



Model Number

ML7-54-G/25/136/143

Retroreflective sensor with 4-pin, M8 x 1 connector

Features

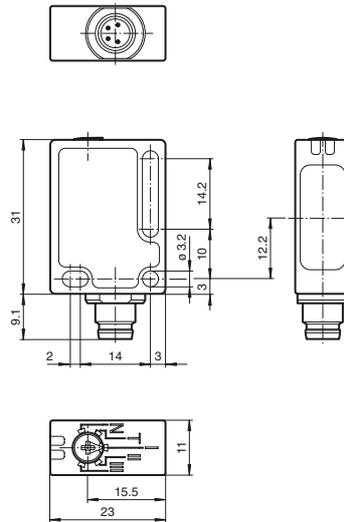
- Reliable sensor for standard applications
- Miniature design with versatile mounting options
- Reliable recognition of reflective objects and clear glass
- Two machines in one: clear object detection or reflection operating mode with long range
- TEACH-IN switch for setting the contrast detection levels
- Automatic adjustment in case of soiling in contrast detection mode

Product information

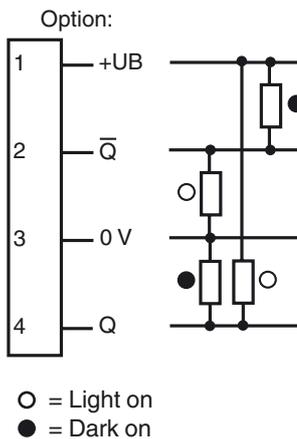
Small, robust, effective, and reliable - these are the properties of the ML7 sensor series. Due to their small size, number of versions, and two different lens positions, they are particularly suited for installation in tight spaces. The robust design and high quality of Pepperl+Fuchs mean they can also be used under harsh environmental conditions. The efficient technology, switching frequencies up to 1000 Hz, high resistance to ambient light, and 4-in-1 output make the series suitable for non-contact object detection.

Release date: 2013-04-18 12:50 Date of issue: 2013-05-13 19:4187_eng.xml

Dimensions



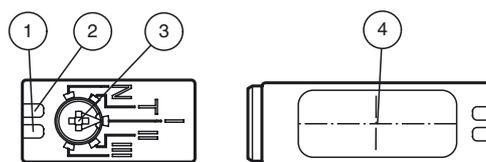
Electrical connection



Pinout



Indicators/operating means



| | | |
|---|-------------------|--------|
| 1 | Operating display | green |
| 2 | Signal display | yellow |
| 3 | Teach-In | |
| 4 | Optical center | |

Technical data**General specifications**

| | |
|----------------------------|--|
| Effective detection range | 0 ... 3.5 m in TEACH mode 0 ... 5.7 m at switch position "N" |
| Reflector distance | 0 ... 3.5 m in TEACH mode 0 ... 5.7 m at switch position "N" |
| Threshold detection range | 7.6 m |
| Reference target | H85-2 reflector |
| Light source | LED |
| Light type | modulated visible red light , 660 nm |
| Angle deviation | max. $\pm 1^\circ$ |
| Diameter of the light spot | approx. 40 mm at detection range 1 m |
| Angle of divergence | 1.7 ° |
| Ambient light limit | 40000 Lux |

Functional safety related parameters

| | |
|--------------------------------|-------|
| MTTF _d | 980 a |
| Mission Time (T _M) | 20 a |
| Diagnostic Coverage (DC) | 0 % |

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: switching state ; Stability control ; Teach-In |
| Controls | 5-step switch for setting the contrast detection levels. |

| | |
|---------------------------|---|
| Contrast detection levels | 10 % - clean, water filled PET bottles 18 % - clear glass bottles 40 % - colored glass or opaque materials adjustable due to TEACH-IN switch |
|---------------------------|---|

Electrical specifications

| | | |
|------------------------|----------------|--------------------|
| Operating voltage | U _B | 10 ... 30 V DC |
| Ripple | | max. 10 % |
| No-load supply current | I ₀ | < 20 mA at 24 V DC |

