Optical Barrier V3

Detection of hot or cold products

Design for extremely harsh environment

Visible optical barrier

15 m
30 m
Optical barrier V3 – benefits

The sensor V3 works in association with a reflector R (cf. literature E 3990).

- Visible red diode emission.
- Insensitivity to ambient light.
- Cast aluminium case with air purged hood for protecting the lens and with optional water-cooling plate.
- Modular construction allowing rapid maintenance.
- Alignment and checking devices: sensitivity potentiometer, light indicator showing operation.
- Alarm signal when lens or reflector is dirty.

Optical Barrier V3 – Presentation

The Optical Barrier V3 consists of:

- An optical unit equipped with an emitting diode, reception photodiode, electronics with high current transistor output, relay or opto solid state relay and power supply.
- A terminal block with protection cover or a connector fitted with high temperature cable with protective steel braid.
- A hood for lens protection with air purging connection.
- An optional water-cooling plate for use at ambient temperature higher than 70 °C (160 °F).

Operating principle

The visible and modulated beam emitted by the diode is reflected back by a prism reflector placed opposite to the sensor, then detected by the photodiode which outputs a signal to the processing electronics. Product presence is determined depending on whether the beam is blocked or not. Beam modulation, special optical filter and automatic correction make the sensor insensitive to ambient light.

Commissioning

1. Locating the path of the beam

   They are two ways of locating the path of the beam:
   - Under low ambient light conditions and at small distances the impact of the beam may be seen on the reflector.
   - Otherwise looking from the reflector position towards the sensor and searching with the eye the position where the emitter LED is the brightest.

2. Mechanical orientation

   Rough positioning of the sensor can be carried out by locating the path of the beam near the product to be detected and at the reflector.

3. Adjustment of the detection position

   The detection position is adjusted using the sensitivity potentiometer.

   With the sensitivity adjusted to the maximum value, the accuracy for the detection is approximately +/-1 cm for a product of cross section larger than 4 cm x 4 cm. Adjusting the sensitivity will increase the detection accuracy.

Performance specifications

<table>
<thead>
<tr>
<th>Reflector (cf. Literature E3990)</th>
<th>R110 - R110 A</th>
<th>R110 HT - R110 HTA</th>
<th>R430 HTA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance V3 - Reflector: mini / maxi</td>
<td>0 / 15 m</td>
<td>0 / 30 m</td>
<td>0 / 30 m</td>
</tr>
</tbody>
</table>
Technical characteristics

Optical Barrier V3

**Outputs**

<table>
<thead>
<tr>
<th>Model</th>
<th>V3 - • - • S</th>
<th>V3 - • - SR*</th>
<th>V3 - • - • R*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transistor output</td>
<td>2 complementary push-pull outputs, short circuit protection, Low impedance : 0/24 V - 100 mA max.</td>
<td>2 Optocoupled complementary Solid State Relay : Impedance : 50 Ω Switching capacity +/- 350 V peak +/- 100 mA peak</td>
<td>Single pole changeover Switching capacity : 230 V a.c. – 2.5 A a.c.</td>
</tr>
<tr>
<td>Isolated solid state relay output</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relay output</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Electrical characteristics**

- 2 complementary push-pull outputs, short circuit protection
- Low impedance : 0/24 V - 100 mA max.

**Response time**

- 1 ms
- Make time : 8 ms
- Break time : 4 ms

**Alarm:**

- Push-pull output, short circuit protection, 0/24 V - 50 mA max.
- (not available for V3 - • - C - • and V3 - • - C - SR • with AC supply voltage)
- 0V if received light is too low or internal temperature > 55°C

**Other data**

<table>
<thead>
<tr>
<th>Emitter</th>
<th>Red LED, with 2.5 kHz modulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage</td>
<td>220 V (-15%) to 240 V (+10%) - 50 / 60 Hz or 110 V (-15%) to 120 V (+10%) - 50 / 60 Hz or 24 V (±10%) - 50 / 60 Hz</td>
</tr>
<tr>
<td>Power consumption</td>
<td>10 VA</td>
</tr>
<tr>
<td>Connection</td>
<td>Terminal block – 2 PG 9 (V3 - • B - • •) Connector fitted with silicone cable with protective steel braid (V3 - • C - • •) Standard length of 2 m (other length: 3, 5 or 8 m)</td>
</tr>
<tr>
<td>Weight</td>
<td>2.5 kg (V3 - • JC - •) – 1.8 kg (V3 - • LB - •)</td>
</tr>
<tr>
<td>Protection rating</td>
<td>IP 67 (cast aluminium case)</td>
</tr>
<tr>
<td>Air purging</td>
<td>Protection of the optic with clean air : 50 to 200 g/cm²; 4 to 16 l/min</td>
</tr>
<tr>
<td>Working temperature</td>
<td>-20 to 70 °C (0 to 160 °F) without cooling, Up to 120 °C (250 °F) with water cooling: industrial quality water at about 25 °C (77 °F), pressure 1-2 bar and flow 1-2 l/min</td>
</tr>
</tbody>
</table>

**Dimensions**

- V3 - LB - •
- V3 - JC - •
Technical characteristics

Optical Barrier V3

Connection

Transistor output V3 - - - S

Connector
V3 - - - C - -

Connection cable
GN - YE

Relay output V3 - - - R und V3 - - - SR *

Connection cable
GN - YE

Terminal block
V3 - - - B - -

Reference for order

<table>
<thead>
<tr>
<th>CASE</th>
<th>MOUNTING</th>
<th>CONNECTION</th>
<th>OUTPUT</th>
<th>SUPPLY VOLTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>Bracket</td>
<td>Terminal block</td>
<td>SR1</td>
<td>230 V AC</td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
<td>SR2</td>
<td>115 V AC</td>
</tr>
<tr>
<td>J</td>
<td>Mounting stand and cooling jacket</td>
<td>Connector</td>
<td>R1</td>
<td>24 V AC</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>Relay</td>
<td>R2</td>
<td>24 V DC</td>
</tr>
</tbody>
</table>

E.g.: V3-LB-R1  230 VAC

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