



Part no.: 50133941
FT328I.X3/2N-M12
Energetic diffuse sensor



Figure can vary

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Technical data

| Basic data | |
|-------------------------------------|---|
| Series | 328 |
| Operating principle | Diffuse reflection principle |
| Application | Detection of dark objects at short range |
| Special design | |
| Special design | V-optics |
| Optical data | |
| Operating range | Guaranteed operating range |
| Operating range, white 90% | 0.001 ... 0.11 m |
| Operating range, gray 50% | 0.001 ... 0.1 m |
| Operating range, gray 18% | 0.003 ... 0.08 m |
| Operating range, black 6% | 0.005 ... 0.07 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 |
| 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) |
| 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 | |
| Assignment | Connection 1, pin 4 |
| Switching element | Transistor , NPN |
| Switching principle | Light switching |
| Switching output 2 | |
| Assignment | Connection 1, pin 2 |
| Switching element | Transistor , NPN |
| Switching principle | Dark switching |
| Timing | |

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| | |
|---------------------|--------|
| Switching frequency | 500 Hz |
| Response time | 1 ms |
| Readiness delay | 300 ms |

Connection
Connection 1

| | |
|--------------------|------------------------------|
| Type of connection | Connector |
| Function | Signal OUT 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 Stainless steel , V2A , 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

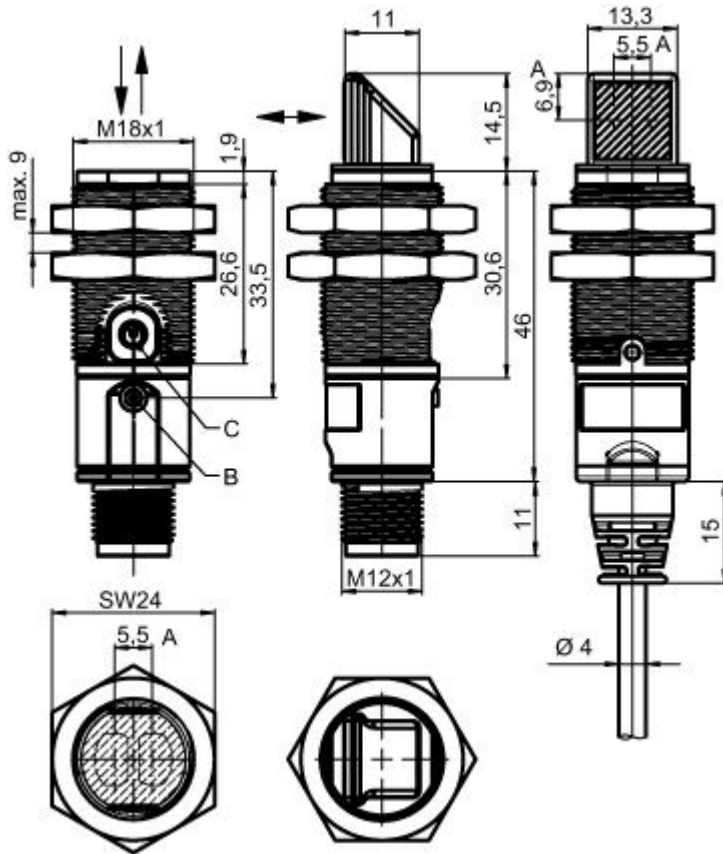
| | |
|----------------------|---------------|
| Degree of protection | IP 67 |
| Protection class | III |
| Certifications | c UL US |
| Standards applied | IEC 60947-5-2 |

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

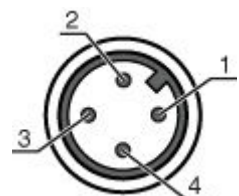


A Optical axis
 B Indicator diode
 C Teach button

Electrical connection

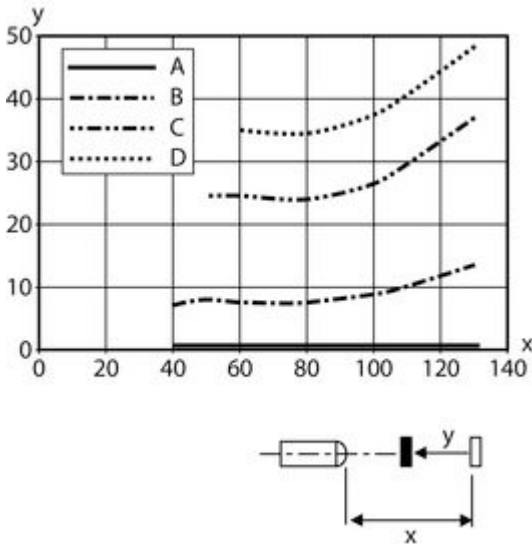
| Connection 1 | |
|--------------------|------------------------------|
| Type of connection | Connector |
| Function | Signal OUT Voltage supply |
| Thread size | M12 |
| Type | Male |
| Material | Plastic |
| No. of pins | 4 -pin |
| Encoding | A-coded |

| 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:

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

Operation and display

LEDs

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

Part number code

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

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

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

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 Connection 2: Open end Shielded: No Cable length: 5,000 mm Sheathing material: PVC |


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| | Part no. | Designation | Article | Description |
|---|----------|--------------------|------------------|--|
|  | 50130690 | KD U-M12-4W-V1-050 | Connection cable | Connection 1: Connector, M12, Angled, Female, A-coded, 4 -pin Connection 2: Open end Shielded: No Cable length: 5,000 mm Sheathing material: PVC |


Mounting technology - Mounting brackets

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

Mounting technology - Rod mounts

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

Mounting technology - Other

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