

# Retroreflective sensor

## MLV12-54-G/32/124

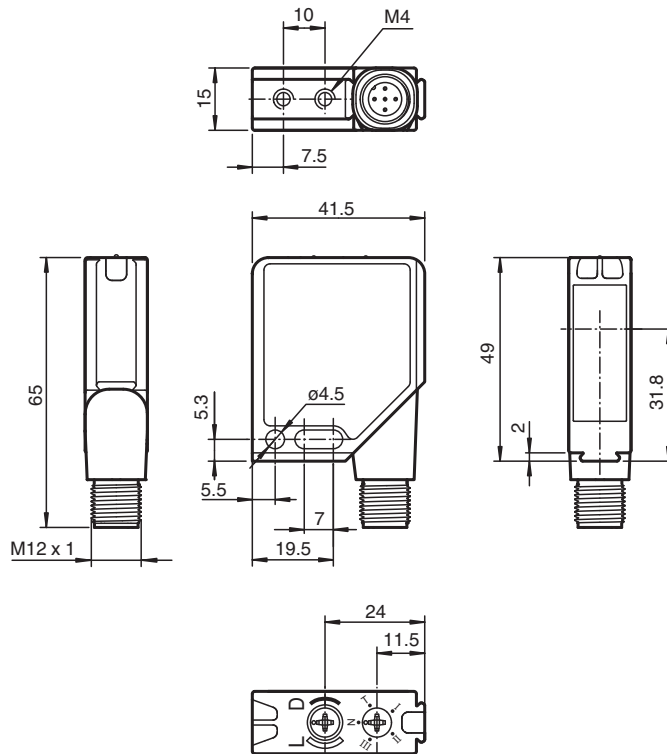


- Series of sensors in a widely used standard housing
- Reliable recognition of reflective objects and clear glass
- TEACH-IN switch for setting the contrast detection levels
- Automatic adjustment in case of soiling in contrast detection mode
- High level of stability thanks to the metal housing frame
- Resistant against noise: reliable operation under all conditions

Retroreflective sensor for glass detection, small design, 5.6 m detection range, red light, light/dark on, PNP output, external Teach-In, M12 plug



### Dimensions



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

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## Technical Data

| General specifications                   |                |   |
|--|----------------|---|
| Effective detection range                |                | 0 ... 4.2 m   |
| Reflector distance                       |                | 0 ... 4.2 m   |
| Threshold detection range                |                | 5.6 m   |
| Reference target                         |                | H85-2 reflector   |
| Light source                             |                | LED   |
| Light type                               |                | modulated visible red light , 660 nm  |
| Polarization filter                      |                | yes   |
| Diameter of the light spot               |                | approx. 110 mm at detection range 4.2 m   |
| Opening angle                            |                | 1.5 °   |
| Ambient light limit                      |                |   |
| Continuous light                         |                | 40000 Lux   |
| Modulated light                          |                | 5000 Lux  |
| Functional safety related parameters     |                |   |
| MTTF <sub>d</sub>                        |                | 1000 a  |
| Mission Time (T <sub>M</sub> )           |                | 20 a  |
| Diagnostic Coverage (DC)                 |                | 0 %   |
| Indicators/operating means               |                |   |
| Operation indicator                      |                | LED green, flashes in case of short-circuit   |
| Function indicator                       |                | 2 LEDs yellow for switching state, stability control, TEACH-IN and contrast detection mode  |
| Control elements                         |                | rotary switch for light/dark, 5-step switch for contrast recognition adjustment   |
| Contrast detection levels                |                | 10 % - clean, water filled PET bottles<br>18 % - clear glass bottles<br>40 % - colored glass or opaque materials<br>adjustable by Teach-In key or external wire |
| Electrical specifications                |                |   |
| Operating voltage                        | U <sub>B</sub> | 10 ... 30 V DC  |
| Ripple                                   |                | max. 10 %   |
| No-load supply current                   | I <sub>0</sub> | max. 55 mA  |
| Input                                    |                |   |
| Function input                           |                | Ext. Teach-In input (ET)  |
| Output                                   |                |   |
| Switching type                           |                | light/dark on switchable  |
| Signal output                            |                | 1 PNP output, short-circuit protected, reverse polarity protected, open collector   |
| Switching voltage                        |                | max. 30 V DC  |
| Switching current                        |                | max. 0.2 A  |
| Voltage drop                             | U <sub>d</sub> | ≤ 2.5 V DC  |
| Switching frequency                      | f              | 1000 Hz   |
| Response time                            |                | 0.5 ms  |
| Conformity                               |                |   |
| Product standard                         |                | EN 60947-5-2  |
| 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 -150 Hz, 5 g in each X, Y and Z directions  |
| Approvals and certificates               |                |   |
| Protection class                         |                | II, rated voltage ≤ 300 V AC with pollution degree 1-2 according to IEC 60664-1   |
| UL approval                              |                | cULus   |
| CCC approval                             |                | CCC approval / marking not required for products rated ≤36 V  |
| Ambient conditions                       |                |   |
| Ambient temperature                      |                | -40 ... 60 °C (-40 ... 140 °F)  |
| Storage temperature                      |                | -40 ... 75 °C (-40 ... 167 °F)  |
| Mechanical specifications                |                |   |

