



Figure can vary

**Part no.: 50122595**  
**FT28.3/2N**  
**Energetic diffuse sensor**



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## Technical data

<b>Basic data</b>	
Series	28
Operating principle	Diffuse reflection principle
<b>Optical data</b>	
Operating range	Guaranteed operating range
Operating range, white 90%	0.001 ... 0.21 m
Operating range, gray 50%	0.002 ... 0.185 m
Operating range, gray 18%	0.003 ... 0.145 m
Operating range, black 6%	0.005 ... 0.125 m
Operating range limit	Typical operating range
Operating range limit, white 90%	0 ... 0.25 m
Operating range limit, gray 50%	0.002 ... 0.225 m
Operating range limit, gray 18%	0.003 ... 0.175 m
Operating range limit, black 6%	0.005 ... 0.15 m
Light source	LED , Red
LED light wavelength	620 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>	
Assignment	Connection 1, conductor 4
Switching element	Transistor , NPN
Switching principle	Light switching
<b>Switching output 2</b>	
Assignment	Connection 1, conductor 2
Switching element	Transistor , NPN
Switching principle	Dark switching
<b>Timing</b>	
Switching frequency	500 Hz
Response time	1 ms
Readiness delay	300 ms

**Connection**
**Connection 1**

Type of connection	Cable
Function	Signal OUT Voltage supply
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)	15 mm x 46.5 mm
Thread size	M18
Dimension	31.8 mm
Housing material	Plastic , ABS
Lens cover material	Plastic
Net weight	75 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**

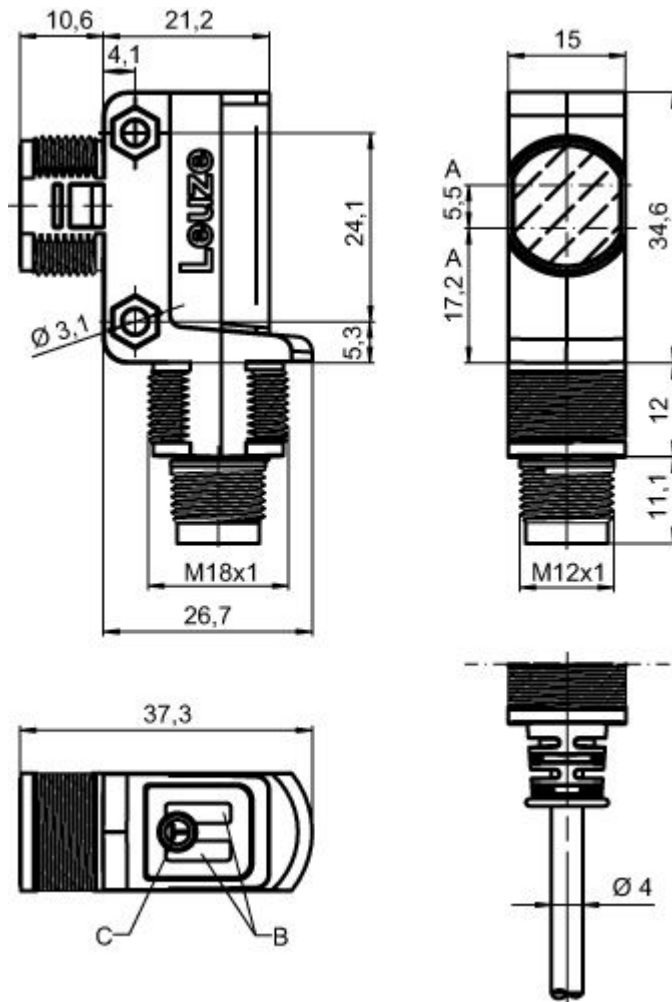
Degree of protection	IP 67
Protection class	III
Certifications	c UL US
Standards applied	IEC 60947-5-2

**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

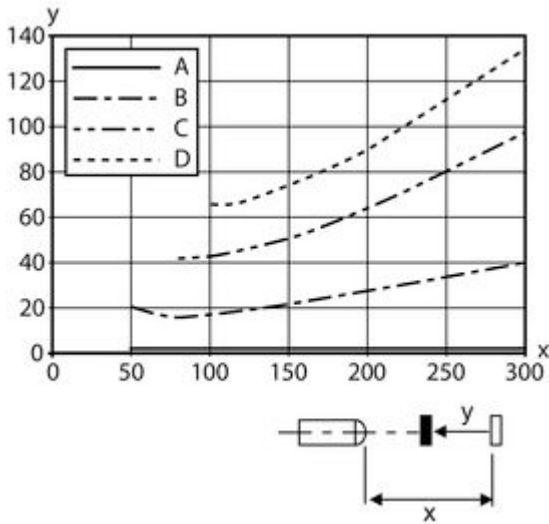
## Electrical connection

Connection 1	
Type of connection	Cable
Function	Signal OUT Voltage supply
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:

$$\text{black/white error} = \frac{\text{reduction of the operating range against black}}{\text{operating range against white}} \times 100\%$$

**Operation and display**

LEDs

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

**Part number code**

Part designation: **AAA28.E/ ff-hh**

AAA28	<p><b>Operating principle / construction:</b>                      LS28: throughbeam photoelectric sensor transmitter                      LE28: throughbeam photoelectric sensor receiver                      ET28: energetic diffuse reflection sensor                      FT28: diffuse reflection sensor with fading                      PRK28: retro-reflective photoelectric sensor with polarization filter</p>
E	<p><b>Equipment:</b>                      3: teach-in via button</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 9: deactivation input (deactivation with high signal) D: deactivation input (deactivation with low signal)
hh	<b>Electrical connection:</b> n/a: cable, standard length 2000 mm, 4-wire 200-M12: cable, length 200 mm with M12 connector, 4-pin, axial (plug)

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

## 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>

<b>For UL applications:</b>
<ul style="list-style-type: none"> <li>For UL applications, use is only permitted in Class 2 circuits in accordance with the NEC (National Electric Code).</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>

- 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
	50117255	BTU 200M-D12	Mounting system	Contains: 2x M3 x 16 screw, 2x M3 x 20 screw, 2x position washers Design of mounting device: Mounting system Fastening, at system: For 12 mm rod, Sheet-metal mounting Mounting bracket, at device: Screw type Type of mounting device: Clampable, Adjustable, Turning, 360° Material: Metal