



## Retroreflective sensor

MLV12-54-LAS/76b/110/115



- Series of sensors in a widely used standard housing
- Visible red light, pulsed LASER light
- Precision: high degree of repeatability thanks to small light spot
- Objects can be reliably detected down to 0 mm: no blind zone
- Resistant against noise: reliable operation under all conditions
- High level of stability thanks to the metal housing frame

Laser retroreflective sensor, small design, polarization filter, 21 m detection range, laser red light, light/dark on, push-pull output, test input, fixed cable



### Safety Information

#### Laser Class 1 Information

The irradiation can lead to irritation especially in a dark environment. Do not point at people!

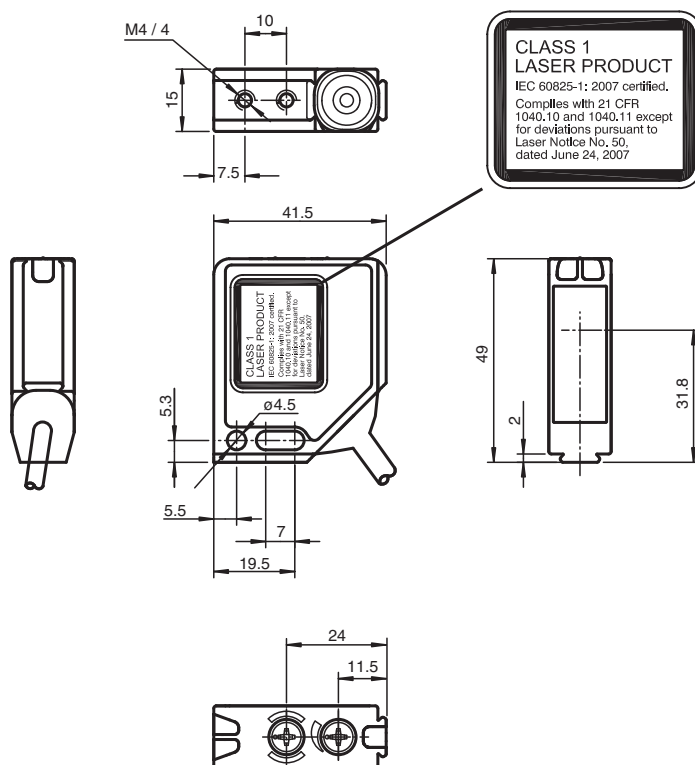
Maintenance and repairs should only be carried out by authorized service personnel!

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.

## Dimensions



## Technical Data

### General specifications

|                            |                                              |
|----------------------------|----------------------------------------------|
| Effective detection range  | 0 ... 12 m                                   |
| Reflector distance         | 0 ... 12 m                                   |
| Threshold detection range  | 17 m                                         |
| Reference target           | MH82 reflector                               |
| Light source               | laser diode                                  |
| Light type                 | modulated visible red light                  |
| Polarization filter        | yes                                          |
| Laser nominal ratings      |                                              |
| Note                       | LASER LIGHT , DO NOT STARE INTO BEAM         |
| Laser class                | 1                                            |
| Wave length                | 650 nm                                       |
| Beam divergence            | < 1.5 mrad                                   |
| Pulse length               | 1.8 µs                                       |
| Repetition rate            | 17.86 kHz                                    |
| max. pulse energy          | 6.7 nJ                                       |
| Diameter of the light spot | approx. 5 mm x 12 mm at 15 m detection range |
| Opening angle              | 0.02 °                                       |
| Ambient light limit        |                                              |
| Continuous light           | 50000 Lux                                    |
| Modulated light            | 5000 Lux                                     |