Output

| | | |
|---------------------|--|-------------|
| Switching type | light on | |
| Signal output | 2 push-pull (4 in 1) outputs, complementary, short-circuit proof, reverse polarity protected | |
| Switching voltage | max. 30 V DC | |
| Switching current | max. 100 mA | |
| Switching frequency | f | 1 kHz |
| Response time | | 500 μ s |

Ambient conditions

| | |
|---------------------|--------------------------------|
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Storage temperature | -40 ... 75 °C (-40 ... 167 °F) |

Mechanical specifications

| | |
|-------------------|--------------------------------------|
| Protection degree | IP67 / IP69K |
| Connection | M8 x 1 connector, 4-pin |
| Material | |
| Housing | PC (glass-fiber-reinforced Makrolon) |
| Optical face | PMMA |
| Connector | plastic |
| Mass | 10 g |

Compliance with standards and directives

| | |
|---------------------|---|
| Standard conformity | |
| Product standard | EN 60947-5-2:2007 IEC 60947-5-2:2007 |
| Standards | EN 50178, UL 508 |

Approvals and certificates

| | |
|------------------|--|
| Protection class | II, rated voltage \leq 50 V AC with pollution degree 1-2 according to IEC 60664-1 functional insulation acc. to DIN EN 50178 |
| UL approval | cULus |
| CCC approval | CCC approval / marking not required for products rated \leq 36 V |

Accessories**Montagekit OMH-ML7-01**

Mounting set consisting of bracket OMH-ML-01 sheet OMH-ML7-03, and fastening material

Montagekit OMH-ML7-02

Mounting set consisting of bracket OMH-ML-02 sheet OMH-ML7-03, and fastening material

OMH-ML7-01

Mounting bracket

OMH-ML7-02

Mounting bracket

OMH-ML7-03

Fixing plate

ORR50G

Reflector, rectangular 50.9 mm x 60.9 mm, mounting holes, fixing strap and polarization filter

