

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



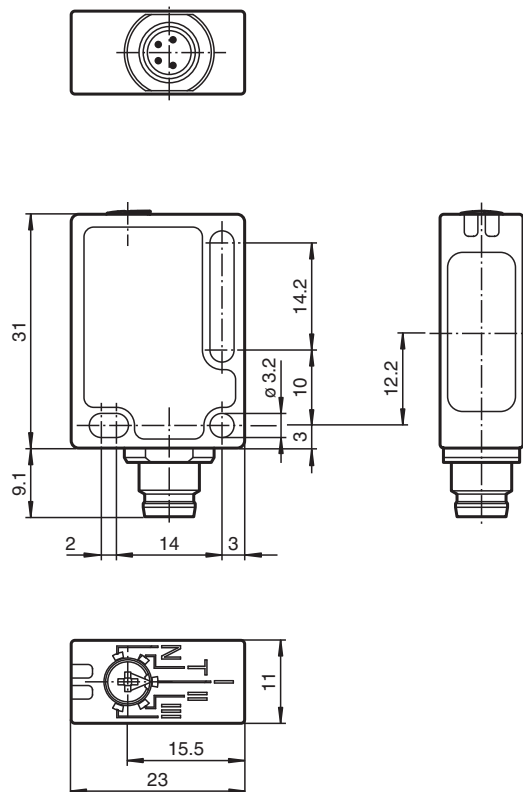
- Reliable sensor for standard applications
- Miniature design with versatile mounting options
- Reliable recognition of reflective objects and clear glass
- Two machines in one: clear object detection or reflection operating mode with long range
- TEACH-IN switch for setting the contrast detection levels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

Retroreflective sensor for standard applications, miniature design, clear object detection, front optical face, 7.6 m detection range, red light, light on, push-pull output, external Teach-In, M8 plug



Function

Dimensions



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	
Polarization filter		yes	
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			
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		LED yellow: switching state ; Stability control ; Teach-In	
Control elements		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	< 20 mA at 24 V DC	
Input			
Function input		Ext. Teach-In input (ET)	
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 μs	
Conformity			
Product standard		EN 60947-5-2	
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	
Ambient conditions			
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F)	
Storage temperature		-40 ... 75 °C (-40 ... 167 °F)	
Mechanical specifications			
Housing width		11 mm	
Housing height		31 mm	
Housing depth		23 mm	
Degree of protection		IP67 / IP69K	
Connection		M8 x 1 connector, 4-pin	

Release date: 2021-09-29 Date of issue: 2021-09-29 Filename: 194194_eng.pdf

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

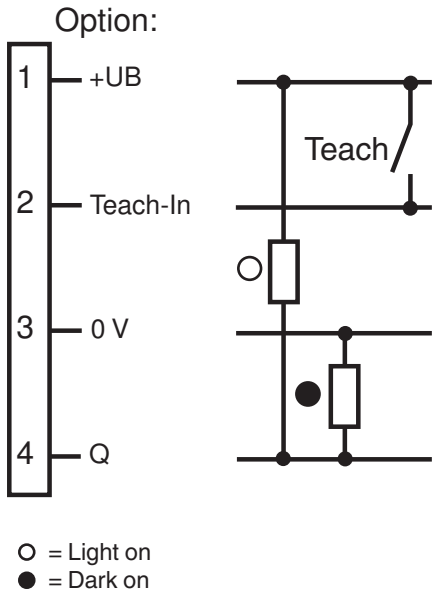
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PEPPERL+FUCHS

Technical Data

Material	
Housing	PC (glass-fiber-reinforced Makrolon)
Optical face	PMMA
Connector	plastic
Mass	10 g

