

# Retroreflective sensor MLV12-54-G/32/82g/124

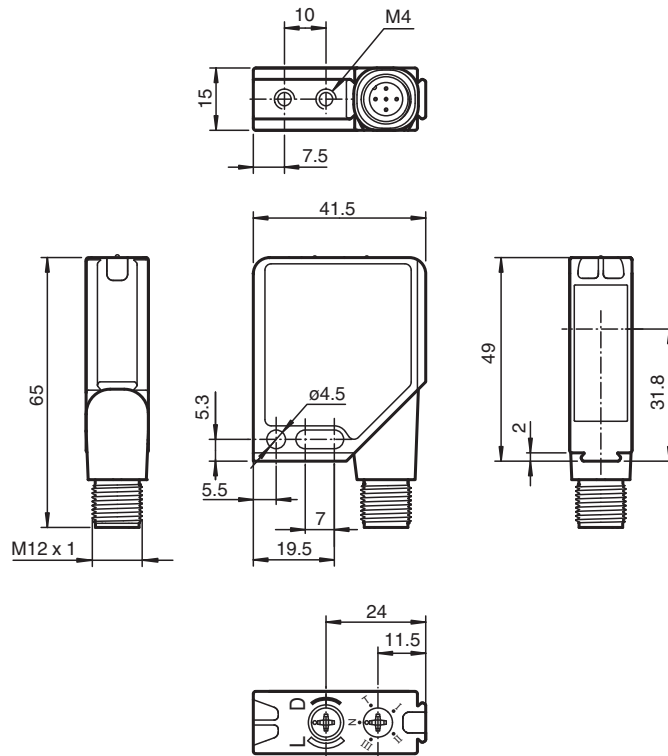


- Series of sensors in a widely used standard housing
- Reliable recognition of reflective objects and clear glass
- TEACH-IN switch for setting the contrast detection levels
- Automatic adjustment in case of soiling in contrast detection mode
- High level of stability thanks to the metal housing frame
- 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, weak signal output, external Teach-In, M12 plug



## Dimensions



## Technical Data

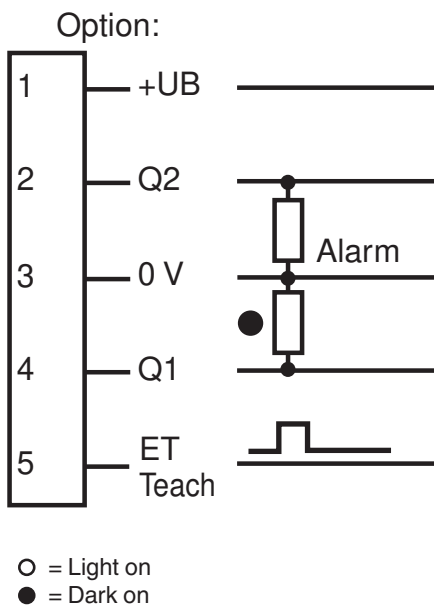
|                                                 |                |  |                                                                                                                                                                 |
|-------------------------------------------------|----------------|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>General specifications</b>                   |                |  |                                                                                                                                                                 |
| 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                                                                                                                                                        |
| <b>Functional safety related parameters</b>     |                |  |                                                                                                                                                                 |
| MTTF <sub>d</sub>                               |                |  | 1000 a                                                                                                                                                          |
| Mission Time (T <sub>M</sub> )                  |                |  | 20 a                                                                                                                                                            |
| Diagnostic Coverage (DC)                        |                |  | 0 %                                                                                                                                                             |
| <b>Indicators/operating means</b>               |                |  |                                                                                                                                                                 |
| 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 |
| <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. 55 mA                                                                                                                                                      |
| <b>Input</b>                                    |                |  |                                                                                                                                                                 |
| Function input                                  |                |  | Ext. Teach-In input (ET)                                                                                                                                        |
| <b>Output</b>                                   |                |  |                                                                                                                                                                 |
| Stability alarm output                          |                |  | 1 PNP function reserve output (alarm), short-circuit protected, protected from reverse polarity, open collector                                                 |
| 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                                                                                                                                                          |
| <b>Conformity</b>                               |                |  |                                                                                                                                                                 |
| Product standard                                |                |  | EN 60947-5-2                                                                                                                                                    |
| <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                                                                                       |
| <b>Approvals and certificates</b>               |                |  |                                                                                                                                                                 |
| 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                                                                                                   |
| <b>Ambient conditions</b>                       |                |  |                                                                                                                                                                 |
| Ambient temperature                             |                |  | -40 ... 60 °C (-40 ... 140 °F)                                                                                                                                  |

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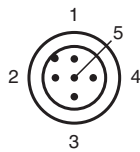
Technical Data

|                                  |  |                                                                                     |
|----------------------------------|--|-------------------------------------------------------------------------------------|
| Storage temperature              |  | -40 ... 75 °C (-40 ... 167 °F)                                                      |
| <b>Mechanical specifications</b> |  |                                                                                     |
| 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



