








W12-2: Fantastic performance - years of experience

| | |
|--|--|
|  | Photoelectric proximity switch FGS |
|  | Photoelectric proximity switch BGS |
|  | Photoelectric proximity switch energ. |



The WL12 G "glass photoelectric switch" designed for filling systems used in the beverage industry, represents more than just a technical advance. This intelligent sensor needs to be configured just once using the teach-in method and then it is able to adapt its switching threshold to increasing contamination continuously and fully automatically during operation. As a result, transparent objects, e.g. transparent films or filled PET mineral water bottles, can now be detected much more reliably.

Continual cleaning and realignment are, therefore, a thing of the past. Monitoring the flow of bottles, and bottle counting, has been made possible while simultaneously minimising maintenance requirements.

| | |
|--|---|
|  | Photoelectric reflex switch |
|  | Through-beam photoelectric switch |
|  | Proximity switch with fibre optic cables |
|  | Proximity switch with fibre optic cables |

The W12-2 series of photoelectric switches is in use all over the world. The key advantage for the user is the wealth of experience gained from the previous W12 series. The W12-2 series is backed by years of know-how gained from many thousands of applications.

A sturdy metal housing protects the WT12-2 photoelectric proximity switch, the WL12-2 photoelectric reflex switch and the WS/WE12-2 through-beam photoelectric switch. Rotatable plugs provide flexibility of location and cable installation. Features such as foreground and background suppression, ASI interface, fibre-optic cable versions, insensitivity to ambient light and mutual interference when units are installed close together, are all device standards.

Further advantages:

- The Teflon-coated version for use in, for example, the beverage industry.
- IP 69K assures reliable operation even when high pressure cleaning equipment is being used.
- The Series W12-2 sensors fulfil the test requirements of



ECOLAB certifies that material resistance tests with cleaning agents and disinfectants in common use in the food-processing sector, were successfully completed.

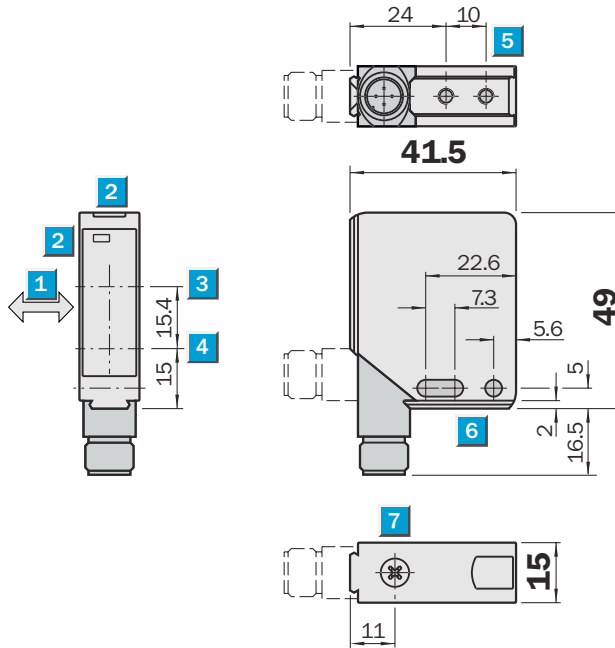
Scanning distance
35 ... 100 mm

Photoelectric proximity switch

- Red light; consequently, fast alignment is possible
- Insensitive to external light sources, i.e., increased operating reliability
- M12 plug rotatable by 90°, or 2 m cable
- Adjustable foreground suppression; ideal for applications with critical surfaces



Dimensional drawing



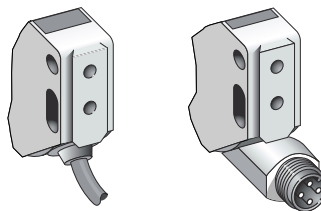
Adjustments possible



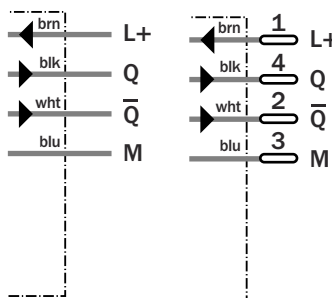
- Standard direction of the material being scanned
- LED signal strength indicator
- Optical axis receiver
- Optical axis sender
- M4 threaded mounting hole - 4 mm deep
- Mounting holes \varnothing 4.2 mm
- Scanning distance adjustment

Connection type

| | |
|------------|------------|
| WT12-2N140 | WT12-2N440 |
| WT12-2P140 | WT12-2P440 |

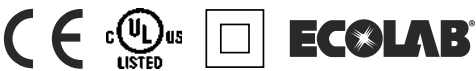


| | |
|--------------------------|------------|
| 4 x 0.25 mm ² | M12, 4-pin |
|--------------------------|------------|



Accessories

| |
|-----------------------|
| Connector, M12, 4-pin |
| Mounting systems |



| WT12-2 | | N140 | N440 | P140 | P440 | | | | | | |
|--------------------------------------|---|------|------|------|------|--|--|--|--|--|--|
| Operating distance | 35 ... 100 mm | | | | | | | | | | |
| Light source, light type | LED, Red light ¹⁾ | | | | | | | | | | |
| Light spot diameter | 3 x 3 mm at 60 mm distance | | | | | | | | | | |
| Supply voltage V_s | DC 10 ... 30 V ²⁾ | | | | | | | | | | |
| Ripple | ≤ 5 V _{ss} ³⁾ | | | | | | | | | | |
| Power consumption | ≤ 40 mA ⁴⁾ | | | | | | | | | | |
| | ≤ 30 mA ⁴⁾ | | | | | | | | | | |
| Switching outputs | NPN antivalent | | | | | | | | | | |
| | PNP antivalent | | | | | | | | | | |
| Output current I _a max | ≤ 100 mA | | | | | | | | | | |
| Response time | ≤ 330 μs ⁵⁾ | | | | | | | | | | |
| Switching frequency | 1,500 Hz ⁶⁾ | | | | | | | | | | |
| Connection type | Cable, 2 m ⁷⁾ | | | | | | | | | | |
| | Connector, M12, 4-pin | | | | | | | | | | |
| VDE protection class | □ ⁸⁾ | | | | | | | | | | |
| Circuit protection | V _s connections reverse-polarity protected / Output Q and Q not short-circuit protected / Interference suppression | | | | | | | | | | |
| Enclosure rating | IP 69K | | | | | | | | | | |
| Ambient temperature operation | -40 °C ... +60 °C | | | | | | | | | | |
| Ambient temperature storage | -40 °C ... +75 °C | | | | | | | | | | |
| Weight | Ca. 200 g | | | | | | | | | | |
| | Ca. 120 g | | | | | | | | | | |
| Housing material | Zinc die-cast ⁹⁾ | | | | | | | | | | |
| Included with delivery | 2 clamps BEF-KH-W12 | | | | | | | | | | |

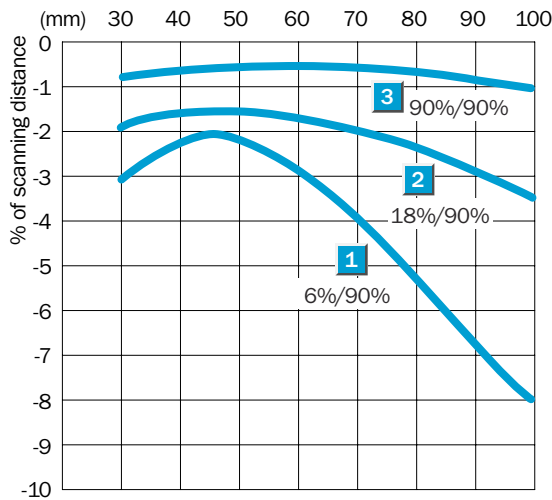
¹⁾ Average service life 100,000 h at T_a = +25 °C
²⁾ Limit values

³⁾ May not exceed or fall short of V_s tolerances
⁴⁾ Without load

⁵⁾ Signal transit time with resistive load
⁶⁾ With light/dark ratio 1:1
⁷⁾ Do not bend below 0 °C

⁸⁾ Reference voltage 50 V DC
⁹⁾ Teflon-coated housing available on request

Scanning distance



| Ordering information | |
|----------------------|-------------|
| Model Name | Part Number |
| WT12-2N140 | 1 016 145 |
| WT12-2N440 | 1 016 146 |
| WT12-2P140 | 1 016 148 |
| WT12-2P440 | 1 016 150 |

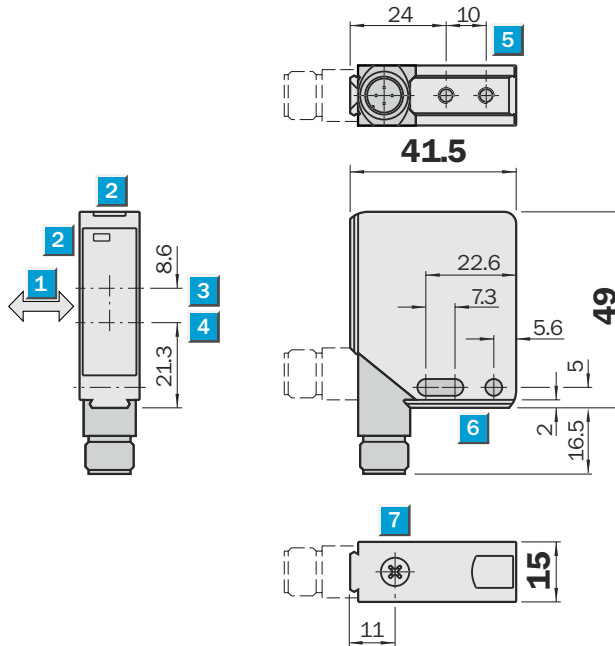
Scanning distance
20 ... 250 mm

Photoelectric proximity switch

- Red light; consequently, fast alignment is possible
- Insensitive to external light sources, i.e., increased operating reliability
- M12 plug rotatable by 90°, or 2 m/5 m cable
- Adjustable background suppression



Dimensional drawing



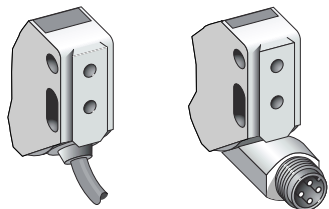
Adjustments possible



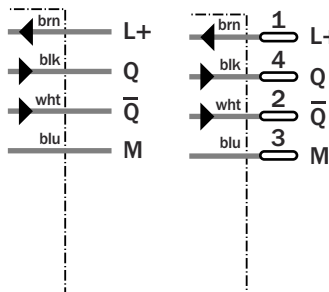
- Standard direction of the material being scanned
- LED signal strength indicator
- Optical axis receiver
- Optical axis sender
- M4 threaded mounting hole - 4 mm deep
- Mounting holes \varnothing 4.2 mm
- Scanning distance adjustment

Connection type

| | |
|------------|------------|
| WT12-2N130 | WT12-2N430 |
| WT12-2P130 | WT12-2P430 |
| WT12-2P830 | |

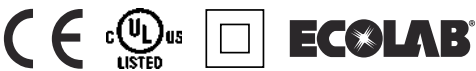


4 x 0.25 mm² M12, 4-pin



Accessories

| |
|-----------------------|
| Connector, M12, 4-pin |
| Mounting systems |



| WT12-2 | | N130 | N430 | N830 | P130 | P430 | P830 | | | |
|--------------------------------------|---|------|------|------|------|------|------|--|--|--|
| Operating distance | 20 ... 250 mm | | | | | | | | | |
| Adjustment of operating distance | Potentiometer | | | | | | | | | |
| Light source, light type | LED, Red light ¹⁾ | | | | | | | | | |
| Light spot diameter | 10 mm at 200 mm distance | | | | | | | | | |
| | 10 mm | | | | | | | | | |
| Supply voltage V_s | DC 10 ... 30 V ²⁾ | | | | | | | | | |
| Ripple | ≤ 5 V _{SS} ³⁾ | | | | | | | | | |
| Power consumption | ≤ 40 mA ⁴⁾ | | | | | | | | | |
| | ≤ 30 mA ⁴⁾ | | | | | | | | | |
| Switching outputs | NPN antivalent | | | | | | | | | |
| | PNP antivalent | | | | | | | | | |
| Output current I _a max | ≤ 100 mA | | | | | | | | | |
| Response time | ≤ 330 μs ⁵⁾ | | | | | | | | | |
| Switching frequency | 1,500 Hz ⁶⁾ | | | | | | | | | |
| Connection type | Cable, PVC, 2 m ⁷⁾ | | | | | | | | | |
| | Connector, M12, 4-pin | | | | | | | | | |
| | Cable, PVC, 5 m ⁷⁾ | | | | | | | | | |
| VDE protection class | □ ⁸⁾ | | | | | | | | | |
| Circuit protection | V _s connections reverse-polarity protected / Output Q and Q not short-circuit protected / Interference suppression | | | | | | | | | |
| | V _s connections reverse-polarity protected / Output Q and Q not short-circuit protected / Interference suppression / Outputs overcurrent and short-circuit protected | | | | | | | | | |
| Enclosure rating | IP 69K | | | | | | | | | |
| Ambient temperature operation | -40 °C ... +60 °C | | | | | | | | | |
| Ambient temperature storage | -40 °C ... +75 °C | | | | | | | | | |
| Weight | Ca. 200 g | | | | | | | | | |
| | Ca. 120 g | | | | | | | | | |
| | Ca. 280 g | | | | | | | | | |
| Housing material | Zinc die-cast ⁹⁾ | | | | | | | | | |
| Included with delivery | 2 clamps BEF-KH-W12 | | | | | | | | | |

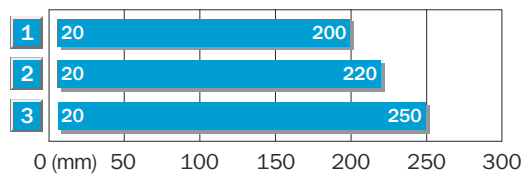
¹⁾ Average service life 100,000 h at T_a = +25 °C
²⁾ Limit values

