



Model Number

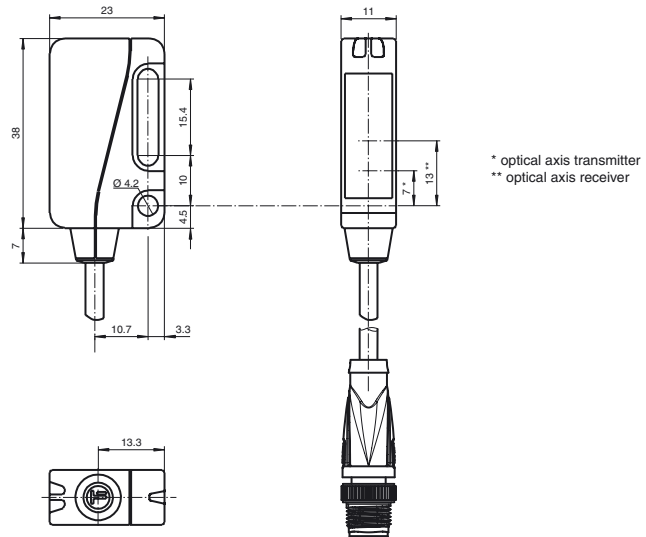
ML9-54/59/103/115a/123

Retroreflective sensor
200 mm fixed cable with 4-pin, M8x1 connector

Features

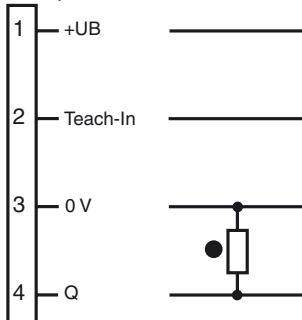
- Ultra bright LEDs for power on, weak signal indication and switching state
- Flashing power on LED in case of short-circuit
- TEACH-IN
- Not sensitive to ambient light, even with switched energy saving lamps
- Protected against mutual interference (no cross-talk)
- Protection class II

Dimensions



Electrical connection

Option: 59/103/115a/123



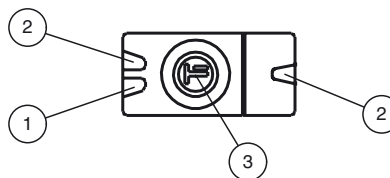
○ = Light on
● = Dark on

Pinout

Wire colors in accordance with EN 60947-5-2

| | | |
|---|----|---------|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |

Indicators/operating means



| | |
|---|------------|
| 1 | LED green |
| 2 | LED yellow |
| 3 | Teach-In |

Release date: 2019-11-26 15:40 Date of issue: 2019-11-26 188747_eng.xml

Technical data**General specifications**

| | |
|----------------------------|-------------------------------------|
| Effective detection range | 0 ... 5 m |
| Threshold detection range | 6 m |
| Reference target | H85-2 reflector |
| Light source | LED |
| Light type | modulated visible red light |
| Polarization filter | yes |
| Diameter of the light spot | approx. 110 mm at a distance of 3 m |
| Angle of divergence | approx. 2.1 ° |
| Ambient light limit | 30000 Lux |

Functional safety related parameters

| | |
|--------------------------------|--------|
| MTTF _d | 1240 a |
| Mission Time (T _M) | 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, lights up when light beam is free, flashes when falling short of the stability control |
| Control elements | Teach-In key |

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 |

Input

| | |
|----------------|--------------------------|
| Function input | Ext. Teach-In input (ET) |
|----------------|--------------------------|

Output

| | | |
|---------------------|-----------------------------------------------------------------------------------|----------|
| Switching type | dark on | |
| Signal output | 1 PNP output, short-circuit protected, reverse polarity protected, open collector | |
| Switching voltage | max. 30 V DC | |
| Switching current | max. 100 mA | |
| Voltage drop | U _d | ≤ 2 V DC |
| Switching frequency | f | 1000 Hz |
| Response time | | 0.5 ms |

Conformity

| | |
|------------------|--------------|
| Product standard | EN 60947-5-2 |
|------------------|--------------|

Ambient conditions

| | |
|---------------------|--------------------------------|
| Ambient temperature | -25 ... 60 °C (-13 ... 140 °F) |
| Storage temperature | -40 ... 75 °C (-40 ... 167 °F) |

Mechanical specifications

| | |
|----------------------|-----------------------------------------------|
| Housing width | 23 mm |
| Housing height | 38 mm |
| Housing depth | 11 mm |
| Degree of protection | IP67 |
| Connection | 200 mm fixed cable with 4-pin, M8x1 connector |
| Material | |
| Housing | PC (glass-fiber-reinforced Makrolon) |
| Optical face | glass |
| Mass | approx. 25 g |