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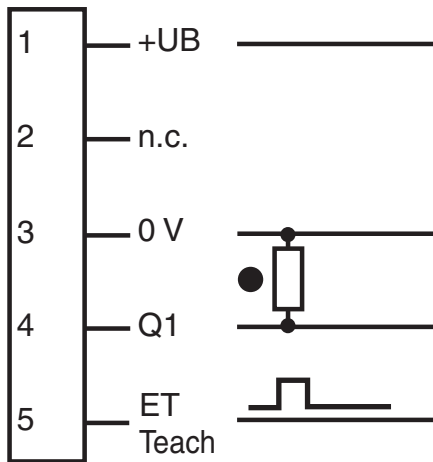
Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

### Technical Data

|                      |   |
|----------------------|---|
| Housing width        | 41.5 mm   |
| Housing height       | 49 mm   |
| Housing depth        | 15 mm   |
| Degree of protection | IP67  |
| Connection           | Metal connector, M12, 5-pin, 90° rotatable  |
| Material             |   |
| Housing              | Frame: nickel plated, die cast zinc,<br>Laterals: glass-fiber reinforced plastic PC |
| Optical face         | Plastic pane  |
| Mass                 | 60 g  |

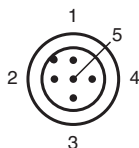
### Connection Assignment

Option:



- = Light on
- = Dark on

### Connection Assignment

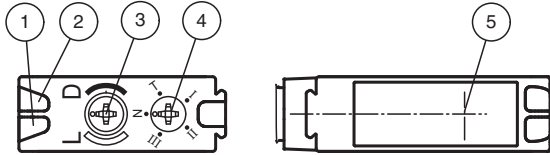


Wire colors in accordance with EN 60947-5-2

|   |    |         |
|---|----|---------|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue)  |
| 4 | BK | (black) |
| 5 | GY | (gray)  |

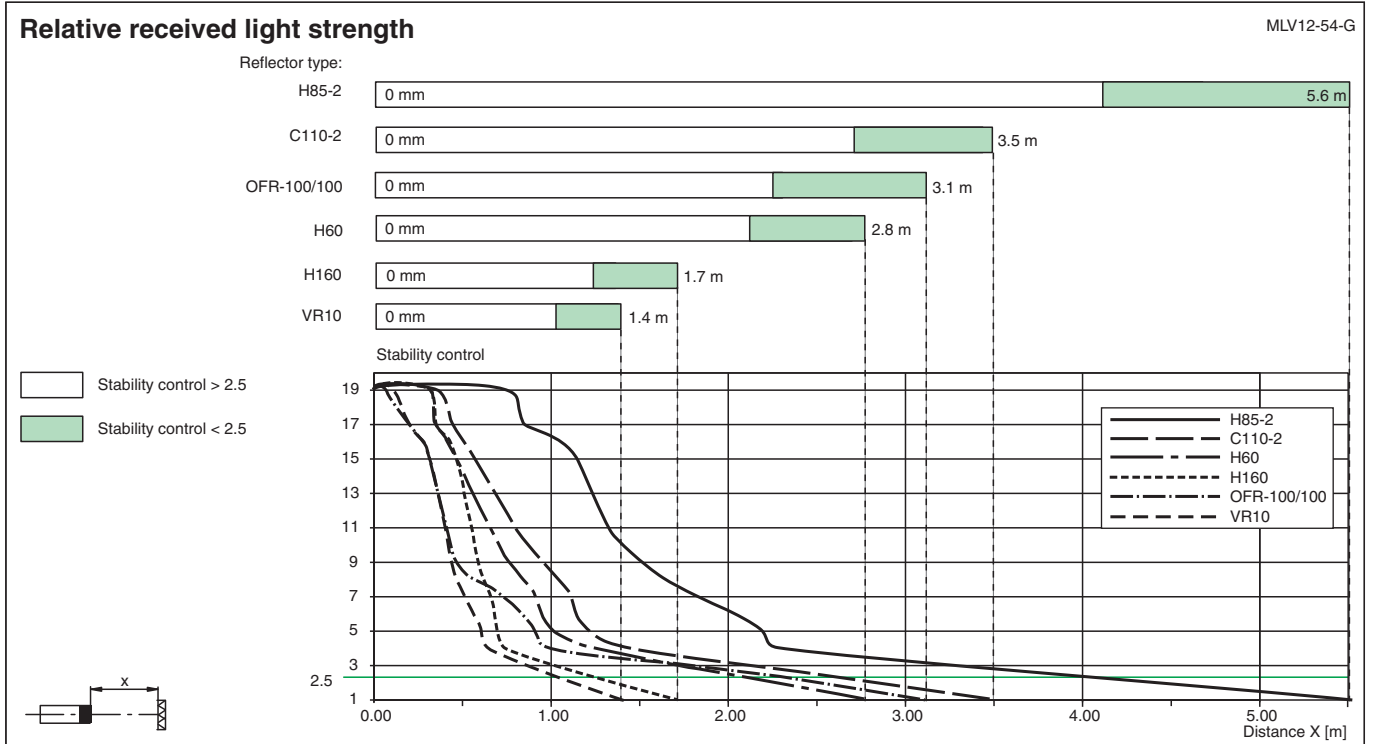
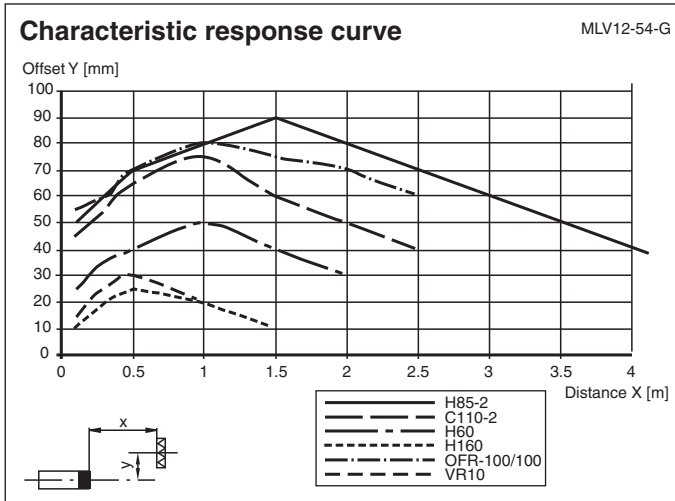
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Assembly



