V$
<b>Switching output 1</b>	
Switching element	Transistor , PNP
Switching principle	Light switching
<b>Switching output 2</b>	
Switching element	Transistor , PNP
Switching principle	Dark switching
<b>Timing</b>	
Switching frequency	500 Hz
Response time	1 ms

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Readiness delay	300 ms
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### 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>

### Mechanical data

Dimension (W x H x L)	14 mm x 32.5 mm x 20.2 mm
Housing material	Plastic , 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

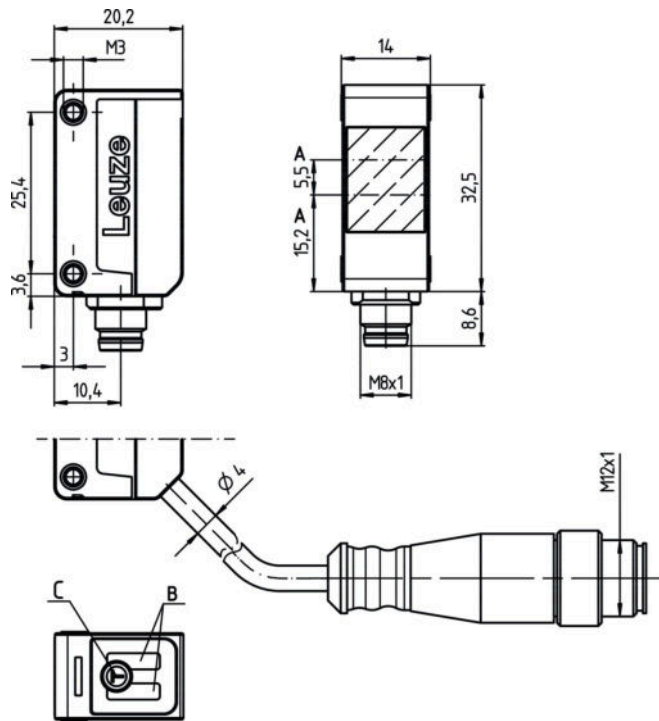
Degree of protection	IP 67
Protection class	III
Certifications	c UL US
Standards applied	IEC 60947-5-2

### Classification

Customs tariff number	85365019
eCl@ss 8.0	27270903
eCl@ss 9.0	27270903
ETIM 5.0	EC001821
ETIM 6.0	EC001821

## Dimensioned drawings

All dimensions in millimeters



A Optical axis  
 B Indicator diode  
 C Teach button

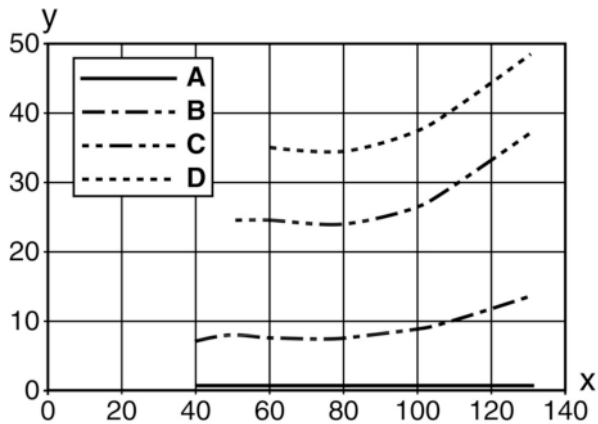
## Electrical connection

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

LEDs

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

AAA5	<p><b>Operating principle / construction:</b>            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>
d	<p><b>Light type:</b>            n/a: red light            l: infrared light</p>
EE	<p><b>Equipment:</b>            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>

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ff	<b>Switching output / function / OUT1OUT2 (OUT1 = pin 4, OUT2 = pin 2):</b> 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	<b>Design:</b> P1: narrow light beam
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)
l	<b>Configuration:</b> P1: different configuration

**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.


**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)

- 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	Contains: 10x 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

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## 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	Contains: 2x M4 x 25 screw, 2x M4 x 20 screw, 4x position washers 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 electronic website in the Download tab of the article detailed page.