



## Retroreflective sensor ML9-54-G-8736

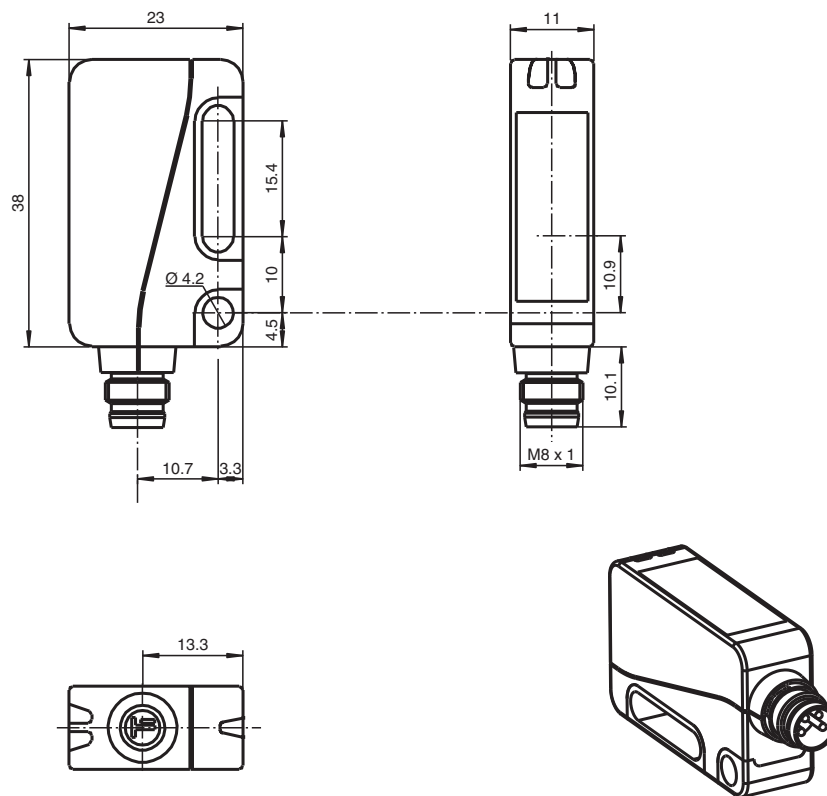


- Ultra bright LEDs for power on, weak signal indication and switching state
- Flashing power on LED in case of short-circuit
- TEACH-IN
- Automatic adjustment in case of soiling in contrast detection mode
- Not sensitive to ambient light, even with switched energy saving lamps
- Protected against mutual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

Retroreflective sensor with polarization filter for clear object detection



### Dimensions



Release date: 2023-03-28 Date of issue: 2023-03-28 Filename: 70129400\_eng.pdf

### Technical Data

#### General specifications

Effective detection range	0 ... 3.5 m in TEACH mode
Reflector distance	0 ... 3.5 m in TEACH mode
Reference target	H85-2 reflector

Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

Pepperl+Fuchs Group  
www.pepperl-fuchs.com

USA: +1 330 486 0001  
fa-info@us.pepperl-fuchs.com

Germany: +49 621 776 1111  
fa-info@de.pepperl-fuchs.com

Singapore: +65 6779 9091  
fa-info@sg.pepperl-fuchs.com

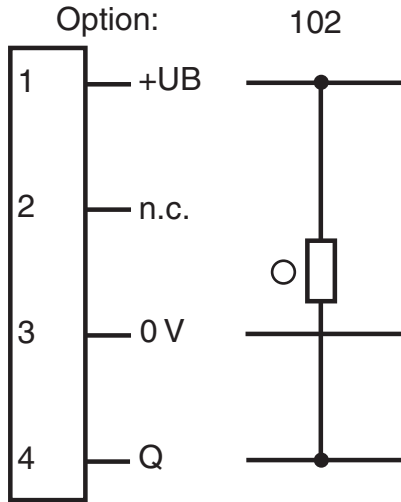
**pf** PEPPERL+FUCHS

## Technical Data

Light source		LED
Light type		modulated visible red light , 660 nm
Polarization filter		yes
Angle deviation		max. $\pm 1^\circ$
Diameter of the light spot		approx. 40 mm at detection range 1 m
Opening angle		1.7 °
Ambient light limit		40000 Lux
<b>Functional safety related parameters</b>		
MTTF <sub>d</sub>		1050 a
Mission Time (T <sub>M</sub> )		20 a
Diagnostic Coverage (DC)		0 %
<b>Indicators/operating means</b>		
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 ; Operating reserve ; Teach-In
Control elements		Teach-In key
Contrast detection levels		15 % - clear glass bottles
<b>Electrical specifications</b>		
Operating voltage	U <sub>B</sub>	10 ... 30 V DC , class 2
Ripple		max. 10 %
No-load supply current	I <sub>0</sub>	< 20 mA at 24 V DC
<b>Output</b>		
Switching type		light/dark on, switchable
Signal output		1 NPN, short-circuit protected open collector
Switching voltage		max. 30 V DC
Switching current		max. 100 mA
Switching frequency	f	1000 Hz
Response time		500 $\mu$ s
<b>Conformity</b>		
Product standard		EN 60947-5-2
<b>Approvals and certificates</b>		
Protection class		II, rated voltage $\leq$ 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 $\leq$ 36 V
<b>Ambient conditions</b>		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F)
Storage temperature		-40 ... 75 °C (-40 ... 167 °F)
<b>Mechanical specifications</b>		
Housing width		23 mm
Housing height		38 mm
Housing depth		11 mm
Degree of protection		IP67
Connection		M8 x 1 connector, 4-pin
Material		
Housing		PC (glass-fiber-reinforced Makrolon)
Optical face		glass
Connector		plastic
Mass		approx. 25 g

