Model Number

ML4.2-P-8m-RT/40b/76a/95/110

Thru-beam sensor

with 4-pin, M8 x 1 connector

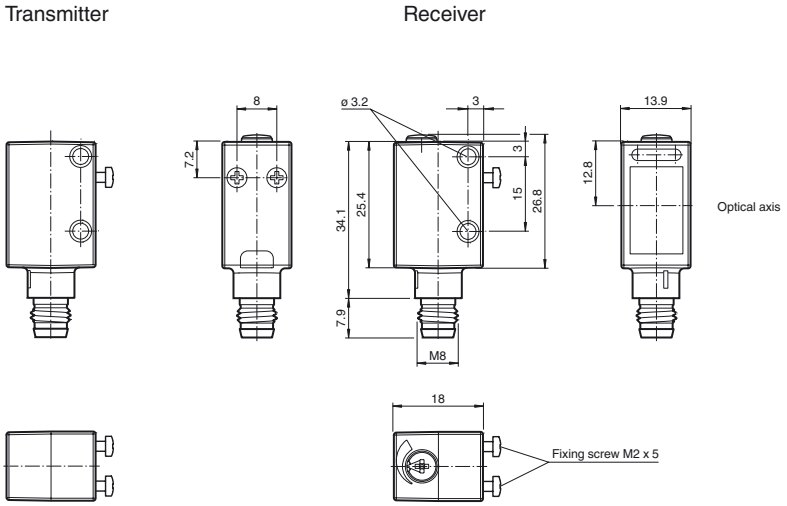
Features

- Short response time
- Highly visible LEDs for Power-On, switching status, short-circuit, and undervoltage
- Test input
- Metal-reinforced fastening holes
- Optical surface made of scratch-resistant glass
- Push-pull output

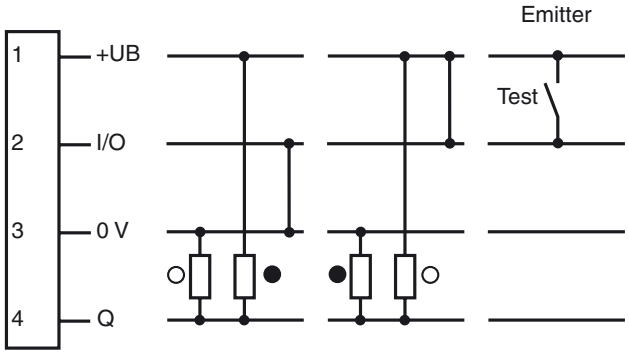
Product information

The ML4.2 series is characterized by a robust, powerful and standard design in a miniature housing. The housing offers IP67/ IP69K degree of protection, a scratch- and chemical-resistant lens, highly visible LEDs and robust all-metal bushings for mounting. Adjustable and tamper-proof sensors are available with a universal push-pull output and an electrical light ON/dark ON switch. The sensors have a high ambient light limit. Reflections from the background are suppressed. The unusually small, sharp light spot and the quick response time offer maximum switching precision on object edges.. Both red and infrared light sources are available. A high-performance fixed focus background suppressor is a useful feature. The sensors are suitable for precise object detection and open up a wide range of application fields.

Dimensions



Electrical connection



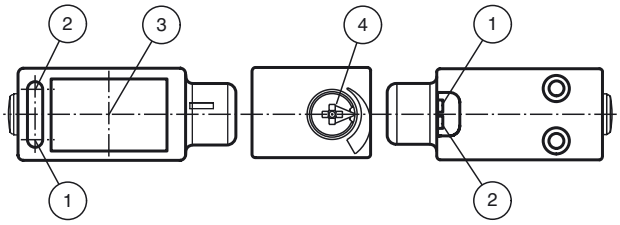
○ = Light on
● = Dark on

Pinout

Wire colors in accordance with EN 60947-5-2

1	BN	(brown)
2	WH	(white)
3	BU	(blue)
4	BK	(black)

Indicators/operating means



1	Operating display	green
2	Signal display (only Receiver)	yellow
3	Optical axis	
4	Sensitivity adjustment (only Receiver)	

