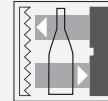




## Retroreflective sensor

### MLV41-54-G/25/123/124/136



- 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

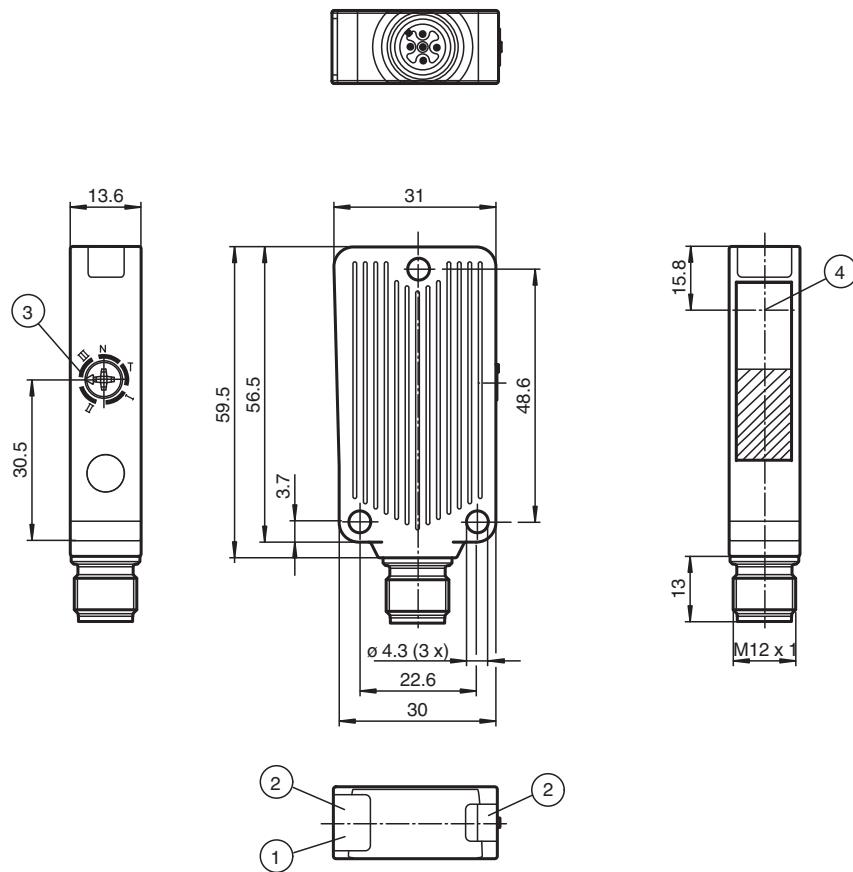
Robust retroreflective sensor for glass detection, compact housing design, 5.2 m detection range, red light, light on, 2 push-pull outputs, M12 plug



#### Function

The unique and extremely popular design of the MLV41 series enables it to be mounted correctly in confined areas and offers all the functions that are normally only found on larger phototransistor 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.

## Dimensions



## 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
Polarization filter	yes
Angle deviation	max. $\pm 1^\circ$
Diameter of the light spot	approx. 100 mm at detection range 4 m
Opening angle	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)	0 %

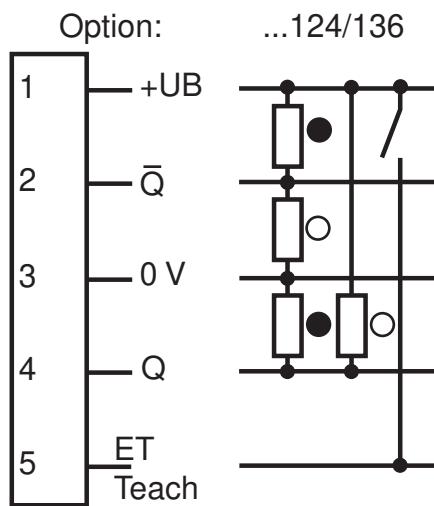
## Indicators/operating means

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	2 LEDs yellow for switching state, stability control, TEACH-IN and contrast detection mode

