

# Thru-beam sensor (pair) OBE2000-R2-SE2-0,2M-V31-P



- Ultra-small housing design
- 45° cable outlet for maximum mounting freedom under extremely tight space constraints
- Extremely large detection range in Long Range Mode
- Option of switching to high precision mode for greater switching

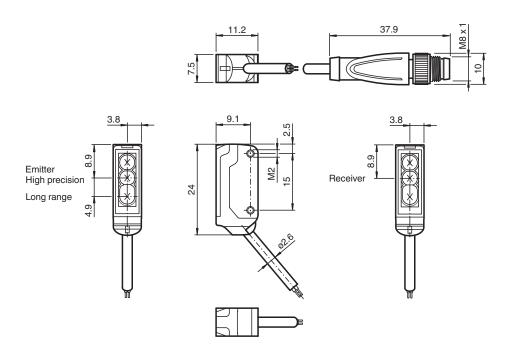
Thru-beam sensor for standard applications, miniature design, 2000 mm detection range, red light, dark on, PNP output, 200 mm fixed cable with plug M8, 4-pin



### **Function**

The nano sensor has been developed for a broad range of applications. It offers excellent durability and is exceptionally easy to install. The housing is compact and, with its 45° cable outlet, can be installed in the smallest spaces. New functional principles and functionality open up a

### **Dimensions**



### **Technical Data**

| Emitter  | OBE2000-R2-S-0,2M-V31-P  |  |
|----------|--------------------------|--|
| Receiver | OBE2000-R2-E2-0,2M-V31-P |  |

