## Technical Description

The expanded **BOS 12M family** represents a radical simplification in sensor technology for the most common applications. All sensors – diffuse, retroreflective or thru-beams are designed in the same housing as a typical inductive proximity sensor (M12×1). This means that **Optical and Inductive proximity sensors are mechanically and electrically compatible!**
As far as installation is concerned, there is no simpler concept for sensors than a drilled hole. And that is
all the sensors from the BOS 12M compact series require for installation.

This simplifies the design of system or machine, making converting sensor types easier, and reduces inventory through **multiple usage of accessories.** This in turn means **standardization and simplification** of your sensor needs. The BOS 12M series in their rugged metal housing is fully potted and provides IP 67 protection.

## Available Models

Diffuse with fixed sensing distances (100 mm and 200 mm) and manufactured to tight tolerances, ideal for rapid and uncomplicated assembly. The use of a red light also makes their alignment easier. The diffuse model with 400 mm range is adjustable. This makes the sensor more flexible and universal.

Retroreflective sensors with polarizing filter, adjustable range (up to 1.5 m) and red light.

Thru-beam sensors with 5 m range, red light and adjustable sensitivity. The output is complimentary, allowing function monitoring of the sensor system. The additional output status display in the sensor face makes it easy to align.

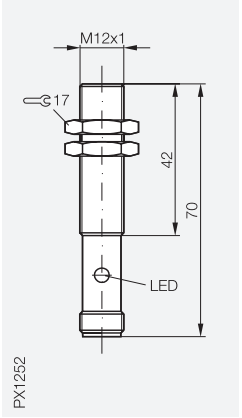
## Features

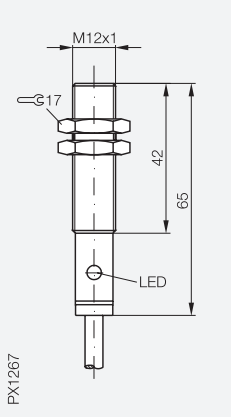
- Supply voltage 10...30 V DC, polarity reverse protected
- Output 200 mA, short protected
- Output status display
- IP 67 housing
- Standard metal housing (M12×1)
- Red and infrared light versions
- Fixed and adjustable sensitivity
- PNP or NPN, light-on or dark-on
- Cable and connector versions (M12 connector)

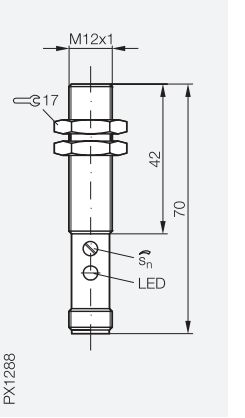
## Applications

- Anywhere M18×1 is too large
- With a simple M12 bore hole for mounting, the sensor can be used wherever inductive proximity switches are in use
- General automation tasks
- Assembly and handling
- Machine building
- Packaging machinery
- Robots
- Machine tools

| | | | | |
|---|---|---|---|---|
| Housing size | | M12×1 | M12×1 | M12×1 |
| Diffuse | sensing range | **100 mm/200 mm** | **100 mm/200 mm** | **400 mm** |
| Retroreflective | sensing range | | | |
| Thru-Beam | sensing range | | | |




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Diffuse** | | | | | | | |
| PNP | O | 100 mm | red light | ① | BOS 12M-PS-1YA-S 4-C | BOS 12M-PS-1YA-B0-C | |
| NPN | O | 100 mm | red light | ④ | BOS 12M-NS-1YA-S 4-C | BOS 12M-NS-1YA-BO-C | |
| PNP | ● | 100 mm | red light | ② | BOS 12M-PO-1YA-S 4-C | BOS 12M-PO-1YA-B0-C | |
| NPN | ● | 100 mm | red light | ④ | BOS 12M-NO-1YA-S 4-C | BOS 12M-NO-1YA-BO-C | |
| PNP | O | 200 mm | red light | ① | BOS 12M-PS-1YB-S 4-C | BOS 12M-PS-1YB-B0-C | |
| NPN | O | 200 mm | red light | ④ | BOS 12M-NS-1YB-S 4-C | BOS 12M-NS-1YB-BO-C | |
| PNP | ● | 200 mm | red light | ② | BOS 12M-PO-1YB-S 4-C | BOS 12M-PO-1YB-B0-C | |
| NPN | ● | 200 mm | red light | ④ | BOS 12M-NO-1YB-S 4-C | BOS 12M-NO-1YB-BO-C | |
| PNP | O | 400 mm | infrared light, pot | ① | | | BOS 12M-PS-1PD-S 4-C |
| NPN | O | 400 mm | infrared light, pot | ④ | | | BOS 12M-NS-1PD-S4-C |
| PNP | ● | 400 mm | infrared light, pot | ② | | | BOS 12M-PO-1PD-S 4-C |
| NPN | ● | 400 mm | infrared light, pot | ④ | | | BOS 12M-NO-1PD-S4-C |
| **Retroreflective** | | | | | | | |
| PNP | ● | 1,5 m | red light, pot, polariz.filter | ① | | | |
| PNP | O | 1,5 m | red light, pot, polariz.filter | ② | | | |
| **Thru-Beam** | | | | | | | |
| PNP | O/● | 5 m | receiver, red light, pot | ③ | | | |
| PNP | | 5 m | emitter | ⑮ | | | |