|   |                    |        |
|---|--------------------|--------|
| 1 | Operating display  | green  |
| 2 | Switch state       | yellow |
| 3 | Bright/dark switch |        |
| 4 | Teach-In switch    |        |
| 5 | Optical axis       |        |

Characteristic Curve








Accessories

|  |                      |   |
|--|----------------------|---|
|  | <b>OMH-MLV12-HWG</b> | Mounting bracket for series MLV12 sensors |
|--|----------------------|---|

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**Accessories**

|   |                      |   |
|---|----------------------|---|
|  | <b>OMH-MLV12-HWK</b> | Mounting bracket for series MLV12 sensors                                 |
|  | <b>OMH-K01</b>       | dove tail mounting clamp  |
|  | <b>OMH-K02</b>       | dove tail mounting clamp  |
|  | <b>OMH-K03</b>       | dove tail mounting clamp  |
|  | <b>OMH-06</b>        | Mounting aid for round steel $\varnothing$ 12 mm or sheet 1.5 mm ... 3 mm |

## Teach-In

### Switch position "N" (normal operation):

Yellow LEDs light if the light beam is free, flash if the functional reserve is used, turn off if the light beam is interrupted.

### Switch position "T" (TEACH-IN operation):

Yellow LED flashes slowly after 1 second (about 1.5 Hz).

The sensor is now ready to be set to a particular contrast detection value using the mechanical switch (position I, II, or III) or an external signal.

### Switch positions "I", "II", and "III" (contrast detection operation):

Contrast detection values: I for 10 %, II for 18 %, III for 40 %.

1. Yellow LED lights continually: light path free
2. Yellow LED off: object detected
3. Yellow LED flashes quickly: unsure detection, too much contamination, functional reserve too low.

A direct switching of the contrast detection levels is possible without having to put the switch back into position "T" first.

### External teach input (ET):

In switch position "T", you can apply a pulse over a control line to plug pin 5 to select the corresponding contrast detection.

The desired contrast detection is set by applying a high pulse of a particular width:

- I: 50 ms (30 ms ... 100 ms)
- II: 150 ms (100 ms ... 200 ms)
- III: > 200 ms

### Pre-fault output (optional):

#### Switch position "N":

Inactive if the functional reserve is used after approx. 5 sec. Immediately inactive if 4 light beam interruptions occur within the flashing time.

#### Contrast detection levels:

The output goes inactive if the contamination no longer permits readjustment; the yellow LED flashes quickly. In the case of additional contamination, the detection of low contrast is no longer guaranteed.

#### Warm-up period:

Any warm-up period can be shortened by repeating the learn (teach) process.

