Retroreflective sensor

MLV41-54-G/98/110

- 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, push-pull output, M8 plug

Function

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.

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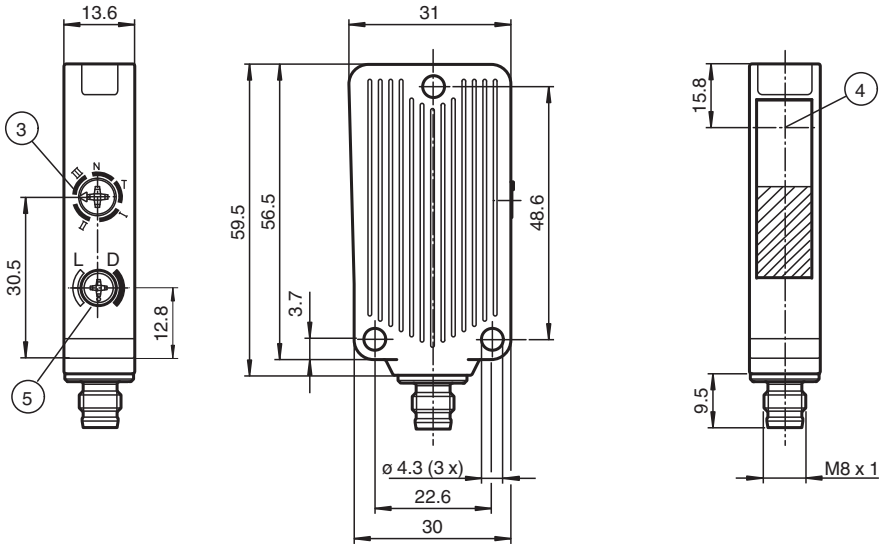
Dimensions



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. ± 1°
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	
$MTTF_d$	900 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	2 LEDs yellow for switching state, stability control, TEACH-IN and contrast detection mode

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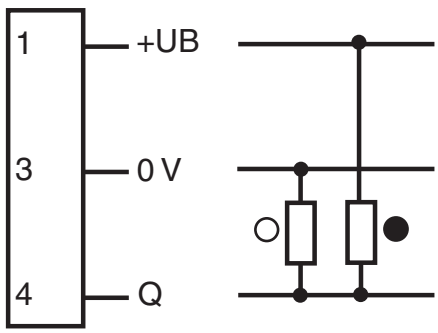
Technical Data

Control elements		rotary switch for light/dark, 5-step switch for contrast recognition adjustment
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
Output		
Signal output		1 push-pull (4 in 1) output, short-circuit protected, 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
Conformity		
Product standard		EN 60947-5-2
Approvals and certificates		
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
Ambient conditions		
Ambient temperature		-40 ... 60 °C (-40 ... 140 °F)
Storage temperature		-40 ... 75 °C (-40 ... 167 °F)
Mechanical specifications		
Housing width		31 mm
Housing height		56.5 mm
Housing depth		13.6 mm
Degree of protection		IP67
Connection		M8 x 1 connector, 3-pin
Material		
Housing		Aluminum , Delta-Seal coated
Optical face		glass pane
Connector		metal
Mass		50 g

Connection Assignment



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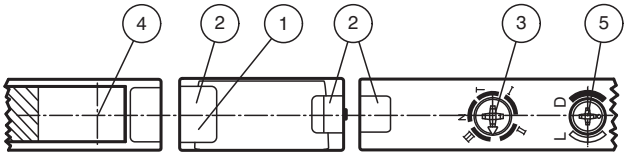
○ = Light on
● = Dark on

