

# Retroreflective sensor

## ML100-55/103/115b-1M

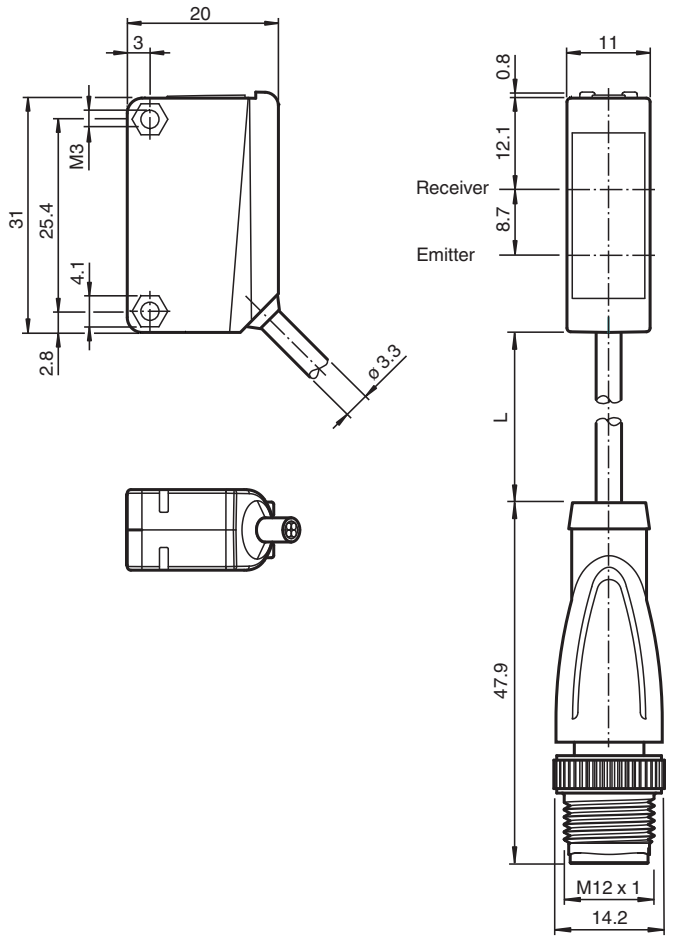
- Miniature design
- Easy to use
- Full metal thread mounting
- Clearly visible LEDs for Power ON, switching state and weak signal indication
- Not sensitive to ambient light

Retroreflective sensor with polarization filter, plastic housing, 5 m detection range, red light, sensitivity adjuster, light/dark on, DC version, PNP output, fixed cable with M12 plug

## Function

The optical sensors of this series are suitable for both standard and demanding applications.
The series features a miniature housing design, two M3 metal-threaded mounting holes and a highly visible LED status indicator.
Each device is equipped with a sensitivity adjuster and a light-on/dark-on changeover switch for increased flexibility.
A wide variety of versions are available in both infrared light and red light with PowerBeam for easy alignment.
Special versions with BlueBeam are suitable for challenging applications like those in the solar and battery industries.

## Dimensions




Release date: 2024-10-24 Date of issue: 2024-10-24 Filename: 70185668_eng.pdf

## Technical Data

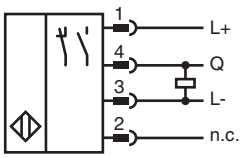
| | | |
|---|---|---|
| **General specifications** | | |
| Effective detection range | | 0 ... 5 m |
| Reflector distance | | 0.02 ... 5 m |
| Threshold detection range | | 7 m |
| Reference target | | H50 reflector |
| Light source | | LED |
| Light type | | modulated visible red light |
| Polarization filter | | yes |
| Diameter of the light spot | | approx. 500 mm at a distance of 7 m |
| Opening angle | | approx. 4 ° |
| Optical face | | frontal |
| Ambient light limit | | EN 60947-5-2:2007+A1:2012 |
| **Functional safety related parameters** | | |
| $MTTF_d$ | | 860 a |
| Mission Time ($T_M$) | | 20 a |
| Diagnostic Coverage (DC) | | 0 % |
| **Indicators/operating means** | | |
| Operation indicator | | LED green: power on |
| Function indicator | | LED yellow: lights up when receiving the light beam ; flashes when falling short of the operating reserve; OFF when light beam is interrupted |
| Control elements | | sensitivity adjustment |
| Control elements | | Light-on/dark-on changeover switch |
| **Electrical specifications** | | |
| Operating voltage | $U_B$ | 10 ... 30 V DC |
| Ripple | | max. 10 % |
| No-load supply current | $I_0$ | < 20 mA |
| **Output** | | |
| Switching type | | The switching type of the sensor is adjustable. The default setting is: light-on |
| Signal output | | 1 PNP output, short-circuit protected, reverse polarity protected, open collector |
| Switching voltage | | max. 30 V DC |
| Switching current | | max. 100 mA , resistive load |
| Voltage drop | $U_d$ | ≤ 1.5 V DC |
| Switching frequency | f | 1000 Hz |
| Response time | | 0.5 ms |
| **Conformity** | | |
| Product standard | | EN 60947-5-2 |
| **Approvals and certificates** | | |
| UL approval | | cULus Listed, Class 2 Power Source or listed Power Supply with a limited voltage output with (maybe integrated) fuse (max. 3.3 A according UL248), Type 1 enclosure |
| CCC approval | | CCC approval / marking not required for products rated ≤36 V |
| **Ambient conditions** | | |
| Ambient temperature | | -30 ... 60 °C (-22 ... 140 °F) |
| Storage temperature | | -40 ... 70 °C (-40 ... 158 °F) |
| **Mechanical specifications** | | |
| Degree of protection | | IP67 |
| Connection | | fixed cable with 4-pin, M12 x 1 connector |
| Material | | |
| Housing | | PC (Polycarbonate) |
| Optical face | | PMMA |
| Cable | | |
| Length | L | 1000 mm |
| Mass | | approx. 40 g |
| Tightening torque, fastening screws | | 0.6 Nm |
| Dimensions | | |

