



### Model Number

**ML4.2-P-20m-LAS/40b/76a/95/110**

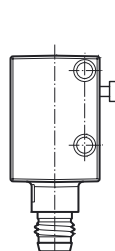
Thru-beam sensor  
with 4-pin, M8 x 1 connector

### Features

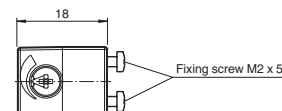
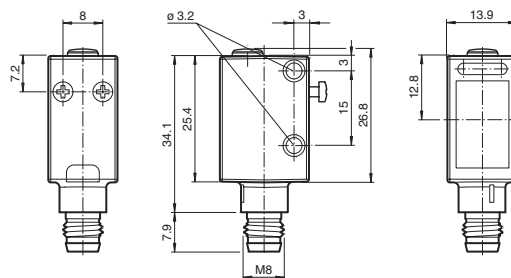
- Miniature design
- Small light beam diameter for detection of small parts
- Very short response time
- Red laser as the light emitter
- Test input
- Not sensitive to ambient light, even with switched energy saving lamps
- Protected against mutual interference (no cross-talk)
- Metal-reinforced fastening holes

### Dimensions

Transmitter

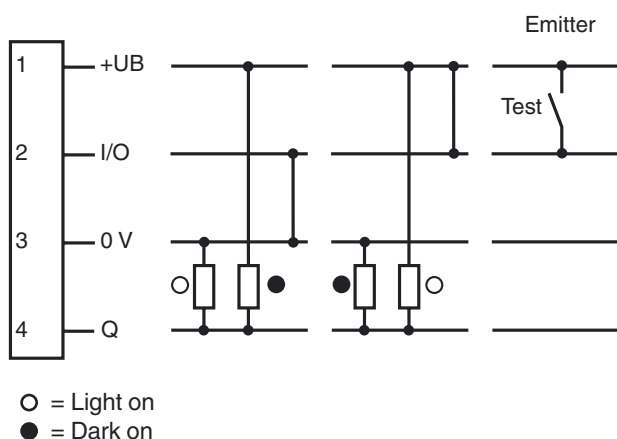


Receiver



Optical axis

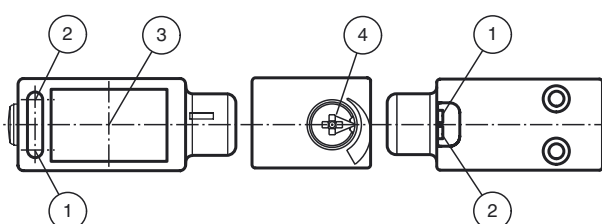
### Electrical connection



### Pinout



### Indicators/operating means



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

## Technical data

### System components

Emitter	ML4.2-T-20m-LAS/76a/95
Receiver	ML4.2-R-20m-LAS/40b/95/110

### General specifications

Effective detection range	0 ... 20 m
Threshold detection range	30 m
Light source	Laser
Light type	modulated visible red light
Laser nominal ratings	
Note	LASER LIGHT , DO NOT STARE INTO BEAM
Laser class	1
Wave length	680 nm
Beam divergence	1.5 mrad
Pulse length	1 µs
Repetition rate	approx. 33 kHz
max. pulse energy	< 8.3 nJ
Target size	min. 7 mm
Diameter of the light spot	40 mm at detection range 20 m
Angle of divergence	approx. 0.1 °
Ambient light limit	
Continuous light	40000 Lux
Modulated light	5000 Lux

### Functional safety related parameters

MTTF <sub>d</sub>	550 a
Mission Time (T <sub>M</sub> )	20 a
Diagnostic Coverage (DC)	60 %

### 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, lights up with receiver lit flashes when falling short of the stability control
Controls	sensitivity adjustment

### Electrical specifications

Operating voltage	U <sub>B</sub>	10 ... 30 V DC
Ripple		< 10 %
No-load supply current	I <sub>0</sub>	< 15 mA at 24 V DC

### Input

Test input	emitter deactivation at +U <sub>B</sub>
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### 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 <sub>d</sub>	≤ 2.5 V DC
Switching frequency	f	4000 Hz
Response time	125 μs	

### Ambient conditions

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

### Mechanical specifications

Protection degree	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

Directive conformity	
EMC Directive 2004/108/EC	EN 60947-5-2:2007
Standard conformity	
Product standard	EN 60947-5-2:2007 IEC 60947-5-2:2007
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
Laser class	IEC 60825-1:2007 EN 60825-1:2007