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Technical data

System components		
Emitter		ML4.2-T-8m-RT/76a/95
Receiver		ML4.2-R/40b/95/110
General specifications		
Effective detection range		0 ... 8000 mm
Threshold detection range		10000 mm
Light source		LED
Light type		modulated visible red light
Target size		min. 7 mm
Diameter of the light spot		300 mm at 8000 mm detection range
Angle of divergence		approx. 2 °
Ambient light limit		
Continuous light		40000 Lux
Modulated light		5000 Lux
Functional safety related parameters		
$MTTF_d$		550 a
Mission Time (T_M)		20 a
Diagnostic Coverage (DC)		60 %
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, lights up with receiver lit flashes when falling short of the stability control
Control elements		sensitivity adjustment
Electrical specifications		
Operating voltage	U_B	10 ... 30 V DC
Ripple		< 10 %
No-load supply current	I_0	< 15 mA at 24 V DC
Input		
Test input		emitter deactivation at $+U_B$
Output		
Switching type		light/dark on electrically switchable
Signal output		Push-pull 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	2000 Hz
Response time		250 µs
Conformity		
Product standard		EN 60947-5-2
Ambient conditions		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F)
Storage temperature		-20 ... 75 °C (-4 ... 167 °F)
Mechanical specifications		
Housing width		13.9 mm
Housing height		31.4 mm
Housing depth		18 mm
Degree of protection		IP67 / IP69K
Connection		M8 x 1 connector, 4-pin
Material		
Housing		ABS
Optical face		glass pane
Mass		15 g (device)
Compliance with standards and directives		
Standard conformity		
Shock and impact resistance		IEC / EN 60068. half-sine, 40 g in each X, Y and Z directions
Vibration resistance		IEC / EN 60068-2-6. Sinus. 10 -2000 Hz, 10 g in each X, Y and Z directions
Approvals and certificates		
CE conformity		yes
UL approval		cULus Listed
CCC approval		CCC approval / marking not required for products rated ≤36 V

Accessories

OMH-4.1
Mounting Clamp

OMH-ML6
Mounting bracket

OMH-ML6-U
Mounting bracket

OMH-ML6-Z
Mounting bracket

OMH-11-02 Aperture-V-H 0.5 mm
Slit diaphragm can be affixed for detecting very small parts

OMH-11-04 Aperture-V-H 1.0 mm
Slit diaphragm can be affixed for detecting very small parts

OMH-11-06 Aperture-V-H 1.5 mm
Slit diaphragm can be affixed for detecting very small parts

OMH-11-08 Aperture-V-H 2.0 mm
Slit diaphragm can be affixed for detecting very small parts

V31-GM-2M-PVC
Female cordset single-ended, M8, 4-pin, PVC cable

V31-WM-2M-PVC
Female cordset single-ended, M8, 4-pin, PVC cable

Other suitable accessories can be found at www.pepperl-fuchs.com

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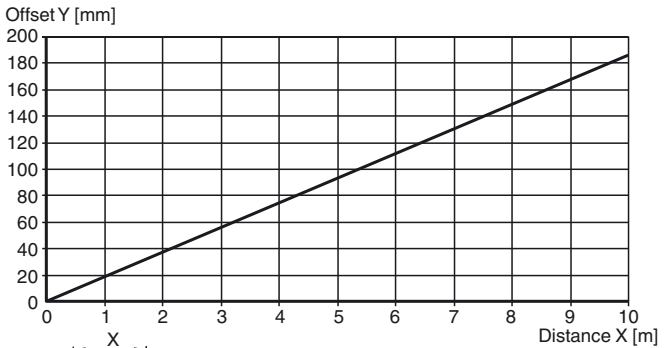
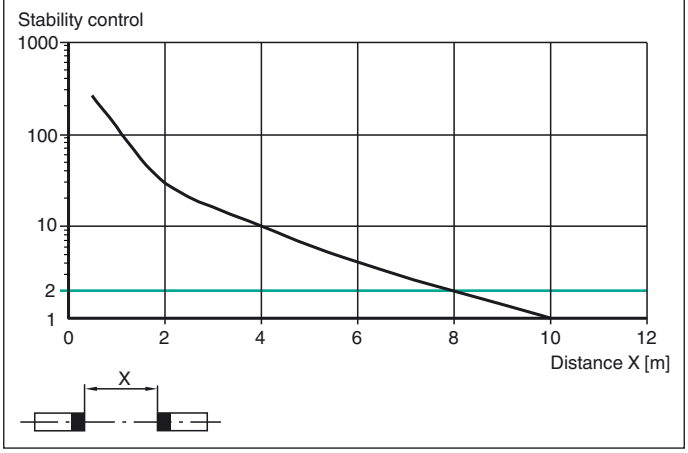
Curves/Diagrams

