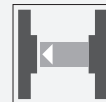




## Thru-beam sensor (pair)

LD28/LV28-LAS-F1-7675/47

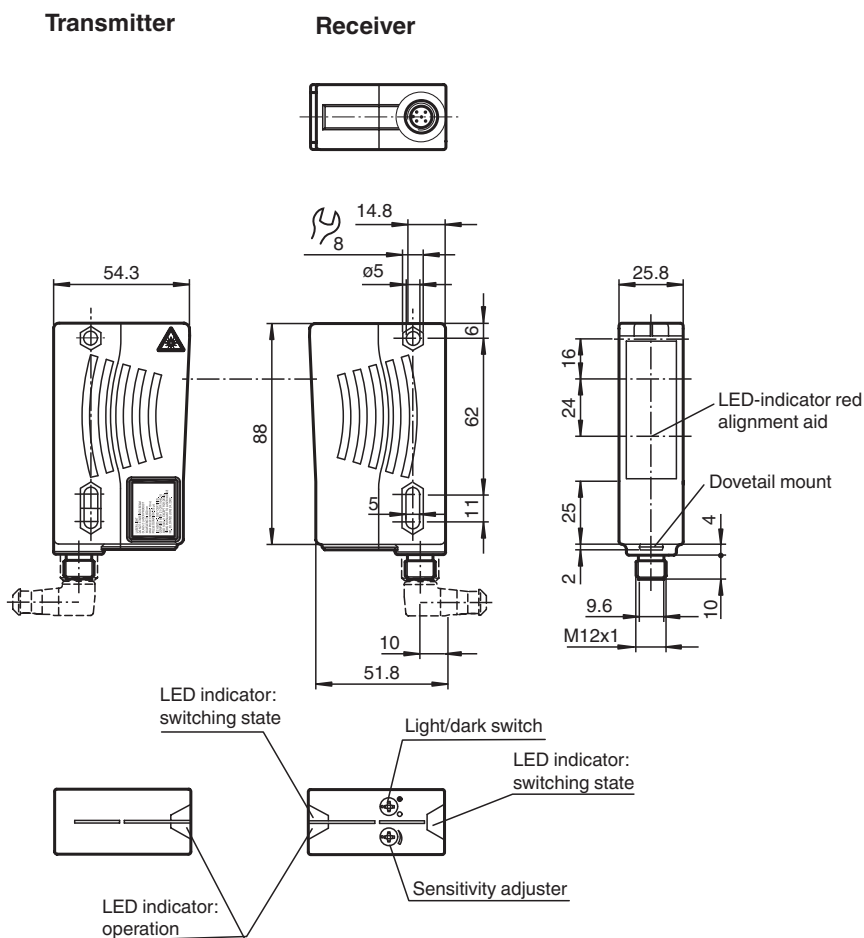


- Universal series with highly versatile fields of use
- Resistant against noise: reliable operation under all conditions
- Highly visible LED as alignment aid in receiver optics
- Emitter with test input
- Laser version for long ranges

Universal thru-beam sensor, large housing design, 120 m detection range, red laser light, laser class 2, 25 kHz transmission frequency, light/dark on, DC version, 2 complementary PNP outputs, test input, pre-fault output, M12 plug