## Technical Data

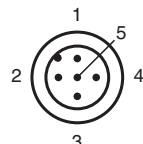
Control elements		
Contrast detection levels		5-step switch for setting the contrast detection levels.
		10 % - clean, water filled PET bottles 18 % - clear glass bottles 40 % - colored glass or opaque materials adjustable due to Teach-In switch
<b>Electrical specifications</b>		
Operating voltage	$U_B$	10 ... 30 V DC
Ripple		max. 10 %
No-load supply current	$I_0$	max. 35 mA
<b>Input</b>		
Function input		Ext. Teach-In input (ET)
<b>Output</b>		
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	$U_d$	≤ 2.5 V DC
Switching frequency	$f$	1000 Hz
Response time		0.5 ms
<b>Conformity</b>		
Product standard		EN 60947-5-2
<b>Approvals and certificates</b>		
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 Listed 57M3 (Only in association with UL Class 2 power supply; Type 1 enclosure)
CCC approval		CCC approval / marking not required for products rated ≤36 V
<b>Ambient conditions</b>		
Ambient temperature		-40 ... 60 °C (-40 ... 140 °F)
Storage temperature		-40 ... 75 °C (-40 ... 167 °F)
<b>Mechanical specifications</b>		
Housing width		31 mm
Housing height		56.5 mm
Housing depth		13.6 mm
Degree of protection		IP67
Connection		5-pin, M12 x 1 connector
Material		
Housing		Aluminum , Delta-Seal coated
Optical face		glass pane
Connector		metal
Mass		50 g

## Connection Assignment



○ = Light on  
 ● = Dark on

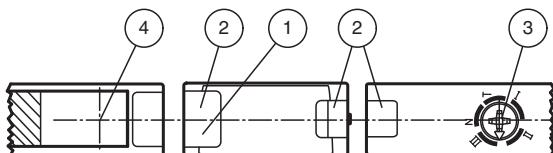
## Connection Assignment



Wire colors in accordance with EN 60947-5-2

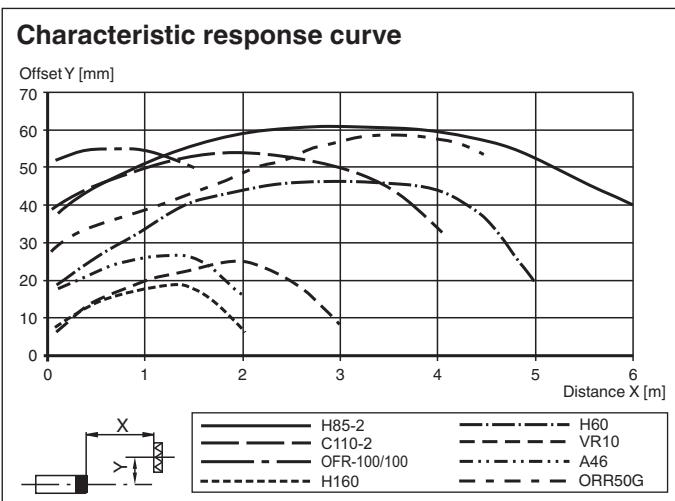
1	BN	(brown)
2	WH	(white)
3	BU	(blue)
4	BK	(black)
5	GY	(gray)