³⁾ May not exceed or fall short of V_s tolerances
⁴⁾ Without load

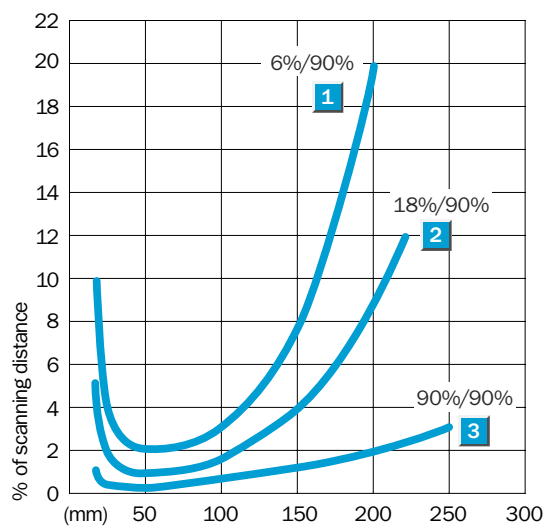
⁵⁾ Signal transit time with resistive load
⁶⁾ With light/dark ratio 1:1
⁷⁾ Do not bend below 0 °C

⁸⁾ Reference voltage 50 V DC
⁹⁾ Teflon-coated housing available on request

Scanning distance



- 1 Scanning distance on black, 6 % remission
- 2 Scanning distance on grey, 18 % remission
- 3 Scanning distance on white, 90 % remission



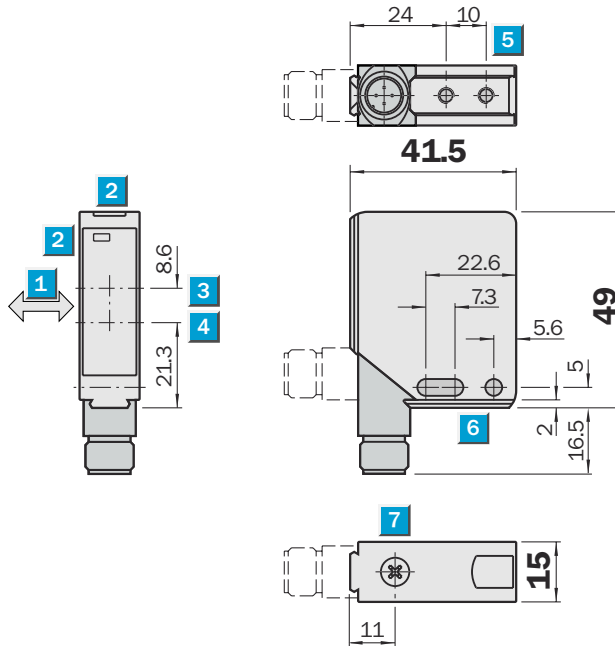
| Ordering information | |
|----------------------|-------------|
| Model Name | Part Number |
| WT12-2N130 | 1 016 122 |
| WT12-2N430 | 1 016 125 |
| WT12-2N830 | 1 016 123 |
| WT12-2P130 | 1 016 129 |
| WT12-2P430 | 1 016 134 |
| WT12-2P830 | 1 016 130 |

Scanning distance
20 ... 250 mm

Photoelectric proximity switch

- Red light; consequently, fast alignment is possible
- Insensitive to external light sources, i.e., increased operating reliability
- M12 plug rotatable by 90°
- With integrated AS-i chip
- Adjustable background suppression

Dimensional drawing



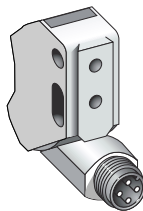
Adjustments possible



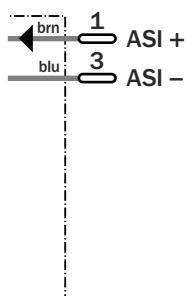
- 1 Standard direction of the material being scanned
- 2 LED signal strength indicator
- 3 Optical axis receiver
- 4 Optical axis sender
- 5 M4 threaded mounting hole - 4 mm deep
- 6 Mounting holes \varnothing 4.2 mm
- 7 Scanning distance adjustment

Connection type

WT12-2Z430



M12, 4-pin



| |
|-----------------------|
| Accessories |
| Connector, M12, 4-pin |
| Mounting systems |

| WT12-2 | | Z430 | | | | | | | | |
|--------------------------------------|---|------|--|--|--|--|--|--|--|--|
| Operating distance | 20 ... 250 mm | | | | | | | | | |
| Adjustment of operating distance | Potentiometer | | | | | | | | | |
| Light source, light type | LED, Red light ¹⁾ | | | | | | | | | |
| Light spot diameter | 10 mm at 200 mm distance | | | | | | | | | |
| Supply voltage V_s | DC 26.5 ... 31.5 V ²⁾ | | | | | | | | | |
| Power consumption | ≤ 35 mA ³⁾ | | | | | | | | | |
| Response time | ≤ 330 μs ⁴⁾ | | | | | | | | | |
| Switching frequency | 1,500 Hz ⁵⁾ | | | | | | | | | |
| Test input sender off | TE to 0 V | | | | | | | | | |
| Alarm output | Pre-failure signalling output | | | | | | | | | |
| Connection type | Connector, M12, 4-pin | | | | | | | | | |
| VDE protection class | □ ⁶⁾ | | | | | | | | | |
| Circuit protection | V _s connections reverse-polarity protected / Output Q and Q not short-circuit protected / Interference suppression | | | | | | | | | |
| Enclosure rating | IP 69K | | | | | | | | | |
| Ambient temperature operation | -25 °C ... +60 °C | | | | | | | | | |
| Ambient temperature storage | -40 °C ... +75 °C | | | | | | | | | |
| Weight | Ca. 120 g | | | | | | | | | |
| Housing material | Zinc die-cast ⁷⁾ | | | | | | | | | |
| Included with delivery | 2 clamps BEF-KH-W12 | | | | | | | | | |

¹⁾ Average service life 100,000 h at T_a = +25 °C

²⁾ Limit values
³⁾ Without load

⁴⁾ Signal transit time with resistive load
⁵⁾ With light/dark ratio 1:1

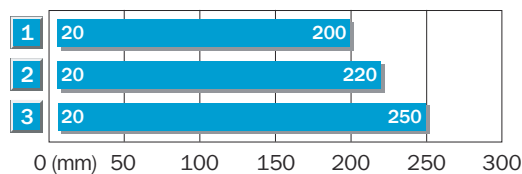
⁶⁾ Reference voltage 50 V DC
⁷⁾ Teflon-coated housing available on request

| Assignment of data bits | | (Host level) | |
|-------------------------|-----------------------|------------------------|--------|
| D ₀ | Switching state | 0 If light interrupted | Input |
| | Mode: light-switching | 1 If light received | |
| D ₁ | Alarm | 0 Active | Input |
| | | 1 Inactive | |
| D ₂ | NC | 0 | Input |
| | | 1 | |
| D ₃ | Test function | 0 Sender ON | Output |
| | | 1 Sender OFF | |

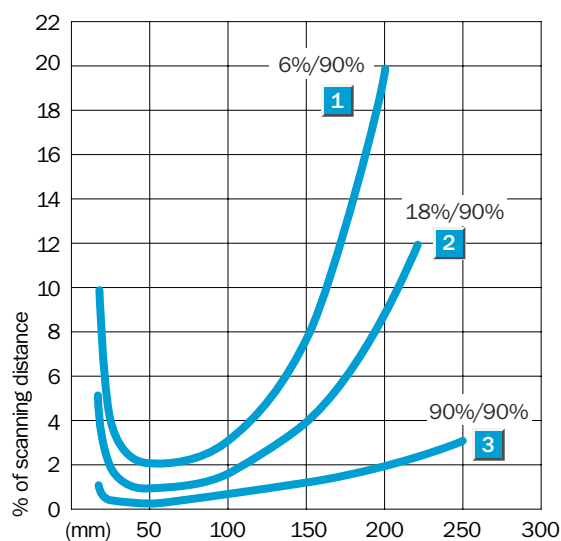
| Assignment of parameter bits | | | (Host level) |
|------------------------------|-----------------------|-------------------|--------------|
| P ₀ * | NC | 0 | Parameter |
| | | 1 | |
| P ₁ * | Light-/dark-switching | 0 Dark-switching | Parameter |
| | | 1 Light-switching | |
| P ₂ * | NC | 0 | Parameter |
| | | 1 | |
| P ₃ * | NC | 0 | Parameter |
| | | 1 | |

* Default setting = 1

Scanning distance



- 1 Scanning distance on black, 6% remission
- 2 Scanning distance on grey, 18% remission
- 3 Scanning distance on white, 90% remission



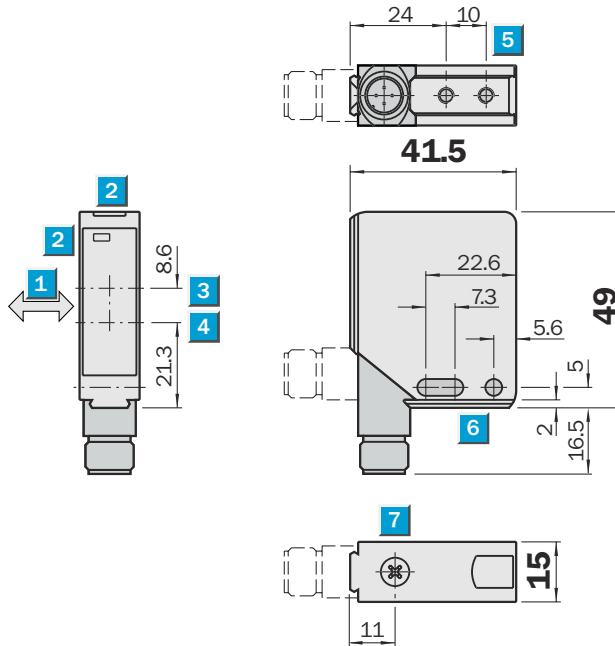
| Ordering information | |
|----------------------|-------------|
| Model Name | Part Number |
| WT12-2Z430 | 1 016 136 |

Scanning distance
20 ... 250 mm

Photoelectric proximity switch

- Infrared light
- Insensitive to external light sources, i.e., increased operating reliability
- M12 plug rotatable by 90°, or 2 m/3 m cable
- Adjustable background suppression

Dimensional drawing



Adjustments possible

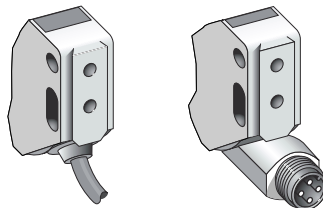


- 1 Standard direction of the material being scanned
- 2 LED signal strength indicator
- 3 Optical axis receiver
- 4 Optical axis send
- 5 M4 threaded mounting hole - 4 mm deep
- 6 Mounting holes Ø 4.2 mm
- 7 Scanning distance adjustment

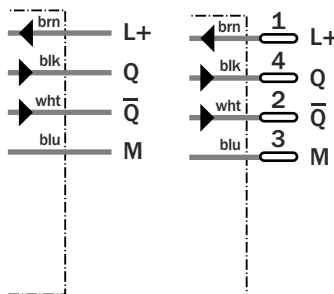


Connection type

| | |
|------------|------------|
| WT12-2N110 | WT12-2N410 |
| WT12-2N710 | WT12-2P410 |
| WT12-2P110 | |
| WT12-2P710 | |

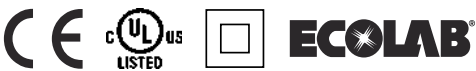


4 x 0.25 mm² M12, 4-pin



Accessories

| |
|-----------------------|
| Connector, M12, 4-pin |
| Mounting systems |



| WT12-2 | | N110 | N410 | N710 | P110 | P410 | P710 | | | | |
|--------------------------------------|---|------|------|------|------|------|------|--|--|--|--|
| Operating distance | 20 ... 250 mm | | | | | | | | | | |
| Adjustment of operating distance | Potentiometer | | | | | | | | | | |
| Light source, light type | LED, Infrared light ¹⁾ | | | | | | | | | | |
| Light spot diameter | 10 mm ar 200 mm distance | | | | | | | | | | |
| | 10 mm at 200 mm distance | | | | | | | | | | |
| Supply voltage V_s | DC 10 ... 30 V ²⁾ | | | | | | | | | | |
| Ripple | ≤ 5 V _{ss} ³⁾ | | | | | | | | | | |
| Power consumption | ≤ 50 mA ⁴⁾ | | | | | | | | | | |
| | ≤ 40 mA ⁴⁾ | | | | | | | | | | |
| Switching outputs | NPN antivalent | | | | | | | | | | |
| | PNP antivalent | | | | | | | | | | |
| Output current I _a max | ≤ 100 mA | | | | | | | | | | |
| Response time | ≤ 330 μs ⁵⁾ | | | | | | | | | | |
| Switching frequency | 1,500 Hz ⁶⁾ | | | | | | | | | | |
| Connection type | Cable, PVC, 2 m ⁷⁾ | | | | | | | | | | |
| | Connector, M12, 4-pin | | | | | | | | | | |
| | Cable, PVC, 3 m ⁷⁾ | | | | | | | | | | |
| VDE protection class | □ ⁸⁾ | | | | | | | | | | |
| Circuit protection | V _s connections reverse-polarity protected / Output Q and Q not short-circuit protected / Interference suppression | | | | | | | | | | |
| | V _s connections reverse-polarity protected / Output Q and Q not short-circuit protected / Interference suppression / Outputs overcurrent and short-circuit protected | | | | | | | | | | |
| Enclosure rating | IP 69K | | | | | | | | | | |
| Ambient temperature operation | -40 °C ... +60 °C | | | | | | | | | | |
| Ambient temperature storage | -40 °C ... +75 °C | | | | | | | | | | |
| Weight | Ca. 200 g | | | | | | | | | | |
| | Ca. 120 g | | | | | | | | | | |
| | Ca. 250 g | | | | | | | | | | |
| Housing material | Zinc die-cast ⁹⁾ | | | | | | | | | | |
| Included with delivery | 2 clamps BEF-KH-W12 | | | | | | | | | | |

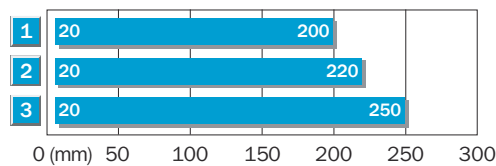
¹⁾ Average service life 100,000 h at T_a = +25 °C
²⁾ Limit values