### Dimensions



### Technical Data

#### System components

Release date: 2023-09-05 Date of issue: 2023-09-05 Filename: t188320\_eng.pdf

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

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**PEPPERL+FUCHS**

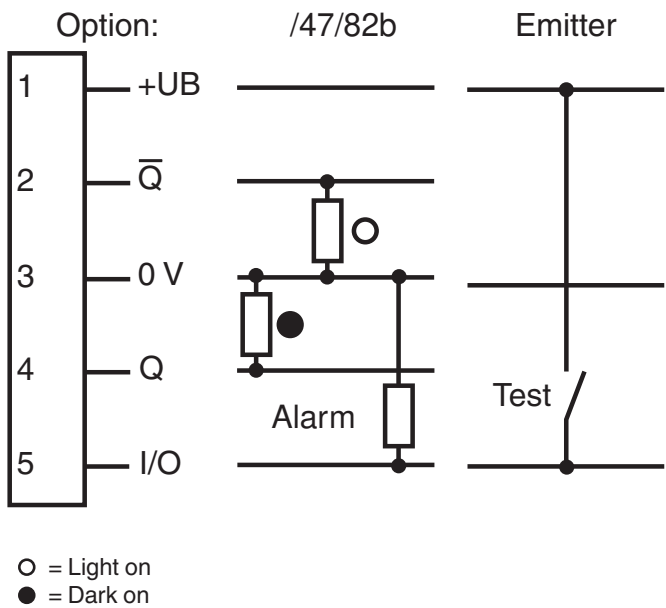
## Technical Data

|                                             |                                      |                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------------------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Emitter                                     | LD28-LAS-F1-7675                     |                                                                                                                                                                                                                                                                                                                                                                                                     |
| Receiver                                    |                                      | LV28-LAS-F1-7675/47                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>General specifications</b>               |                                      |                                                                                                                                                                                                                                                                                                                                                                                                     |
| Effective detection range                   |                                      | 0 ... 120 m                                                                                                                                                                                                                                                                                                                                                                                         |
| Threshold detection range                   |                                      | 150 m                                                                                                                                                                                                                                                                                                                                                                                               |
| Light source                                |                                      | laser diode                                                                                                                                                                                                                                                                                                                                                                                         |
| Light type                                  |                                      | modulated visible red light                                                                                                                                                                                                                                                                                                                                                                         |
| Laser nominal ratings                       |                                      |                                                                                                                                                                                                                                                                                                                                                                                                     |
| Note                                        | LASER LIGHT , DO NOT STARE INTO BEAM |                                                                                                                                                                                                                                                                                                                                                                                                     |
| Laser class                                 |                                      | 2                                                                                                                                                                                                                                                                                                                                                                                                   |
| Wave length                                 |                                      | 650 nm                                                                                                                                                                                                                                                                                                                                                                                              |
| Beam divergence                             |                                      | < 4 mrad                                                                                                                                                                                                                                                                                                                                                                                            |
| Pulse length                                |                                      | 20 µs                                                                                                                                                                                                                                                                                                                                                                                               |
| Repetition rate                             |                                      | 25 kHz                                                                                                                                                                                                                                                                                                                                                                                              |
| max. pulse energy                           |                                      | 18 nJ                                                                                                                                                                                                                                                                                                                                                                                               |
| Alignment aid                               |                                      | LED red (in receiver lens)<br>illuminated constantly: beam is interrupted,<br>flashes: reaching switching point,<br>off: sufficient stability control                                                                                                                                                                                                                                               |
| Diameter of the light spot                  |                                      | Approx. 20 mm at 5 m, approx. 75 mm x 300 mm at 70 m horizontal in relation to the housing axis                                                                                                                                                                                                                                                                                                     |
| Opening angle                               |                                      | Emitter: 0.23 °<br>Receiver: 5 °                                                                                                                                                                                                                                                                                                                                                                    |
| Ambient light limit                         |                                      | 50000 Lux                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Functional safety related parameters</b> |                                      |                                                                                                                                                                                                                                                                                                                                                                                                     |
| MTTF <sub>d</sub>                           |                                      | 540 a                                                                                                                                                                                                                                                                                                                                                                                               |
| Mission Time (T <sub>M</sub> )              |                                      | 20 a                                                                                                                                                                                                                                                                                                                                                                                                |
| Diagnostic Coverage (DC)                    |                                      | 90 %                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Indicators/operating means</b>           |                                      |                                                                                                                                                                                                                                                                                                                                                                                                     |
| Operation indicator                         |                                      | LED green                                                                                                                                                                                                                                                                                                                                                                                           |
| Function indicator                          |                                      | LED yellow:<br>1. LED lit constantly: signal > 2 x switching point (function reserve)<br>2. LED flashes: signal between 1 x switching point and 2 x switching point<br>3. LED off: signal < switching point                                                                                                                                                                                         |
| Control elements                            |                                      | sensitivity adjustment (Adjustment to < 25% of the effective operating range) , Light-on/dark-on changeover switch                                                                                                                                                                                                                                                                                  |
| <b>Electrical specifications</b>            |                                      |                                                                                                                                                                                                                                                                                                                                                                                                     |
| Operating voltage                           | U <sub>B</sub>                       | 10 ... 30 V DC                                                                                                                                                                                                                                                                                                                                                                                      |
| Ripple                                      |                                      | 10 %                                                                                                                                                                                                                                                                                                                                                                                                |
| No-load supply current                      | I <sub>0</sub>                       | Emitter: ≤ 55 mA<br>Receiver: ≤ 40 mA                                                                                                                                                                                                                                                                                                                                                               |
| <b>Input</b>                                |                                      |                                                                                                                                                                                                                                                                                                                                                                                                     |
| Test input                                  |                                      | emitter deactivation at +U <sub>B</sub>                                                                                                                                                                                                                                                                                                                                                             |
| <b>Output</b>                               |                                      |                                                                                                                                                                                                                                                                                                                                                                                                     |
| Stability alarm output                      |                                      | 1 PNP transistor, short-circuit protected, protected from reverse polarity, open collector, U <sub>max</sub> = 30 V DC, I <sub>max</sub> = 0.2 A<br>The output becomes inactive if the signal level has fallen below the function reserve for approx. 10 s (yellow and red LEDs flash).<br>If the light beam is interrupted four times during this period, the output immediately becomes inactive. |
| Switching type                              |                                      | light/dark on, switchable                                                                                                                                                                                                                                                                                                                                                                           |
| Signal output                               |                                      | 2 PNP, complementary, short-circuit protected, reverse polarity protected , open collectors                                                                                                                                                                                                                                                                                                         |
| Switching voltage                           |                                      | max. 30 V DC                                                                                                                                                                                                                                                                                                                                                                                        |
| Switching current                           |                                      | max. 200 mA                                                                                                                                                                                                                                                                                                                                                                                         |
| Switching frequency                         | f                                    | 1000 Hz                                                                                                                                                                                                                                                                                                                                                                                             |
| Response time                               |                                      | 0.5 ms                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Conformity</b>                           |                                      |                                                                                                                                                                                                                                                                                                                                                                                                     |
| Product standard                            |                                      | EN 60947-5-2                                                                                                                                                                                                                                                                                                                                                                                        |

