LBDoor TB12.D.N
Single-beam miniature photoelectric sensor with fixed cable

Original operation instruction

General

Product information

There is no simpler way of installing a sensor: drill the hole, clip in the sensor and you’re done. What’s more, LBDoor TB12.D.N plug-in sensors for doors and turnstiles offer top performance at an extremely attractive price. The switching mechanism is integrated in the compact, self-contained and temperature-stable housing, making LBDoor TB12.D.N suitable even for extremely cold regions with temperatures as low as -40°C.

Features

Single-beam miniature photoelectric sensor, ideal for installing in frames or contours
– Integrated circuit
– Plug-in style housing for 13 mm hole
– Narrow opening angle, suitable for mounting in pairs
– Dark on version also available
– Version with test input

Typical applications

Monitoring function for turnstiles
– Activation function for restarting escalators
– Monitoring of industrial gates
– Person detection for automatic doors and gates

Safety instructions

The unit may only be installed and commissioned by trained and qualified personnel.
The unit may only be opened and repaired by the manufacturer.
This unit may only be operated from a protective low-voltage with safe electrical isolation.
Always consider the safety functions of your application as a whole, never just in relation to one individual component of the system.
The installer is responsible for carrying out a risk assessment and installing the detector and the system correctly.
Avoid touching any electronic components.

Electrical connection – Indicators / operating means

Electrical connection

Transmitter / black cable
Receiver / grey cable

<table>
<thead>
<tr>
<th>NPN</th>
<th>PNP</th>
</tr>
</thead>
<tbody>
<tr>
<td>$U_b$</td>
<td>$U_b$</td>
</tr>
<tr>
<td>10–30 VDC brown</td>
<td>10–30 VDC brown</td>
</tr>
<tr>
<td>Test- black</td>
<td>Test- black</td>
</tr>
<tr>
<td>or input</td>
<td>or input</td>
</tr>
<tr>
<td>0V blue</td>
<td>0V blue</td>
</tr>
<tr>
<td>$U_a$</td>
<td>$U_a$</td>
</tr>
<tr>
<td>&lt; 100 mA</td>
<td>&lt; 100 mA</td>
</tr>
<tr>
<td>black</td>
<td>black</td>
</tr>
<tr>
<td>blue</td>
<td>blue</td>
</tr>
<tr>
<td>0V</td>
<td>0V</td>
</tr>
</tbody>
</table>

Indicators / operating means

Back of receiver

1 Signal display (red)
### Technical data

#### General specifications

Detection range | 0 – 6 m
--- | ---
Light source | IRED
Light type | Modulated infrared light, 880 nm
Diameter of the light spot | Approx. 1300 mm at a distance of 6 m
Angle of divergence | Emitter: +/- 8 ° Receiver: +/- 10 °
Optical face | Frontal
Ambient light limit | Halogen light 100000 Lux; according to EN 60947-5-2:2007

#### Functional safety related parameters

| MTTF<sub>d</sub> | 795 a
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Mission Time (T<sub>M</sub>) | 20 a
Diagnostic Coverage (DC) | 0 %

#### Indicators

Function indicator | LED red: lights up when receiving the light beam; flashes when falling short of the stability control; OFF when light beam is interrupted

#### Electrical specifications

| Operating voltage U<sub>B</sub> | 10 – 30 V DC
--- | ---
No-load supply current I<sub>0</sub> | Emitter: ≤ 20 mA
 | Receiver: ≤ 10 mA

#### Input

Test input | Threshold < 1.4 V (emitter deactivation)

#### Output

Switching type | Dark on
Signal output | 1 NPN output, short-circuit protected, reverse polarity protected, open collector
Switching voltage | Max. 30 V DC
Switching current | Max. 100 mA
Voltage drop U<sub>d</sub> | ≤ 1.5 V DC
Switching frequency f | 62.5 Hz
Response time | 8 ms

#### Mechanical specifications

Degree of protection | IP67
Connection | 0.15 / 7 m PVC connection cable with 3-pin JST connector
 | Receiver: grey; Emitter: black
Material | PC, black
Optical face | Plastic pane
Weight | Approx. 100 g per device

#### Ambient conditions

| Ambient temperature | -40 – 60 °C (-40 – 140 °F), fixed mounted
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 | -20 – 80 °C (-4 – 140 °F), movable mounted
Storage temperature | -40 – 70 °C (-40 – 158 °F)
Relative humidity | 90 %, non-condensing

#### Approval

CCC approval | CCC approval / marking not required for products rated ≤ 36 V

### Curves / Diagrams

#### Characteristic response curve

![Characteristic response curve](image)

#### Relative received light strength

![Relative received light strength](image)
Operating principle

The thru-beam sensor requires two devices for operation; a light source and a light receiver. The light source and receiver must be optically aligned with one another in a single line. The infrared light emitted from the source is recorded by the receiver and evaluated.

The sensor detects both people and objects for as long as an object interrupts the detection beam, regardless of movement and surface structure.

Function

The series LBDoor TB12.D.N light beam sensor requires a pair of devices for operation, comprising a light transmitter and a light receiver. The transmitter and receiver must be arranged in optical alignment with each other. The infrared light from the transmitter is detected by the receiver and evaluated.

Static detection:
The light beam sensor detects persons and objects independently of movement and surface structure for as long as the object breaks the detection beam.

Output (black wire of receiver)

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Unpowered</td>
<td>open</td>
<td>open</td>
<td>open</td>
<td>open</td>
<td>off</td>
</tr>
<tr>
<td>Not aligned</td>
<td>open</td>
<td>0V</td>
<td>open</td>
<td>UB</td>
<td>off</td>
</tr>
<tr>
<td>Idle (ok)</td>
<td>0V</td>
<td>open</td>
<td>UB</td>
<td>open</td>
<td>ON</td>
</tr>
<tr>
<td>Object</td>
<td>open</td>
<td>0V</td>
<td>UB</td>
<td>open</td>
<td>ON</td>
</tr>
<tr>
<td>Testing</td>
<td>open</td>
<td>0V</td>
<td>UB</td>
<td>open</td>
<td>off</td>
</tr>
</tbody>
</table>

Installation:
Thanks to its small dimensions, the light beam can be fitted in a U-profile or behind a face panel.

Hole diameter [mm]

<table>
<thead>
<tr>
<th>Sheet thickness [mm]</th>
<th>13</th>
<th>13.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>OK</td>
<td>X</td>
</tr>
<tr>
<td>2</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>3</td>
<td>OK</td>
<td>OK</td>
</tr>
</tbody>
</table>

X = Mounting is not possible   OK = Mounting possible

Installation of twin-beam arrangement:
A twin-beam version requires 2 transmitters and receivers. When using thru-beam sensors with the same transmission frequency:
Ensure that the minimum beam distance is 20 cm and that the light source and receiver are arranged in a cross formation.

EU Declaration of Conformity

See attachment

WEEE

Devices with this symbol must be treated separately during disposal. This must be done in accordance with the laws of the respective countries for environmentally sound disposal, processing and recycling of electrical and electronic equipment.

Contact

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Made in Vietnam