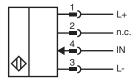
**General specifications** 

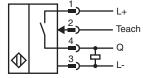
| a distance of 50 mm  Opening angle approx. 2 °  Optical face frontal  Ambient light limit EN 60947-5-2 : 30000 Lux  Functional safety related parameters  MTTF <sub>d</sub> 806 a  Mission Time (T <sub>M</sub> ) 20 a  Diagnostic Coverage (DC) 0%  Indicators/operating means  Operation indicator LED green, statically lit Power on , short-circuit : LED green flashing (approx. 4 Hz)  Function indicator Receiver: LED yellow, lights up when light beam is free, flashes when falling short of the operating reserve ; OFF when light beam is interrupted  Electrical specifications  Operating voltage U <sub>B</sub> 10 30 V DC , class 2  No-load supply current I <sub>0</sub> Emitter: ≤ 11 mA Receiver: ≤ 8 mA  | Technical Data                       |                |  |
|---|--------------------------------------|----------------|--|
| Long range mode: 2.5 m   Long range mode: 2.5 m   High precision mode: 300 m   Angle deviation   2 approx. 2 on modulated visible red light, 630 m   Angle deviation   2 approx. 2 on modulated visible red light, 630 m   Angle deviation   2 approx. 2 on modulated visible red light, 630 m   Angle deviation   2 approx. 2 on modulated visible red light, 630 m   Angle deviation   2 approx. 2 on mode: 150 mm   4 distance of 2000 mm High precision mode: 0.5 mm   2 approx. 2 on mode: 150 mm   4 distance of 2000 mm High precision mode: 0.5 mm   2 approx. 2 on mode: 150 mm   4 appr                        | Effective detection range            |                |  |
| Light type modulated visible red light , 630 nm Angle deviation   approx. 2*   Long range mode: 150 mm at a distance of 2000 mm High precision mode: 0.5 mm a distance of 150 mm at a distance of 2000 mm High precision mode: 0.5 mm a distance of 150 mm at a distance of 2000 mm High precision mode: 0.5 mm a distance of 150 mm at a distance of 2000 mm High precision mode: 0.5 mm a distance of 150 mm at a distance of 2000 mm High precision mode: 0.5 mm a distance of 2000 mm High precision mode: 0.5 mm a distance of 2000 mm High precision mode: 0.5 mm a distance of 2000 mm High precision mode: 0.5 mm a distance of 2000 mm High precision mode: 0.5 mm a distance of 2000 mm High precision mode: 0.5 mm a distance of 2000 mm High precision mode: 0.5 mm Amount of 2000 a mode 2000 mm High precision mode: 0.5 mm Amount of 2000 a mode 2000 mm High precision mode: 0.5 mm Amount of 2000 a mode 2000 a mode 2000 mm High precision mode: 0.5 mm Amount of 2000 a mode 2000 mm High precision mode: 0.5 mm Amount of 2000 a mode 2000 a mode 2000 mm High precision mode: 0.5 mm Amount of 2000 a mode 2000 a mode 2000 mm High precision mode: 0.5 mm Amount of 2000 a mode 2000 mm High precision mode: 0.5 mm Amount of 2000 a mode 2000 a mode 2000 mm High precision mode: 0.5 mm Amount of 2000 a mode 2000 mm High precision mode: 0.5 mm Amount of 2000 mm High precision mode: 0.5 mm High precision mode: 0.5 mm Amount of 2000 mm High precision mode: 0.5 mm High precision m                      | Threshold detection range            |                | Long range mode: 2.5 m   |
| Light type Angle deviation Angle deviation Diameter of the light spot Opening angle Optical face Angle distance of 50 mm at a distance of 2000 mm High precision mode: 0.5 mm a distance of 50 mm at a distance of 2000 mm High precision mode: 0.5 mm a distance of 50 mm at a distance of 2000 mm High precision mode: 0.5 mm a distance of 50 mm at a distance of 2000 mm High precision mode: 0.5 mm a distance of 50 mm at a distance of 2000 mm High precision mode: 0.5 mm a distance of 50 mm at a distance of 2000 mm High precision mode: 0.5 mm a distance of 50 mm at a distance of 2000 mm High precision mode: 0.5 mm a distance of 50 mm at a distance of 2000 mm High precision mode: 0.5 mm a distance of 50 mm at a distance of 2000 mm High precision mode: 0.5 mm and the precision of 2000 mm High time mode: 0.5 mm and the precision of 2000 mm High time mode: 0.5 mm and the precision of 2000 mm and the precision indicator  Function indicator  Funct                       | Light source                         |                | , · · · · · · · · · · · · · · · · · · ·  |
| Angle deviation Diameter of the light spot Diameter of the light spot Diameter of the light spot Opening angle Opening angle Optical face Ambient light limit Functional safety related parameters MTTF <sub>d</sub> Mission Time (T <sub>M</sub> ) Diagnostic Coverage (DC) Indicators/operating means Operation indicator Functional diagnostic Coverage (DC) Indicators/operating means Operation indicator Percenting voltage Operating v | Light type                           |                | modulated visible red light , 630 nm   |
| Diameter of the light spot   Long range mode: 150 mm at a distance of 2000 mm High precision mode: 0.5 mm at distance of 50 mm and stance of 50                         | • ,.                                 |                |  |
| Optical face   Monitor light limit   EN 60947-5-2 : 30000 Lux   | -                                    |                | Long range mode: 150 mm at a distance of 2000 mm High precision mode: 0.5 mm at a distance of 50 mm  |
| Ambient light limit         EN 60947-5-2: 30000 Lux           Functional safety related parameters         806 a           Mission Time (T <sub>M</sub> )         20 a           Diagnostic Coverage (DC)         0 %           Indicators/operating means         LED green, statically lit Power on , short-circuit : LED green flashing (approx. 4 Hz)           Function indicator         LED green, statically lit Power on , short-circuit : LED green flashing (approx. 4 Hz)           Function indicator         Receiver. LED yellow, lights up when light beam is interrupted           Electrical specifications         Coperating veltage           Operating voltage         Up         10 30 V DC , class 2           No-load supply current         ½ Emitter : ±1 tm A Receiver ≤ 8 mA           Input         Emitter selection BK: not connected, Long Range mode BK: 0 V, High Precision Mc Teach-In input           Output         Emitter selection BK: not connected, Long Range mode BK: 0 V, High Precision Mc Teach-In input           Output         Teach-In input           Switching treehol         Teach-In input           Output         Teach-In input           Switching treehol         Teach-In input           Output         Teach-In input           Switching treehol         Teach-In input           Output put short-circuit protected, reverse polarity protected, open collector  | Opening angle                        |                | approx. 2 °  |