### Functional safety related parameters

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

Pepperl+Fuchs Group  
www.pepperl-fuchs.com

USA: +1 330 486 0001  
fa-info@us.pepperl-fuchs.com

Germany: +49 621 776 1111  
fa-info@de.pepperl-fuchs.com

Singapore: +65 6779 9091  
fa-info@sg.pepperl-fuchs.com

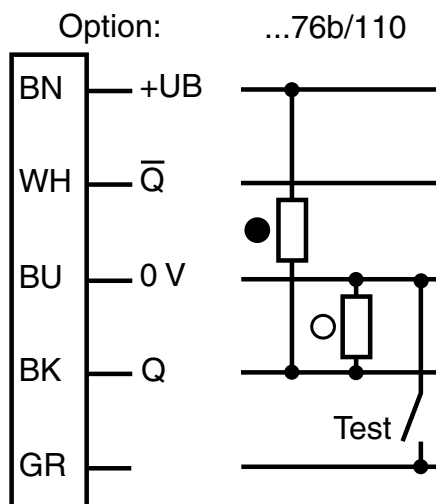
**PEPPERL+FUCHS**

## Technical Data

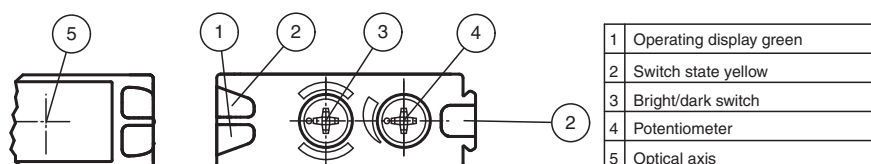
|                                                 |                |                                                                                                                                        |
|-------------------------------------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------|
| MTTF <sub>d</sub>                               |                | 930 a                                                                                                                                  |
| Mission Time (T <sub>M</sub> )                  |                | 10 a                                                                                                                                   |
| Diagnostic Coverage (DC)                        |                | 90 %                                                                                                                                   |
| <b>Indicators/operating means</b>               |                |                                                                                                                                        |
| Operation indicator                             |                | LED green, flashes in case of short-circuit                                                                                            |
| Function indicator                              |                | 2 LEDs yellow, light up when light beam is free, flash when falling short of the stability control, off when light beam is interrupted |
| Control elements                                |                | rotary switch for light/dark, sensitivity adjuster                                                                                     |
| <b>Electrical specifications</b>                |                |                                                                                                                                        |
| Operating voltage                               | U <sub>B</sub> | 10 ... 30 V DC                                                                                                                         |
| Ripple                                          |                | max. 10 %                                                                                                                              |
| No-load supply current                          | I <sub>0</sub> | max. 40 mA                                                                                                                             |
| <b>Input</b>                                    |                |                                                                                                                                        |
| Test input                                      |                | emitter deactivation at 0 V                                                                                                            |
| <b>Output</b>                                   |                |                                                                                                                                        |
| Switching type                                  |                | light/dark on switchable                                                                                                               |
| Signal output                                   |                | 1 push-pull (4 in 1) output, short-circuit protected, reverse polarity protected                                                       |
| Switching voltage                               |                | max. 30 V DC                                                                                                                           |
| Switching current                               |                | max. 0.1 A                                                                                                                             |
| Voltage drop                                    | U <sub>d</sub> | ≤ 2.5 V DC                                                                                                                             |
| Switching frequency                             | f              | 2500 Hz                                                                                                                                |
| Response time                                   |                | 0.2 ms                                                                                                                                 |
| <b>Conformity</b>                               |                |                                                                                                                                        |
| Product standard                                |                | EN 60947-5-2                                                                                                                           |
| Laser safety                                    |                | IEC 60825-1:2007 Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007   |
| <b>Compliance with standards and directives</b> |                |                                                                                                                                        |
| 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 -150 Hz, 5 g in each X, Y and Z directions                                                               |
| Laser class                                     |                | IEC 60825-1:2007 Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007   |
| <b>Approvals and certificates</b>               |                |                                                                                                                                        |
| EAC conformity                                  |                | TR CU 020/2011                                                                                                                         |
| Protection class                                |                | II, rated voltage ≤ 300 V AC with pollution degree 1-2 according to IEC 60664-1                                                        |
| UL approval                                     |                | cULus Listed, Type 1 enclosure                                                                                                         |
| CCC approval                                    |                | CCC approval / marking not required for products rated ≤36 V                                                                           |
| <b>Ambient conditions</b>                       |                |                                                                                                                                        |
| Ambient temperature                             |                | -10 ... 50 °C (14 ... 122 °F)                                                                                                          |
| Storage temperature                             |                | -20 ... 65 °C (-4 ... 149 °F)                                                                                                          |
| <b>Mechanical specifications</b>                |                |                                                                                                                                        |
| Housing width                                   |                | 41.5 mm                                                                                                                                |
| Housing height                                  |                | 49 mm                                                                                                                                  |
| Housing depth                                   |                | 15 mm                                                                                                                                  |
| Degree of protection                            |                | IP67                                                                                                                                   |
| Connection                                      |                | 2500 mm fixed cable , PUR                                                                                                              |
| <b>Material</b>                                 |                |                                                                                                                                        |
| Housing                                         |                | Frame: nickel plated, die cast zinc,<br>Laterals: glass-fiber reinforced plastic PC                                                    |
| Optical face                                    |                | Plastic pane                                                                                                                           |
| Mass                                            |                | 60 g                                                                                                                                   |

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## Connection Assignment



## Assembly



## Relative received light strength

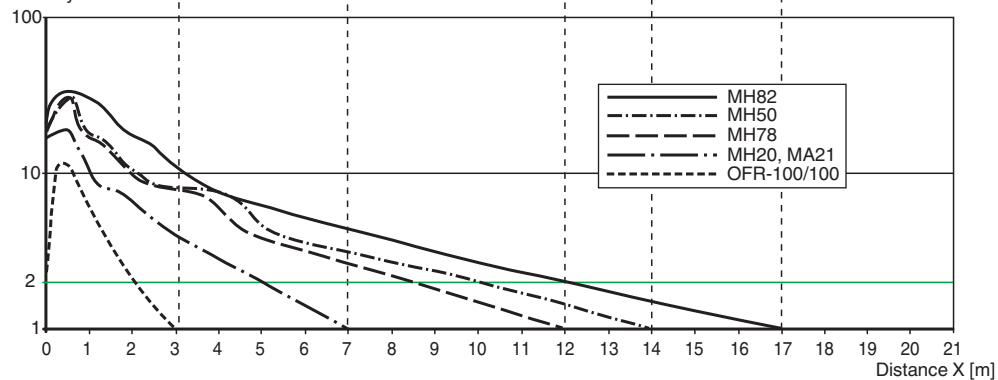
Reflector type:

