Retroreflective sensor

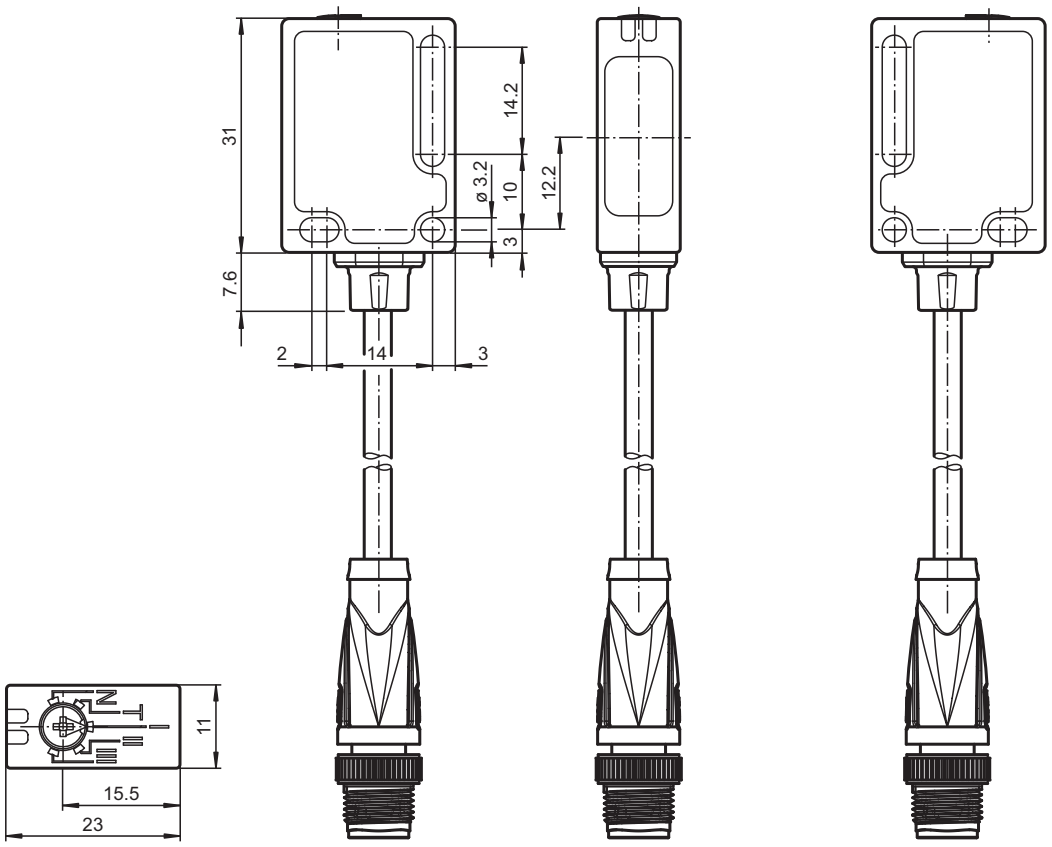
ML7-54-G/33/59/103/115a 0,5M

- Reliable sensor for standard applications
- Miniature design with versatile mounting options
- 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, dark on, PNP output, fixed cable with M8 plug

Function

Dimensions



Technical Data

General specifications

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Technical Data

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. ± 1°
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
Output		
Switching type		dark-on
Signal output		1 PNP output, short-circuit protected, reverse polarity protected, open collector
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		fixed cable 500 mm with 3-pin, M8 x 1 connector
Material		
Housing		PC (glass-fiber-reinforced Makrolon)
Optical face		PMMA

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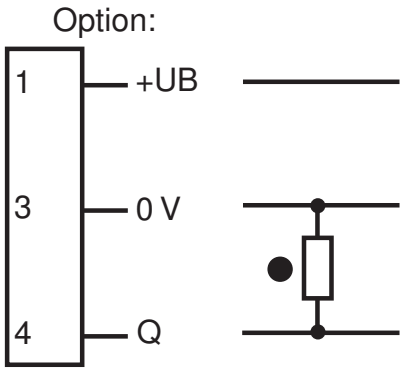
Mass		30 g