| Functional safety related parameters           MTTe         806 a           Mission Time (Tw)         20 a           Diagnostic Coverage (DC)         0 %           Indicators/operating means         LED green, statically lit Power on , short-circuit : LED green flashing (approx. 4 Hz)           Operation indicator         Receiver. LED yellow, lights up when light beam is free, flashes when falling short or the operating reserve; OFF when light beam is interrupted           Electrical specifications         W           Operating voltage         U <sub>B</sub> 10 30 V DC , class 2           No-load supply current         Emitter : ±1 tm A           Receiver: ≤ 8 mA         Receiver: ≤ 8 mA           Input         Emitter selection BK: not connected, Long Range mode BK: 0 V, High Precision Mc           Switching threshold         Teach-In input           Cutput         Switching threshold           Vibrage         NO contact / dark on           Signal output         1 PNP output, short-circuit protected, reverse polarity protected, open collector           Switching current         max. 50 mA           Voltage drop         U <sub>d</sub> ≤ 1.5 V DC           Switching frequency         f approx. 800 Hz           Response time         600 µs           Controlling frequency         c Ne 60947-5-2           Reprovals a   | Optical face                         |                | frontal  |
| MTFF <sub>d</sub> 806 a           Mission Time (T <sub>rk</sub> )         20 a           Diagnostic Coverage (DC)         0 %           Indicators/operating means         Use green, statically lit Power on , short-circuit : LED green flashing (approx. 4 Hz)           Cyperation indicator         Receiver. LED yellow, lights up when light beam is free, flashes when falling short or the operating reserve ; OFF when light beam is interrupted           Electrical specifications         Use mitter : £11 m.A Receiver. ≤ 8 m.A           Operating voltage         Use mitter: £11 m.A Receiver. ≤ 8 m.A           Input         Emitter: £11 m.A Receiver. ≤ 8 m.A           Input         Emitter: £11 m.A Receiver. ≤ 8 m.A           Input         Emitter: £11 m.A Receiver. ≤ 8 m.A           Input         Emitter selection BK: not connected, Long Range mode BK: 0 V, High Precision Mc Switching threshold           Output         Emitter selection BK: not connected, Long Range mode BK: 0 V, High Precision Mc Switching threshold           Switching threshold         Texture input the special properation input the special prope   | Ambient light limit                  |                | EN 60947-5-2 : 30000 Lux   |
| Mission Time (T <sub>a</sub> )         20 a           Diagnostic Coverage (DC)         0 %           Indicators/operating means         Cperation indicator         LED green, statically lit Power on , short-circuit : LED green flashing (approx. 4 Hz)           Function indicator         Receiver. LED yellow, lights up when light beam is free, flashes when falling short or the operating reserve ; OFF when light beam is interrupted           Electrical specifications         Ua         10 30 V DC , class 2           No-load supply current         ½ Emitter selection BK: not connected, Long Range mode BK: 0 V, High Precision Mc Switching threshold         Teach-In input           Control input         Emitter selection BK: not connected, Long Range mode BK: 0 V, High Precision Mc Switching threshold         Teach-In input           Output         Teach-In input           Switching type         NO contact / dark on           Signal output         1 PNP output, short-circuit protected, reverse polarity protected, open collector was so max. 30 V DC           Switching voltage         max. 50 V DC           Switching greuency         f approx. 800 Hz           Response time         600 μs           Conformity           Product standard         EN 60947-5-2           Approvals and certificates         CULus Recognized, Class 2 Power Source           CCC approval         CCC approval / marking not required for produc   | Functional safety related parameters |                |  |
| Diagnostic Coverage (DC) Indicators/operating means Operation indicator Operation indicator Receiver. LED yellow, lights up when light beam is free, flashes when falling short of the operating reserve; OFF when light beam is interrupted  Electrical specifications Operating voltage UB No-load supply current UB Emitter ≤ 11 mA Receiver: ≤ 8 mA Input  Control input Switching threshold Teach-In input Switching type NO contact / dark on Signal output Switching output Switching output Switching current Switching frequency Feedows ≤ 8 mA Suppose time 600 μs Controlliby Product standard Approvals and certificates UL approval Abbient temperature CCC approval Ambient temperature Storage temperature Surage deep (CC approval Abbient Capped) Surage deep deep deep deep deep deep deep de  | MTTF <sub>d</sub>                    |                | 806 a  |
| Indicators/operating means  Operation indicator  Function indicator  Electrical specifications  Operating voltage  No-load supply current  Control input  Control input  Switching threshold  Switching urrent  Voltage drop  Woltage in above the specification wax. 50 mA  Voltage drop  Woltage in above the specification wax. 50 mA  Voltage drop  Woltage in above the specification wax. 50 mA  Voltage drop  Woltage drop  Woltage drop  Woltage drop  Woltage drop  Conformity  Product standard  Approvals and certificates  U.a pproval  CCC approval  CCC approval  Ambient conditions  Machanical specifications  Housing height  Housing height  Housing height  Housing depth  Degree of protection  Material  Housing  PCABS and TPU  Cotable  PCABS and TPU                        | Mission Time (T <sub>M</sub> )       |                | 20 a   |
