Retroreflective sensor with polarization filter for clear object

MLV12-54-G/30/124/126g

Model Number

MLV12-54-G/30/124/126g
Retroreflective sensor with 5-pin M12 connector, 90° adjustable position

Features

- Series of sensors in a widely used standard housing
- Reliable recognition of reflective objects and clear glass
- TEACH-IN switch for setting the contrast detection levels
- Automatic adjustment in case of soiling in contrast detection mode
- 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>(+UB)</th>
<th>Q2</th>
<th>0 V</th>
<th>Q1</th>
<th>ET</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Alarm</td>
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<tr>
<td>5</td>
<td>Teach</td>
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</tr>
</tbody>
</table>

Pinout

Indicators/operating means

1. Operating display green
2. Switch status yellow
3. Bright/dark switch
4. Teach-In switch
5. Optical axis
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### Technical data

#### General specifications
- Effective detection range: 0 ... 4.2 m
- Reflector distance: 0 ... 4.2 m
- Threshold detection range: 5.6 m
- Reference target: HBS-2 reflector
- Light source: LED
- Light type: modulated visible red light, 660 nm
- Diameter of the light spot: approx. 110 mm at detection range 4.2 m
- Angle of divergence: 1.5°
- Ambient light limit: continuous light 40000 Lux
- Modulated light: 5000 Lux

#### Functional safety related parameters
- MTTF<sub>d</sub>: 1000 a
- Mission Time (T<sub>M</sub>): 20 a
- Diagnostic Coverage (DC): 0%

#### Indicators/operating means
- Operating display: LED green, flashes in case of short-circuit
- Function display: 2 LEDs yellow for switching state, stability control, TEACH-IN and contrast detection mode
- Controls: rotary switch for light/dark, 5-step switch for contrast recognition adjustment
- Contrast detection levels:
  - 10% - clean, water filled PET bottles
  - 18% - clear glass bottles
  - 40% - colored glass or opaque materials
  - adjustable by TEACH-IN key or external wire

#### Electrical specifications
- Operating voltage: U<sub>B</sub> 10 ... 30 V DC
- Ripple: max. 10%
- No-load supply current: I<sub>0</sub> max. 55 mA

#### Input
- Function input: Ext. Teach-In input (ET)

#### Output
- Pre-fault indication output: 1 NPN function reserve output (alarm), short-circuit protected, open collector
- Switching type: light/dark on switchable
- Signal output: 1 NPN output, short-circuit protected, reverse polarity protected, open collector
- Switching voltage: max. 30 V DC
- Switching current: max. 0.2 A
- Voltage drop: U<sub>d</sub> ≤ 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
- Protection degree: 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: 60 g

#### Compliance with standards and directives
- Standard conformity:
  - IEC 60947-5-2:2007
- 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
- UL approval: cULus
- CCC approval: CCC approval / marking not required for products rated ≤36 V

### Accessories
- OMH-MLV12-HWG
  - Mounting bracket for series MLV12 sensors
- OMH-MLV12-HWK
  - Mounting bracket for series MLV12 sensors
- OMH-K01
  - dove tail mounting clamp
- OMH-K02
  - dove tail mounting clamp
- OMH-K03
  - dove tail mounting clamp
- OMH-06
  - Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm
- ORR50G
  - Reflector, rectangular 50.9 mm x 60.9 mm, mounting holes, fixing strap and polarization filter

Other suitable accessories can be found at www.pepperl-fuchs.com
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Curves/Diagrams

Characteristic response curve

Offset Y [mm]

Distance X [m]

H85-2
C110-2
H80
H190
OFR-100/100
VR10

Relative received light strength

Reflector type

H85-2
C110-2
OFR-100/100
H80
H190
VR10

Stability control > 2.5
Stability control < 2.5
Stability control

TEACH-IN

- Switch position “N” (normal operation):
  Yellow LEDs light if the light beam is free, flash if the functional reserve is used, turn off if the light beam is interrupted.

- Switch position “T” (TEACH-IN operation):
  Yellow LED flashes slowly after 1 second (about 1.5 Hz).
  The sensor is now ready to be set to a particular contrast detection value using the mechanical switch (position I, II, or III) or an external signal.

- Switch positions “I”, “II”, and “III” (contrast detection operation)
  Contrast detection values:
  1. Yellow LED lights continually: light path free
  2. Yellow LED off: object detected
  3. Yellow LED flashes quickly: unsure detection, too much contamination, functional reserve too low.
  A direct switching of the contrast detection levels is possible without having to put the switch back into position “T” first.

- External teach input (ET):
  In switch position “T”, you can apply a pulse over a control line to plug pin 5 to select the corresponding contrast detection. The desired contrast detection is set by applying a high pulse of a particular width:
  I: 50 ms (30 ms ... 100 ms)
  II: 150 ms (100 ms ... 200 ms)
  III: >200 ms

- Pre-fault output (optional):
  Switch position “N”:
  Inactive if the functional reserve is used after approx. 5 sec. Immediately inactive if 4 light beam interruptions occur within the flashing time.

- Contrast detection levels:
  The output goes inactive if the contamination no longer permits readjustment; the yellow LED flashes quickly. In the case of additional contamination, the detection of low contrast is no longer guaranteed.

- Warm-up period:
  Any warm-up period can be shortened by repeating the learn (teach) process.

Refer to “General Notes Relating to Pepperl+Fuchs Product Information”.
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