³⁾ May not exceed or fall short of V_s tolerances
⁴⁾ Without load

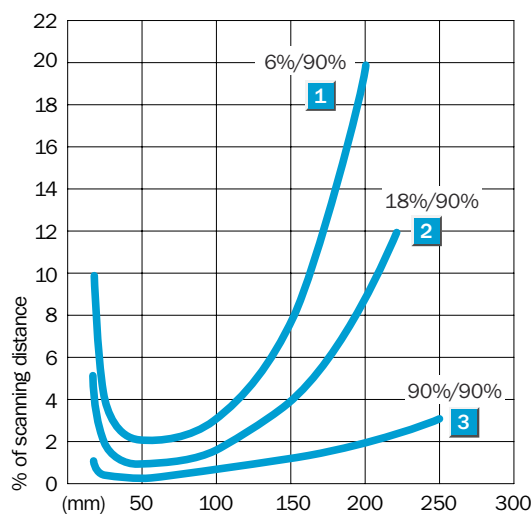
⁵⁾ Signal transit time with resistive load
⁶⁾ With light/dark ratio 1:1
⁷⁾ Do not bend below 0 °C

⁸⁾ Reference voltage 50 V DC
⁹⁾ Teflon-coated housing available on request

Scanning distance



- 1 Scanning distance on black, 6 % remission
- 2 Scanning distance on grey, 18 % remission
- 3 Scanning distance on white, 90 % remission



Ordering information

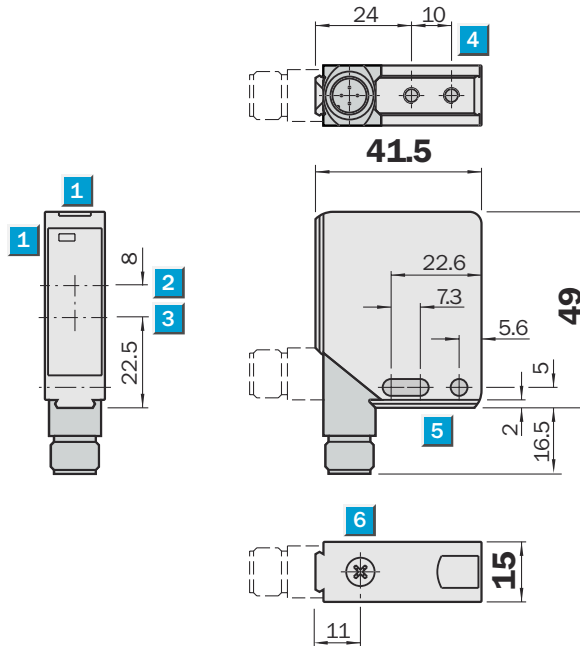
| Model Name | Part Number |
|------------|-------------|
| WT12-2N110 | 1 016 118 |
| WT12-2N410 | 1 016 124 |
| WT12-2N710 | 1 016 121 |
| WT12-2P110 | 1 016 126 |
| WT12-2P410 | 1 016 131 |
| WT12-2P710 | 1 016 128 |

Scanning distance
10 ... 1,000 mm

Photoelectric proximity switch

- Red light; consequently, fast alignment is possible
- Insensitive to external light sources, i.e., increased operating reliability
- M12 plug rotatable by 90°, or 2 m cable
- Energetic proximity switch, scanning distance adjustable; ideal for standard applications

Dimensional drawing



Adjustments possible

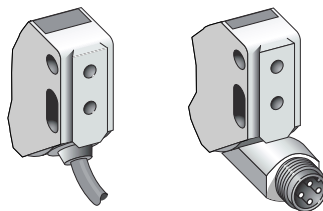


- 1 LED signal strength indicator
- 2 Optical axis receiver
- 3 Optical axis sender
- 4 M4 threaded mounting hole - 4 mm deep
- 5 Mounting holes Ø 4.2 mm
- 6 Scanning distance adjustment

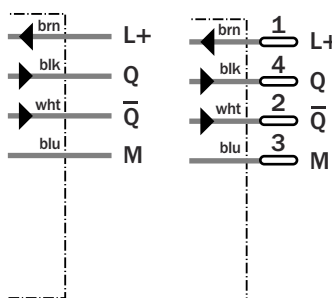


Connection type

| | |
|------------|------------|
| WT12-2N150 | WT12-2N450 |
| WT12-2P150 | WT12-2P450 |

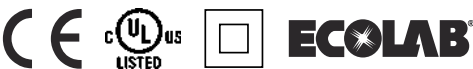


| | |
|--------------------------|------------|
| 4 x 0.25 mm ² | M12, 4-pin |
|--------------------------|------------|



Accessories

| |
|-----------------------|
| Connector, M12, 4-pin |
| Mounting systems |



| WT12-2 | | N150 | N450 | P150 | P450 |
|--------------------------------------|---|------|------|------|------|
| Scanning distance typ. max. | 10 ... 1,000 mm | | | | |
| Operating distance | 80 ... 800 mm | | | | |
| Adjustment of operating distance | Potentiometer | | | | |
| Light source, light type | LED, Red light ¹⁾ | | | | |
| Light spot diameter | 30 mm at 600 mm distance | | | | |
| Supply voltage V_s | DC 10 ... 30 V ²⁾ | | | | |
| Ripple | ≤ 5 V _{SS} ³⁾ | | | | |
| Power consumption | ≤ 40 mA ⁴⁾ | | | | |
| | ≤ 30 mA ⁴⁾ | | | | |
| Switching outputs | NPN antivalent | | | | |
| | PNP antivalent | | | | |
| Output current I _a max | ≤ 100 mA | | | | |
| Response time | ≤ 330 μs ⁵⁾ | | | | |
| Switching frequency | 1,500 Hz ⁶⁾ | | | | |
| Connection type | Cable, 2 m ⁷⁾ | | | | |
| | Connector, M12, 4-pin | | | | |
| VDE protection class | □ ⁸⁾ | | | | |
| Circuit protection | V _s connections reverse-polarity protected / Output Q and Q not short-circuit protected / Interference suppression | | | | |
| Enclosure rating | IP 69K | | | | |
| Ambient temperature operation | -40 °C ... +60 °C | | | | |
| Ambient temperature storage | -40 °C ... +75 °C | | | | |
| Weight | Ca. 200 g | | | | |
| | Ca. 120 g | | | | |
| Housing material | Zinc die-cast ⁹⁾ | | | | |
| Included with delivery | 2 clamps BEF-KH-W12 | | | | |

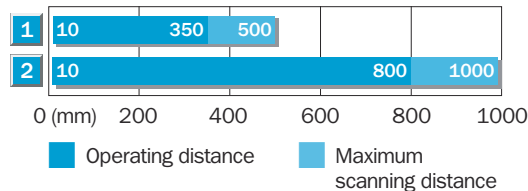
¹⁾ Average service life 100,000 h at T_a = +25 °C
²⁾ Limit values

³⁾ May not exceed or fall short of V_s tolerances
⁴⁾ Without load

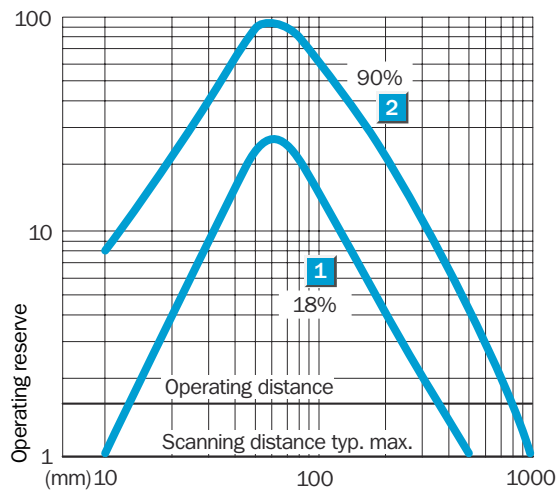
⁵⁾ Signal transit time with resistive load
⁶⁾ With light/dark ratio 1:1
⁷⁾ Do not bend below 0 °C

⁸⁾ Reference voltage 50 V DC
⁹⁾ Teflon-coated housing available on request

Scanning distance



- 1 Scanning distance on grey, 18 % remission
- 2 Scanning distance on white, 90 % remission



Ordering information

| Model Name | Part Number |
|------------|-------------|
| WT12-2N150 | 1 016 138 |
| WT12-2N450 | 1 016 139 |
| WT12-2P150 | 1 016 140 |
| WT12-2P450 | 1 016 142 |

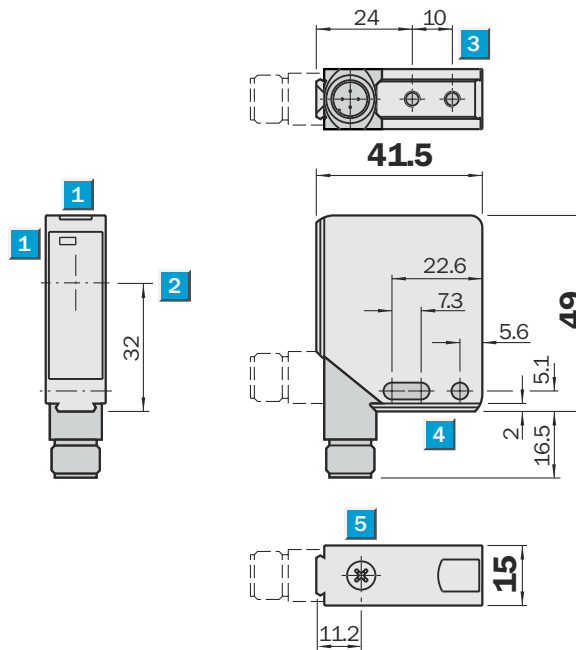
Scanning range
0 ... 7 m

Photoelectric reflex switch

- Red light; consequently, fast alignment is possible
- Insensitive to external light sources, i.e., increased operating reliability
- M12 plug rotatable by 90°, or 2 m/3 m cable
- Adjustable sensitivity; optimum adaptation to application



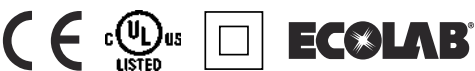
Dimensional drawing



Adjustments possible

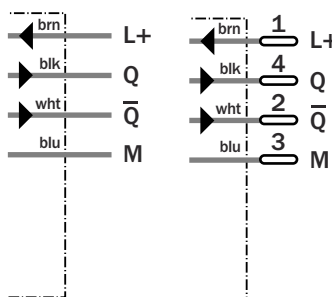
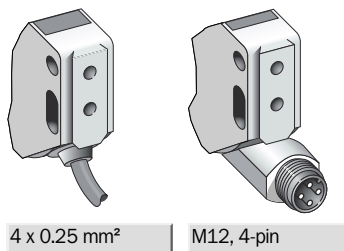


- 1 LED signal strength indicator
- 2 Centre of optical axis
- 3 M4 threaded mounting hole - 4 mm deep
- 4 Mounting holes \varnothing 4.2 mm
- 5 Sensitivity adjustment



Connection type

| | |
|------------|------------|
| WL12-2N120 | WL12-2N420 |
| WL12-2N130 | WL12-2N430 |
| WL12-2N730 | WL12-2P420 |
| WL12-2P120 | WL12-2P430 |
| WL12-2P130 | |



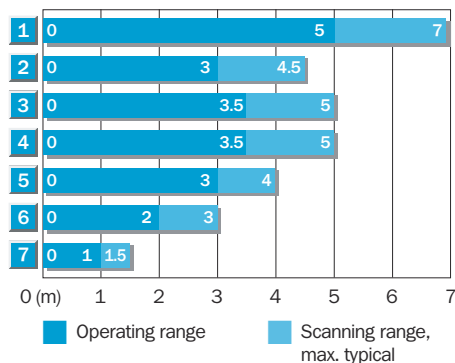
Accessories

| |
|-----------------------|
| Connector, M12, 4-pin |
| Mounting systems |
| Reflectors |

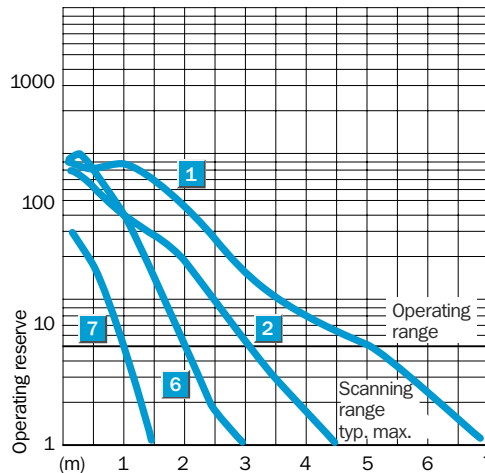
| WL12-2 | | N120 | N130 | N420 | N430 | N730 | P120 | P130 | P420 | P430 | P730 |
|--------------------------------------|---|------|------|------|------|------|------|------|------|------|------|
| Scanning range typ. max. | 0 ... 2 m | | | | | | | | | | |
| | 0 ... 7 m | | | | | | | | | | |
| Scanning range, recommended | 0 ... 1 m | | | | | | | | | | |
| | 0 ... 5 m | | | | | | | | | | |
| Relating to | Reflector PL80A ¹⁾ | | | | | | | | | | |
| | Reflector PL80A ²⁾ | | | | | | | | | | |
| Sensitivity adjustment | Potentiometer | | | | | | | | | | |
| Light source, light type | LED, Red light ³⁾ | | | | | | | | | | |
| Light spot diameter | 2 mm at 90 mm distance | | | | | | | | | | |
| | 80 mm at 3 m distance | | | | | | | | | | |
| Polarisation filter | ✓ | | | | | | | | | | |
| Supply voltage V_s | DC 10 ... 30 V ⁴⁾ | | | | | | | | | | |
| Ripple | ≤ 5 V _{SS} ⁵⁾ | | | | | | | | | | |
| Power consumption | ≤ 40 mA ⁶⁾ | | | | | | | | | | |
| | ≤ 30 mA ⁶⁾ | | | | | | | | | | |
| Switching outputs | NPN antivalent | | | | | | | | | | |
| | PNP antivalent | | | | | | | | | | |
| Output current I _a max | ≤ 100 mA | | | | | | | | | | |
| Response time | ≤ 330 μs ⁷⁾ | | | | | | | | | | |
| Switching frequency | 1,500 Hz ⁸⁾ | | | | | | | | | | |
| Connection type | Cable, 2 m ⁹⁾ | | | | | | | | | | |
| | Connector, M12, 4-pin | | | | | | | | | | |
| | Cable, 3 m ⁹⁾ | | | | | | | | | | |
| VDE protection class | □ ¹⁰⁾ | | | | | | | | | | |
| Circuit protection | V _s connections reverse-polarity protected / Output Q and Q not short-circuit protected / Interference suppression | | | | | | | | | | |
| Enclosure rating | IP 69K | | | | | | | | | | |
| Ambient temperature operation | -40 °C ... +60 °C | | | | | | | | | | |
| Ambient temperature storage | -40 °C ... +75 °C | | | | | | | | | | |
| Weight | Ca. 200 g | | | | | | | | | | |
| | Ca. 120 g | | | | | | | | | | |
| | Ca. 230 g | | | | | | | | | | |
| Housing material | Zinc die-cast ¹¹⁾ | | | | | | | | | | |
| Included with delivery | 2 clamps BEF-KH-W12 | | | | | | | | | | |