### Approvals and certificates

CE conformity	yes
UL approval	cULus Listed

## 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

M8, 4-pin socket, PVC cable

### V31-WM-2M-PVC

M8, 4-pin socket, PVC cable

### V31-GM-5M-PUR

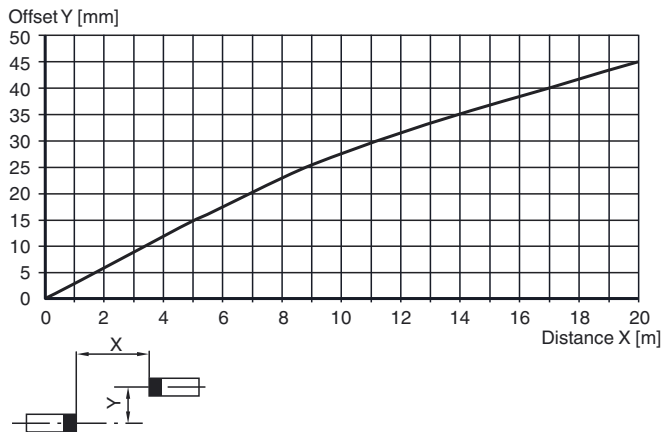
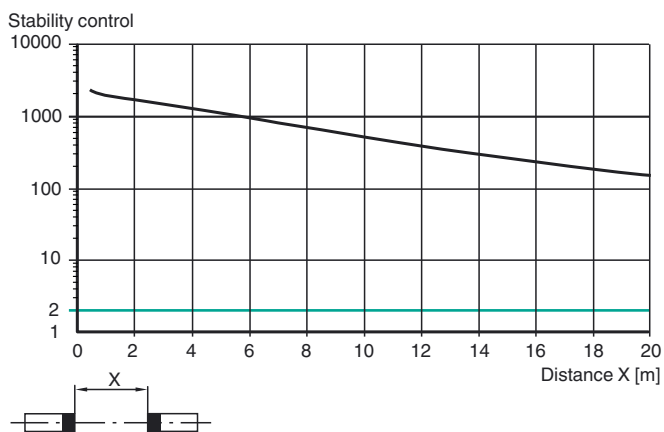
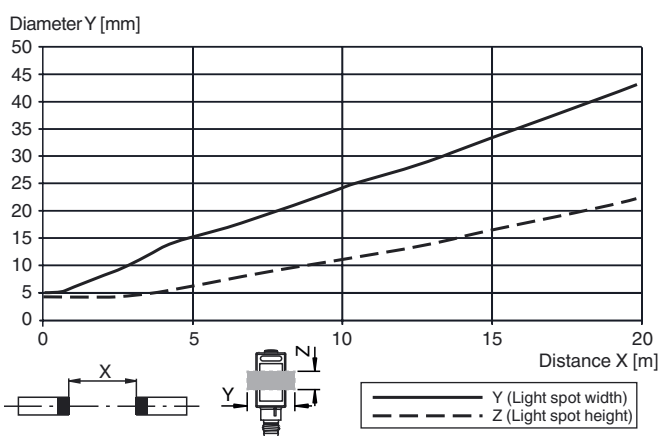
4-pin, M8 socket, PUR cable

### V31-WM-5M-PUR

4-pin, M8 socket, PUR cable

Other suitable accessories can be found at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

CCC approval

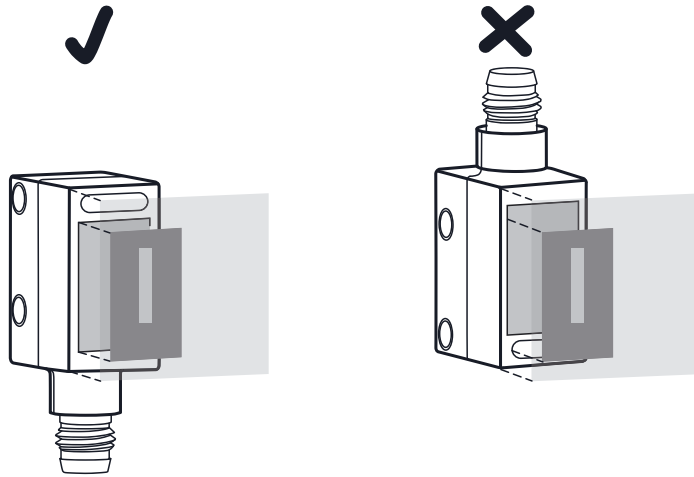
CCC approval / marking not required for products rated  $\leq 36$  V**Curves/Diagrams****Characteristic response curve****Relative received light strength****Light spot diameter****Aperture alignment**

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

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



#### Laser notice laser class 1

- The irradiation can lead to irritation especially in a dark environment. Do not point at people!
- Maintenance and repairs should only be carried out by authorized service personnel!
- Attach the device so that the warning is clearly visible and readable.
- The warning accompanies the device and should be attached in immediate proximity to the device.
- Caution – Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.