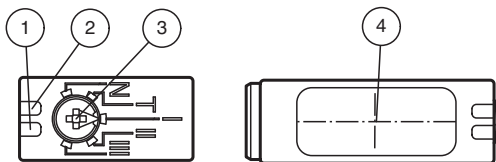
Connection Assignment



Connection Assignment



Assembly

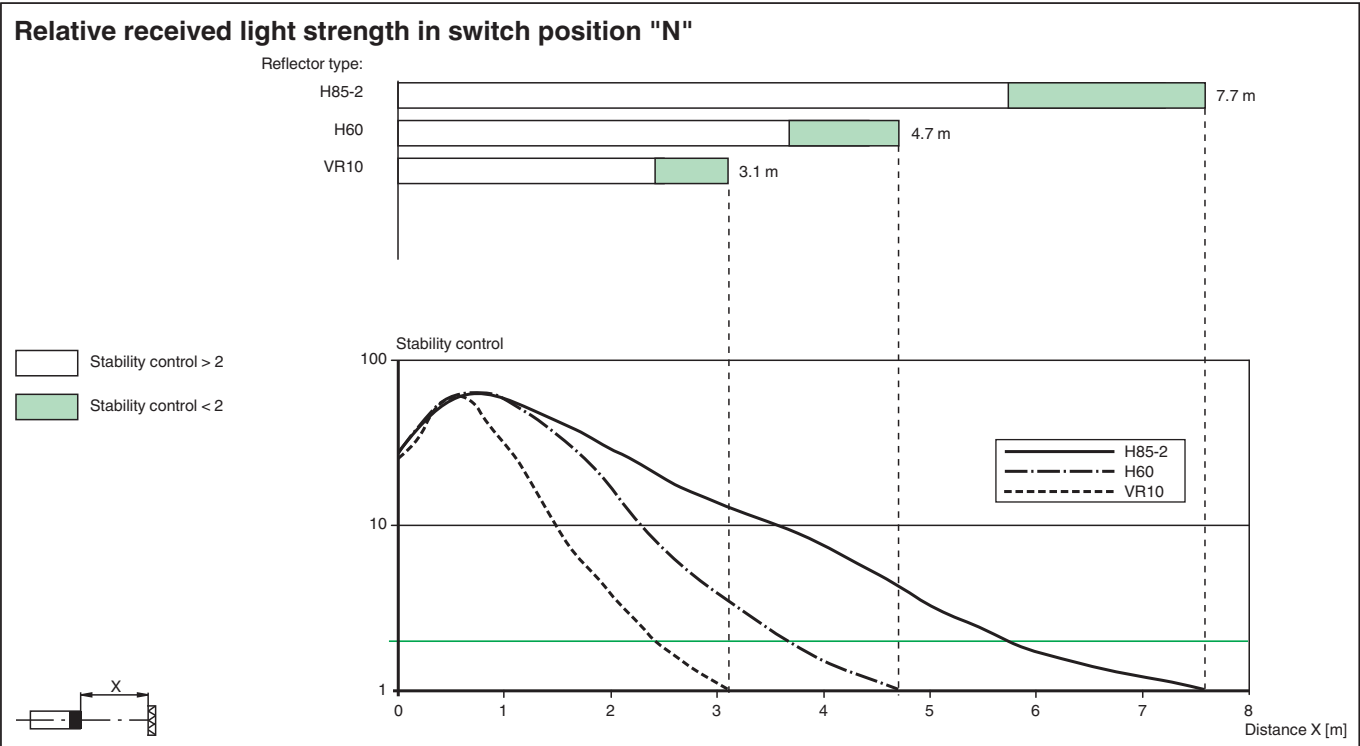
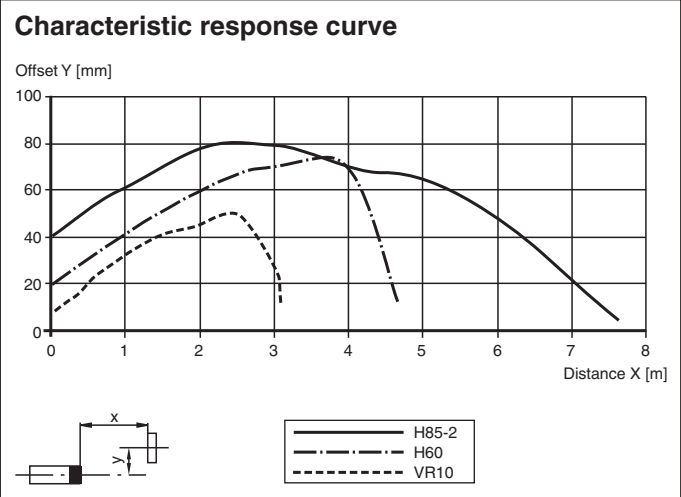