1) Focus = 90 mm
 2) Focus = infinite
 3) Average service life 100,000 h at T_a = +25 °C
 4) Limit values
 5) May not exceed or fall short of V_s tolerances
 6) Without load
 7) Signal transit time with resistive load
 8) With light/dark ratio 1:1
 9) Do not bend below 0 °C
 10) Reference voltage 50 V DC
 11) Teflon-coated housing available on request

Scanning range and operating reserve



| Reflector type | Operating range |
|-------------------|-----------------|
| 1 PL 80 A | 0 ... 5.0 m |
| 2 C 110 | 0 ... 3.0 m |
| 3 PL 50 A | 0 ... 3.5 m |
| 4 PL 40 A | 0 ... 3.5 m |
| 5 PL 30 A | 0 ... 3.0 m |
| 6 PL 20 A | 0 ... 2.0 m |
| 7 Reflective tape | 0 ... 1.0 m |



Ordering information

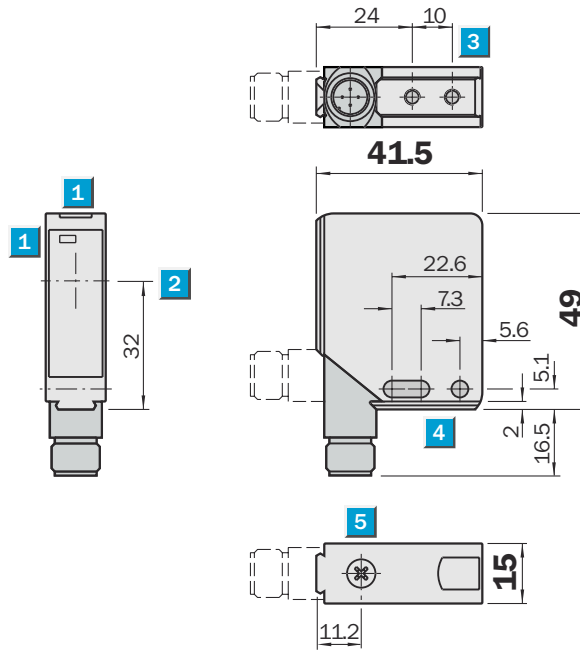
| Model Name | Part Number |
|------------|-------------|
| WL12-2N120 | 1 016 084 |
| WL12-2N130 | 1 016 085 |
| WL12-2N420 | 1 016 091 |
| WL12-2N430 | 1 016 092 |
| WL12-2N730 | 1 016 088 |
| WL12-2P120 | 1 016 095 |
| WL12-2P130 | 1 016 096 |
| WL12-2P420 | 1 016 101 |
| WL12-2P430 | 1 016 102 |
| WL12-2P730 | 1 016 098 |

Scanning range
0 ... 7 m

Photoelectric reflex switch

- Red light; consequently, fast alignment is possible
- Insensitive to external light sources, i.e., increased operating reliability
- M12 plug rotatable by 90°, or 2 m cable
- Adjustable sensitivity; optimum adaptation to application

Dimensional drawing



Adjustments possible

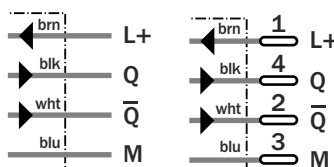
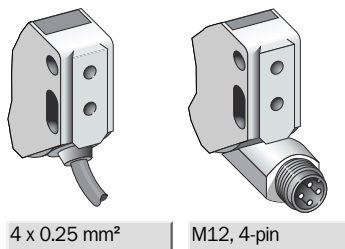


- 1 LED signal strength indicator
- 2 Centre of optical axis
- 3 M4 threaded mounting hole - 4 mm deep
- 4 Mounting holes \varnothing 4.2 mm
- 5 Sensitivity adjustment



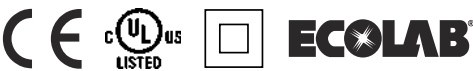
Connection type

| | |
|------------|------------|
| WL12-2N180 | WL12-2N480 |
| WL12-2N190 | WL12-2P480 |
| WL12-2N490 | WL12-2P490 |
| WL12-2P180 | |
| WL12-2P190 | |



Accessories

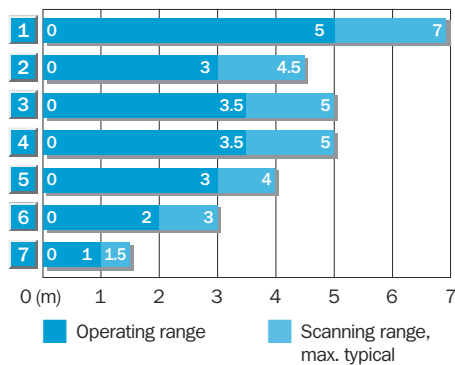
| |
|-----------------------|
| Connector, M12, 4-pin |
| Mounting systems |
| Reflectors |



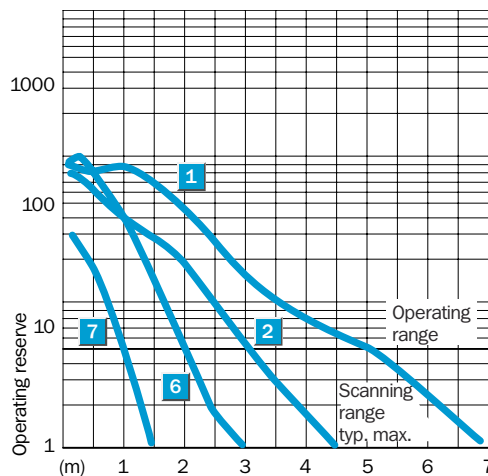
| WL12-2 | | N180 | N190 | N480 | N490 | P180 | P190 | P480 | P490 |
|--------------------------------------|---|------|------|------|------|------|------|------|------|
| Scanning range typ. max. | 0 ... 7 m | | | | | | | | |
| | 0 ... 2 m | | | | | | | | |
| Scanning range, recommended | 0 ... 5 m | | | | | | | | |
| | 0 ... 1 m | | | | | | | | |
| Relating to | Reflector PL80A ¹⁾ | | | | | | | | |
| | Reflector PL80A ²⁾ | | | | | | | | |
| Sensitivity adjustment | Potentiometer | | | | | | | | |
| Light source, light type | LED, Red light ³⁾ | | | | | | | | |
| Light spot diameter | 80 mm at 3 m distance | | | | | | | | |
| | 2 mm at 90 mm distance | | | | | | | | |
| Supply voltage V_s | DC 10 ... 30 V ⁴⁾ | | | | | | | | |
| Ripple | ≤ 5 V _{SS} ⁵⁾ | | | | | | | | |
| Power consumption | ≤ 40 mA ⁶⁾ | | | | | | | | |
| | ≤ 30 mA ⁶⁾ | | | | | | | | |
| Switching outputs | NPN antivalent | | | | | | | | |
| | PNP antivalent | | | | | | | | |
| Output current I _{a,max} | 100 mA | | | | | | | | |
| Response time | ≤ 330 μs ⁷⁾ | | | | | | | | |
| Switching frequency | 1,500 Hz ⁸⁾ | | | | | | | | |
| Connection type | Cable, 2 m ⁹⁾ | | | | | | | | |
| | Connector, M12, 4-pin | | | | | | | | |
| VDE protection class | □ ¹⁰⁾ | | | | | | | | |
| Circuit protection | V _s connections reverse-polarity protected / Output Q and Q not short-circuit protected / Interference suppression | | | | | | | | |
| Enclosure rating | IP 69K | | | | | | | | |
| Ambient temperature operation | -40 °C ... +60 °C | | | | | | | | |
| Ambient temperature storage | -40 °C ... +75 °C | | | | | | | | |
| Weight | Ca. 200 g | | | | | | | | |
| | Ca. 120 g | | | | | | | | |
| Housing material | Zinc die-cast ¹¹⁾ | | | | | | | | |
| Included with delivery | 2 clamps BEF-KH-W12 | | | | | | | | |

¹⁾ Focus = infinite
²⁾ Focus = 90 mm
³⁾ Average service life 100,000 h at T_a = +25 °C
⁴⁾ Limit values
⁵⁾ May not exceed or fall short of V_s tolerances
⁶⁾ Without load
⁷⁾ Signal transit time with resistive load
⁸⁾ With light/dark ratio 1:1
⁹⁾ Do not bend below 0 °C
¹⁰⁾ Reference voltage 50 V DC
¹¹⁾ Teflon-coated housing available on request

Scanning range and operating reserve



| Reflector type | Operating range |
|-------------------|-----------------|
| 1 PL 80 A | 0 ... 5.0 m |
| 2 C 110 | 0 ... 3.0 m |
| 3 PL 50 A | 0 ... 3.5 m |
| 4 PL 40 A | 0 ... 3.5 m |
| 5 PL 30 A | 0 ... 3.0 m |
| 6 PL 20 A | 0 ... 2.0 m |
| 7 Reflective tape | 0 ... 1.0 m |



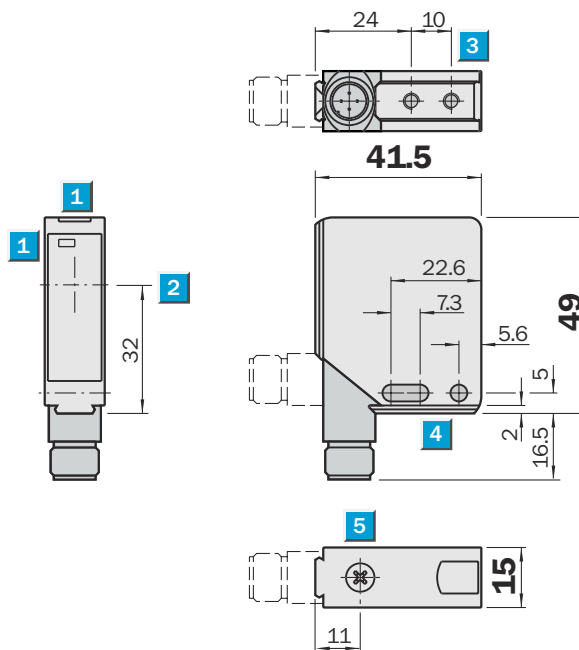
| Ordering information | |
|----------------------|-------------|
| Model Name | Part Number |
| WL12-2N180 | 1 016 089 |
| WL12-2N190 | 1 016 090 |
| WL12-2N480 | 1 016 093 |
| WL12-2N490 | 1 016 094 |
| WL12-2P180 | 1 016 099 |
| WL12-2P190 | 1 016 100 |
| WL12-2P480 | 1 016 106 |
| WL12-2P490 | 1 016 107 |

Scanning range
0 ... 7 m

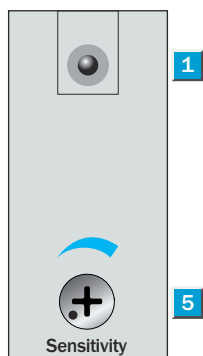
Photoelectric reflex switch

- Red light; consequently, fast alignment is possible
- Insensitive to external light sources, i.e., increased operating reliability
- M12 plug rotatable by 90°
- Integrated AS-i chip
- Adjustable sensitivity; optimum adaptation to application

Dimensional drawing



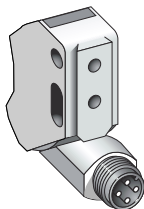
Adjustments possible



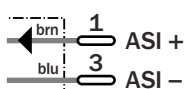
- 1 LED signal strength indicator
- 2 Centre of optical axis
- 3 M4 threaded mounting hole - 4 mm deep
- 4 Mounting holes Ø 4.2 mm
- 5 Sensitivity adjustment

Connection type

WL12-2Z430



M12, 4-pin



| |
|-----------------------|
| Accessories |
| Connector, M12, 4-pin |
| Mounting systems |

WL12-2

Z430

| | |
|--------------------------------------|--|
| Scanning range typ. max. | 0 ... 7 m |
| Scanning range, recommended | 0 ... 5 m |
| Relating to | Reflector PL80A |
| Sensitivity adjustment | Potentiometer |
| Light source, light type | LED, Red light ¹⁾ |
| Light spot diameter | 80 mm at 3 m distance |
| Polarisation filter | ✓ |
| Supply voltage V_s | DC 26.5 ... 31.6 V ²⁾ |
| Power consumption | ≤ 35 mA ³⁾ |
| Response time | ≤ 330 μs ⁴⁾ |
| Switching frequency | 1,500 Hz ⁵⁾ |
| Test input sender off | TE to 0 V |
| Alarm output | Pre-failure signalling output |
| Connection type | Connector, M12, 4-pin |
| VDE protection class | □ ⁶⁾ |
| Circuit protection | V _s connections reverse-polarity protected / Interference suppression |
| Enclosure rating | IP 69K |
| Ambient temperature operation | -25 °C ... +60 °C |
| Ambient temperature storage | -40 °C ... +75 °C |
| Weight | Ca. 120 g |
| Housing material | Zinc die-cast ⁷⁾ |
| Included with delivery | 2 clamps BEF-KH-W12 |

