Model Number

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

Retroreflective sensor
with 5-pin, M12 x 1 connector

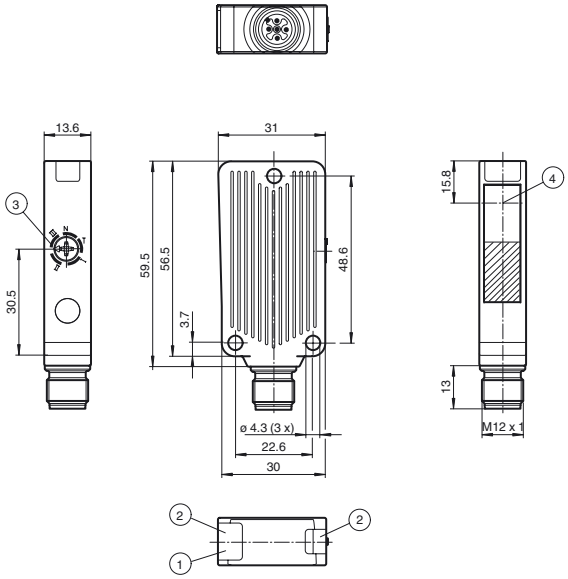
Features

- 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

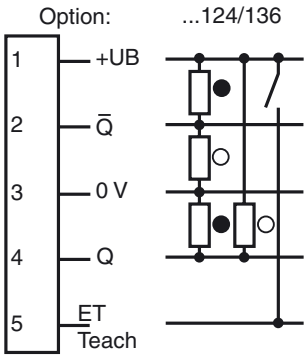
Product information

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 photoelectric 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

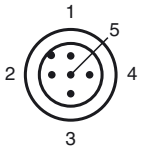


Electrical connection

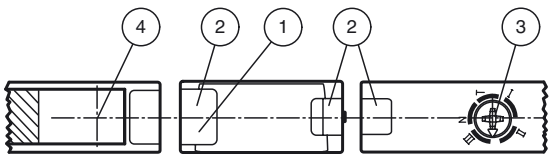


○ = Light on
● = Dark on

Pinout



Indicators/operating means



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

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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. ± 1°
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		
$MTTF_d$		900 a
Mission Time (T_M)		20 a
Diagnostic Coverage (DC)		0 %
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
Electrical specifications		
Operating voltage	U_B	10 ... 30 V DC
Ripple		max. 10 %
No-load supply current	I_0	max. 35 mA
Input		
Function input		Ext. Teach-In input (ET)
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_d	≤ 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 ≤ 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

Accessories

OMH-41
Mounting bracket

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

ORR50G
Reflector, rectangular 50.9 mm x 60.9 mm, mounting holes, fixing strap and polarization filter

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

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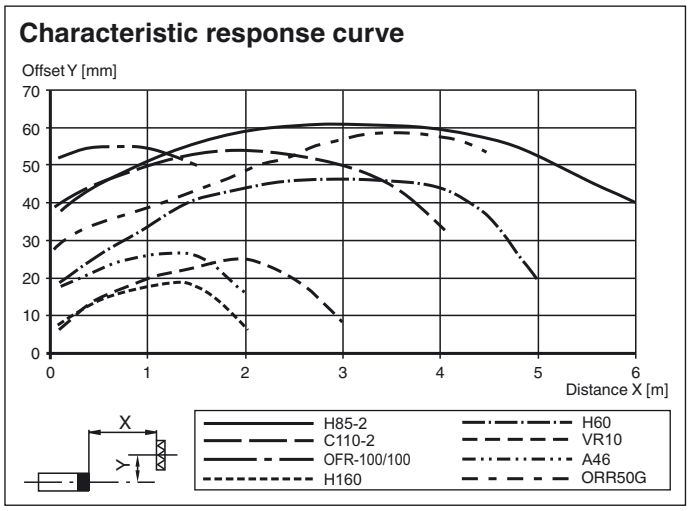
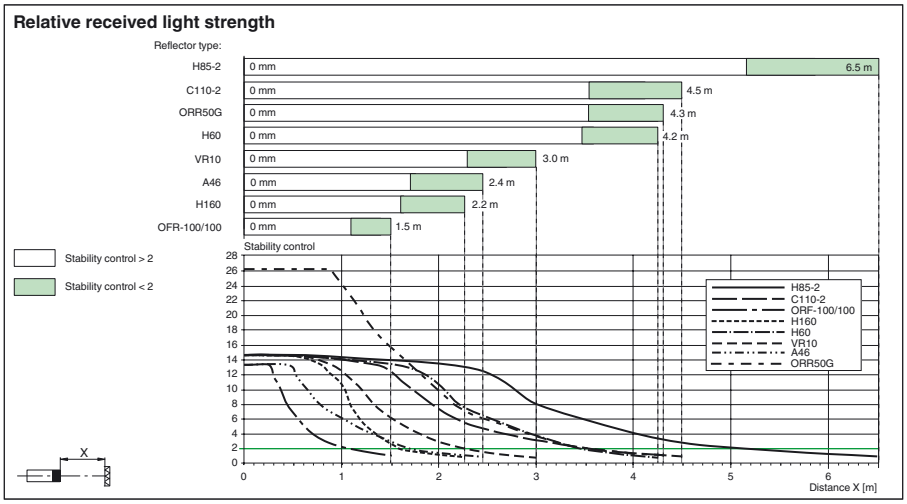
Curves/Diagrams





Additional information

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 **without functional reserve**.
	N	on	on	-	In switch position "N" aligned with reflector. Reflector detected **with functional reserve** (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	*Slow* alternating flashing: Teach-In process **correctly** executed. Max. duration of the Teach-In process: 2 s
	T	flashes	flashes	8/s	*Rapid* alternating flashing: Teach-In process **not correctly** 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)

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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)

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