



Model Number

ML7-54-G/25/110/123/143

Retroreflective sensor
with 4-pin, M8 x 1 connector

Features

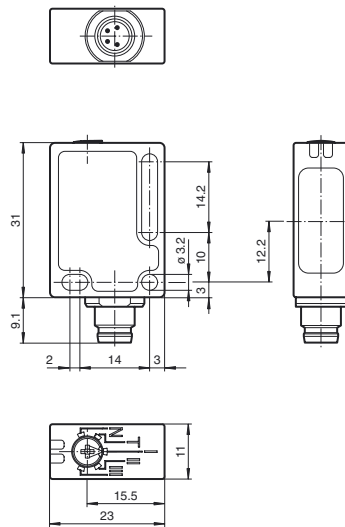
- Reliable sensor for standard applications
- Miniature design with versatile mounting options
- Reliable recognition of reflective objects and clear glass
- Two machines in one: clear object detection or reflection operating mode with long range
- TEACH-IN switch for setting the contrast detection levels
- Automatic adjustment in case of soiling in contrast detection mode
- Certified by ECOLAB

Product information

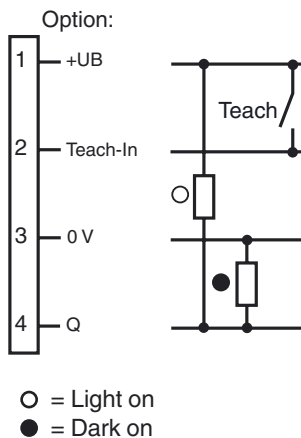
Small, robust, effective, and reliable - these are the properties of the ML7 sensor series. Due to their small size, number of versions, and two different lens positions, they are particularly suited for installation in tight spaces. The robust design and high quality of Pepperl+Fuchs mean they can also be used under harsh environmental conditions. The efficient technology, switching frequencies up to 1000 Hz, high resistance to ambient light, and 4-in-1 output make the series suitable for non-contact object detection.

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Dimensions



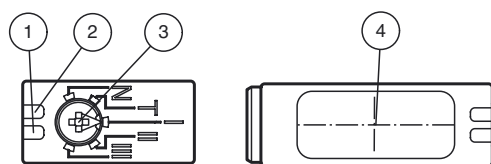
Electrical connection



Pinout



Indicators/operating means



1	Operating display	green
2	Signal display	yellow
3	Teach-In	
4	Optical center	

Technical data**General specifications**

Effective detection range	0 ... 3.5 m in TEACH mode 0 ... 5.7 m at switch position "N"
Reflector distance	0 ... 3.5 m in TEACH mode 0 ... 5.7 m at switch position "N"
Threshold detection range	7.6 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. 40 mm at detection range 1 m
Angle of divergence	1.7 °
Ambient light limit	40000 Lux

Functional safety related parameters

MTTF _d	980 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	LED yellow: switching state ; Stability control ; Teach-In
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 _B	10 ... 30 V DC
Ripple		max. 10 %
No-load supply current	I ₀	< 20 mA at 24 V DC

Input

Function input	Ext. Teach-In input (ET)
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Output

Switching type	light on	
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	
Switching frequency	f	1 kHz
Response time	500 μ s	

Ambient conditions

Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Storage temperature	-40 ... 75 °C (-40 ... 167 °F)

Mechanical specifications

Protection degree	IP67 / IP69K
Connection	M8 x 1 connector, 4-pin
Material	
Housing	PC (glass-fiber-reinforced Makrolon)
Optical face	PMMA
Connector	plastic
Mass	10 g

Compliance with standards and directives

Standard conformity	
Product standard	EN 60947-5-2:2007 IEC 60947-5-2:2007
Standards	EN 50178, UL 508

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
CCC approval	CCC approval / marking not required for products rated ≤ 36 V

Accessories**Montagekit OMH-ML7-01**

Mounting set consisting of bracket OMH-ML-01 sheet OMH-ML7-03, and fastening material

Montagekit OMH-ML7-02

Mounting set consisting of bracket OMH-ML-02 sheet OMH-ML7-03, and fastening material