Release date: 2024-10-24 Date of issue: 2024-10-24 Filename: 70185668_eng.pdf

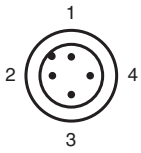
## Technical Data

| | |
|---|---|
| Height | 31 mm |
| Width | 11 mm |
| Depth | 20 mm |
| Cable length | 0.3 m |

## Connection



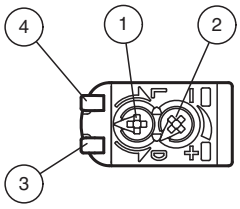

## Connection Assignment




Wire colors in accordance with EN 60947-5-2

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

## Assembly

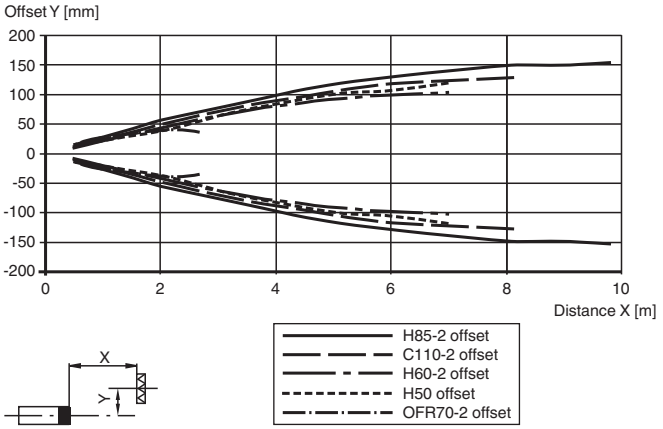



| | | |
|---|---|---|
| 1 | Light-Dark-switching | |
| 2 | Sensitivity adjuster | |
| 3 | Signal display | yellow |
| 4 | Operating display | green |

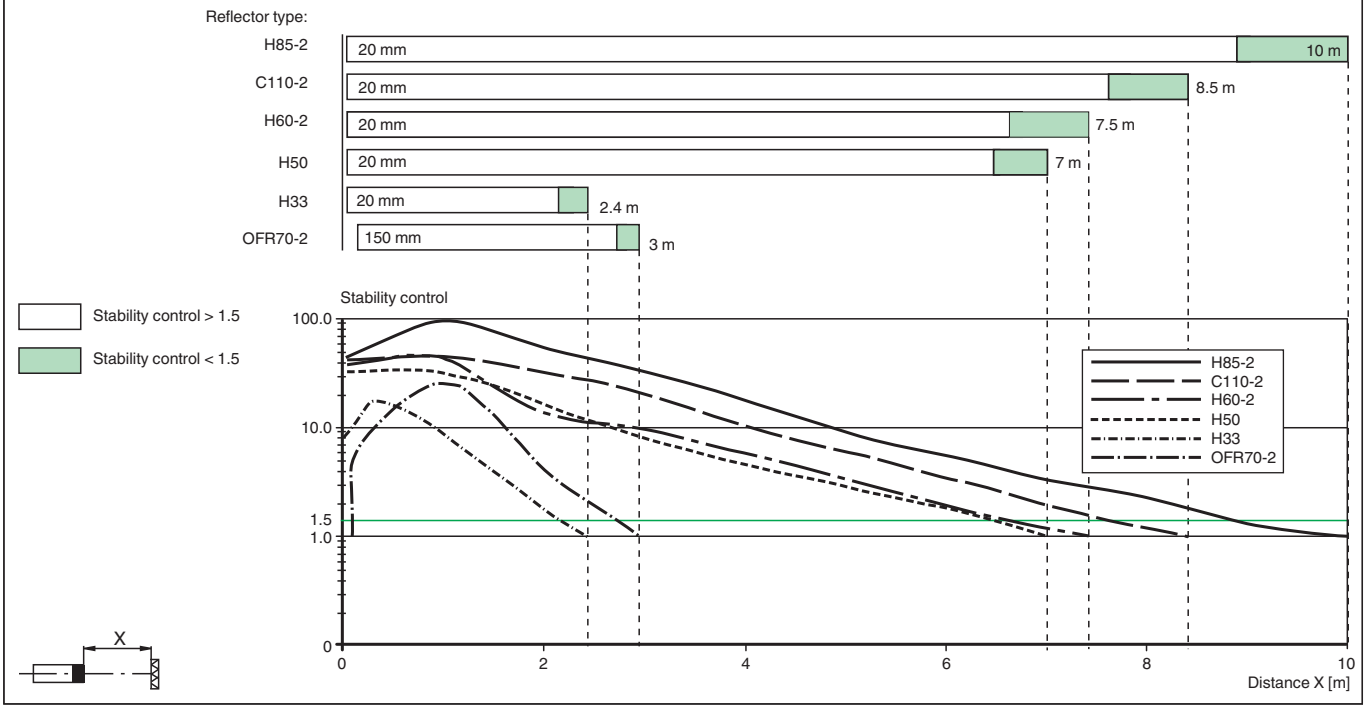
Release date: 2024-10-24 Date of issue: 2024-10-24 Filename: 70185668_eng.pdf

## Characteristic Curve

### Characteristic response curve




### Relative received light strength (typical)




Release date: 2024-10-24 Date of issue: 2024-10-24 Filename: 70185668_eng.pdf