¹⁾ Average service life 100,000 h at T_a = +25 °C

²⁾ Limit values
³⁾ Without load

⁴⁾ Signal transit time with resistive load
⁵⁾ With light/dark ratio 1:1

⁶⁾ Reference voltage 50 V DC
⁷⁾ Teflon-coated housing available on request

Assignment of data bits (Host level)

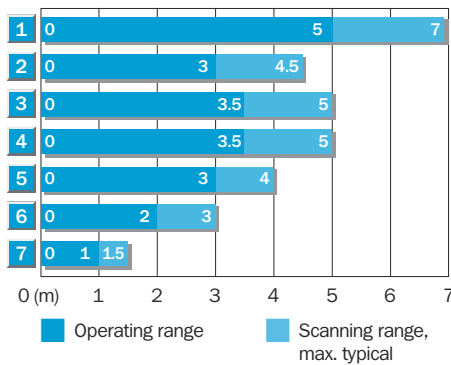
| | | | |
|----------------|-----------------|------------------------|--------|
| D ₀ | Switching state | 0 If light interrupted | Input |
| | Mode: | 1 If light received | |
| | light-switching | | |
| D ₁ | Alarm | 0 Active | Input |
| | | 1 Inactive | |
| D ₂ | NC | 0 | Input |
| | | 1 | |
| D ₃ | Test function | 0 Sender ON | Output |
| | | 1 Sender OFF | |

Assignment of parameter bits (Host level)

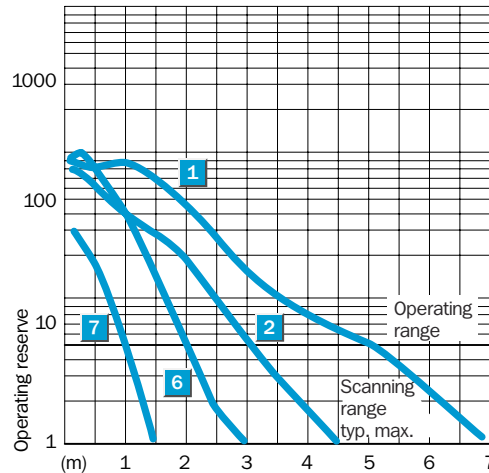
| | | | |
|------------------|----------------|-------------------|-----------|
| P ₀ * | NC | 0 | Parameter |
| | | 1 | |
| P ₁ * | Light-/ | 0 Dark-switching | Parameter |
| | dark-switching | 1 Light-switching | |
| P ₂ * | NC | 0 | Parameter |
| | | 1 | |
| P ₃ * | NC | 0 | Parameter |
| | | 1 | |

* Default setting = 1

Scanning range and operating reserve



| Reflector type | Operating range |
|-------------------|-----------------|
| 1 PL 80 A | 0 ... 5.0 m |
| 2 C 110 | 0 ... 3.0 m |
| 3 PL 50 A | 0 ... 3.5 m |
| 4 PL 40 A | 0 ... 3.5 m |
| 5 PL 30 A | 0 ... 3.0 m |
| 6 PL 20 A | 0 ... 2.0 m |
| 7 Reflective tape | 0 ... 1.0 m |



Ordering information

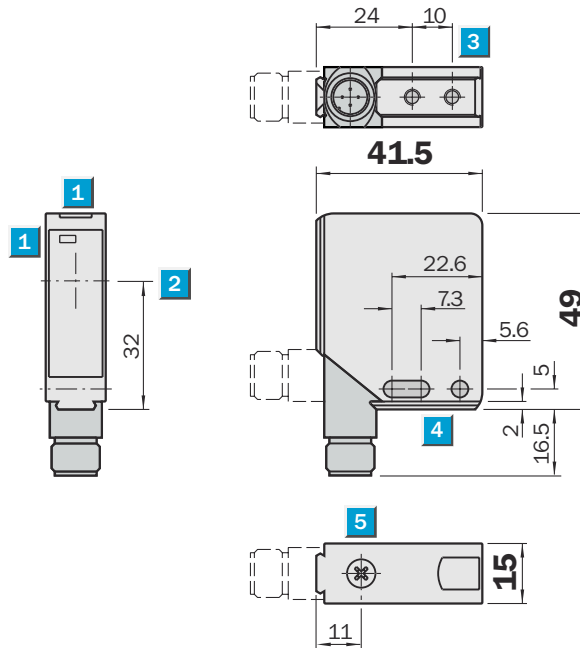
| Model Name | Part Number |
|------------|-------------|
| WL12-ZZ430 | 1 016 108 |

Scanning range
0 ... 3 m

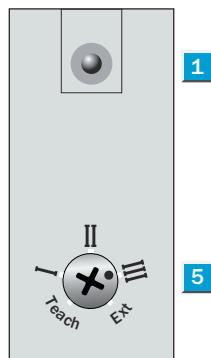
Photoelectric reflex switch

- Red light; consequently, fast alignment is possible
- Reliable detection of transparent objects
- Innovative microprocessor technology allows continuous adaptation of the switching threshold on contamination
- Operating range can be preselected via rotary switch or external cable

Dimensional drawing



Adjustments possible

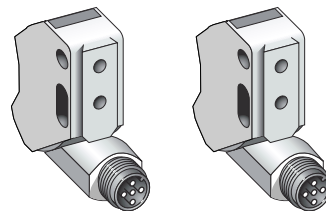


- 1 LED signal strength indicator
- 2 Centre of optical axis
- 3 M4 threaded mounting hole - 4 mm deep
- 4 Mounting holes \varnothing 4.2 mm
- 5 Function selector



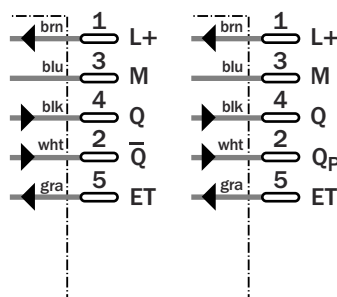
Connection type

| | |
|------------|------------|
| WL12G-N530 | WL12G-V530 |
| WL12G-P510 | WL12G-W530 |
| WL12G-P530 | |



M12, 5-pin

M12, 5-pin



Accessories

| |
|-----------------------|
| Connector, M12, 5-pin |
| Mounting systems |
| Reflectors |

| WL12G- | | N530 | P510 | P530 | V530 | W530 |
|--------------------------------------|---|------|------|------|------|------|
| Scanning range typ. max. | 0 ... 3 m | | | | | |
| Scanning range, recommended | 0 ... 2.7 m | | | | | |
| Relating to | Reflector PL80A | | | | | |
| Sensitivity adjustment | Potentiometer | | | | | |
| Light source, light type | LED, Red light ¹⁾ | | | | | |
| | LED, Infrared light | | | | | |
| Light spot diameter | Approx. 8 x 13 mm at 200 mm distance | | | | | |
| Polarisation filter | ✓ | | | | | |
| Supply voltage V_s | DC 10 ... 30 V ²⁾ | | | | | |
| Ripple | ≤ 5 V _{ss} ³⁾ | | | | | |
| Power consumption | ≤ 65 mA ⁴⁾ | | | | | |
| Switching outputs | NPN antivalent | | | | | |
| | PNP antivalent | | | | | |
| | PNP, Q and plausibility output | | | | | |
| | NPN, Q and plausibility output | | | | | |
| Switching mode | Light-switching | | | | | |
| Output current I _a max | 100 mA | | | | | |
| | ≤ 100 mA | | | | | |
| Response time | ≤ 0,5 ms ⁵⁾ | | | | | |
| Switching frequency | 1,000 Hz ⁶⁾ | | | | | |
| Connection type | Connector, M12, 5-pin | | | | | |
| VDE protection class | □ ⁷⁾ | | | | | |
| Circuit protection | V _s connections reverse-polarity protected / Output Q and Q not short-circuit protected / Interference suppression | | | | | |
| Enclosure rating | IP 69K | | | | | |
| Ambient temperature operation | -25 °C ... +60 °C | | | | | |
| Ambient temperature storage | -40 °C ... +75 °C | | | | | |
| Weight | Ca. 120 g | | | | | |
| Housing material | Zinc die-cast ⁸⁾ | | | | | |
| Included with delivery | 2 clamps BEF-KH-W12 | | | | | |

¹⁾ Average service life 100,000 h at T_a = +25 °C
²⁾ Limit values

³⁾ May not exceed or fall short of V_s tolerances
⁴⁾ Without load

⁵⁾ Signal transit time with resistive load
⁶⁾ With light/dark ratio 1:1
⁷⁾ Reference voltage 50 V DC

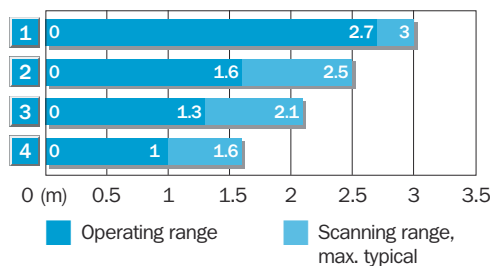
⁸⁾ Teflon-coated housing available on request

Operating range setting Set via rotary switch on device or via ET cable (+V_s to ET)

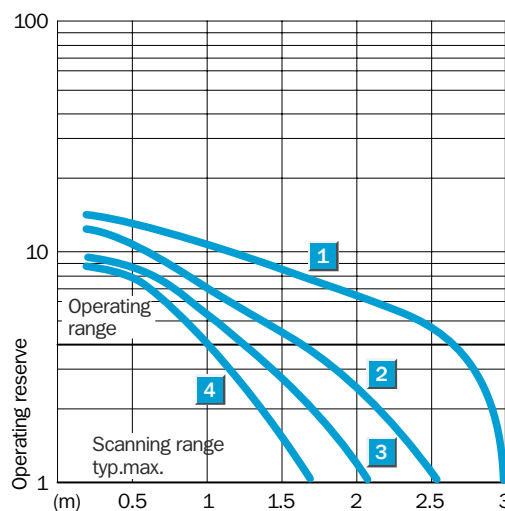
| Mode I : 50 ms * | Mode II : 150 ms * | Mode III : 250 ms * |
|--------------------------------------|--------------------------------------|---|
| Switches at signal attenuation > 10% | Switches at signal attenuation > 18% | Switches at signal attenuation > 40% |
| Clean PET bottles | Clear-glass bottles | Coloured glass or non-transparent objects |

* Pulse duration via ET (control cable), duration set via rotary switch approx. 2 s

Scanning range and operating reserve



| Reflector type | Operating range |
|----------------|-----------------|
| 1 PL 80 A | 0 ... 2.7 m |
| 2 PL 40 A | 0 ... 1.6 m |
| 3 PL 30 A | 0 ... 1.3 m |
| 4 PL 20 A | 0 ... 1.0 m |



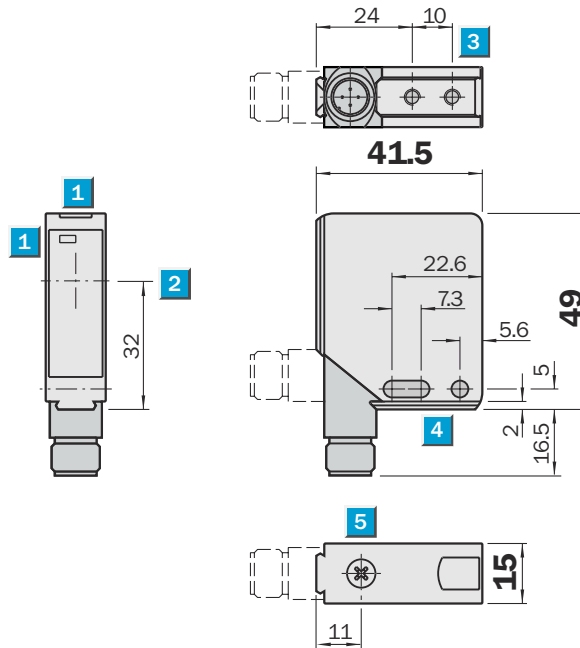
| Ordering information | |
|----------------------|-------------|
| Model Name | Part Number |
| WL12G-N530 | 1 016 309 |
| WL12G-P510 | 1 016 738 |
| WL12G-P530 | 1 016 289 |
| WL12G-V530 | 1 016 310 |
| WL12G-W530 | 1 016 311 |

Scanning range
0 ... 4 m

Photoelectric reflex switch

- Red light; consequently, fast alignment is possible
- Insensitive to external light sources, i.e., increased operating reliability
- Detection of glass and transparent films
- Adjustable sensitivity, optimum adaptation to application

Dimensional drawing



Adjustments possible

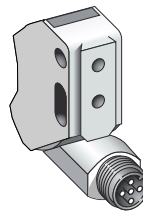
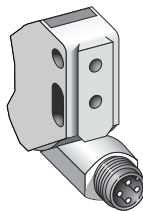


- 1 LED signal strength indicator
- 2 Centre of optical axis
- 3 M4 threaded mounting hole - 4 mm deep
- 4 Mounting holes \varnothing 4.2 mm
- 5 Sensitivity adjustment



