

**Model Number**

**MLV41-54-G/25/76a/124/136**

Retroreflective sensor  
with 5-pin, M12 x 1 connector

**Features**

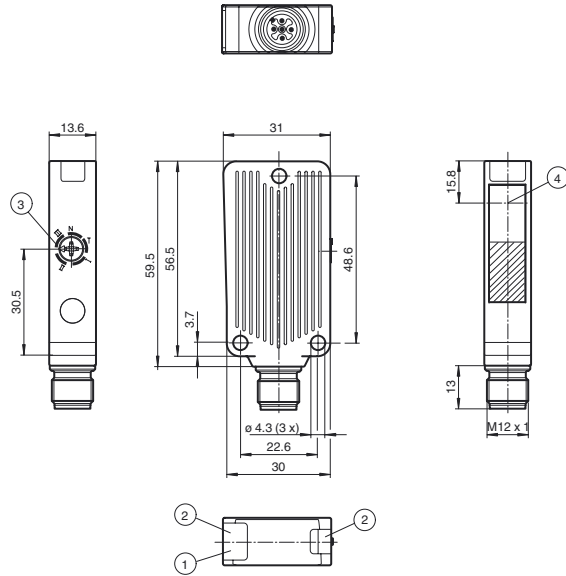
- Rugged series in corrosion-resistant metal housing
- Reliable recognition of reflective objects and clear glass
- Two machines in one: clear object detection or reflection operating mode with long range
- TEACH-IN switch for setting the contrast detection levels
- Automatic adjustment in case of soiling in contrast detection mode
- Resistant against noise: reliable operation under all conditions

**Product information**

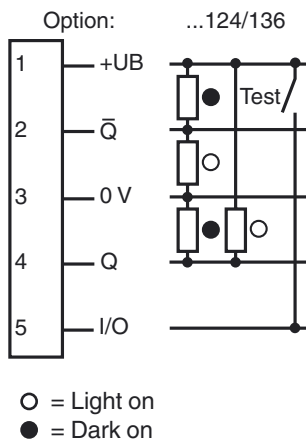
The unique and extremely popular design of the MLV41 series enables it be mounted correctly in confined areas and offers all the functions that are normally only found on larger phototelectric sensors. The MLV41 series comes with a range of functions. For example, highly visible status LEDs on the front and back, resistance to ambient light, crosstalk protection and universally applicable output stages that permit every possible switching logic and polarity to be realized. The enhanced resistance to ambient light ensures reliable operation even where modern energy-saving lamps with electronic ballasts are in use. The same applies where multiple devices are present, i.e. the use of a number of sensors in the same vicinity causes no problems.

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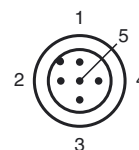
**Dimensions**



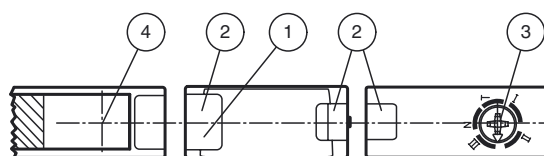
**Electrical connection**



**Pinout**



**Indicators/operating means**



1	Operating display	green
2	Functional display	yellow
3	Teach-In switch	
4	Optical center emitter and receiver	

**Technical data****General specifications**

Effective detection range	0 ... 4 m in TEACH mode 0 ... 5.2 m at switch position "N"
Reflector distance	0 ... 4 m in TEACH mode 0 ... 5.2 m at switch position "N"
Threshold detection range	6.5 m

Reference target	H85-2 reflector
Light source	LED
Light type	modulated visible red light , 660 nm
Angle deviation	max. $\pm 1^\circ$
Diameter of the light spot	approx. 100 mm at detection range 4 m
Angle of divergence	1.5 °
Ambient light limit	40000 Lux

**Functional safety related parameters**

MTTF <sub>d</sub>	900 a
Mission Time (T <sub>M</sub> )	20 a
Diagnostic Coverage (DC)	60 %

**Indicators/operating means**

Operating display	LED green, statically lit Power on , Undervoltage indicator: Green LED, pulsing (approx. 0.8 Hz) , short-circuit : LED green flashing (approx. 4 Hz)
Function display	2 LEDs yellow for switching state, stability control, TEACH-IN and contrast detection mode
Controls	5-step switch for setting the contrast detection levels.

