LBDoor TB12.P
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.P 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.P 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

1 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.
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.

2 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</td>
<td>10–30 VDC</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test-</th>
<th>black</th>
</tr>
</thead>
<tbody>
<tr>
<td>input</td>
<td>brown</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Input</th>
<th>black</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 100 mA</td>
<td>&lt; 100 mA</td>
</tr>
<tr>
<td>blue</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**: 795 a
- **Mission Time (T_M)**: 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_B)**: 10 – 30 V DC
- **No-load supply current (I_0)**:
  - Emitter: ≤ 20 mA
  - Receiver: ≤ 10 mA

#### Input

- **Test input**: Threshold < 1.4 V (emitter deactivation)

#### Output

- **Switching type**: Light on
- **Signal output**: 1 PNP output, short-circuit protected, reverse polarity protected, open collector
- **Switching voltage**: Max. 30 V DC
- **Switching current**: Max. 100 mA
- **Voltage drop (U_d)**: ≤ 1.5 V DC
- **Switching frequency (f)**: 62.5 Hz
- **Response time**: 8 ms

#### Approval

- **CCC approval**: CCC approval / marking not required for products rated ≤ 36 V

#### Mechanical specifications

- **Degree of protection**: IP67
- **Connection**: 0.15 / 7 m PVC connection cable with 3-pin JST connector
- **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
  - -20 – 60 °C (-4 – 140 °F), movable mounted
- **Storage temperature**: -40 – 70 °C (-40 – 158 °F)
- **Relative humidity**: 90 %, noncondensing

#### Curves / Diagrams

### Characteristic response curve

<table>
<thead>
<tr>
<th>Distance X [m]</th>
<th>Offset Y [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td>0 100 200 300 400 500 600 700 800 900 1000</td>
</tr>
</tbody>
</table>

### Relative received light strength

<table>
<thead>
<tr>
<th>Distance X [m]</th>
<th>Relative received light strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 2 4 6 8 10 12 14</td>
<td>0.1 1 10 100 1000 10000 100000 1000000</td>
</tr>
</tbody>
</table>
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.P 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>
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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>open</td>
<td>UB</td>
<td>off</td>
</tr>
<tr>
<td>Testing</td>
<td>open</td>
<td>0V</td>
<td>open</td>
<td>UB</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.

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