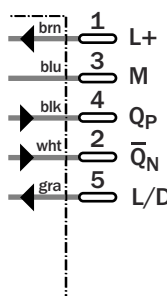
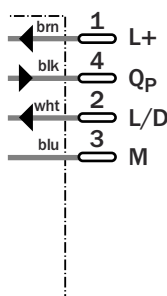
Connection type

| | |
|------------|------------|
| WL12-2P460 | WL12-2B560 |
|------------|------------|



M12, 4-pin

M12, 5-pin



Accessories

| |
|-----------------------|
| Connector, M12, 4-pin |
| Connector, M12, 5-pin |
| Mounting systems |
| Reflectors |

| WL12-2 | | B560 | P460 |
|--------------------------------------|---|------|------|
| Scanning range typ. max. | 0 ... 4 m | | |
| Scanning range, recommended | 0 ... 3.5 m | | |
| Relating to | Reflector PL80A | | |
| Sensitivity adjustment | Potentiometer | | |
| Light source, light type | LED, Red light ¹⁾ | | |
| Light spot diameter | 30 mm at 1.5 m distance | | |
| Angle of dispersion | Ca. 1.5 ° | | |
| Polarisation filter | ✓ | | |
| Supply voltage V_s | DC 10 ... 30 V ²⁾ | | |
| Ripple | ≤ 5 V _{SS} ³⁾ | | |
| Power consumption | ≤ 30 mA ⁴⁾ | | |
| Switching outputs | Transistor outputs Qp and Qn | | |
| | PNP | | |
| Switching mode | Light-/dark-switching, switchable ⁵⁾ | | |
| Output current I _a max | 100 mA | | |
| Response time | ≤ 330 μs ⁶⁾ | | |
| Switching frequency | 1,500 Hz ⁷⁾ | | |
| Connection type | Connector, M12, 5-pin | | |
| | Connector, M12, 4-pin | | |
| VDE protection class | □ ⁸⁾ | | |
| Circuit protection | V _s connections reverse-polarity protected / Output QP and QN short-circuit protected / Interference suppression | | |
| Enclosure rating | IP 69K | | |
| Ambient temperature operation | -40 °C ... +60 °C | | |
| Ambient temperature storage | -40 °C ... +75 °C | | |
| Weight | Ca. 120 g | | |
| Housing material | Zinc die-cast ⁹⁾ | | |
| Included with delivery | 2 clamps BEF-KH-W12 | | |

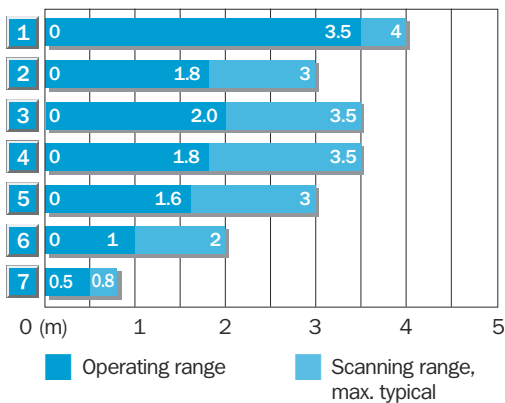
¹⁾ Average service life 100,000 h at T_a = +25 °C
²⁾ Limit values
³⁾ May not exceed or fall short of

V_s tolerances
⁴⁾ Without load
⁵⁾ Control cable 0 V or open-circuited = light-switching. Control cable

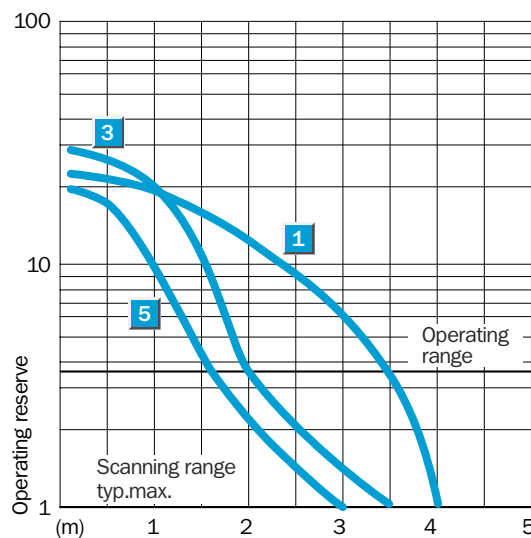
V_s = dark-switching
⁶⁾ Signal transit time with resistive load
⁷⁾ With light/dark ratio 1:1
⁸⁾ Reference voltage 50 V DC

⁹⁾ Teflon-coated housing available on request

Scanning range and operating reserve



| Reflector type | Operating range |
|----------------|-----------------|
| 1 | PL 80 A |
| 2 | C 110 |
| 3 | PL 50 A |
| 4 | PL 40 A |
| 5 | PL 30 A |
| 6 | PL 20 A |
| 7 | Reflective tape |



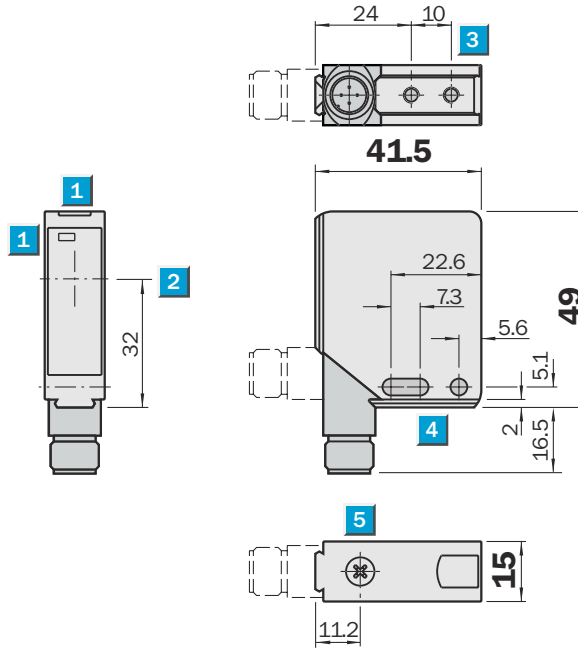
| Ordering information | |
|----------------------|-------------|
| Model Name | Part Number |
| WL12-2B560 | 1 016 080 |
| WL12-2P460 | 1 016 105 |

Scanning range
0 ... 20 m

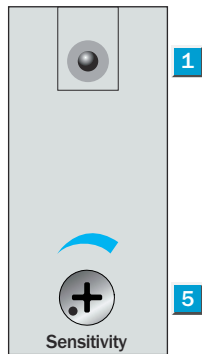
Through-beam photoelectric switch

- Red light; consequently, fast alignment is possible
- Insensitive to external light sources, i.e., increased operating reliability
- M12 plug rotatable by 90°, or 2 m cable
- Adjustable sensitivity; optimum adaptation to application

Dimensional drawing



Adjustments possible



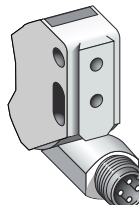
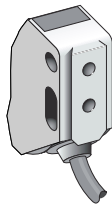
- 1 LED signal strength indicator
- 2 Centre of optical axis
- 3 M4 threaded mounting hole - 4 mm deep
- 4 Mounting holes \varnothing 4.2 mm
- 5 Sensitivity adjustment



Connection type

WS/WE12-2N130
WS/WE12-2P130

WS/WE12-2N430
WS/WE12-2P430

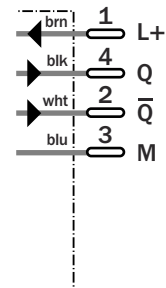
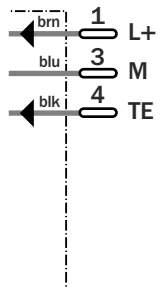
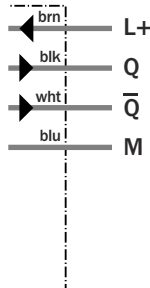
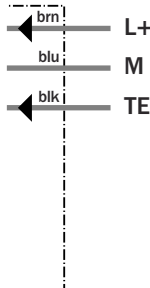


4 x 0.25 mm²
Sender

Receiver

M12, 4-pin
Sender

Receiver



| Accessories |
|-----------------------|
| Connector, M12, 4-pin |
| Masks |
| Mounting systems |

| WS/WE12-2 | | N130 | N430 | P130 | P430 |
|--------------------------------------|---|------|------|------|------|
| Scanning range typ. max. | 0 ... 20 m | | | | |
| Scanning range, recommended | 0 ... 15 m | | | | |
| Sensitivity adjustment | Potentiometer | | | | |
| Light source, light type | LED, Red light ¹⁾ | | | | |
| Light spot diameter | Approx. 500 mm at 15 m distance | | | | |
| Angle of dispersion | 1.5 ° | | | | |
| Supply voltage V_s | DC 10 ... 30 V ²⁾ | | | | |
| Ripple | ≤ 5 V _{SS} ³⁾ | | | | |
| Power consumption, sender | ≤ 30 mA ⁴⁾ | | | | |
| Power consumption, receiver | ≤ 25 mA ⁴⁾ | | | | |
| | ≤ 15 mA ⁴⁾ | | | | |
| Switching outputs | NPN antivalent | | | | |
| | PNP antivalent | | | | |
| Output current I _a max | 100 mA | | | | |
| Response time | ≤ 330 μs ⁵⁾ | | | | |
| Switching frequency | 1,500 Hz ⁶⁾ | | | | |
| Test input sender off | TE to 0 V | | | | |
| Connection type | Cable, 2 m ⁷⁾ | | | | |
| | Connector, M12, 4-pin | | | | |
| VDE protection class | □ ⁸⁾ | | | | |
| Circuit protection | V _s connections reverse-polarity protected / Output Q and Q not short-circuit protected / Interference suppression | | | | |
| Enclosure rating | IP 69K | | | | |
| Ambient temperature operation | -40 °C ... +60 °C | | | | |
| Ambient temperature storage | -40 °C ... +75 °C | | | | |
| Weight | Ca. 200 g | | | | |
| | Ca. 120 g | | | | |
| Housing material | Zinc die-cast ⁹⁾ | | | | |
| Included with delivery | 2 clamps BEF-KH-W12 | | | | |

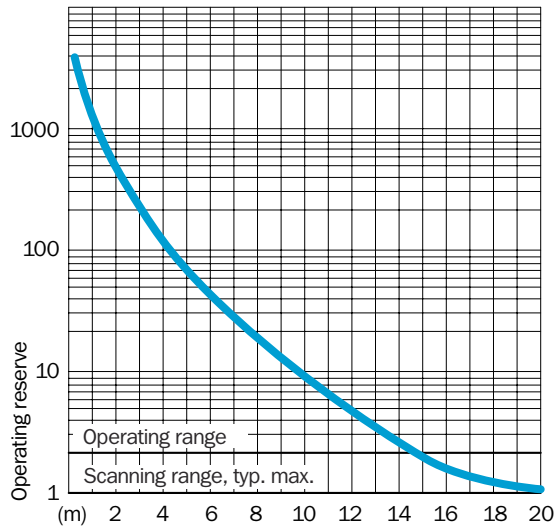
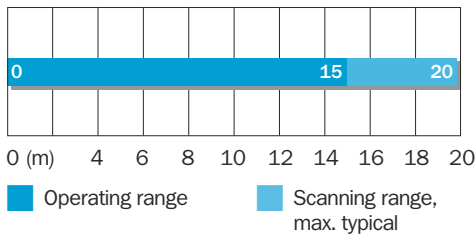
¹⁾ Average service life 100,000 h at T_a = +25 °C
²⁾ Limit values

³⁾ May not exceed or fall short of V_s tolerances
⁴⁾ Without load

⁵⁾ Signal transit time with resistive load
⁶⁾ With light/dark ratio 1:1
⁷⁾ Do not bend below 0 °C

⁸⁾ Reference voltage 50 V DC
⁹⁾ Teflon-coated housing available on request

Scanning range and operating reserve



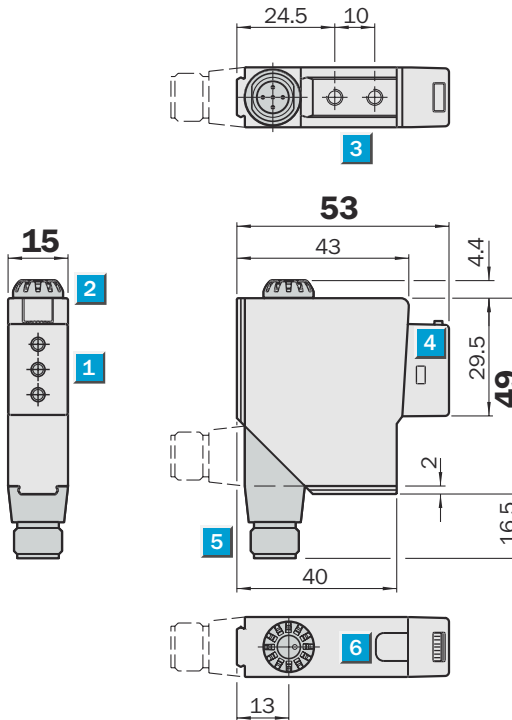
| Ordering information | |
|----------------------|-------------|
| Model Name | Part Number |
| WS/WE12-2N130 | 1 016 154 |
| WS/WE12-2N430 | 1 016 155 |
| WS/WE12-2P130 | 1 016 156 |
| WS/WE12-2P430 | 1 016 157 |

| | |
|--|--|
| | Scanning distance 0 ... 280 mm |
| | Scanning range 0 ... 300 mm |
| Proximity switch with fibre optic cables | |

- Red, infrared or green light
- Plug-in fibre-optic cables
- Switch-selectable light-/dark-switching
- Adjustable sensitivity



Dimensional drawing

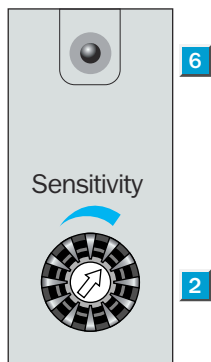


AD adapter* for

| Fibre-optic | Model Name | Part Number |
|--------------------------|------------|-------------|
| LL 3 - ... Ø (1.0 mm) | AD-LL-1M0 | 2 015 026 |
| LL 3 - ... Ø (2.2 mm) | AD-LL-2M2 | 2 015 210 |
| LM/LT- ... | AD-LL-GF | 2 015 034 |
| LH10-1000 | AD-LL-HGA | 2 015 033 |

* not included with delivery

Adjustments possible

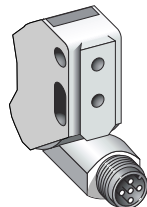


- 1 Connector for fibre-optic cable
- 2 Sensitivity control
- 3 M4 threaded mounting hole - 4 mm deep
- 4 Adapter
- 5 Plug not rotatable. Plug facing backwards on request
- 5 LED signal strength indicator