Connection Assignment



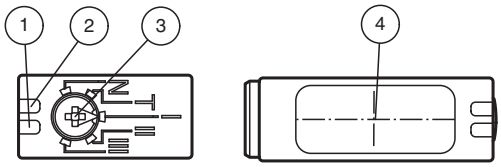
○ = Light on
● = Dark on

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	Signal display	yellow
3	Teach-In	
4	Optical center	

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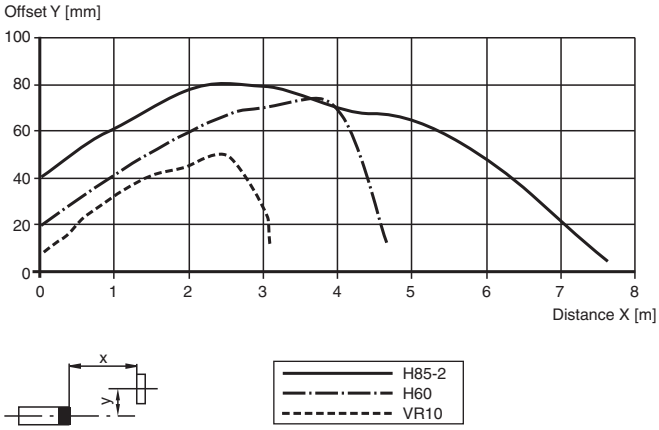
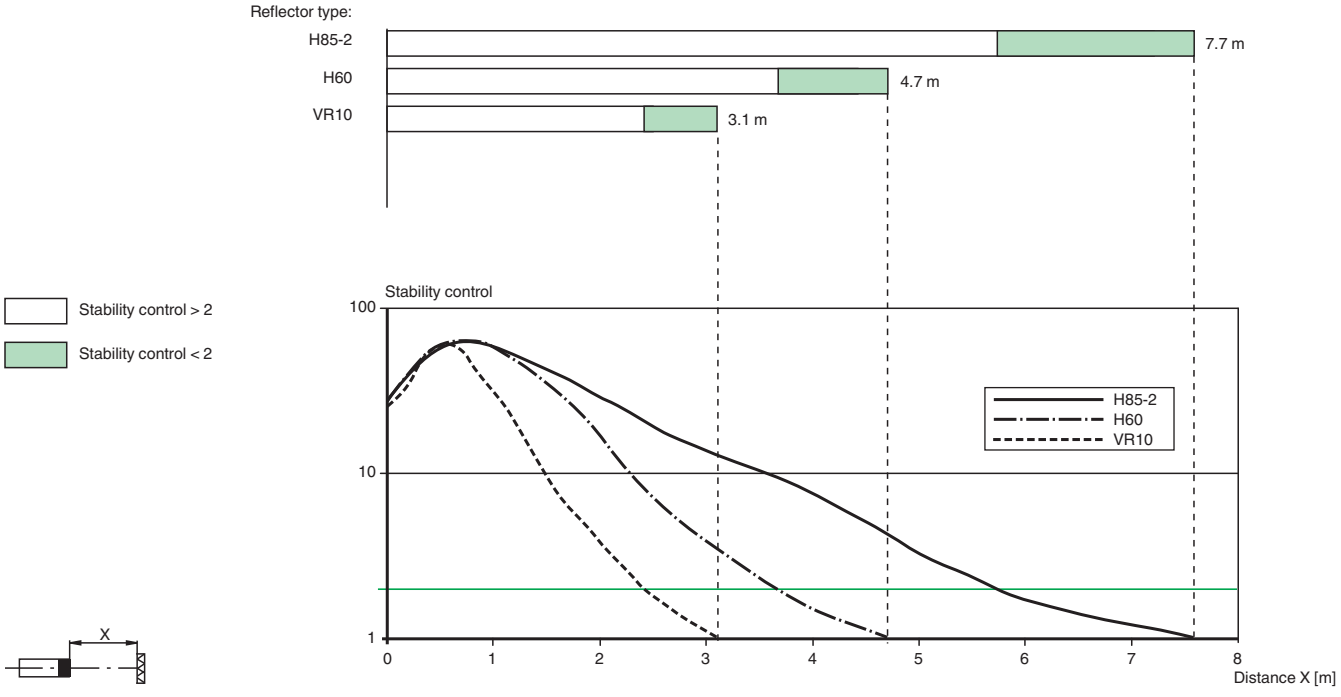
Characteristic Curve