Contrast detection levels	10 % - clean, water filled PET bottles 18 % - clear glass bottles 40 % - colored glass or opaque materials adjustable due to TEACH-IN switch
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**Electrical specifications**

Operating voltage	U <sub>B</sub>	10 ... 30 V DC
Ripple		max. 10 %
No-load supply current	I <sub>0</sub>	max. 35 mA

**Input**

Test input	emitter deactivation with +Ub
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**Output**

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	
Voltage drop	U <sub>d</sub>	$\leq 2.5$ 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	M12 x 1 connector, 5-pin
Material	
Housing	aluminum , Delta-Seal coated
Optical face	glass pane
Connector	metal
Mass	50 g

**Compliance with standards and directives**

Directive conformity	
EMC Directive 2004/108/EC	EN 60947-5-2:2007
Standard conformity	
Product standard	EN 60947-5-2:2007 IEC 60947-5-2:2007

**Approvals and certificates**

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 Listed 57M3 (Only in association with UL Class 2 power supply; Type 1 enclosure)
CCC approval	CCC approval / marking not required for products rated $\leq 36$ V

**Accessories**

**OMH-41**  
Mounting bracket

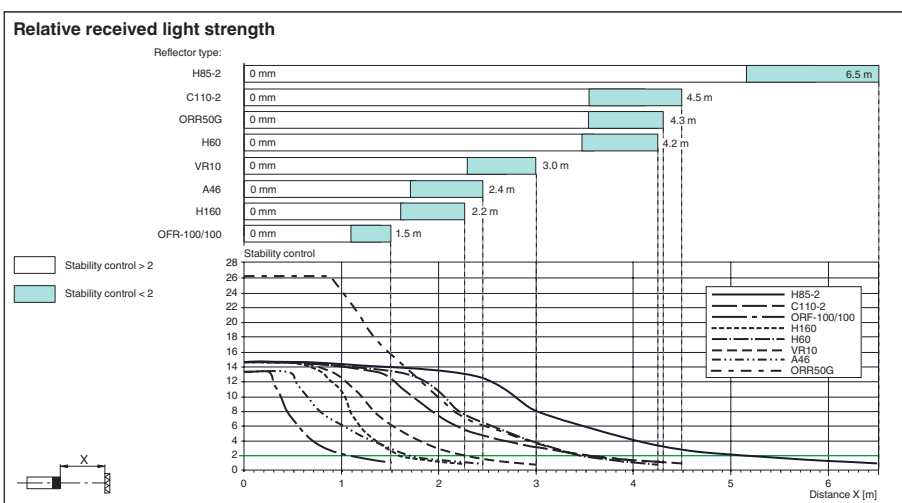
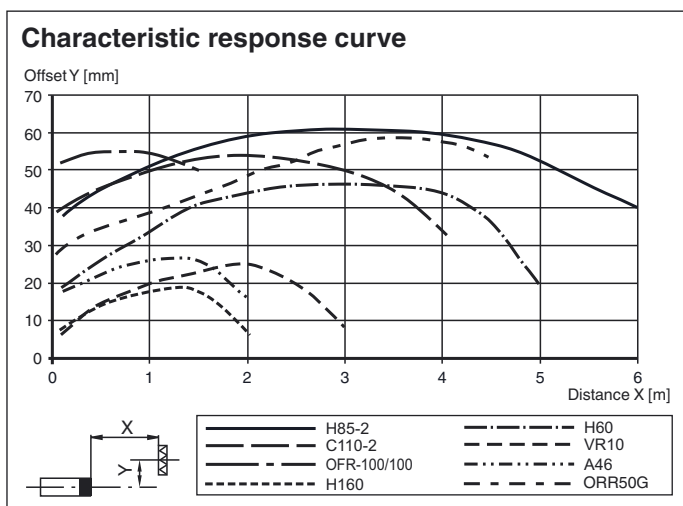
**OMH-09**  
Mounting bracket for Sensors series  
MLV41 for M12 rod mounting

**V15-G-2M-PUR**  
Female cordset, M12, 5-pin, PUR cable

**V15-W-2M-PUR**  
Female cordset, M12, 5-pin, PUR cable

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

**Curves/Diagrams**



**Additional information**

**Adjustment instructions for TEACH-IN operation:**

Step	Switch position	LED green	LED yellow	Time/frequency	Explanations/comments
1	N	on	flashes	4/s	In switch position "N" directed towards reflector. Reflector detected <b>without function reserve</b> .
	N	on	on	-	In switch position "N" directed towards reflector. Reflector detected <b>with function reserve</b> (recommended).
2	T	off/on	on	200 ms	The selection of a new switch position is indicated by the green LED going out for a short time. This also applies to the selection of the other switch positions.
	T	flashes	flashes	2.5 s	<i>Slow</i> alternating flashing: Teach-In process has been performed <b>correctly</b> . Max. duration of the Teach-In process: 2 s
	T	flashes	flashes	8/s	<i>Quick</i> alternating flashing: Teach-In process has <b>not</b> been performed <b>correctly</b> . (e.g. receiver signal not sufficient, sensor not directed correctly towards reflector) Status is terminated by turning switch to position N.
3/1	I	on	on	-	Contrast detection 10 % is activated. (e.g. clean PET bottles filled with water)
3/2	II	on	on	-	Contrast detection 18 % is activated. (e.g. clear glass bottles)

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3/3	III	on	on	-	Contrast detection 40 % is activated. (e.g. coloured glass or non-transparent materials)
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**Ext. teach input:**

In switch position "T", the respective contrast detection level can be selected by externally 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