Retroreflective sensor with polarization filter for clear object
ML9-54-G/25/136/115

Model Number
ML9-54-G/25/136/115
Retroreflective sensor with 2 m fixed cable

Features
- Ultra bright LEDs for power on, pre fault indication and switching state
- Flashing power on LED in case of short-circuit
- TEACH-IN
- Automatic adjustment in case of soiling in contrast detection mode
- Not sensitive to ambient light, even with switched energy saving lamps
- Protected against mutual interference (no cross-talk)
- Protection class II

Dimensions

Electrical connection

Option:

- BN +UB
- WH Ø
- BU 0 V
- BK Q

Indicators/operating means

1 LED green
2 LED yellow
3 Teach-In
# Technical data

## General specifications

- **Effective detection range**
  - 0 ... 3.5 m in TEACH mode
  - 0 ... 5.7 m in normal mode
- **Reflector distance**
  - 0 ... 3.5 m in TEACH mode
  - 0 ... 5.7 mm in normal mode
- **Threshold detection range** 7.6 m
- **Reference target** H85-2 reflector
- **Light source** LED
- **Light type** modulated visible red light, 660 nm
- **Polarization filter** yes
- **Angle deviation** max. ± 1°
- **Diameter of the light spot** approx. 40 mm at detection range 1 m
- **Angle of divergence** 1.7°
- **Ambient light limit** 40000 Lux

## Functional safety related parameters

- **MTTFd** 1050 a
- **Mission Time (TM)** 20 a
- **Diagnostic Coverage (DC)** 0%

## Indicators/operating means

- **Operation indicator** LED green, statically lit Power on, Undervoltage indicator: Green LED, pulsing (approx. 0.8 Hz), short-circuit: LED green flashing (approx. 4 Hz)
- **Function indicator** LED yellow: switching state, Stability control, Teach-In
- **Control elements** Teach-In key
- **Contrast detection levels** 10% - clean, water filled PET bottles

## Electrical specifications

- **Operating voltage** $U_B$ 10 ... 30 V DC, class 2
- **Ripple** max. 10%
- **No-load supply current** $I_0$ < 20 mA at 24 V DC

### Output

- **Switching type** light on
- **Signal output** 2 push-pull (4 in 1) outputs, complementary, short-circuit proof, reverse polarity protected
- **Switching voltage** max. 30 V DC
- **Switching current** max. 100 mA
- **Switching frequency** $f$ 1000 Hz
- **Response time** 500 µs

### Ambient conditions

- **Ambient temperature** -20 ... 60 °C (-4 ... 140 °F)
- **Storage temperature** -40 ... 75 °C (-40 ... 167 °F)

## Mechanical specifications

- **Degree of protection** IP67
- **Connection** 2 m fixed cable
- **Material**
  - **Housing** PC (glass-fiber-reinforced Makrolon)
  - **Optical face** glass
  - **Mass** approx. 25 g

## Compliance with standards and directives

- **Standard conformity**
  - Product standard EN 60947-5-2:2007
  - IEC 60947-5-2:2007
- **Standards** EN 50178, UL 508

## Approvals and certificates

- **Protection class** II, rated voltage ≤ 50 V AC with pollution degree 1-2 according to IEC 60664-1 functional insulation acc. to DIN EN 50178
- **UL approval** cULus
- **CCC approval** CCC approval / marking not required for products rated ≤ 36 V

### Other suitable accessories

- OMH-ML9 Mounting bracket

**OMH-ML9-01** Threaded bolt M3

Other suitable accessories can be found at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)
Adjustment instructions

Adjustment instructions for devices with Teach-In
After the operating voltage has been applied, the LED is lit green. The sensor is automatically set to a state of maximum sensitivity (state as supplied) or the state of the most recent Teach-In setting.

Assemble the appropriate reflector opposite the light barrier.

Teach-In using the Teach key
- Align the sensor to an appropriate reflector.
- Press the Teach key - as confirmation, the green display LED is briefly turned off once.
• Hold the Teach key down until the yellow and green display LED is flashing at regular intervals (about 2.5 Hz). Then release the Teach key.

• During the internal set-up of the sensor, the green and yellow display LEDs flash alternately (about 2.5 Hz).

• Teach-In successful: The green and yellow display LEDs are lit. Contrast detection 10% is activated. The device is ready for operation.

• Teach-In not successful: The green and yellow display LEDs flash alternately and rapidly (about 8 Hz) for about 5 seconds. Then the sensor goes to the state with maximum sensitivity. After this happens, repeat the Teach-In procedure, starting with step 1.