Connection Assignment

Wire colors in accordance with EN 60947-5-2

1	BN	(brown)
3	BU	(blue)
4	BK	(black)

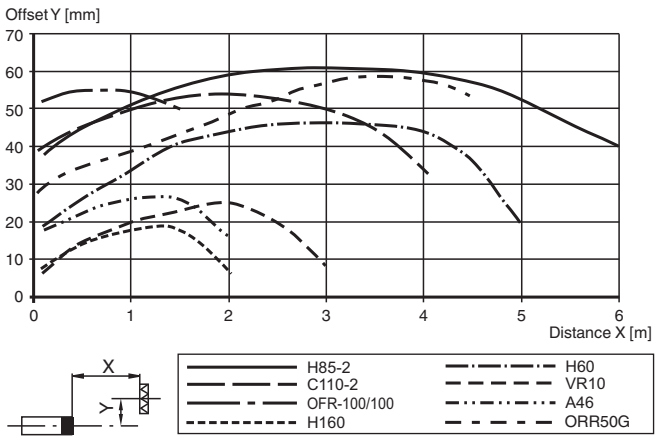
Assembly



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

Characteristic Curve

Characteristic response curve



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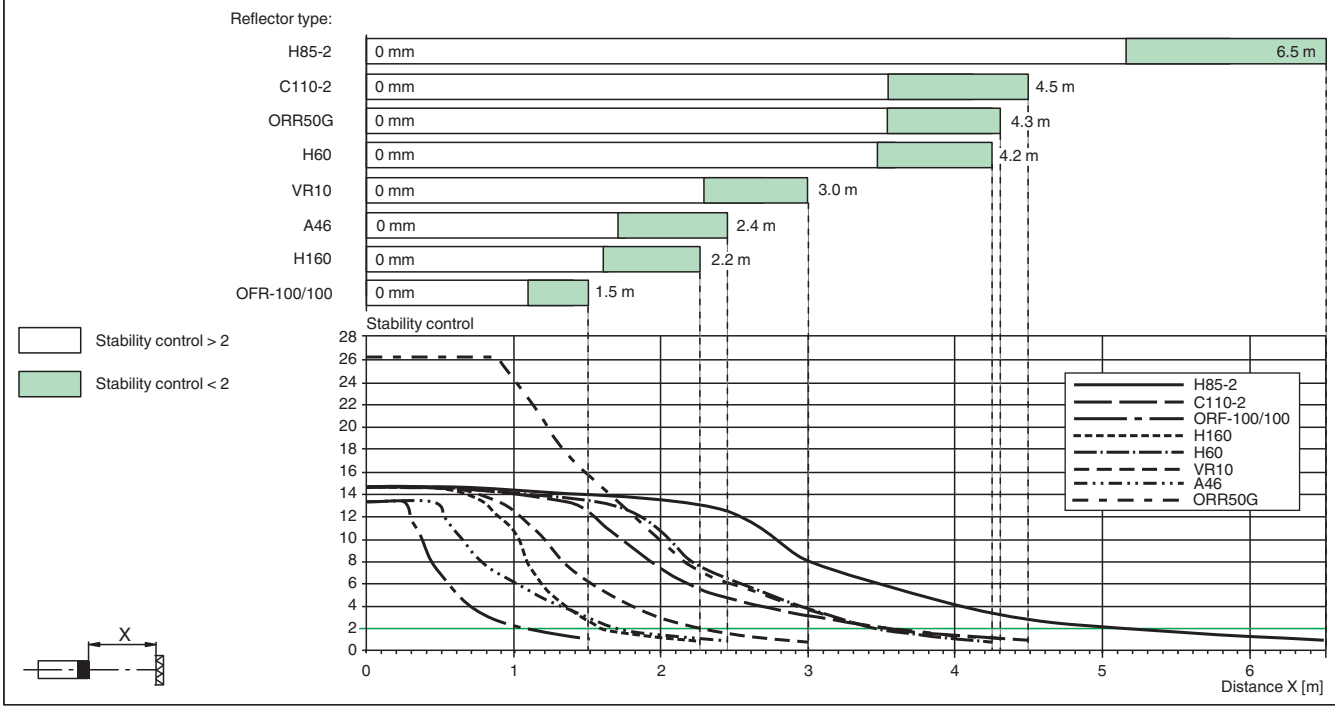
Characteristic Curve

Relative received light strength



Accessories

	**OMH-09**	Mounting bracket for Sensors series MLV41 for M12 rod mounting
	**V3-WM-2M-PUR**	Female cordset single-ended M8 angled A-coded, 3-pin, PUR cable grey
	**REF-H85-2**	Reflector, rectangular 84.5 mm x 84.5 mm, mounting holes
	**REF-H50**	Reflector, rectangular 51 mm x 61 mm, mounting holes, fixing strap
	**REF-VR10**	Reflector, rectangular 60 mm x 19 mm, mounting holes
	**ORR50G**	Reflector, rectangular 50.9 mm x 60.9 mm, mounting holes, fixing strap and polarization filter
	**OFR-100/100**	Reflective tape 100 mm x 100 mm

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Teach-In

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 **without function reserve**.
	N	on	on	-	In switch position "N" directed towards reflector. Reflector detected **with function reserve** (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	*Slow* alternating flashing: Teach-In process has been performed **correctly**. Max. duration of the Teach-In process: 2 s
	T	flashes	flashes	8/s	*Quick* alternating flashing: Teach-In process has **not** been performed **correctly**. (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)
3/3	III	on	on	-	Contrast detection 40 % is activated. (e.g. coloured glass or non-transparent materials)

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