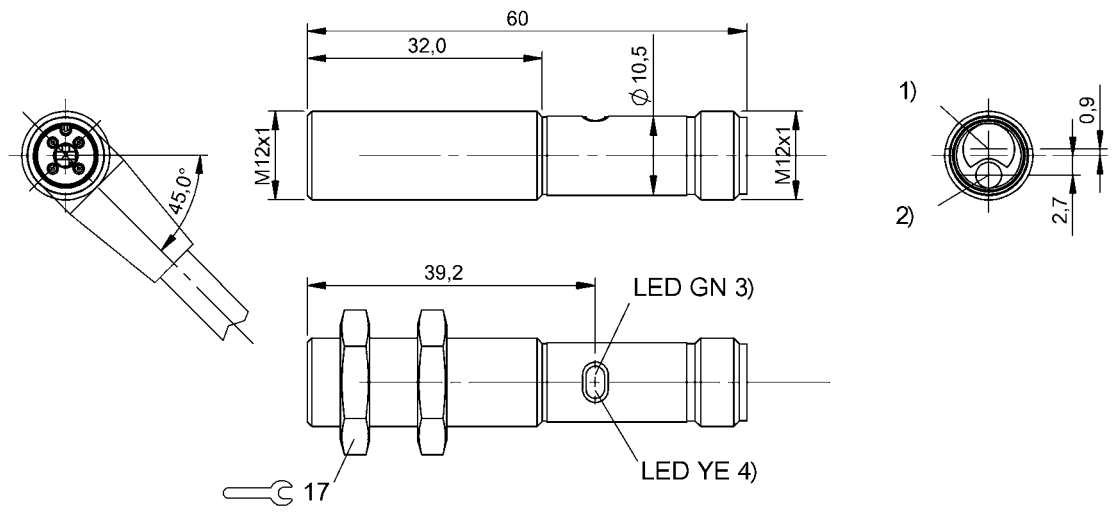


Photoelectric Sensors  
BOS 12M-PA-RF10-S4  
Order Code: BOS01UM



1) Optical axis receiver, 2) Optical axis emitter, 3) Operating voltage/Error, 4) Light reception/limit area



Basic features

|                        |                             |
|------------------------|-----------------------------|
| Approval/Conformity    | CE<br>UKCA<br>cULus<br>WEEE |
| Basic standard         | IEC 60947-5-2               |
| Principle of operation | Photoelectric sensor        |
| Series                 | 12M                         |
| Style                  | Cylinder<br>Straight optics |

Display/Operation

|          |   |
|----------|---|
| Adjuster | no  |
| Display  | LED green: Power<br>Error - LED green, flashing<br>Limit range - LED yellow, flashing<br>LED yellow: Light received |

Electrical connection

|                             |                              |
|-----------------------------|------------------------------|
| Connection                  | Connector, M12x1-Male, 4-pin |
| Contact, surface protection | Gold plated                  |
| Polarity reversal protected | yes                          |
| Short-circuit protection    | yes                          |

Electrical data

|  |             |
|--|-------------|
| Load capacitance max. at Ue                        | 0.2 µF      |
| No-load current I <sub>o</sub> max. at Ue          | 20 mA       |
| Operating voltage U <sub>b</sub>                   | 10...30 VDC |
| Rated operating current I <sub>e</sub>             | 100 mA      |
| Rated operating voltage U <sub>e</sub> DC          | 24 V        |
| Ripple max. (% of U <sub>e</sub> )                 | 15 %        |
| Switching frequency                                | 1000 Hz     |
| Turn-off delay t <sub>off</sub> max.               | 0.5 ms      |
| Turn-on delay t <sub>on</sub> max.                 | 0.5 ms      |
| Utilization category                               | DC -13      |
| Voltage drop U <sub>d</sub> max. at I <sub>e</sub> | 1.5 V       |

Environmental conditions

|                         |   |
|-------------------------|---|
| Ambient temperature     | -5...60 °C  |
| Contamination scale     | 3   |
| EN 60068-2-27, Shock    | Half-sinus, 30 g <sub>n</sub> , 11 ms, 3x6<br>Half-sinus, 100 g <sub>n</sub> , 2 ms, 3x8000     |
| EN 60068-2-6, Vibration | 10...55 Hz, amplitude 1 mm, 3x30 min<br>10...2000 Hz, amplitude 1 mm, 30 g <sub>n</sub> , 3x5 h |
| IP rating               | IP67  |

Functional safety

|              |        |
|--------------|--------|
| MTTF (40 °C) | 1561 a |
|--------------|--------|

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**BALLUFF**

### Interface

|                  |                                 |
|------------------|---------------------------------|
| Switching output | PNP normally closed (NC)        |
|                  | PNP normally open (NO) Pins 4-2 |

### Material

|                          |                      |
|--------------------------|----------------------|
| Housing material         | Brass, nickel-plated |
| Material sensing surface | PMMA                 |
| Surface protection       | nickel-plated        |

### Mechanical data

|                                       |              |
|---------------------------------------|--------------|
| Dimension                             | Ø 12 x 60 mm |
| Distance deviation 6 % max. (% of Sr) | 5.0 %        |
| Mounting part                         | Nut M12x1    |
| Tightening torque max.                | 7 Nm         |
|                                       | 15 Nm        |

### Optical features

|                                |                               |
|--------------------------------|-------------------------------|
| Ambient light max.             | 50000 Lux                     |
| Beam characteristic            | Focus, typical at 25 mm       |
| LED group per IEC 62471        | Exempt Group                  |
| Light spot size                | Ø 2 mm at 25 mm               |
| Light type                     | LED, red light                |
| Principle of optical operation | Diffuse sensor, triangulation |
| Smallest part typ.             | Ø 0.05 mm wire                |
| Special optical feature        | Fixed focus                   |
|                                | Fixed background suppression  |
| Switching function, optical    | Light-on                      |
|                                | dark-on                       |
| Wave length                    | 650 nm                        |

### Range/Distance

|  |           |
|--|-----------|
| Distance deviation 18 % max. (% of Sr) | 1 %       |
| Hysteresis H max. (% of Sr)            | 1.0 %     |
| Range                                  | 1...25 mm |
| Rated operating distance Sn            | 25 mm     |
| Repeat accuracy max. (% of Sr)         | 1.0 %     |
| Temperature drift max. (% of Sr)       | 5 %       |

### Remarks

Order accessories separately.

For additional information, refer to user's guide.

Only for applications per NFPA 79 (machines with a supply voltage of maximum 600 V). Use an R/C (CYJV2) cable with suitable properties for attaching the device.

Reference object (target): gray card, 100 x 100, 90 % remission, axial approach.

The sensor is functional again after the overload has been eliminated.

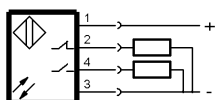
For more information about MTTF and B10d see MTTF / B10d Certificate

Indication of the MTTF- / B10d value does not represent a binding composition and/or life expectancy assurance; these are simply experiential values with no warranty implications. These declared values also do not extend the expiration period for defect claims or affect it in any way.

## Connector Drawings



## Wiring Diagrams



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Opto Symbols