| Operation indicator         LED green, statically lit Power on , short-circuit : LED green flashing (approx. 4 Hz)           Function indicator         Receiver. LED yellow, lights up when light beam is free, flashes when falling short or the operating reserve; OFF when light beam is interrupted           Electrical specifications         Operating voltage         U <sub>B</sub> 10 30 V DC , class 2           No-load supply current         In         Emitter selection BK: not connected, Long Range mode BK: 0 V, High Precision Mc Receiver: ≤ 8 mA           Input         Control Input         Emitter selection BK: not connected, Long Range mode BK: 0 V, High Precision Mc Switching threshold           Output         Teach-In input         NO contact / dark on           Signal output         1 PNP output, short-circuit protected, reverse polarity protected, open collector max. 30 V DC           Switching current         Max. 50 mA           Voltage drop         U <sub>d</sub> ≤ 1.5 V DC           Switching frequency         f         approx. 800 Hz           Response time         600 μs           Conformity         EN 60947-5-2           Approvals and certificates         UL approval         cULus Recognized, Class 2 Power Source           CCC approval         CCC approval / marking not required for products rated ≤36 V           Ambient conditions         Connection         20 mm fixed cable with 4-pin, M8x1 connector <td>Diagnostic Coverage (DC)</td> <td></td> <td>0 %</td>   | Diagnostic Coverage (DC)             |                | 0 %  |
| Function indicator  Receiver: LED yellow, lights up when light beam is free, flashes when falling short of the operating reserve; OFF when light beam is interrupted  Electrical specifications Operating voltage Ua 1030 V DC, class 2 No-load supply current In Receiver: \$8 mA Input  Control input Switching threshold Teach-In input Output Switching threshold Output Switching output Switching output 1 PNP output, short-circuit protected, reverse polarity protected, open collector max. 50 mA Voltage drop Wat \$1.5 V DC Switching current Wat \$1.5 V DC Switching frequency In approx. 800 Hz Response time 600 µs  Conformity Product standard EN 60947-5-2 Approvals and certificates UL approval CCC approval CCC approval CCC approval / marking not required for products rated \$36 V Ambient conditions Ambient conditions Ambient conditions Ambient conditions  Ambient specifications Housing width 7.5 mm Housing depth 11.2 mm Degree of protection Degree of protection Material Housing PC/ABS and TPU PCC able PUR  | Indicators/operating means           |                |  |
| the operating reserve ; ÖFF when light beam is interrupted    Control and Supply current   Control input   Co                       | Operation indicator                  |                | LED green, statically lit Power on , short-circuit : LED green flashing (approx. 4 Hz)   |
| Operating voltage         U <sub>B</sub> 10 30 V DC , class 2           No-load supply current         In Emitter sell mA           Receiver ≤ 8 mA           Input           Control input         Emitter selection BK: not connected, Long Range mode BK: 0 V, High Precision Mc switching threshold           Output         Teach-In input           Switching threshold         NO contact / dark on           Signal output         1 PNP output, short-circuit protected, reverse polarity protected, open collector switching voltage           Switching current         max. 50 mA           Voltage drop         U <sub>d</sub> ≤ 1.5 V DC           Switching frequency         f         approx. 800 Hz           Response time         600 μs           Conformity         EN 60947-5-2           Approvals and certificates         EN 60947-5-2           UL approval         CULus Recognized, Class 2 Power Source           CCC approval         CCC approval/marking not required for products rated ≤36 V           Ambient conditions         CCC approval / marking not required for products rated ≤36 V           Mechanical specifications         En 50 m C (-13 140 °F)           Housing width         7.5 mm           Housing depth         11.2 mm           Degree of protection         1 P67  | Function indicator                   |                | Receiver: LED yellow, lights up when light beam is free, flashes when falling short of the operating reserve; OFF when light beam is interrupted |
| No-load supply current   I₀   Emitter: ≤ 11 mA   Receiver: ≤ 8 mA   | Electrical specifications            |                |  |
| Receiver: ≤ 8 mA  | Operating voltage                    | $U_B$          | 10 30 V DC , class 2   |
| Control input         Emitter selection BK: not connected, Long Range mode BK: 0 V, High Precision Mc Teach-In input           Output         Volunt (ark) on           Signal output         1 PNP output, short-circuit protected, reverse polarity protected, open collector max. 30 V DC           Switching current         max. 30 V DC           Switching current         max. 50 mA           Voltage drop         U <sub>d</sub> ≤ 1.5 V DC           Switching frequency         f approx. 800 Hz           Response time         600 μs           Conformity         Product standard           Product standard         EN 60947-5-2           Approvals and certificates         UL approval           UL approval         CULus Recognized, Class 2 Power Source           CCC approval         CCC approval / marking not required for products rated ≤36 V           Ambient conditions         Ambient temperature         -25 60 °C (-13 140 °F)           Storage temperature         -30 70 °C (-22 158 °F)           Mechanical specifications         Housing width         7.5 mm           Housing height         24 mm           Housing         PC/ABS and TPU           Optical face         PC           Cable         PUR   | No-load supply current               | I <sub>0</sub> |  |
| Switching threshold     Teach-In input       Output       Switching type     NO contact / dark on       Signal output     1 PNP output, short-circuit protected, reverse polarity protected, open collector max. 30 v DC       Switching current     max. 30 v DC       Switching frequency     f     approx. 800 Hz       Response time     600 μs       Conformity       Product standard     EN 60947-5-2       Approvals and certificates       UL approval     cULus Recognized, Class 2 Power Source       CCC approval     CCC approval / marking not required for products rated ≤36 V       Ambient conditions       Ambient temperature     -25 60 °C (-13 140 °F)       Storage temperature     -30 70 °C (-22 158 °F)       Mechanical specifications       Housing width     7.5 mm       Housing depth     11.2 mm       Degree of protection     IP67       Connection     20 mm fixed cable with 4-pin, M8x1 connector       Material     Housing       PC/ABS and TPU       Optical face     PC       Cable     PUR  | Input                                |                |  |