## Assembly

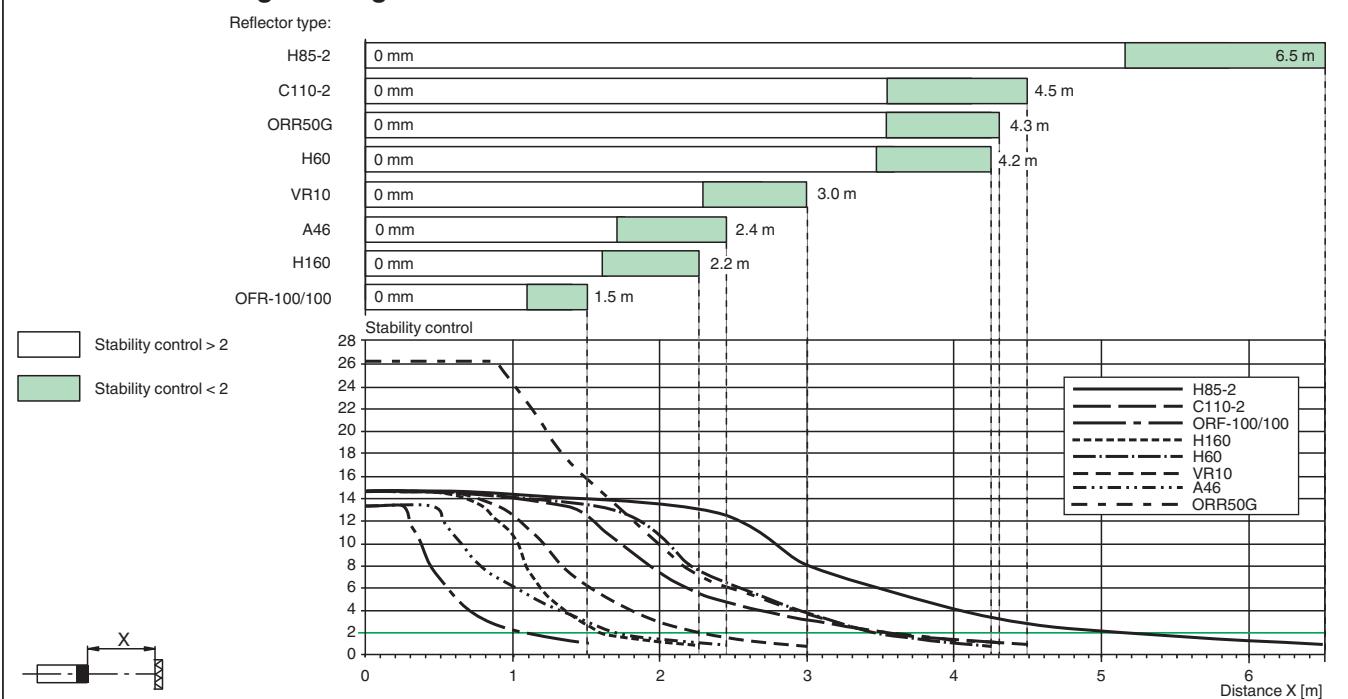


1	Operating display	green
2	Functional display	yellow
3	Teach-In switch	
4	Optical center emitter and receiver	

## Characteristic Curve



## Relative received light strength



## Accessories

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 183433\_eng.pdf

	<b>OMH-09</b>	Mounting bracket for Sensors series MLV41 for M12 rod mounting
	<b>V15-G-2M-PUR</b>	Female cordset single-ended M12 straight A-coded, 5-pin, PUR cable grey
	<b>REF-H85-2</b>	Reflector, rectangular 84.5 mm x 84.5 mm, mounting holes
	<b>REF-H50</b>	Reflector, rectangular 51 mm x 61 mm, mounting holes, fixing strap
	<b>REF-VR10</b>	Reflector, rectangular 60 mm x 19 mm, mounting holes

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

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PEPPERL+FUCHS

## Accessories

	<b>ORR50G</b>	Reflector, rectangular 50.9 mm x 60.9 mm, mounting holes, fixing strap and polarization filter
	<b>OFR-100/100</b>	Reflective tape 100 mm x 100 mm

## Teach-In

## Instructions for the Teach-In mode:

Step	Switch position	LED green	LED yellow	Time/ Frequency	Explanations/ Remarks
1	N	on	flashes	4/s	In switch position "N" aligned with reflector. Reflector detected <b>without functional reserve</b> .
	N	on	on	-	In switch position "N" aligned with reflector. Reflector detected <b>with functional reserve</b> (recommended).
2	T	off/on	on	200 ms	A new switch position is indicated by the green LED going out briefly. This applies also for the selection of the other switch positions.
	T	flashes	flashes	2.5/s	<i>Slow</i> alternating flashing: Teach-In process <b>correctly</b> executed. Max. duration of the Teach-In process: 2 s
	T	flashes	flashes	8/s	<i>Rapid</i> alternating flashing: Teach-In process <b>not correctly</b> executed. (e.g. receiver signal not sufficient, sensor not correctly aligned with 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. bottles made of clear glass)
3/3	III	on	on	-	Contrast detection 40 % is activated. (e.g. tinted glass or intransparent materials)

## Ext. TEACH input:

In switch position "T" it is possible to trigger a Teach-In process and to select the corresponding contrast detection level by the external application of a High pulse of a certain width:

- I: 50 ms (30 ... 80 ms)
- II: 150 ms (120 ... 180 ms)
- III: 250 ms (220 ... 280 ms)
- N: 350 ms (320 ... 380 ms)