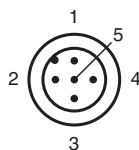
Technical Data

|                                   |                                                                                                                                      |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Laser safety                      | EN 60825-1                                                                                                                           |
| <b>Approvals and certificates</b> |                                                                                                                                      |
| Protection class                  | II, rated voltage ≤ 250 V AC with pollution degree 1-2 according to IEC 60664-1                                                      |
| UL approval                       | cULus Listed , Class 2 power source                                                                                                  |
| CCC approval                      | CCC approval / marking not required for products rated ≤36 V                                                                         |
| FDA approval                      | IEC 60825-1:2007 Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007 |
| <b>Ambient conditions</b>         |                                                                                                                                      |
| Ambient temperature               | 0 ... 40 °C (32 ... 104 °F)                                                                                                          |
| Storage temperature               | -20 ... 75 °C (-4 ... 167 °F)                                                                                                        |
| <b>Mechanical specifications</b>  |                                                                                                                                      |
| Housing width                     | 25.8 mm                                                                                                                              |
| Housing height                    | 88 mm                                                                                                                                |
| Housing depth                     | 54.3 mm                                                                                                                              |
| Degree of protection              | IP67                                                                                                                                 |
| Connection                        | 5-pin, M12 x 1 plastic connector                                                                                                     |
| <b>Material</b>                   |                                                                                                                                      |
| Housing                           | Plastic ABS                                                                                                                          |
| Optical face                      | Plastic pane                                                                                                                         |
| Mass                              | 140 g (emitter and receiver)                                                                                                         |

