**Model Number**

M12/MV12-F1-IR/76b/82b/124/128

Thru-beam sensor with 5-pin M12 connector, 90° adjustable position

**Features**

- Series of sensors in a widely used standard housing
- TEACH-IN switch for setting the contrast detection levels
- Automatic adjustment in case of soiling in contrast detection mode
- Additional LED as alignment aid in receiver optics
- High level of stability thanks to the metal housing frame
- Resistant against noise: reliable operation under all conditions

**Dimensions**

**Electrical connection**

<table>
<thead>
<tr>
<th>Option</th>
<th>Emitter 2-switch-off</th>
<th>Emitter 2-switch-off</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+UB</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Q2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0 V</td>
<td>Alarm</td>
</tr>
<tr>
<td>4</td>
<td>Q1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>ET</td>
<td>Test</td>
</tr>
</tbody>
</table>

○ = Light on
● = Dark on

**Pinout**

Wire colors in accordance with EN 60847-5-2

1. BN (brown)
2. WH (white)
3. BU (blue)
4. BK (black)
5. GY (gray)
## Technical data

### System components
- **Emitter**: M12-F1/IR/76b/124
- **Receiver**: MV12-F1/82b/124/128

### General specifications
- **Effective detection range**: 0 ... 16 m
- **Threshold detection range**: 25 m
- **Light source**: 2 LED
- **Light type**: modulated infrared light, 880 nm
- **Target size**: min. 12 mm
- **Alignment aid**: LED red in receiver
- **Diameter of the light spot**: approx. 420 mm at a distance of 16 m
- **Angle of divergence**: 1.5 °
- **Ambient light limit**
  - Continuous light: 40000 Lux
  - Modulated light: 5000 Lux

### Functional safety related parameters
- **MTTF_d**: 570 a
- **Mission Time (Tm)**: 20 a
- **Diagnostic Coverage (DC)**: 90 %

### Indicators/operating means
- **Operation indicator**: LED green, flashes in case of short-circuit
- **Function indicator**: 2 LEDs yellow for switching state, stability control, TEACH-IN and contrast detection mode
- **Control elements**: rotary switch for light/dark, 5-step switch for contrast recognition adjustment
- **Contrast detection levels**
  - 15 % - clear glass bottles
  - 25 % - plastic foils
  - 40 % - colored glass or opaque materials
  - adjustable by Teach-In key or external wire

### Electrical specifications
- **Operating voltage** (U_B): 10 ... 30 V DC
- **Ripple**: max. 10 %
- **No-load supply current** (I_0)
  - Emitter: ≤ 35 mA
  - Receiver: ≤ 45 mA
- **Input**
  - Test input: emitter deactivation at 0 V
  - Function input: Ext. Teach-In input (ET)
- **Output**
  - Pre-fault indication output: 1 PNP, inactive when level falls below function reserve after approx. 5 s.
  - Immediately inactive if the beam is interrupted 4 times during the flashtime.
- **Switching type**: light/dark on, switchable
- **Signal output**: 1 push-pull (4 in 1) output, short-circuit protected, reverse polarity protected
- **Switching voltage**: max. 30 V DC
- **Switching current**: max. 0.2 A
- **Voltage drop** (U_d): ≤ 2.5 V DC
- **Switching frequency**: f = 1000 Hz
- **Response time**: 0.5 ms

### Ambient conditions
- **Ambient temperature**
  - -40 ... 60 °C (-40 ... 140 °F)
- **Storage temperature**
  - -40 ... 75 °C (-40 ... 167 °F)

### Mechanical specifications
- **Housing width**: 41.5 mm
- **Housing height**: 49 mm
- **Housing depth**: 15 mm
- **Degree of protection**: IP67
- **Connection**: Metal connector, M12, 5-pin, 90° rotatable
- **Material**
  - Housing: frame: nickel plated, die cast zinc.
  - Laterals: glass-fiber reinforced plastic PC
- **Optical face**: Plastic pane
- **Mass**: 120 g (emitter and receiver)

### Compliance with standards and directives
- **Shock and impact resistance**: IEC / EN 60068, half-sine, 40 g in each X, Y and Z directions
- **Vibration resistance**: IEC / EN 60068-2-6, Sinus. 10 -150 Hz, 5 g in each X, Y and Z directions

### Approvals and certificates
- **Protection class**: II, rated voltage ≤ 300 V AC with pollution degree 1-2 according to IEC 60664-1

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## Accessories

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OMH-MLV12-HWG</td>
<td>Mounting bracket for series MLV12 sensors</td>
</tr>
<tr>
<td>OMH-MLV12-HWK</td>
<td>Mounting bracket for series MLV12 sensors</td>
</tr>
<tr>
<td>OMH-K01</td>
<td>dove tail mounting clamp</td>
</tr>
<tr>
<td>OMH-K02</td>
<td>dove tail mounting clamp</td>
</tr>
<tr>
<td>OMH-K03</td>
<td>dove tail mounting clamp</td>
</tr>
<tr>
<td>OMH-06</td>
<td>Mounting aid for round steel ø 12 mm or sheet</td>
</tr>
<tr>
<td>V15-G-2M-PUR</td>
<td>Female cordset, M12, 5-pin, PUR cable</td>
</tr>
</tbody>
</table>

Other suitable accessories can be found at www.pepperl-fuchs.com
Thru-beam sensor

Alignment
In switching position "N" senders and recipients align to:
Yellow LED lights up constantly, red LED is off.

TEACH-IN
• Switch position "N" (standard operation):
  LEDs are lit when the light beam is unobstructed, they flash when the value falls short of the function
  reserve and switch off when the beam is interrupted.
• Switch position "T" (Teach-in mode):
  After 1 s, the LED flashes slowly (approx. 1.5 Hz). The sensor is now ready to be set for a specific
  contrast detection value either via the mechanical switch (pos. I, II or III) or an external signal.
• Switch positions "I", "II" and "III" (contrast detection mode)
  Contrast recognition values: I for 15 %, II for 25 %, III for 40 %
  1. LED permanently lit: light path unobstructed
  2. LED on: element to be sensed detected
  3. LED flashes rapidly: detection failure, excessive soiling, function reserve too low.

• Ext. TEACH-IN input
  The desired contrast recognition capability can be adjusted by applying a logic „high“ pulse with a certain pulse length when the switch is in position T.
  I: 50 ms (30 ms ... 100 ms)
  II: 150 ms (100 ms ... 200 ms)
  III: > 200 ms
  Mode selector in position T.

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

Curves/Diagrams

Characteristic response curve

Relative received light strength

Notes