Approvals and certificates

| | |
|------------------|--------------------------------------------------------------------------------|
| Protection class | II, rated voltage ≤ 50 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-ML9**

Mounting aid for ML9 series, Mounting bracket

OMH-ML9-01

Mounting aid for ML9 series, Threaded bolt M3

V31-GM-2M-PVC

Female cordset single-ended, M8, 4-pin, PVC cable

V31-WM-2M-PVC

Female cordset single-ended, M8, 4-pin, PVC cable

V31-GM-5M-PUR

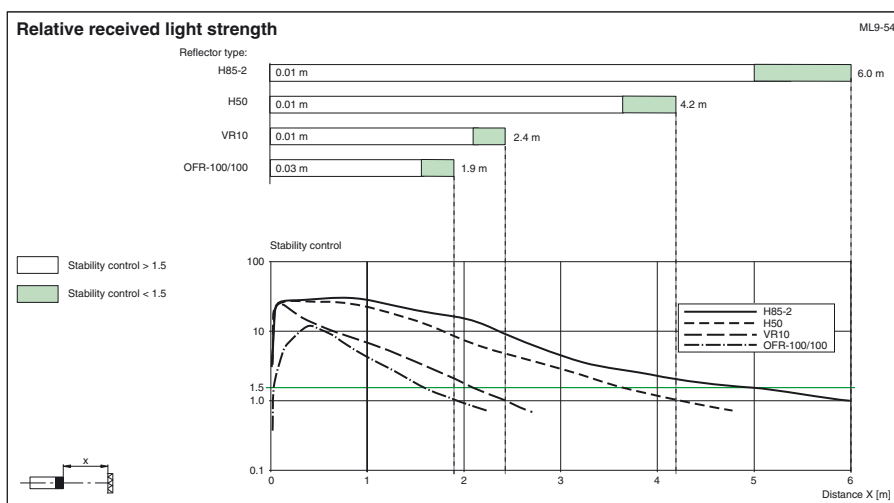
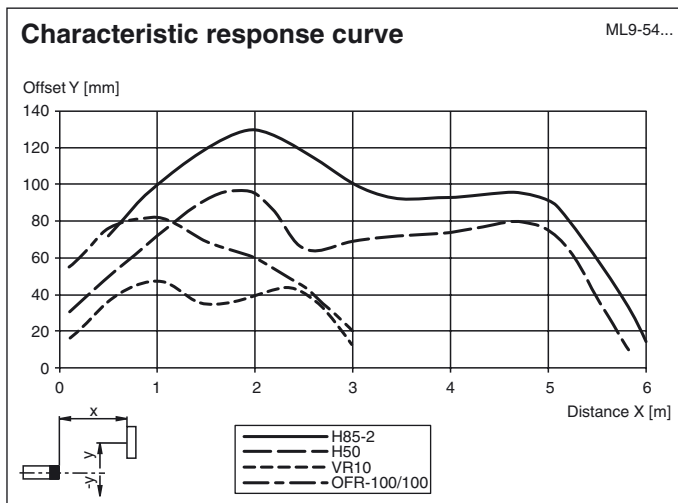
Female cordset single-ended, M8, 4-pin, PUR cable

V31-WM-5M-PUR

Female cordset single-ended, M8, 4-pin, PUR cable

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

Curves/Diagrams



Setting Instructions

Setting Instructions for Devices with Teach-In

After the operating voltage is applied, the green LED lights up. The sensor is automatically in max. sensitivity status (state as supplied) or in the status of the most recent Teach-In setting.

Mount a suitable reflector opposite the photoelectric sensor.

Teach-In with the Teach key

- Align the sensor to a suitable reflector.
- Press the Teach key. The green LED indicator light goes off briefly to confirm this.
- Hold down the Teach key until the yellow and green indicator LEDs flash synchronously (about 2.5 Hz). Then release the Teach key
- During internal setup of the sensor, the green and yellow indicator LEDs flash alternately (about 2.5 Hz).
- Teach-In successful: The green and yellow indicator LEDs are lit. The device is ready for operation.
- Teach-In not successful: The green and yellow indicator LEDs flash quickly and alternately (about 8 Hz) for about 5 seconds. Then the sensor switches to the status with maximum sensitivity. After that, repeat the Teach-In procedure, starting with step 1.

Teach-In via external Teach-In input (ET)

Teach-In can also be initiated via the external Teach-In input (ET)

To do this, the ET must be open (or at 0 V) for at least 50 ms, after which +UB is applied for a duration of 50 to 80 ms.

Teach-In lasts for a maximum of 11 seconds (if not successful)