| Output       Switching type     NO contact / dark on       Signal output     1 PNP output, short-circuit protected, reverse polarity protected, open collector max. 30 V DC       Switching current     max. 50 mA       Voltage drop     U <sub>d</sub> ≤ 1.5 V DC       Switching frequency     f approx. 800 Hz       Response time     600 μs       Confamity       Product standard       EN 60947-5-2       Approvals and certificates       UL approval       CCC approval / marking not required for products rated ≤36 V       Ambient conditions       Ambient temperature     -25 60 °C (-13 140 °F)       Storage temperature     -30 70 °C (-22 158 °F)       Mechanical specifications       Housing width     7.5 mm       Housing height     24 mm       Housing depth     11.2 mm       Degree of protection     1P67       Connection     20 mm fixed cable with 4-pin, M8x1 connector       Material     Housing       PC/ABS and TPU       Optical face     PC       Cable     PUR  | Control input                        |                | Emitter selection BK: not connected, Long Range mode BK: 0 V, High Precision Mode  |
| Switching type       NO contact / dark on         Signal output       1 PNP output, short-circuit protected, reverse polarity protected, open collector max. 30 V DC         Switching current       max. 50 mA         Voltage drop       U <sub>d</sub> ≤ 1.5 V DC         Switching frequency       f approx. 800 Hz         Response time       600 μs         Conformity         Product standard       EN 60947-5-2         Approvals and certificates         UL approval       CULus Recognized, Class 2 Power Source         CCC approval / marking not required for products rated ≤36 V         Ambient conditions         Ambient temperature       -25 60 °C (-13 140 °F)         Storage temperature       -30 70 °C (-22 158 °F)         Mechanical specifications         Housing width       7.5 mm         Housing depth       11.2 mm         Degree of protection       IP67         Connection       200 mm fixed cable with 4-pin, M8x1 connector         Material       Housing         PC/ABS and TPU         Optical face       PC         Cable       PUR   | Switching threshold                  |                | Teach-In input   |
| Signal output 1 PNP output, short-circuit protected, reverse polarity protected, open collector wax. 30 V DC Switching current 2 max. 50 mA  Voltage drop 3 Ug ≤ 1.5 V DC  Switching frequency f approx. 800 Hz  Response time 600 μs  Conformity  Product standard EN 60947-5-2  Approvals and certificates  UL approval CCC approval CCC approval / marking not required for products rated ≤36 V  Ambient conditions  Ambient temperature -25 60 °C (-13 140 °F)  Storage temperature -30 70 °C (-22 158 °F)  Mechanical specifications  Housing width 7.5 mm  Housing height 11.2 mm  Degree of protection 1P67  Connection 200 mm fixed cable with 4-pin, M8x1 connector  Material Housing PC/ABS and TPU  Optical face PC Cable PUR   | Output                               |                |  |
| Switching voltage max. 30 V DC Switching current max. 50 mA  Voltage drop U <sub>d</sub> ≤ 1.5 V DC  Switching frequency f approx. 800 Hz Response time 600 $\mu$ s  Conformity  Product standard EN 60947-5-2  Approvals and certificates UL approval CCC approval CCC approval marking not required for products rated ≤36 V  Ambient conditions  Ambient temperature 2-25 60 °C (-13 140 °F) Storage temperature 30 70 °C (-22 158 °F)  Mechanical specifications  Housing width 7.5 mm  Housing depth 11.2 mm  Degree of protection 1P67  Connection 200 mm fixed cable with 4-pin, M8x1 connector  Material  Housing PC/ABS and TPU  Optical face PC Cable PUR   | Switching type                       |                | NO contact / dark on   |
| Switching current $Part = Part = Pa$                       | Signal output                        |                | 1 PNP output, short-circuit protected, reverse polarity protected, open collector  |
| Voltage drop       U <sub>d</sub> ≤ 1.5 V DC         Switching frequency       f       approx. 800 Hz         Response time       600 μs         Conformity         Product standard       EN 60947-5-2         Approvals and certificates         UL approval       cULus Recognized, Class 2 Power Source         CCC approval / marking not required for products rated ≤36 V         Ambient conditions         Ambient temperature       -25 60 °C (-13 140 °F)         Storage temperature       -30 70 °C (-22 158 °F)         Mechanical specifications         Housing width       7.5 mm         Housing depth       11.2 mm         Degree of protection       IP67         Connection       200 mm fixed cable with 4-pin, M8x1 connector         Material       Housing         Optical face       PC         Cable       PUR  | Switching voltage                    |                | max. 30 V DC   |
| Switching frequency Response time 600 μs  Conformity Product standard EN 60947-5-2  Approvals and certificates  UL approval CCC approval CCC approval CCC approval CCC approval / marking not required for products rated ≤36 V  Ambient conditions Ambient temperature -25 60 °C (-13 140 °F) Storage temperature -30 70 °C (-22 158 °F)  Mechanical specifications  Housing width 7.5 mm  Housing depth 11.2 mm  Degree of protection 1P67  Connection 200 mm fixed cable with 4-pin, M8x1 connector  Material Housing Optical face Cable PUR   | Switching current                    |                | max. 50 mA   |
| Response time 600 μs  Conformity  Product standard EN 60947-5-2  Approvals and certificates  UL approval cULus Recognized, Class 2 Power Source  CCC approval CCC approval/ marking not required for products rated ≤36 V  Ambient conditions  Ambient temperature -25 60 °C (-13 140 °F) Storage temperature -30 70 °C (-22 158 °F)  Mechanical specifications  Housing width 7.5 mm  Housing depth 11.2 mm  Degree of protection   IP67  Connection 200 mm fixed cable with 4-pin, M8x1 connector  Material  Housing PC/ABS and TPU  Optical face PC  Cable PUR   | Voltage drop                         | $U_{d}$        | ≤ 1.5 V DC   |