| | | | |
|---|---|---|---|
| Supply voltage $U_B$ | 10...30 V DC | 10...30 V DC | 10...30 V DC |
| Voltage drop $U_d$ at $I_e$ | ≤ 2.5 V | ≤ 2.5 V | ≤ 2.5 V |
| Rated isolation voltage $U_i$ | 75 V DC | 75 V DC | 75 V DC |
| Rated operational current $I_e$ | ≤ 200 mA | ≤ 200 mA | ≤ 200 mA |
| No-load supply current $I_0$ | ≤ 20 mA | ≤ 20 mA | ≤ 20 mA |
| Short circuit protected | yes | yes | yes |
| Permissible capacitance | 0.5 µF | 0.5 µF | 0.5 µF |
| On/Off delay | 2.5 ms | 2.5 ms | 2.5 ms |
| Frequency of operating cycles | 200 Hz | 200 Hz | 200 Hz |
| Utilization category | DC 13 | DC 13 | DC 13 |
| Output | PNP/NPN | PNP/NPN | PNP/NPN |
| Output function | O or ● | O or ● | O or ● |
| Permissible ambient light | 5000 Lux | 5000 Lux | 5000 Lux |
| Sensitivity/Range adjustment | no | no | yes |
| Output function indication | yes | yes | yes |
| Stability indication | no | no | no |
| Ambient temperature range $T_a$ | –15...+55 °C | –15...+55 °C | –15...+55 °C |
| Degree of protection per IEC 529 | IP 67 | IP 67 | IP 67 |
| Housing material | nickel plated brass | nickel plated brass | nickel plated brass |
| Material of sensing face | PMMA | PMMA | PMMA |
| Connection | connector | cable | connector |
| No. of wires × conductor cross section | | 3 × 22 AWG | |
| Weight | 30 g | 136 g (with 3 m cable) | 30 g |
| Recommended connector | BKS-S 19/BKS-S 20 | | BKS-S 19/BKS-S 20 |