V31-WM-2M-PUR

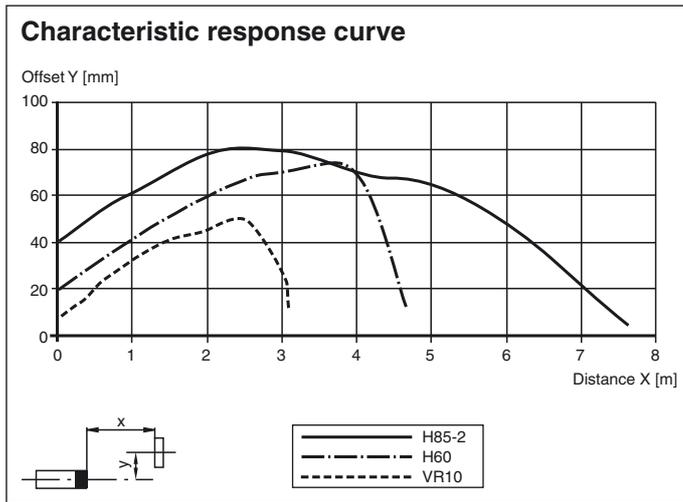
4-pin, M8 socket, PUR cable

V31-GM-2M-PUR

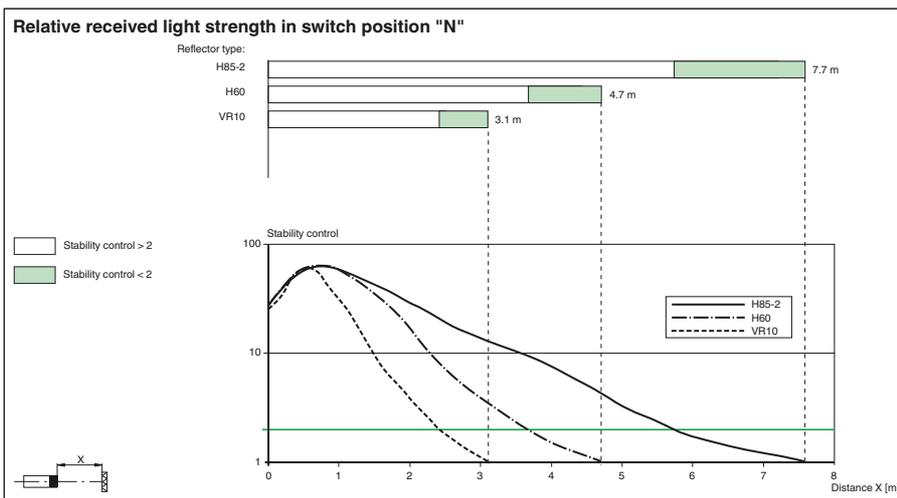
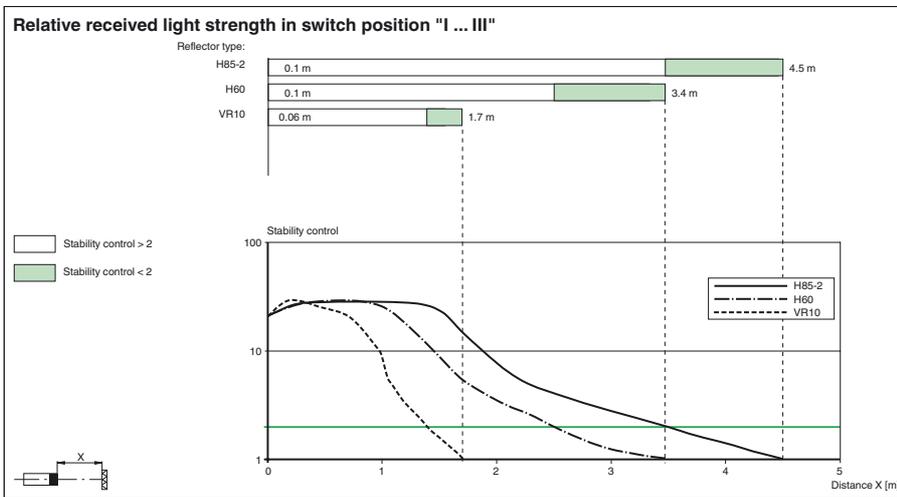
4-pin, M8 socket, PUR cable

Suitable reflectors and cable sockets can be found in the Internet

Curves/Diagrams



Curves/Diagrams



Additional information

Adjustment instructions for Teach-In operation:

| Step | Switch position | LED green | LED yellow | Time/frequency | Explanations/comments |
|------|-----------------|-----------|------------|----------------|-----------------------|
|------|-----------------|-----------|------------|----------------|-----------------------|

Release date: 2013-04-18 12:50 Date of issue: 2013-05-13 19:187_eng.xml

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 4411
fa-info@de.pepperl-fuchs.com

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

| | | | | | |
|-----|-----|---------|---------|--------|---|
| 1 | N | on | flashes | 4/s | In switch position "N" directed towards reflector. Reflector detected without function reserve . |
| | N | on | on | - | In switch position "N" directed towards reflector. Reflector detected with function reserve (recommended). |
| 2 | T | off/on | on | 200 ms | The selection of a new switch position is indicated by the green LED going out for a short time. This also applies to the selection of the other switch positions. |
| | T | flashes | flashes | 2.5 s | <i>Slow</i> alternating flashing: Teach-In process has been performed correctly . Max. duration of the Teach-In process: 2 s |
| | T | flashes | flashes | 8/s | <i>Quick</i> alternating flashing: Teach-In process has not been performed correctly . (e.g. receiver signal not sufficient, sensor not directed correctly towards reflector). Status is terminated by turning switch to position N. |
| 3/1 | I | on | on | - | Contrast detection 10 % is activated. (e.g. clean PET bottles filled with water) |
| 3/2 | II | on | on | - | Contrast detection 18 % is activated. (e.g. clear glass bottles) |
| 3/3 | III | on | on | - | Contrast detection 40 % is activated. (e.g. coloured glass or non-transparent materials) |