Characteristic response curve



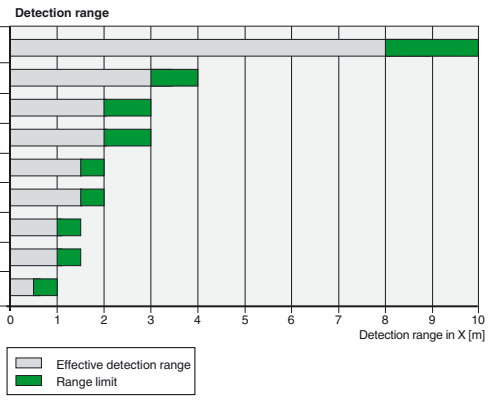
Relative received light strength



Curves/Diagrams

To aid in the detection of small objects, various apertures OMH-11-... can be placed on the sensors.
This results in different detection ranges:

Aperture	Aperture type	Min. object size
No aperture		7.0 mm
OMH-11-08	Vertical	2.0 mm
OMH-11-08	Horizontal	2.0 mm
OMH-11-06	Vertical	1.5 mm
OMH-11-06	Horizontal	1.5 mm
OMH-11-04	Vertical	1.0 mm
OMH-11-04	Horizontal	1.0 mm
OMH-11-02	Vertical	0.5 mm
OMH-11-02	Horizontal	0.5 mm



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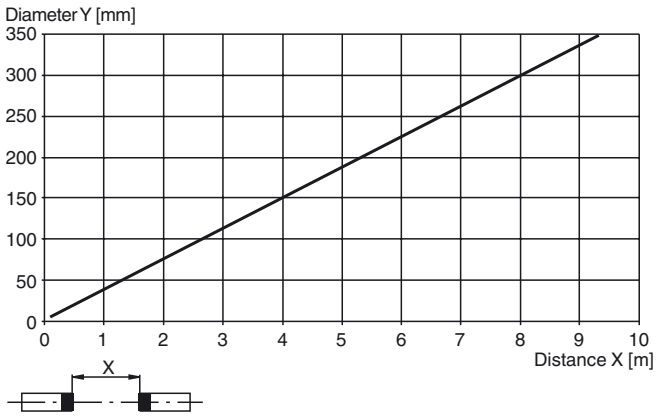
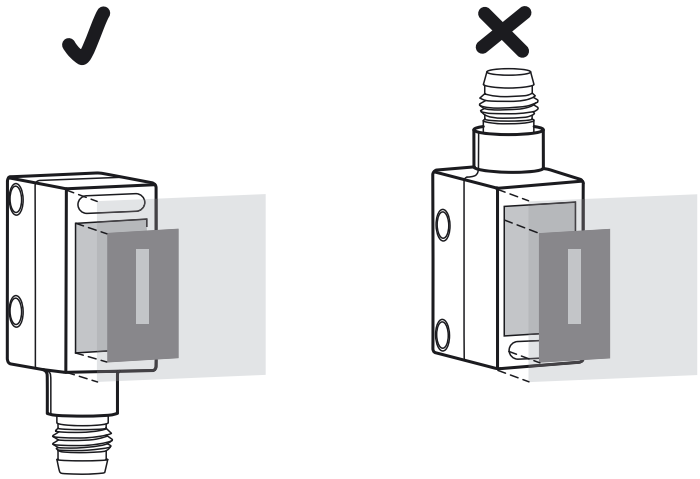
Light spot diameter



Aperture alignment

When attaching the aperture, make sure that the sensor lens is aligned exactly with the black aperture.



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