| Conformity  Product standard EN 60947-5-2  Approvals and certificates  UL approval cULus Recognized, Class 2 Power Source  CCC approval CCC approval / marking not required for products rated ≤36 V  Ambient conditions  Ambient temperature -25 60 °C (-13 140 °F)  Storage temperature -30 70 °C (-22 158 °F)  Mechanical specifications  Housing width 7.5 mm  Housing height 24 mm  Housing depth 11.2 mm  Degree of protection IP67  Connection 200 mm fixed cable with 4-pin, M8x1 connector  Material Housing PC/ABS and TPU  Optical face PC  Cable PUR  | Switching frequency                  | f              | approx. 800 Hz   |
| Product standard EN 60947-5-2  Approvals and certificates  UL approval cULus Recognized, Class 2 Power Source  CCC approval CCC approval / marking not required for products rated ≤36 V  Ambient conditions  Ambient temperature -25 60 °C (-13 140 °F)  Storage temperature -30 70 °C (-22 158 °F)  Mechanical specifications  Housing width 7.5 mm  Housing height 24 mm  Housing depth 11.2 mm  Degree of protection IP67  Connection 200 mm fixed cable with 4-pin, M8x1 connector  Material Housing PC/ABS and TPU  Optical face PC  Cable PUR  | Response time                        |                | 600 μs   |
| Approvals and certificates  UL approval  CCC approval  CCC approval / CCC approval / marking not required for products rated ≤36 V  Ambient conditions  Ambient temperature  -25 60 °C (-13 140 °F)  Storage temperature  -30 70 °C (-22 158 °F)  Mechanical specifications  Housing width  7.5 mm  Housing height  24 mm  Housing depth  11.2 mm  Degree of protection  Connection  Material  Housing  PC/ABS and TPU  Optical face  PC  Cable  PUR  | Conformity                           |                |  |
| UL approval cULus Recognized, Class 2 Power Source  CCC approval CCC approval / marking not required for products rated ≤36 V  Ambient conditions  Ambient temperature -25 60 °C (-13 140 °F)  Storage temperature -30 70 °C (-22 158 °F)  Mechanical specifications  Housing width 7.5 mm  Housing height 24 mm  Housing depth 11.2 mm  Degree of protection IP67  Connection 200 mm fixed cable with 4-pin, M8x1 connector  Material Housing PC/ABS and TPU  Optical face PC  Cable PUR   | Product standard                     |                | EN 60947-5-2   |
| CCC approval CCC approval / marking not required for products rated ≤36 V  Ambient conditions  Ambient temperature -25 60 °C (-13 140 °F)  Storage temperature -30 70 °C (-22 158 °F)  Mechanical specifications  Housing width 7.5 mm  Housing height 24 mm  Housing depth 11.2 mm  Degree of protection IP67  Connection 200 mm fixed cable with 4-pin, M8x1 connector  Material Housing PC/ABS and TPU  Optical face PC  Cable PUR   | Approvals and certificates           |                |  |
| Ambient conditions  Ambient temperature -25 60 °C (-13 140 °F)  Storage temperature -30 70 °C (-22 158 °F)  Mechanical specifications  Housing width 7.5 mm  Housing height 24 mm  Housing depth 11.2 mm  Degree of protection IP67  Connection 200 mm fixed cable with 4-pin, M8x1 connector  Material  Housing PC/ABS and TPU  Optical face PC  Cable PUR   | UL approval                          |                | cULus Recognized, Class 2 Power Source   |
| Ambient temperature -25 60 °C (-13 140 °F)  Storage temperature -30 70 °C (-22 158 °F)  Mechanical specifications  Housing width 7.5 mm  Housing height 24 mm  Housing depth 11.2 mm  Degree of protection IP67  Connection 200 mm fixed cable with 4-pin, M8x1 connector  Material  Housing PC/ABS and TPU  Optical face PC  Cable PUR   | CCC approval                         |                | CCC approval / marking not required for products rated ≤36 V   |
| Storage temperature -30 70 °C (-22 158 °F)  Mechanical specifications  Housing width 7.5 mm  Housing height 24 mm  Housing depth 11.2 mm  Degree of protection IP67  Connection 200 mm fixed cable with 4-pin, M8x1 connector  Material  Housing PC/ABS and TPU  Optical face PC  Cable PUR   | Ambient conditions                   |                |  |
| Mechanical specificationsHousing width7.5 mmHousing height24 mmHousing depth11.2 mmDegree of protectionIP67Connection200 mm fixed cable with 4-pin, M8x1 connectorMaterialPC/ABS and TPUOptical facePCCablePUR  | Ambient temperature                  |                | -25 60 °C (-13 140 °F)   |
| Housing width 7.5 mm  Housing height 24 mm  Housing depth 11.2 mm  Degree of protection IP67  Connection 200 mm fixed cable with 4-pin, M8x1 connector  Material PC/ABS and TPU  Optical face PC  Cable PUR   | Storage temperature                  |                | -30 70 °C (-22 158 °F)   |
| Housing width 7.5 mm  Housing height 24 mm  Housing depth 11.2 mm  Degree of protection IP67  Connection 200 mm fixed cable with 4-pin, M8x1 connector  Material PC/ABS and TPU  Optical face PC  Cable PUR   | Mechanical specifications            |                |  |
| Housing height 24 mm  Housing depth 11.2 mm  Degree of protection IP67  Connection 200 mm fixed cable with 4-pin, M8x1 connector  Material PC/ABS and TPU  Optical face PC  Cable PUR   |                                      |                | 7.5 mm   |
| Housing depth 11.2 mm  Degree of protection IP67  Connection 200 mm fixed cable with 4-pin, M8x1 connector  Material PC/ABS and TPU  Optical face PC  Cable PUR   |                                      |                | 24 mm  |
| Connection 200 mm fixed cable with 4-pin, M8x1 connector  Material  Housing PC/ABS and TPU  Optical face PC  Cable PUR  |                                      |                | 11.2 mm  |
| Connection 200 mm fixed cable with 4-pin, M8x1 connector  Material  Housing PC/ABS and TPU  Optical face PC  Cable PUR  | • '                                  |                | IP67   |
| Material Housing PC/ABS and TPU Optical face PC Cable PUR   |                                      |                | 200 mm fixed cable with 4-pin, M8x1 connector  |
| Optical face PC Cable PUR   | Material                             |                |  |
| Optical face PC Cable PUR   | Housing                              |                | PC/ABS and TPU   |
| Cable PUR   | *                                    |                |  |
|   |                                      |                |  |
| ,   |                                      |                |  |
| Mass approx. 20 g per sensor  | Mass                                 |                | -  |