Release date: 2023-03-28 Date of issue: 2023-03-28 Filename: 70129400\_eng.pdf

**Connection Assignment**



○ = Light on  
● = Dark on

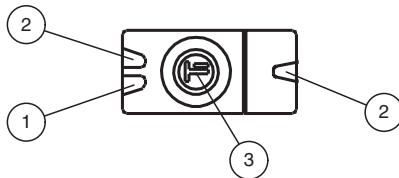
**Connection Assignment**



Wire colors in accordance with EN 60947-5-2

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

**Assembly**

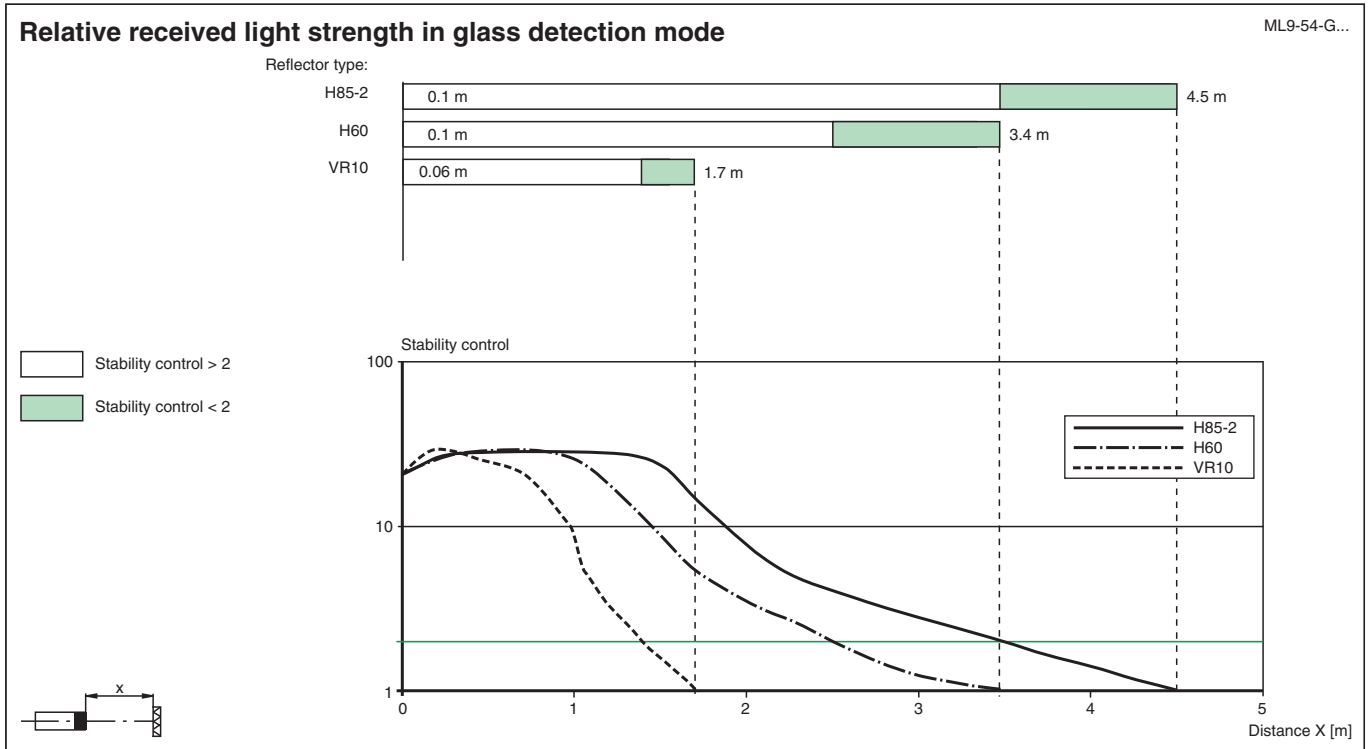


1	LED green
2	LED yellow
3	Teach-In

**Mounting**

Mount a suitable reflector opposite the sensor.

Release date: 2023-03-28 Date of issue: 2023-03-28 Filename: 70129400\_eng.pdf



## Commissioning

- Connect the operating voltage.
- The sensor automatically starts the teach-in process.
  - The green and yellow LED indicators flash simultaneously (approx. 2.5 Hz). The green and yellow LED indicators flash alternately (approx. 2.5 Hz) while the sensor is being set up.
- Teach-in successful:** Green and yellow LED indicators light up. The device is ready for operation and 15 % contrast detection is enabled.
- Teach-in unsuccessful:** The sensor remains in teach-in mode until the teach-in process has been successfully completed.

## Configuration

- Light-on/dark-on switching via teach-in button**
- You can switch the output to be light on/dark on by holding down the teach-in button for between 5 seconds and 10 seconds.
- Press the teach-in button. The green LED indicator briefly goes out once as confirmation.
  - Press and hold the teach-in button for between 5 seconds and 10 seconds. First, the yellow and green LED indicators will flash simultaneously (approx. 2.5 Hz). After 5 seconds, the yellow LED indicator is continuously lit and the green LED indicator flashes (approx. 2.5 Hz). Release the teach-in button. The output switching type (light-on/dark-on switching) has been changed.

## Teach-In



- Teach-in via the teach-in button**
- Direct the sensor at a suitable reflector.
  - Press the teach-in button. The green LED indicator briefly goes out once as confirmation.
  - Press and hold the teach-in button until the yellow and green LED indicators flash simultaneously (approx. 2.5 Hz). Release the teach-in button. The green and yellow LED indicators flash alternately (approx. 2.5 Hz) while the sensor is being set up.
- Teach-in successful:** Green and yellow LED indicators light up. The device is ready for operation and 15 % contrast detection is enabled.
- Teach-in unsuccessful:** The sensor remains in teach-in mode until the teach-in process has been successfully completed.

## Accessories

	<b>V31-GM-2M-PVC</b>	Female cordset single-ended M8 straight A-coded, 4-pin, PVC cable grey
	<b>V31-WM-2M-PVC</b>	Female cordset single-ended M8 angled A-coded, 4-pin, PVC cable grey
	<b>V31-GM-5M-PUR</b>	Female cordset single-ended M8 straight A-coded, 4-pin, PUR cable grey
	<b>V31-WM-5M-PUR</b>	Female cordset single-ended M8 angled A-coded, 4-pin, PUR cable grey

Release date: 2023-03-28 Date of issue: 2023-03-28 Filename: 70129400\_eng.pdf

**Accessories**

	<b>OMH-ML9</b>	Mounting aid for ML9 series, Mounting bracket
	<b>OMH-ML9-01</b>	Mounting aid for ML9 series, Threaded bolt M3