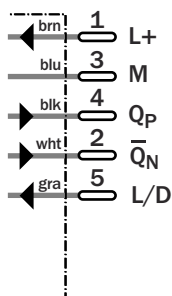


Connection type

| |
|-------------|
| WLL12-B5181 |
| WLL12-B5281 |
| WLL12-B5381 |
| WLL12-B5481 |



M12, 5-pin



| Accessories |
|--------------------------------|
| Adapter for fibre-optic cables |
| Connector, M12, 5-pin |
| Fibre-optic cables |
| Mounting systems |

| WLL12-B | | 5181 | 5281 | 5381 | 5481 | | | | | | |
|---|---|------|------|------|------|--|--|--|--|--|--|
| Scanning distance typ. max. | 0 ... 280 mm ¹⁾ | | | | | | | | | | |
| | 0 ... 60 mm ¹⁾ | | | | | | | | | | |
| Fibre-optic cable (proximity system) | LM/LT | | | | | | | | | | |
| Scanning range typ. max. | 0 ... 200 mm | | | | | | | | | | |
| | 0 ... 300 mm | | | | | | | | | | |
| | 0 ... 20 mm | | | | | | | | | | |
| Fibre-optic cable (through-beam system) | LM/LT | | | | | | | | | | |
| Light source, light type | LED, Red light ²⁾ | | | | | | | | | | |
| | LED, Infrared light ²⁾ | | | | | | | | | | |
| | LED, Green light ²⁾ | | | | | | | | | | |
| Supply voltage V_s | DC 10 ... 30 V ³⁾ | | | | | | | | | | |
| Ripple | ≤ 5 V _{SS} ⁴⁾ | | | | | | | | | | |
| Power consumption | ≤ 35 mA ⁵⁾ | | | | | | | | | | |
| Switching outputs | PNP: Q/NPN: Q | | | | | | | | | | |
| Switching mode | Light-/dark-switching, switchable | | | | | | | | | | |
| Output current I _a max | 100 mA | | | | | | | | | | |
| Response time | 360 μs ⁶⁾ | | | | | | | | | | |
| Switching frequency | 1,300 Hz ⁷⁾ | | | | | | | | | | |
| Connection type | Connector, M12, 5-pin | | | | | | | | | | |
| VDE protection class | □ ⁸⁾ | | | | | | | | | | |
| Circuit protection | V _s connections reverse-polarity protected / Output Q and Q not short-circuit protected / Interference suppression | | | | | | | | | | |
| Enclosure rating | IP 67 | | | | | | | | | | |
| Ambient temperature operation | -25 °C ... +60 °C | | | | | | | | | | |
| Ambient temperature storage | -25 °C ... +70 °C | | | | | | | | | | |
| Weight | Ca. 130 g | | | | | | | | | | |
| Housing material | Zinc die-cast | | | | | | | | | | |
| Included with delivery | 2 clamps BEF-KH-W12 | | | | | | | | | | |

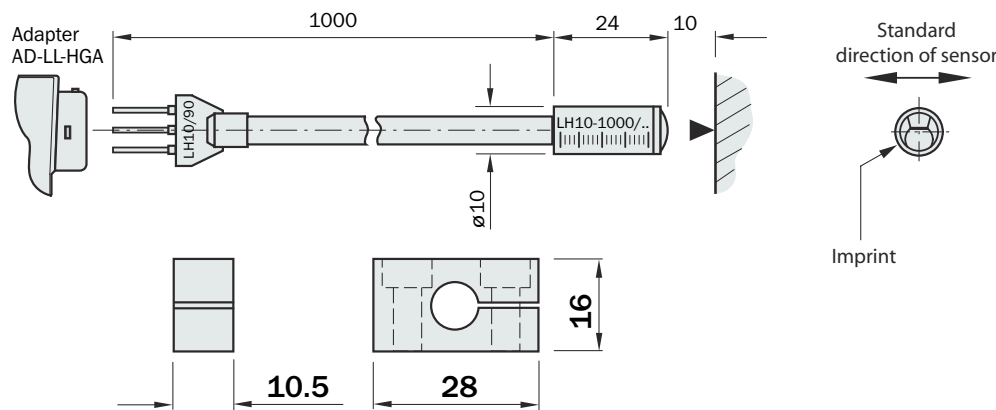
¹⁾ Object with 90 % remission (based on standard white to DIN 5033)
²⁾ Average service life 100,000 h

at T_a = +25 °C
³⁾ Limit values
⁴⁾ May not exceed or fall short of

V_s tolerances
⁵⁾ Without load
⁶⁾ Signal transit time with resistive load

⁷⁾ With light/dark ratio 1:1
⁸⁾ Reference voltage 50 V DC

Proximity system with background suppression, WLL12-B5481 with LH10-1000 fibre-optic cable



| | |
|-----------------------|--|
| Scanning distance: | 10 mm (- 1 mm), fixed |
| Light spot diameter: | approx. 2.5 x 3.5 mm |
| Switching hysteresis: | ≤ 0.3 mm, based on standard white 90 % to standard black 6 % |

Ordering information

| Model Name | Part Number |
|-------------|-------------|
| WLL12-B5181 | 1 011 677 |
| WLL12-B5281 | 1 011 687 |
| WLL12-B5381 | 1 011 688 |
| WLL12-B5481 | 1 011 965 |



Features

- Highly flexible
- Small bend radii
- Most fibre-optic cables can easily be cut to length using cutter FC⁸⁾ (supplied)
- Operating temperature - 40 ... + 70 °C, special designs up to 180 °C



Selection table: sensors, fibre-optic cables, scanning ranges

Proximity Systems

LL3 Fibre-optic cables

| Description | Bend radius mm | Type | Order no. | Scanning distance SD ¹⁾ and minimum object diameter MD ⁷⁾ in mm in combination with sensor type | | | | |
|--|---------------------|-------------------------|-----------|---|-------------------|------|-------------------------|------|
| | | | | Adapter for WLL12-2 AD-LL- | WLL12-2 Red light | | WLL12-2 Infra-red light | |
| | | | | | SD | MD | SD | MD |
| Compact sleeve, M4, long scanning range | 25 | LL3-DM01 | 5308071 | ● | | | | |
| Super compact, sleeve 2.5 mm diameter | 15 | LL3-DT03 | 5308072 | ● | | | | |
| Super compact, sleeve M3 | 10 | LL3-DS06 | 5308073 | ● | | | | |
| Long scanning range, M6, coaxial fibre-optic cable | 25 | LL3-DB01 | 5308074 | 2M2 | 30 | 0.02 | 12 | 0.02 |
| 10 m length, M6, coaxial fibre-optic cable | 25 | LL3-DB01-10 | 5308075 | ● | | | | |
| For front lenses, M3 | 15 | LL3-DT01 | 5308076 | ● | | | | |
| Thin, short sleeve, M4, coaxial fibre-optic cable | 25 | LL3-DM02 | 5308077 | ● | | | | |
| Highly flexible, M6, long scanning range | 4 | LL3-DR01 | 5308078 | 2M2 | 40 | 0.02 | 8 | 0.02 |
| Highly flexible, small sleeve, M3 | 4 | LL3-DR02 | 5308079 | ● | | | | |
| Highly flexible, 3 mm diameter, thin sleeve | 4 | LL3-DR03 | 5308080 | ● | | | | |
| Highly flexible, 1.5 mm diameter, thin sleeve | 4 | LL3-DR04 ⁴⁾ | 5308081 | 2M2 | 4 | 0.02 | | ● |
| Highly flexible, M4, compact sleeve | 4 | LL3-DR06 | 5308082 | ● | | | | |
| Supple sleeve, M6, long scanning ranges | 25/10 ³⁾ | LL3-DB02 | 5308083 | ● | | | | |
| Supple sleeve, M4 | 25/10 ³⁾ | LL3-DM03 | 5308084 | ● | | | | |
| Thin long tip, M3 | 15 | LL3-DT02 | 5308085 | ● | | | | |
| Thin long tip, M3, coaxial fibre-optic cable | 15 | LL3-DT04 ⁴⁾ | 5308086 | 2M2 | 6 | 0.02 | | ● |
| Diameter 3.0 mm, thin tip, 0.82 mm diameter | 4 | LL3-DR05 ⁴⁾ | 5308087 | 2M2 | 4 | 0.02 | | ● |
| 90° offset, 5.0 mm diameter | 25 | LL3-DV01 | 5308088 | ● | | | | |
| 90° offset, small sleeve, 3.0 mm diameter | 15 | LL3-DV02 | 5308089 | ● | | | | |
| 90° offset, M6 | 25 | LL3-DV03 | 5308090 | 2M2 | 20 | 0.03 | | ● |
| Temperature resistant to 180 °C, M6, long scanning range | 30 | LL3-DH 01 ⁵⁾ | 5308091 | 2M2 | 50 | 0.02 | 15 | 0.02 |
| Temperature resistant to 100 °C, M6 | 25 | LL3-DH 02 ⁶⁾ | 5308092 | ● | | | | |
| Teflon sheath, resistant to chemicals, 6.0 mm diameter | 40 | LL3-DY 01 | 5308093 | ● | | | | |
| Level switch, clear liquid, 6.0 mm diameter | 50 | LL3-DF 01 | 5308094 | ● | | | | |
| Level switch, cloudy liquid, 6.0 mm diameter | 50 | LL3-DF 02 | 5308095 | ● | | | | |

¹⁾ For white scanned object, 90 % remission, minimum object diameter = size of light (aperture LL: approx. 65°) fibre-optic cable not shortened
²⁾ With scanning front lens for LL3, see front lenses for LL3
³⁾ Bend radius of the supple end sleeve
⁴⁾ Cannot be cut
⁵⁾ Ambient operating temperature - 40 ... + 180 °C
⁶⁾ Ambient operating temperature - 40 ... + 100 °C
⁷⁾ Minimum object diameter: scanning range reduction!
⁸⁾ Cutter FC see page 30

● not available

| Adaptor for WLL12-2 | | |
|---------------------|-----------|--------|
| Type | Order no. | LL-φ |
| AD-LL2M2 | 2015210 | 2.2 mm |

Fibre-optic cable Through-beam systems



Features

- Highly flexible
- Small bend radii
- Most fibre-optic cables can be easily cut to length using cutter FC⁷⁾ (supplied)
- Operating temperature – 40 ... +70 °C, special designs up to 180 °C

Selection table: sensors, fibre-optic cables, scanning ranges

Through-beam systems

LL3 Fibre-optic cables

Scanning range SR¹⁾ and minimum object diameter MD⁶⁾ in mm in combination with sensor type

| Description | Bend radius mm | Type | Order no. | Adaptor for WLL12-2 AD-LL- | | | | | |
|--|---------------------|-------------------------|-----------|----------------------------|-----|-------------------------|----|-----|--|
| | | | | WLL12-2 Red Light | | WLL12-2 Infra-red light | | | |
| | | | | SR | MD | SR | MD | | |
| Standard M4 | 25 | LL3-TB02 | 5308048 | 2M2 | 120 | 0.2 | 25 | 0.2 | |
| Standard, 3 mm diameter, long range | 35 | LL3-TS07 | 5308049 | 2M2 | 180 | 0.5 | 45 | 0.5 | |
| Standard, M4, long range | 25 | LL3-TB01 | 5308050 | 2M2 | 180 | 0.5 | 45 | 0.5 | |
| Standard, M4, length 10 m | 25 | LL3-TB01-10 | 5308051 | 2M2 | 70 | 0.5 | 25 | 0.5 | |
| Highly flexible, M4, long range | 4 | LL3-TR01 | 5308052 | 2M2 | 110 | 0.3 | 25 | 0.3 | |
| Highly flexible, M3 | 4 | LL3-TR02 | 5308053 | 1M0 | 25 | 0.2 | 4 | 0.2 | |
| Small sleeve, 1.5 mm diameter, highly flexible, length 1 m | 4 | LL3-TR03 | 5308054 | ● | ● | ● | ● | ● | |
| Small sleeve, 1.5 mm diameter, highly flexible, length 2 m | 4 | LL3-TR03-2 | 5308055 | ● | ● | ● | ● | ● | |
| Flexible end sleeve, M4 | 25/10 ³⁾ | LL3-TB03 | 5308056 | ● | ● | ● | ● | ● | |
| Compact, M3, end piece 1.0 mm diameter | 15 | LL3-TT01 | 5308057 | ● | ● | ● | ● | ● | |
| 90° offset, standard, 3 mm diameter | 25 | LL3-TV01 | 5308058 | ● | ● | ● | ● | ● | |
| 90° offset, compact, 2.5 mm diameter | 15 | LL3-TV02 | 5308059 | ● | ● | ● | ● | ● | |
| 90° offset, compact, M3 | 15 | LL3-TV04 | 5308060 | ● | ● | ● | ● | ● | |
| 90° offset, standard, 3 mm diameter | 25 | LL3-TS08 | 5308061 | 2M2 | 60 | 0.2 | 10 | 0.2 | |
| 90° offset, long range | 25 | LL3-TS12 | 5308062 | 2M2 | 400 | 0.5 | ● | ● | |
| Fibre-optic cable cell | 25 | LL3-TS10 | 5308063 | 2M2 | 75 | 1.0 | 20 | 1.0 | |
| Temperature-resistant, M4 | 25 | LL3-TH 01 ⁴⁾ | 5308064 | 2M2 | 70 | 0.2 | 15 | 0.2 | |
| Temperature-resistant up to 180 °C, M4 | 30 | LL3-TH 02 ⁵⁾ | 5308065 | 2M2 | 160 | 0.5 | 30 | 0.5 | |
| Teflon sheath, 6.0 mm diameter, chemically resistant | 40 | LL3-TY01 | 5308066 | 2M2 | 620 | 0.8 | 70 | 0.8 | |
| Teflon sheath, 6.0 mm diameter, chemically resistant | 40 | LL3-TY02 | 5308067 | 2M2 | 160 | 0.5 | 25 | 0.5 | |
| 90° offset | | | | | | | | | |
| Small end sleeve, M3, long range | 25 | LL3-TM01 | 5308068 | ● | ● | ● | ● | ● | |
| Small end sleeve M3 | 15 | LL3-TM02 | 5308069 | 1M0 | 30 | 0.2 | 4 | 0.2 | |
| Small end sleeve, 1.5 mm diameter | 15 | LL3-TM03 | 5308070 | ● | ● | ● | ● | ● | |

¹⁾ Fibre-optic cable not shortened
²⁾ With scanning front lens for LL3, see front lenses for LL3
³⁾ Bend radius of the supple end sleeve
⁴⁾ Ambient operating temperature – 40 ... +100 °C
⁵⁾ Ambient operating temperature – 40 ... +180 °C
⁶⁾ Minimum object diameter: scanning range reduction!
⁷⁾ Cutter FC see page 30