Cable length 200 mm

# **Connection Assignment**





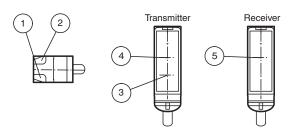
# **Connection Assignment**



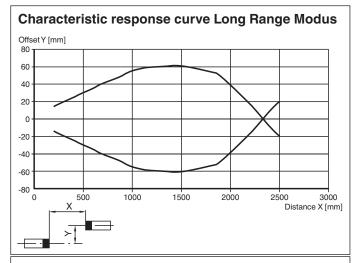
Wire colors in accordance with EN 60947-5-2

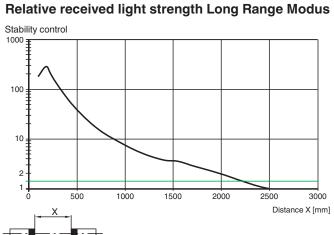
ΒN (brown) 3 4 BU (blue) BK (black)

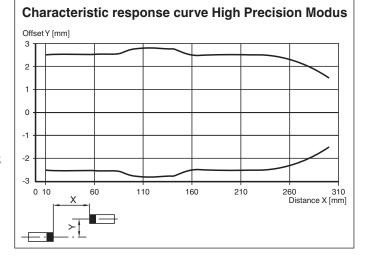
# **Assembly**



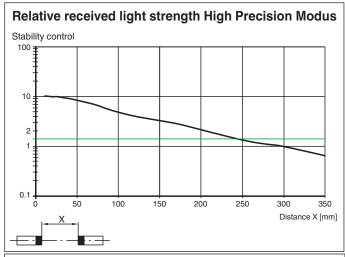
| 1 | Operating display green |  |  |  |
|---|-------------------------|--|--|--|
| 2 | Signal display yellow   |  |  |  |
| 3 | Emitter long range      |  |  |  |
| 4 | Emitter high precision  |  |  |  |
| 5 | Receiver                |  |  |  |
|   |                         |  |  |  |