Characteristic response curve



Relative received light strength in switch position "N"



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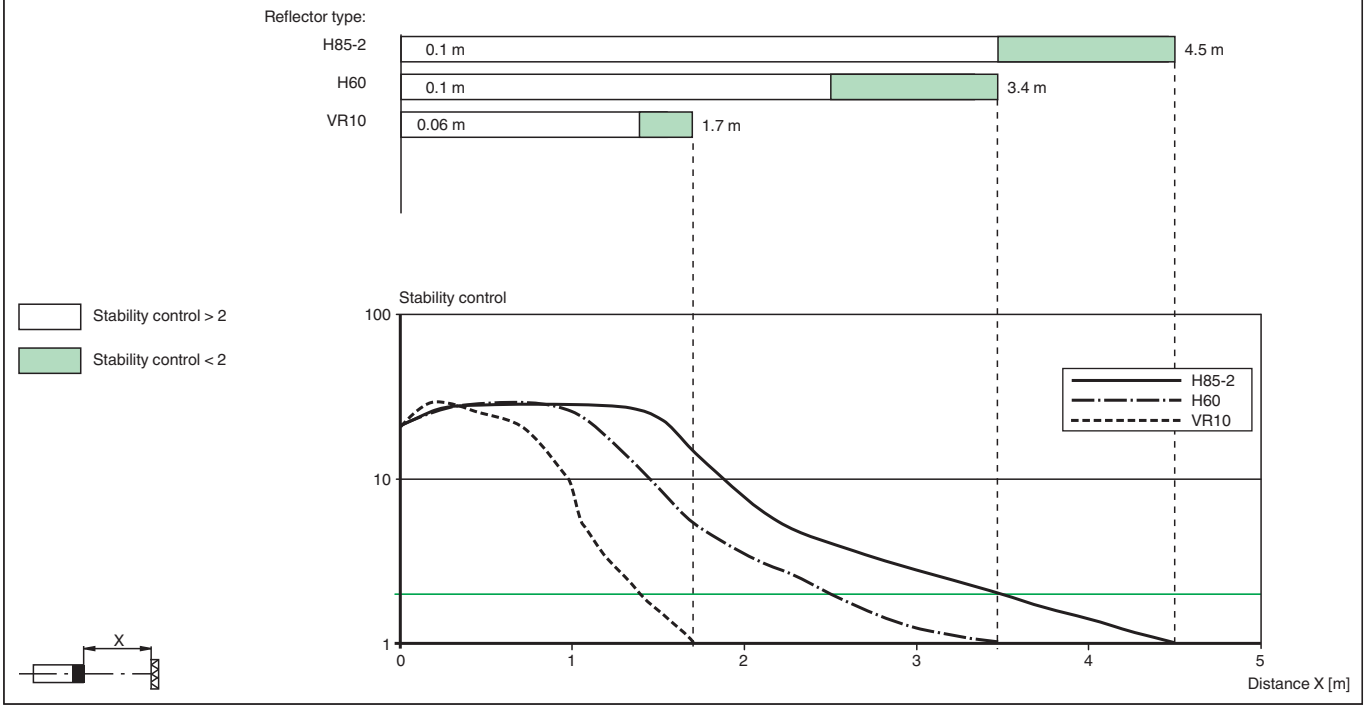
Characteristic Curve

Relative received light strength in switch position "I ... III"



Accessories

	OMH-ML7-01	Mounting aid for ML7 and ML8 series, Mounting bracket

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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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