Connection Assignment



Connection Assignment



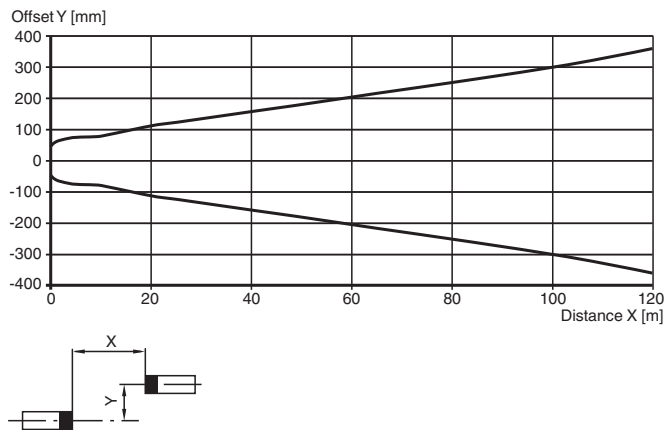
## Connection Assignment

Wire colors in accordance with EN 60947-5-2

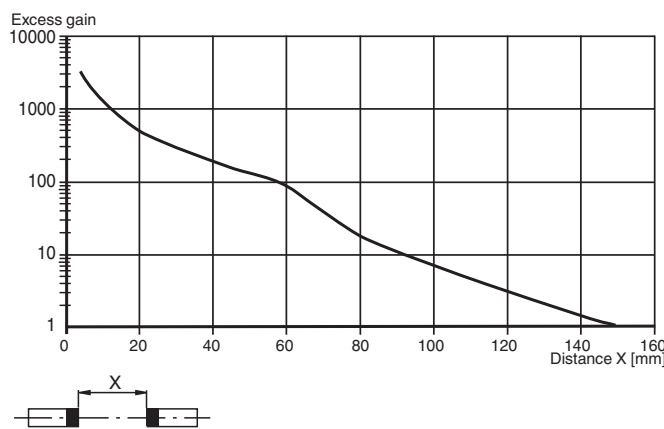
|   |    |         |
|---|----|---------|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue)  |
| 4 | BK | (black) |
| 5 | GY | (gray)  |

## Characteristic Curve

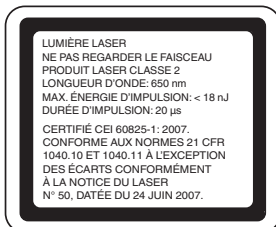
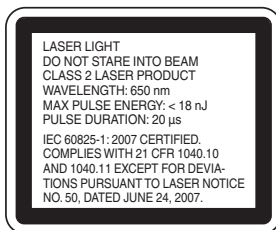
### Characteristic response curve



### Relative received light strength



## Safety Information



## Safety Information

### Laser Class 2 Information

The irradiation can lead to irritation especially in a dark environment. Do not point at people!

Caution: Do not look into the beam!

Maintenance and repairs should only be carried out by authorized service personnel!

Attach the device so that the warning is clearly visible and readable.

Caution – Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

## Accessories

|                                                                                     |                     |                                                                         |
|-------------------------------------------------------------------------------------|---------------------|-------------------------------------------------------------------------|
|  | <b>OMH-05</b>       | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm           |
|  | <b>OMH-21</b>       | Mounting bracket: mounting aid for sensors in the RL* series            |
|  | <b>OMH-22</b>       | Mounting aid for RL* series                                             |
|  | <b>OMH-RLK29-HW</b> | Mounting bracket for rear wall mounting                                 |
|  | <b>OMH-RL28-C</b>   | Weld slag cover model                                                   |
|  | <b>V15-G-2M-PUR</b> | Female cordset single-ended M12 straight A-coded, 5-pin, PUR cable grey |