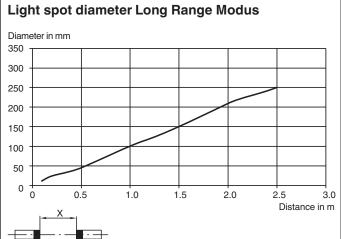


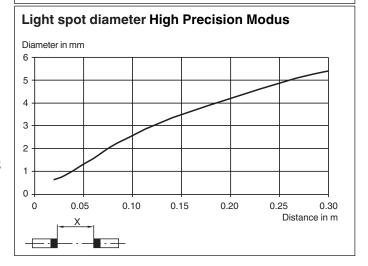




### **Characteristic Curve**







|       | MH-R2-01 | Mounting aid for R2 series, Mounting bracket |
|-------|----------|--|
| (379) | MH-R2-02 | Mounting aid for R2 series, Mounting bracket |
|       | MH-R2-03 | Mounting aid for R2 series, Mounting bracket |

# MH-R2-04 Mounting aid for R2 series, Mounting bracket V31-GM-2M-PUR Female cordset single-ended M8 straight A-coded, 4-pin, PUR cable grey V31-WM-2M-PUR Female cordset single-ended M8 angled A-coded, 4-pin, PUR cable grey

The thru-beam sensor enables the switching points to be taught in for optimum adaptation to specific applications. This eliminates the need for additional components such as apertures.

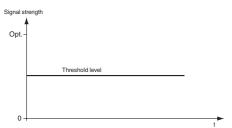
Essentially, all Teach-in methods can be used in both "High Precision" and "High Power" operating modes.

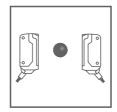
The sensitivity of the thru-beam sensor can be adjusted using three Teach-in methods:

#### **Position Teach**

When using this Teach-in method, the following settings are made on the thru-beam sensor:

- The gain is set to an optimum value
- The signal threshold is set to a minimum





### Recommended application:

This method enables extremely small differences in contrast to be detected, as well as minuscule particles in the beam path, and provides exceptional positioning accuracy.

The best results are achieved in "High Precision" mode.

- 1. Make sure that there are no objects in the beam path and that the sensor is connected to the power supply.
- Connect the white cable on the receiver (WH/IN) to the blue cable (BU/0 V) on the receiver.

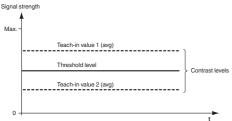
The green and yellow LED indicators flash simultaneously at 2.5 Hz

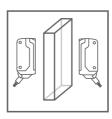
- Disconnect the white cable on the receiver (WH/IN) from the blue cable (BU/0 V) on the receiver.
  - The green and yellow LED indicators flash alternately at 2.5 Hz
- The end of the Teach-in process is indicated when the green LED indicator lights up sold and yellow LED blinks.

### **Two-Point Teach-In**

When using this Teach-in method, the following settings are made on the thru-beam sensor:

- The gain is set to an optimum value
- The signal threshold is set in the center between the two taught signal values





### Recommended application:

Enables detection of transparent objects.

The best results are achieved in "High Precision" mode.

- Make sure that there are no objects in the beam path and that the sensor is connected to the power supply.
- Connect the white cable on the receiver (WH/IN) to the blue cable (BU/0 V) on the receiver.

The green and yellow LED indicators flash simultaneously at 2.5 Hz

- Position the object in the beam path.
- Disconnect the white cable on the receiver (WH/IN) from the blue cable (BU/0 V) on the receiver.

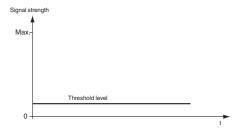
The green and yellow LED indicators flash alternately at 2.5 Hz

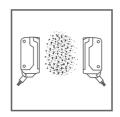
The end of the Teach-in process is indicated when the green LED indicator lights up sold.

### **Maximum Teach-In**

When using this Teach-in method, the following settings are made on the thru-beam sensor:

- The gain is set to a maximum
- The signal threshold is set to a minimum





### Thru-beam sensor (pair)

Recommended application:

Enables an object to be detected with a high excess gain. This can be useful if there is severe environmental contamination or to achieve long operating times.

The best results are achieved in "High Precision" mode.

- 1. Make sure that there are no objects in the beam path and that the sensor is connected to the power supply.
- 2. Cover the receiver or transmitter.
- 3. Connect the white cable on the receiver (WH/IN) to the blue cable (BU/0 V) on the receiver.
  - The green and yellow LED indicators flash simultaneously at 2.5 Hz
- Disconnect the white cable on the receiver (WH/IN) from the blue cable (BU/0 V) on the receiver.
   The green and yellow LED indicators flash alternately at 2.5 Hz
- 5. The end of the Teach-in process is indicated when the green LED indicator lights up sold.