**Time of Flight Barrier**

**VFT1**

- Detection up to 10 m, on cold or hot objects
- Without Reflector
- Easy setup and installation
- Design for steel industry conditions
Description

Diffuse Reflective Barrier VFT1

Operating principle

The VFT1 is a LED based Time-of-Flight detector. With this technology DELTA introduces an innovative solution for the detection of product in the difficult environment of the steel industry. It works on very dark low reflecting targets, as well as high temperature targets, and has an extended operating temperature range compared to laser technology. Thanks to the Time-of-Flight technology the sensor is able to measure the position of the target, and can eliminate any background object.

Features and benefits

- Detection range: from 0.8 m, up to 10 m on grey surface (18% remission), 8 m on black surface (6% remission)
- Target temperature: up to 1250 °C (2280 °F)
- Detection resolution (distance between target and background):
  - 150 mm for a distance range of 1.2 to 6 m, and a maximum target temperature of 1000°C (1830 °F)
  - 300 mm for 0.8 to 10 m and a maximum target temperature of 1250 °C (2280 °F)
- Response time: from 2 ms on white matt surface at 2 m to 14 ms on black surface (6% remission) at 8 m
- 2 complementary static outputs for product presence and 1 output for alarm
- Visible laser pointer (class 2)
- Easy sensor setup with detection range selection and sensitivity adjustment
- Water cooling (model VFT1–J) & air purging
- Optional heat shield for model VFT1–J+

Presentation

The VFT1 is an easy to use detector thanks to:

- 3 LED giving sensor status:
  - P.P. is green when detection output is activated (Product Presence)
  - Ctrl is orange when detection margin is not enough or saturated.
  - Alarm is red when alarm output is activated (internal T° too high, emitter or receiver out of function)
- The ‘Dist.’ potentiometer to setup the detection range by selecting the maximum distance (max. 10m). For example, potentiometer on position 2 will setup the detection range from 0.8 to 2 m.
- The ‘Sens./Laser’ potentiometer to adjust sensitivity.
- A laser pointer to make alignment of sensor. It is activated as soon as you turn the ‘Sens./Laser’ potentiometer (stays ON during 15 min then automatically switches OFF).

Typical applications

The VFT1 can be used in many applications of detection, especially where it’s not easy or not possible to position a reflector for use of standard light barriers.

Some examples below:

Detection of products on cooling bed

Detection of hot and cold coils
Detection area

Note: if there is guide or plate between sensor and target, minimum aperture 100 x 70 mm or minimum diameter 100 mm.

Technical specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>VFT1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detection range</td>
<td>0.8 to 10 m</td>
</tr>
<tr>
<td>Response Time (1)</td>
<td>0.8 to 6 m on black surface (6% remission) / Max. 14 ms &lt;br&gt;0.8 to 10 m on grey surface (18% remission) / Max. 7 ms &lt;br&gt;0.8 to 10 m on white surface (80% remission)/ Max. 3.5 ms</td>
</tr>
<tr>
<td>Maximum target temperature</td>
<td>1250 °C (2280 °F)</td>
</tr>
<tr>
<td>Detection resolution (2)</td>
<td>300 mm &lt;br&gt;150 mm for a detection range of 1.2 to 6 m, and max target temperature 1000°C (1832°F)</td>
</tr>
<tr>
<td>LED emitter</td>
<td>IR 850 nm, non-visible working beam</td>
</tr>
<tr>
<td>Laser pointer (IEC 60825-1)</td>
<td>≤ 1 mW class 2 ; Activated during 15 min as soon as a potentiometer is turned</td>
</tr>
<tr>
<td>Product Presence (P.P.) Static outputs S and /S</td>
<td>2 Push-Pull complementary outputs &lt;br&gt;Low impedance: 0 / 24 V – 50 mA, protected against short circuit</td>
</tr>
<tr>
<td>Alarm output</td>
<td>PNP “High side” 0.1A: 24 V when alarm activated (internal failure)</td>
</tr>
<tr>
<td>Display and setting</td>
<td>3 status LED (P.P., Ctrl, Alarm) &lt;br&gt;2 potentiometers to select the detection range and adjust the sensitivity</td>
</tr>
<tr>
<td>Operating voltage</td>
<td>10 to 30 VDC</td>
</tr>
<tr>
<td>Power consumption</td>
<td>&lt; 8 W</td>
</tr>
<tr>
<td>Cable (model VFT1-C)</td>
<td>Connector fitted with silicone cable with protective steel braid &lt;br&gt;Standard length of 2 m (other length: 3, 5, 8 m)</td>
</tr>
<tr>
<td>Weight</td>
<td>2.5 kg (VFT1-LB) - 3.0 kg (VFT1-JC)</td>
</tr>
<tr>
<td>Protection rating</td>
<td>IP 66 (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>Operating temperature</td>
<td>-20 °C to 60 °C (-4 °F to 140 °F) without cooling, &lt;br&gt;Up to 120 °C (250 °F) with water cooling: industrial quality water at about 25 °C, pressure 1-2 bar and flow 1-2 l/min</td>
</tr>
</tbody>
</table>

(1) Response time depends on the remission of the surface, the size of the receiver's spot and the distance. Values given for an area of detection filled at 100%.

(2) Detection resolution is the minimum distance between object to detect and the background.
Technical Characteristics  

Diffuse Reflective Barrier VFT1

Dimensions

### VFT1-LB

1. Air supply Ø10
2. Water supplies Ø10
3. Connector clearance 120 mm
4. Mounting with screw Ø10

### VFT1-JC

5. 2 cable glands (cable Ø from 7 to 10.5 mm)
6. Optical axis
7. Distance Reference

- Receiver Ø30 mm
- Emitter LED Ø30 mm
- Laser Pointer Ø6 mm

Note: if there is guide or plate between sensor and target, minimum aperture 100 x 70 mm or minimum diameter 100 mm.

Reference for order

<table>
<thead>
<tr>
<th>Case</th>
<th>Mounting</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>Bracket</td>
<td>Terminal Block</td>
</tr>
<tr>
<td>J</td>
<td>Mounting stand &amp; Cooling jacket</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Connector L=2</td>
<td></td>
</tr>
</tbody>
</table>

- Cable length 2: 2 m (1)
- Connector L=3: 3 m
- 5: 5 m
- 8: 8 m

(1) standard length

Example: VFT1-JC 24VDC L=2

Accessories

- Heat shield to protect from direct radiation, only for VFT1-J models, Reference 7593826

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