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)  |

Assembly

1

2

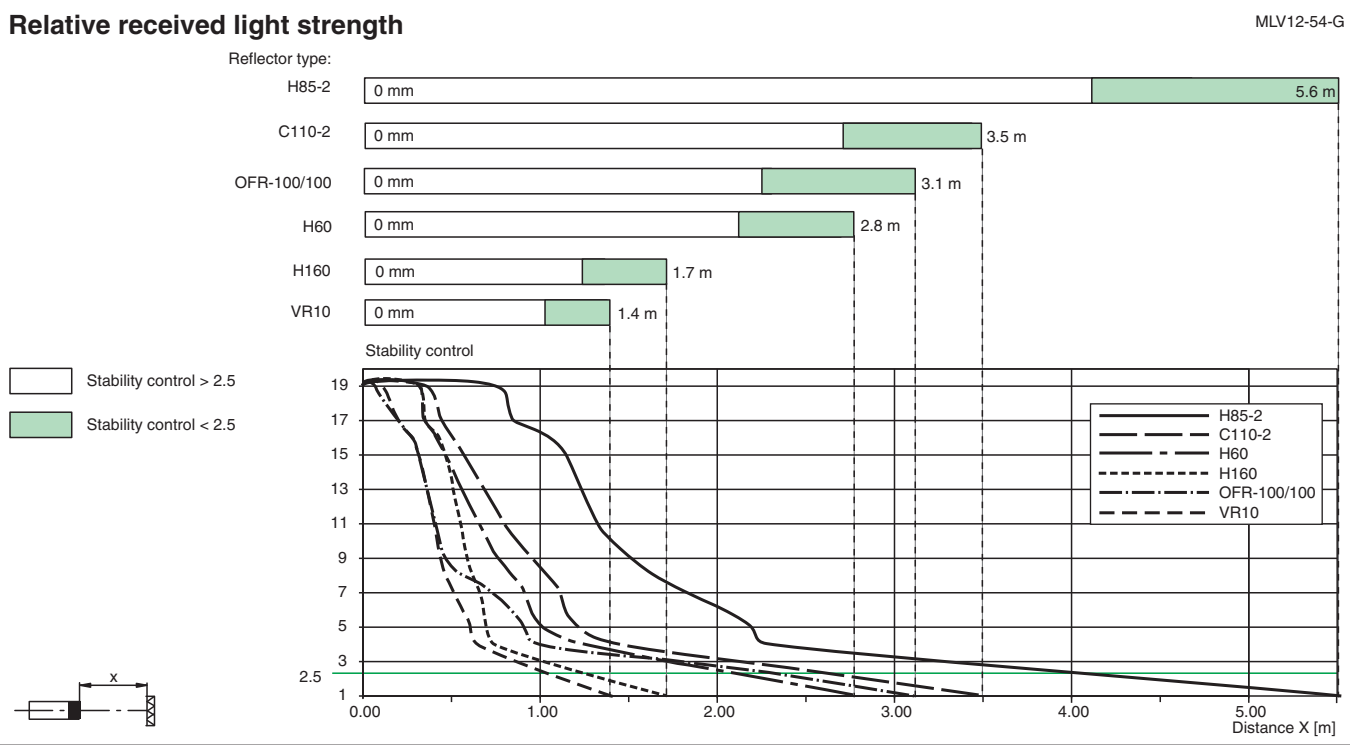
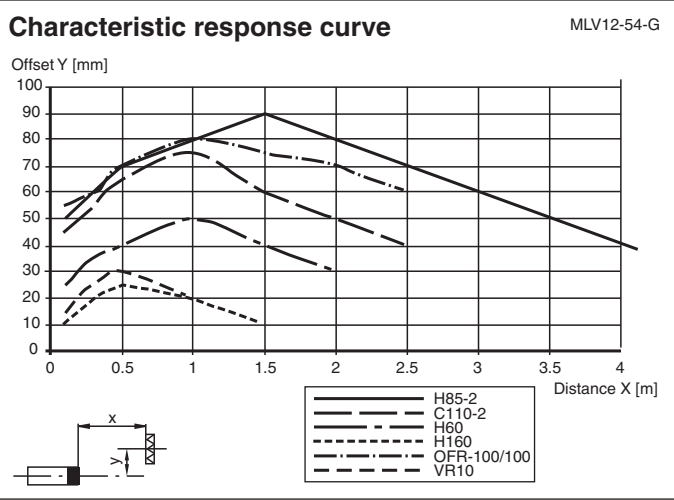
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4

5

|   |                    |        |
|---|--------------------|--------|
| 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 |
|-------------------------------------------------------------------------------------|----------------------|-------------------------------------------|

## 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 ø 12 mm or sheet 1.5 mm ... 3 mm                                  |
|  | <b>ORR50G</b>        | Reflector, rectangular 50.9 mm x 60.9 mm, mounting holes, fixing strap and polarization filter |

## 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.