|            |      |      |
|------------|------|------|
| MH82       | 0 mm | 17 m |
| MH50       | 0 mm | 14 m |
| MH78       | 0 mm | 12 m |
| MH20, MA21 | 0 mm | 7 m  |
| OFR100/100 | 0 mm | 3 m  |

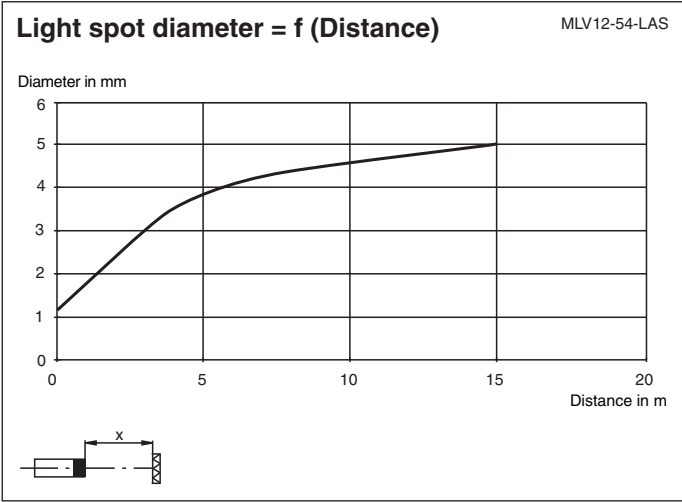
Stability control > 2

Stability control < 2

Stability control



Characteristic Curve



System Description

**System Description**  
The retro-reflective sensor contains both an emitter and a receiver in a single housing. A reflector reflects the light from emitter back to the receiver. If an object interrupts the light beam, the switching function is initiated.

Installation

**Mounting**  
The sensors can be secured directly using thru-holes or using a mounting bracket or mounting clamp. Mounting brackets and clamping elements are available as accessories.  
Ensure that the background is level to prevent the housing from becoming distorted when the fittings are tightened.  
Secure the nut and screw with spring disks to prevent the sensor from becoming misaligned.

Commissioning

**Aligning the sensor:** Apply the operating voltage to the sensor. The operating indicator lights up green.  
Mount a suitable reflector opposite the light barrier. Roughly align the sensor (without an object) with the reflector. Next, adjust the sensor to the reflector by swiveling the sensor horizontally and vertically so that the yellow signal indicator lights up continuously. In the event of misalignment, the yellow signal indicator flashes.

**Commissioning**  
**Checking object detection:** Follow the steps below to check that the sensor detects objects as required.  
Position the object in the beam path of the sensor.  
When the object is detected, the yellow signal indicator goes out. If the yellow signal indicator remains lit, reduce the sensitivity of the potentiometer until the yellow signal indicator goes out.  
When the object disappears from the beam path of the sensor, the yellow signal indicator lights up again continuously.

Maintenance

**Maintenance**  
**Cleaning:** If the transmission reception deteriorates, e.g., due to dirt, the yellow signal indicator on the receiver flashes. Clean the optical interfaces of the sensor (e.g., lenses) at regular intervals.  
**Maintenance:** Check the mounting fittings and the electrical connections regularly.

Accessories

|                                                                                     |                      |                                           |
|-------------------------------------------------------------------------------------|----------------------|-------------------------------------------|
|  | <b>OMH-MLV12-HWG</b> | Mounting bracket for series MLV12 sensors |
|  | <b>OMH-MLV12-HWK</b> | Mounting bracket for series MLV12 sensors |
|  | <b>OMH-K01</b>       | dove tail mounting clamp                  |

## Accessories

|                                                                                   |                 |                                                                           |
|-----------------------------------------------------------------------------------|-----------------|---------------------------------------------------------------------------|
|  | <b>OMH-K02</b>  | dove tail mounting clamp                                                  |
|  | <b>OMH-K03</b>  | dove tail mounting clamp                                                  |
|  | <b>OMH-01</b>   | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm             |
|  | <b>OMH-06</b>   | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm             |
|  | <b>REF-MH82</b> | Reflector with Micro-structure, rectangular 82 mm x 60 mm, mounting holes |
|  | <b>REF-MH78</b> | Reflector with Micro-structure, hexagonal 78 mm x 61 mm, mounting holes   |
|  | <b>REF-MH20</b> | Reflector with Micro-structure, rectangular 32 mm x 20 mm, mounting holes |
|  | <b>REF-MA21</b> | Reflector with Micro-structure, round ø 21 mm, self-adhesive              |