1	Operating display	green
2	Signal display	yellow
3	Teach-In	
4	Optical center	

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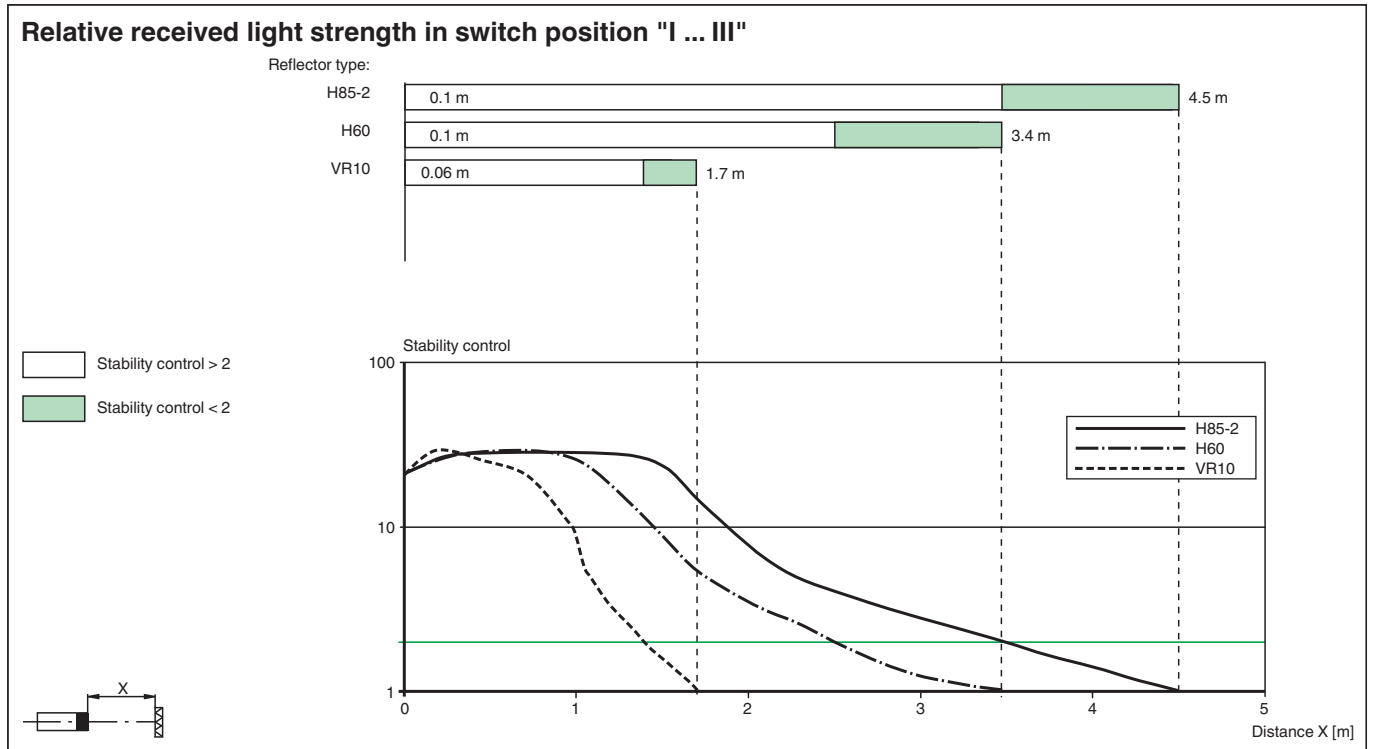
Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

Characteristic Curve



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Characteristic Curve



Accessories

	OMH-ML7-01	Mounting aid for ML7 and ML8 series, Mounting bracket
	V31-WM-2M-PUR	Female cordset single-ended M8 angled A-coded, 4-pin, PUR cable grey
	V31-GM-2M-PUR	Female cordset single-ended M8 straight A-coded, 4-pin, PUR cable grey

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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 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)