O/● = Light-On/Dark-On

| M12×1<br>**400 mm** | M12×1<br>**1.5 m** | M12×1<br>**1.5 m** | M12×1<br>**5 m** | M12×1<br>**5 m** |
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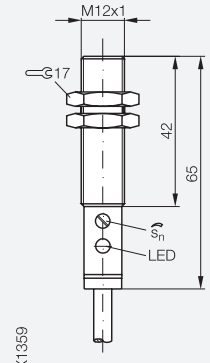
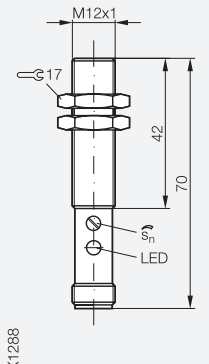
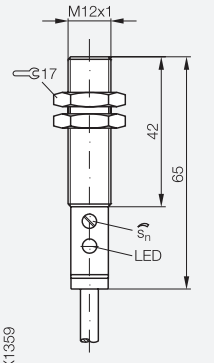
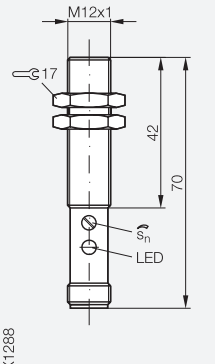
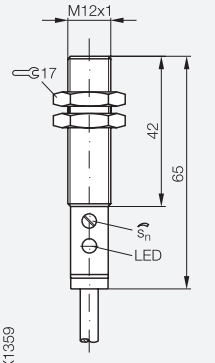
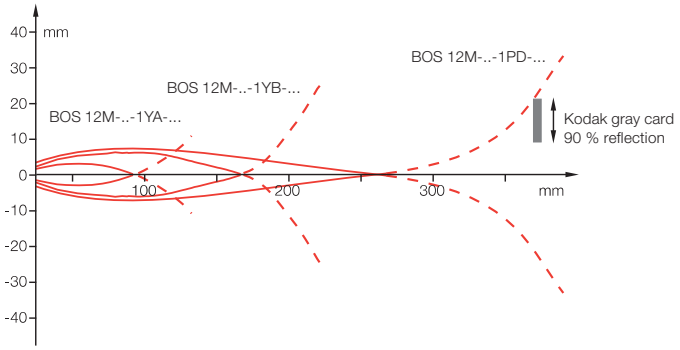
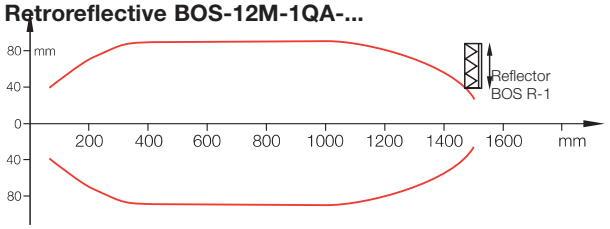
|  |  |  |  |  |
| BOS 12M-PS-1PD-BO-C<br>BOS 12M-NS-1PD-BO-C<br>BOS 12M-PO-1PD-BO-C<br>BOS 12M-NO-1PD-BO-C | | | | |
| | BOS 12M-PS-1QA-S 4-C<br>BOS 12M-PO-1QA-S 4-C | BOS 12M-PS-1QA-B0-C<br>BOS 12M-PO-1QA-B0-C | | |
| | | | BLE 12M-PA-1PD-S 4-C<br>BLS 12M-XX-1RD-S 4-L | BLE 12M-PA-1PD-BO-C<br>BLS 12M-XX-1RD-BO-L |
| 10...30 V DC | 10...30 V DC | 10...30 V DC | 10...30 V DC | 10...30 V DC |
| ≤ 2.5 V | ≤ 2.5 V | ≤ 2.5 V | ≤ 2.5 V | ≤ 2.5 V |
| 75 V DC | 75 V DC | 75 V DC | 75 V DC | 75 V DC |
| ≤ 200 mA | ≤ 200 mA | ≤ 200 mA | ≤ 200 mA | ≤ 200 mA |
| ≤ 20 mA | ≤ 20 mA | ≤ 20 mA | ≤ 20 mA | ≤ 20 mA |
| yes | yes | yes | yes | yes |
| 0.5 µF | 0.5 µF | 0.5 µF | 0.5 µF | 0.5 µF |
| 2.5 ms | 2.5 ms | 2.5 ms | 1 ms | 1 ms |
| 200 Hz | 200 Hz | 200 Hz | 500 Hz | 500 Hz |
| DC 13 | DC 13 | DC 13 | DC 13 | DC 13 |
| PNP/NPN | PNP/NPN | PNP/NPN | PNP/NPN | PNP/NPN |
| O or ● | O or ● | O or ● | O/● | O/● |
| 5000 Lux | 5000 Lux | 5000 Lux | 5000 Lux | 5000 Lux |
| yes | yes | yes | yes (BLS no) | yes (BLS no) |
| yes | yes | yes | yes | yes |
| no | no | no | no | no |
| –15...+55 °C | –15...+55 °C | –15...+55 °C | –15...+55 °C | –15...+55 °C |
| IP 67 | IP 67 | IP 67 | IP 67 | IP 67 |
| nickel plated brass | nickel plated brass | nickel plated brass | nickel plated brass | nickel plated brass |
| PMMA | PMMA | PMMA | PMMA | PMMA |
| cable | connector | cable | connector | cable |
| 3×22 AWG | | 3× 22AWG | | 3×22 AWG |
| 136 g (with 3 m cable) | 30 g | 136 g (with 3 m cable) | 30 g | 136 g (with 3 m cable) |
| | BKS-S 19/BKS-S 20 | | BKS-S 19/BKS-S 20 | |

### Diffuse BOS-12M-1YA/1YB/1PD-...



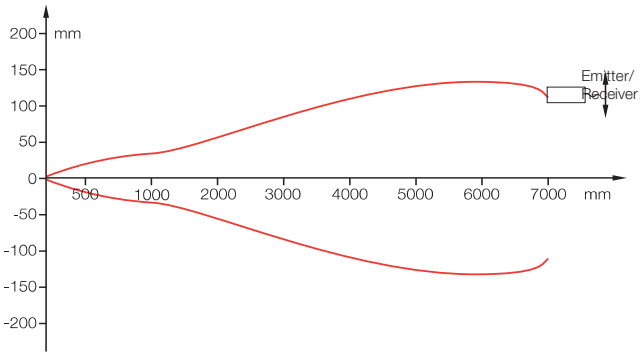

Sensing distance measured with lateral approach using Kodak gray card.

### Retroreflective BOS-12M-1QA-...




Sensing distance measured with lateral approach using reflector.

### Thru-Beam BLS 12M/BLE 12M...




For the thru-beam sensor the maximum possible offset between emitter and receiver is measured.

– Diffuse values referenced to Kodak gray card with 90% reflection.
– Retroreflective values referenced to R1 reflector.
– NPN versions on request.
– Sensors supplied standard with 3 m potted cable. Other lengths on request.

### Connection Diagrams