



**Part no.: 50122719**  
**FT328.3/2N-M12**  
**Energetic diffuse sensor**



Figure can vary

## Contents

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

## Technical data

| <b>Basic data</b>                   |   |
|-------------------------------------|---|
| Series                              | 328   |
| Operating principle                 | Diffuse reflection principle                            |
| <b>Optical data</b>                 |   |
| Operating range                     | Guaranteed operating range                              |
| Operating range, white 90%          | 0.001 ... 0.215 m                                       |
| Operating range, gray 50%           | 0.001 ... 0.19 m  |
| Operating range, gray 18%           | 0.003 ... 0.15 m  |
| Operating range, black 6%           | 0.005 ... 0.125 m                                       |
| Operating range limit               | Typical operating range                                 |
| Operating range limit, white 90%    | 0.001 ... 0.28 m  |
| Operating range limit, gray 50%     | 0.001 ... 0.245 m                                       |
| Operating range limit, gray 18%     | 0.003 ... 0.19 m  |
| Operating range limit, black 6%     | 0.005 ... 0.16 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<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 ... 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: $\geq(U_B-2.5V)$<br>low: $\leq 2.5V$              |
| <b>Switching output 1</b>           |   |
| Assignment                          | Connection 1, pin 4                                     |
| Switching element                   | Transistor , NPN  |
| Switching principle                 | Light switching   |
| <b>Switching output 2</b>           |   |
| Assignment                          | Connection 1, pin 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 | Connector                    |
| Function           | Signal OUT<br>Voltage supply |
| Thread size        | M12                          |
| Type               | Male                         |
| Material           | Plastic                      |
| No. of pins        | 4 -pin                       |
| Encoding           | A-coded                      |

**Mechanical data**

|                     |  |
|---------------------|--|
| Thread size         | M18 x 1 mm                             |
| Dimension (Ø x L)   | 18 mm x 46 mm                          |
| Housing material    | Plastic<br>Stainless steel , V2A , ABS |
| Lens cover material | Plastic                                |
| Net weight          | 20 g                                   |
| Housing color       | Black<br>Silver                        |

**Operation and display**

|                      |              |
|----------------------|--------------|
| Type of display      | LED          |
| Number of LEDs       | 1 Piece(s)   |
| Operational controls | Teach button |

**Environmental data**

|                                |               |
|--------------------------------|---------------|
| Ambient temperature, operation | -40 ... 60 °C |
| Ambient temperature, storage   | -40 ... 70 °C |

**Certifications**

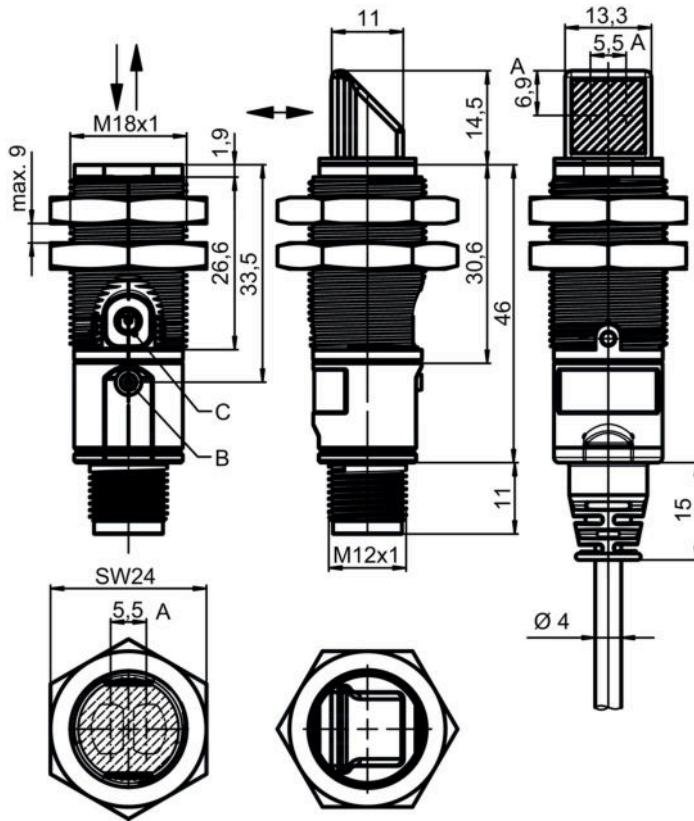
|                      |               |
|----------------------|---------------|
| Degree of protection | IP 67         |
| Protection class     | III           |
| Certifications       | c UL US       |
| Standards applied    | IEC 60947-5-2 |