OMH-ML7-01

Mounting bracket

OMH-ML7-02

Mounting bracket

OMH-ML7-03

Fixing plate

V31-WM-2M-PUR

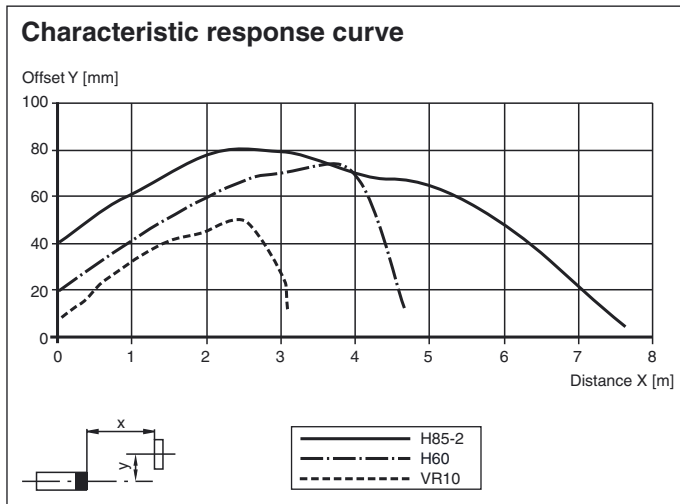
4-pin, M8 socket, PUR cable

V31-GM-2M-PUR

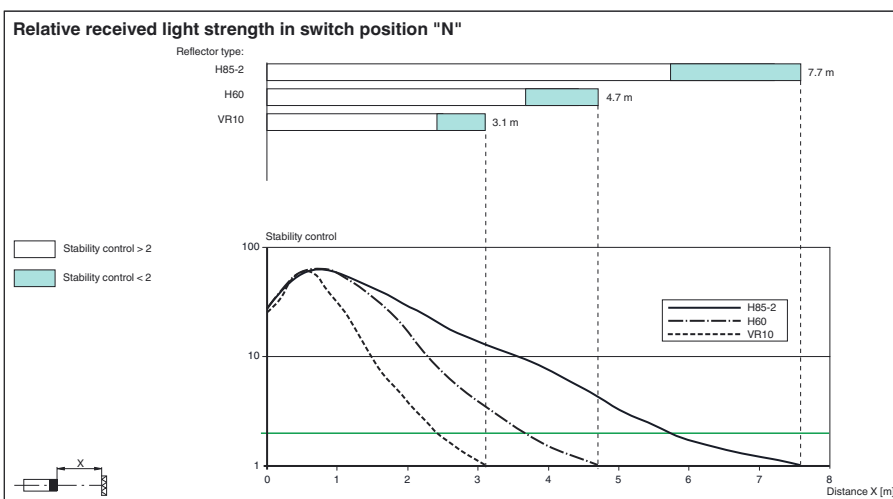
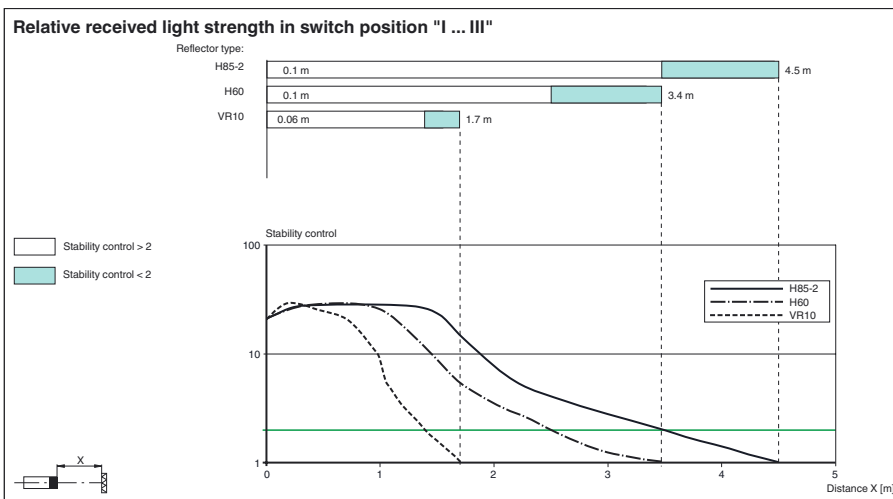
4-pin, M8 socket, PUR cable

Suitable reflectors and cable sockets can be found in the Internet

Curves/Diagrams



Curves/Diagrams



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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	<i>Slow</i> alternating flashing: Teach-In process correctly executed. Max. duration of the Teach-In process: 2 s
	T	flashes	flashes	8/s	<i>Rapid</i> 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)
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)