**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

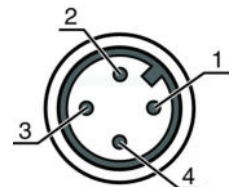


A Optical axis  
 B Indicator diode  
 C Teach button

### Electrical connection

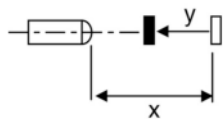
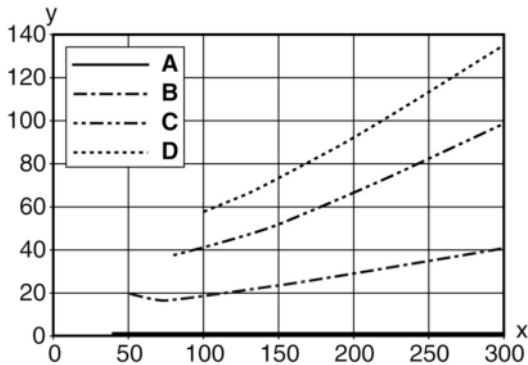
| Connection 1       |                              |
|--------------------|------------------------------|
| Type of connection | Connector                    |
| Function           | Signal OUT<br>Voltage supply |
| Thread size        | M12                          |
| Type               | Male                         |
| Material           | Plastic                      |
| No. of pins        | 4 - pin                      |
| Encoding           | A-coded                      |

| Pin | Pin assignment |
|-----|----------------|
| 1   | V+             |
| 2   | OUT 2          |
| 3   | GND            |
| 4   | 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   | Green, continuous light  | Operational readiness |
|     | Yellow, continuous light | Object detected       |

## Part number code

Part designation: XXX328BY-AAAF.BB/CC-DDD

|        |   |
|--------|---|
| XXX328 | <b>Operating principle:</b><br>PRK: retro-reflective photoelectric sensor with polarization filter<br>ET: energetic diffuse reflection sensor<br>FT: diffuse reflection sensor with fading<br>LE: throughbeam photoelectric sensor receiver<br>LS: throughbeam photoelectric sensor transmitter |
| Y      | <b>Light type:</b><br>n/a: red light<br>I: infrared light   |
| AAAF   | <b>Preset range (optional):</b><br>n/a: operating range acc. to data sheet<br>XXXX: preset range [mm]   |

Part no.: 50122719 – FT328.3/2N-M12 – Energetic diffuse sensor

|     |   |
|-----|---|
| BB  | <b>Equipment:</b><br>n/a: axial optics<br>W: 90° angular optics<br>3: teach-in via button   |
| CC  | <b>Switching output / function (OUT1 = pin 4, OUT2 = pin 2)::</b><br>4: PNP transistor output, light switching<br>P: PNP transistor output, dark switching<br>2: NPN transistor output, light switching<br>N: NPN transistor output, dark switching<br>9: input for transmitter deactivation (deactivation with HIGH signal)<br>D: input for transmitter deactivation (deactivation with LOW signal)<br>X: pin not used |
| DDD | <b>Electrical connection:</b><br>n/a: cable, standard length 2000 mm, 4-wire<br>M12: M12 connector, 4-pin (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.


**For UL applications:**

- For UL applications, use is only permitted in Class 2 circuits in accordance with the NEC (National Electric Code).
- 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**


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 |


Part no.: 50122719 – FT328.3/2N-M12 – Energetic diffuse sensor

|   | Part no. | Designation        | Article          | Description  |
|---|----------|--------------------|------------------|--|
|  | 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  |
|---|----------|-------------|------------------|--|
|  | 50113548 | BT D18M.5   | Mounting bracket | Diameter, inner: 18 mm<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: Stainless steel |

### Mounting technology - Rod mounts

|   | Part no. | Designation  | Article         | Description  |
|---|----------|--------------|-----------------|--|
|  | 50117490 | BTU D18M-D12 | Mounting system | Design of mounting device: Mounting system<br>Fastening, at system: Through-hole mounting<br>Mounting bracket, at device: Screw type<br>Type of mounting device: Clampable, Adjustable, Turning, 360°<br>Material: Metal |

### Mounting technology - Other

|   | Part no.    | Designation | Article   | Description  |
|---|-------------|-------------|-----------|--|
|  | 50126631 ** | BT 328M     | Fastening | Contains: 2x M18 mounting nut<br>Design of mounting device: Mounting clamp<br>Fastening, at system: For 18 mm rod, Through-hole mounting<br>Mounting bracket, at device: Screw type<br>Type of mounting device: Turning, 360°<br>Material: Stainless steel |

\*\* Included in delivery contents

#### Note

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