● not available

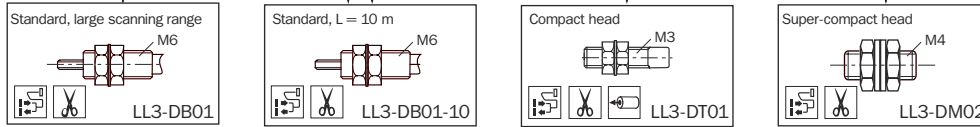
| Adaptor for WLL12-2 | | |
|---------------------|-----------|--------|
| Type | Order no. | LL-φ |
| AD-LL1M0 | 2015026 | 1.0 mm |
| AD-LL2M2 | 2015210 | 2.2 mm |

Flow chart – selection of fibre-optic cables

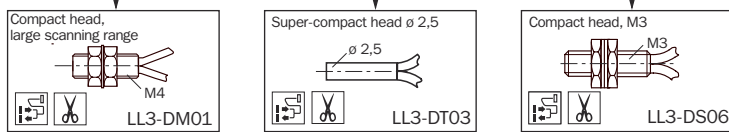


Coaxial structure for precise switching

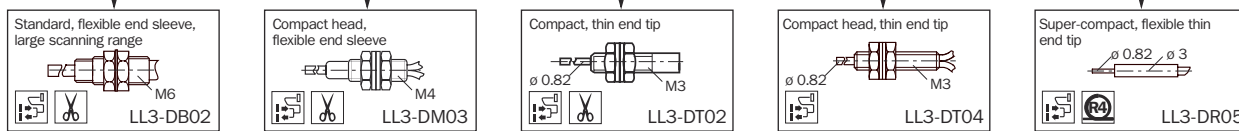
Fibre-optic cable length 10 m



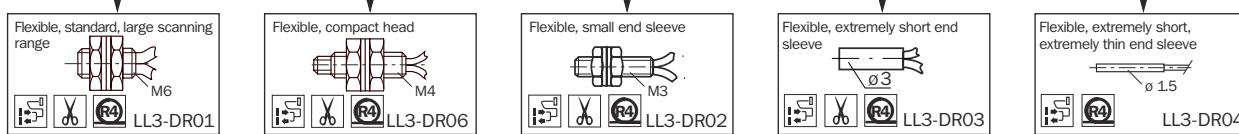
Compact end sleeve, excellent scanning ranges



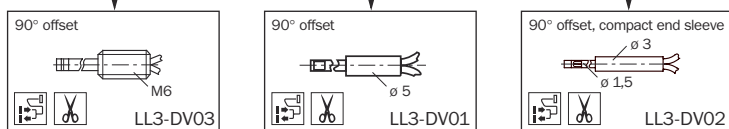
Thin end sleeves, long, very thin and flexible end tips: ideal for small, inaccessible objects



Extremely flexible fibre-optic cable, bend radius R4, for dynamic mechanical systems



Integrated 90° offset, extremely short installation depths

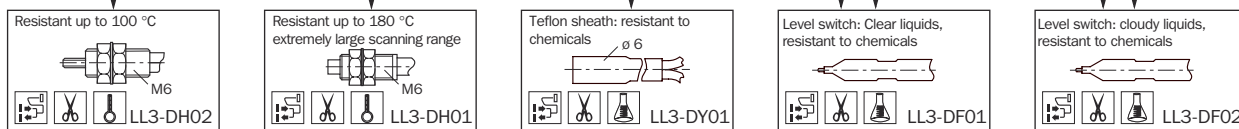


Special applications:

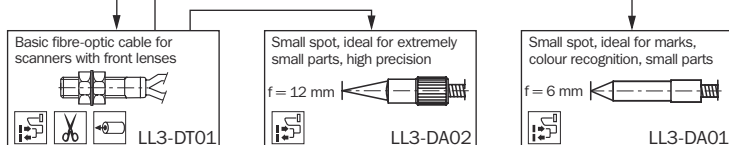
Level switches

Chemicals

High temperature

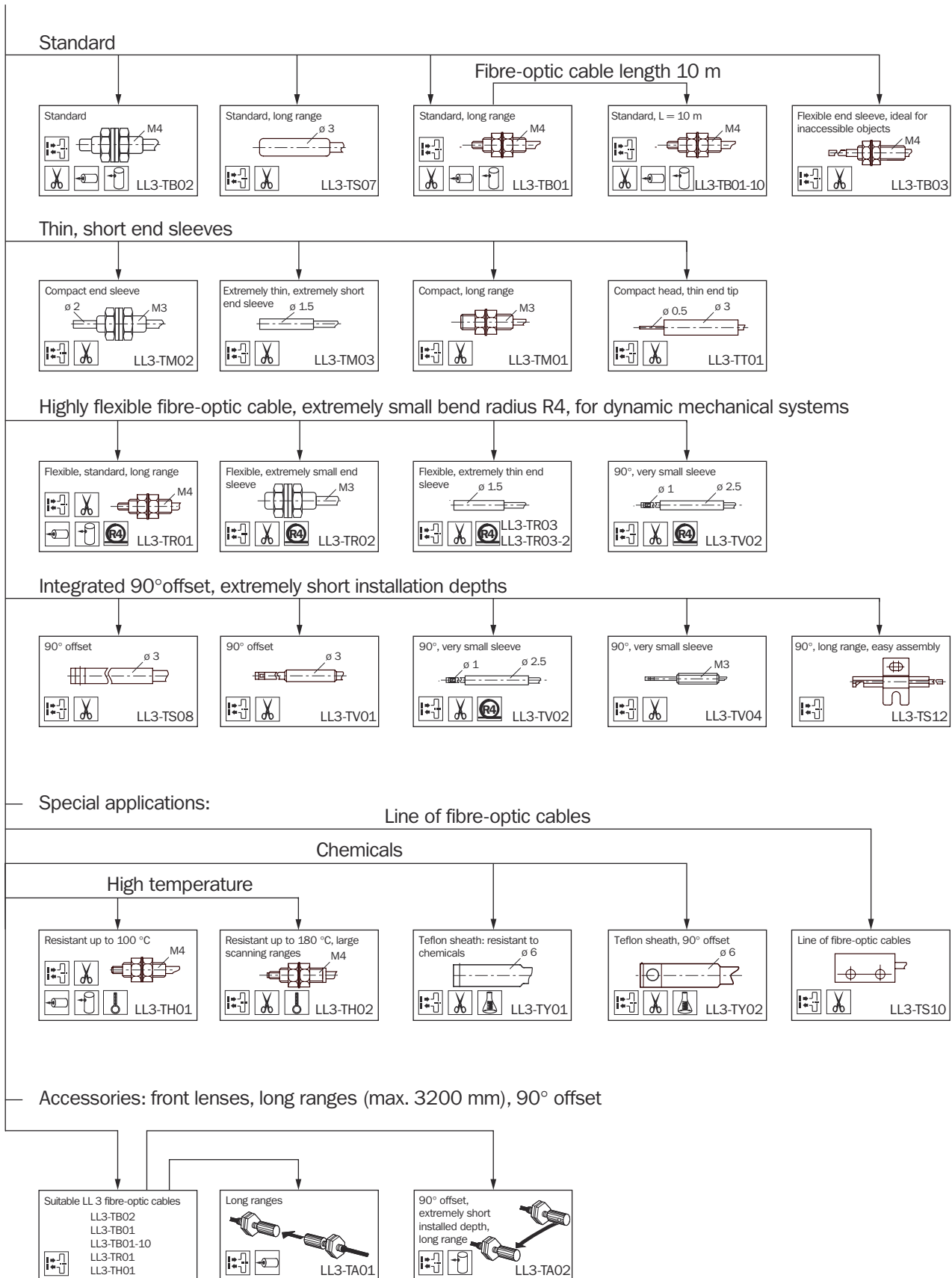


Accessories: lenses at the front with focused optics



Flow chart – selection of fibre-optic cables

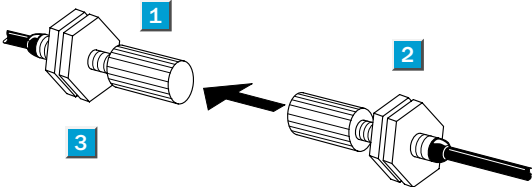
Fibre-optic cable Through-beam systems



Front lenses for through-beam systems

■ Long ranges

- 1 Light spot diameter: approx. 170 mm at 1000 mm
- 2 Aperture approx. 15°
- 3 Material: CuZn (nickel-plated)/glass

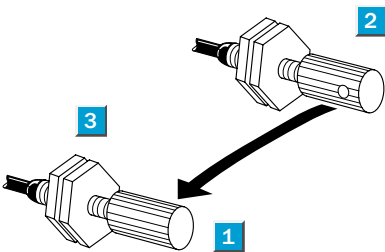


| Order information | |
|-------------------|-----------|
| Type | Order no. |
| LL3-TA01 | 5308128 |

Front lenses for through-beam systems

■ Compact 90° offset

- 1 Light spot diameter: X-axis approx. 110 mm
Y-axis: approx. 170 mm, for 200 mm range in each case
- 2 Aperture, X-axis approx. 30°, Y-axis: approx. 40°
- 3 Material: CuZn (nickel-plated)/glass

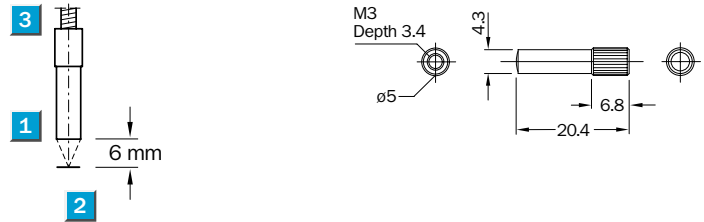


| Order information | |
|-------------------|-----------|
| Type | Order no. |
| LL3-TA02 | 5308129 |

Front lenses for proximity systems

- For detection of very small parts
- Focused, very small light spot diameter
- High sensitivity (6 % remission)
- For suppressing interference – causing backgrounds

- 1 Light spot diameter: approx. 0.25 mm at the focal point = 6 mm
- 2 Aperture: focus = 6 mm
- 3 Material: Al (aluminium)/glass

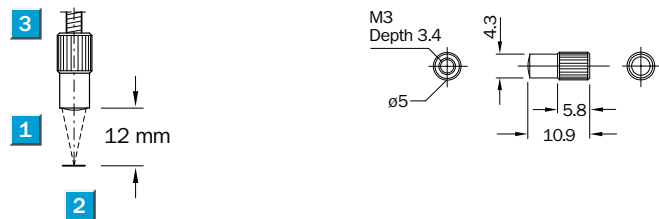


| Order information | |
|-------------------|-----------|
| Type | Order no. |
| LL3-DA01 | 5308127 |

Front lenses for proximity systems

- Suitable as a “mark sensor” for colour marks
- Focused, very small light spot diameter
- High sensitivity (6 % remission)
- For suppressing interference – causing backgrounds

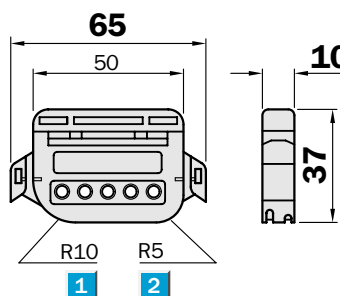
- 1 Light spot diameter approx. 3 mm at the focal point = 12 mm
- 2 Aperture: focus = 12 mm
- 3 Material: Al (aluminium)/glass



| Order information | |
|-------------------|-----------|
| Type | Order no. |
| LL3-DA02 | 5308130 |

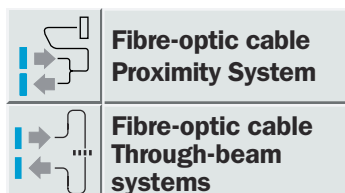
Cutter FC[®] for fibre-optic cables

| Type | Order no. |
|------|-----------|
| FC | 5304 141 |



- 1 Template for bend radius R 10 mm, for sensing tip \varnothing 1.5 mm and \varnothing 2.5 mm
- 2 Bend radius R 5 mm

* Supplied with fibre optic cable for cutting it to length



Features

- Robust glass fibre-fibre optic cable within a helical metal spring
- Operating temperature for chrome-plated helical metal spring - 25... + 250 °C
Operating temperature for helical metal spring with PVC sheath - 10... + 60 °C
- Minimum bend radius 20 mm

Selection table: sensors, fibre-optic cables, scanning distance/range

Fibre-optic cables, proximity systems

Scanning distance in mm with photoelectric switches

| Description | Type | Order no. | Scanning distance in mm with photoelectric switches | | | | | | | | |
|---|-----------|-----------|---|----|-----|----------------|----|-----|-------------|---|----|
| | | | WLL12-B5181 | | | WLL12-B5281 | | | WLL12-B5381 | | |
| | | | 1 | 2 | 4 | 1 | 2 | 4 | 1 | 2 | 3 |
| | | | Red light | | | Infrared light | | | Green light | | |
| 150 mm | LM31-150 | 2015225 | 50 | 12 | 280 | 60 | 20 | 280 | 5 | 2 | 60 |
| 450 mm | LM31-450 | 2015223 | 50 | 12 | 280 | 60 | 20 | 280 | 5 | 2 | 60 |
| 750 mm | LM31-750 | 2015224 | 50 | 12 | 280 | 60 | 20 | 280 | 5 | 2 | 60 |
| 1500 mm | LM31-1500 | 2017381 | 50 | 12 | 280 | 60 | 20 | 280 | 5 | 2 | 60 |
| 150 mm, with rectangular light outlet | LM35-150 | 2015226 | 50 | 12 | 280 | 60 | 20 | 280 | 5 | 2 | 60 |
| 450 mm, with rectangular light outlet | LM35-450 | 2015230 | 50 | 12 | 280 | 60 | 20 | 280 | 5 | 2 | 60 |
| 750 mm, with rectangular light outlet | LM35-750 | 2015231 | 50 | 12 | 280 | 60 | 20 | 280 | 5 | 2 | 60 |
| 150 mm, with 90° offset head with rectangular light outlet | LM36-150 | 2015232 | 50 | 12 | 280 | 60 | 20 | 280 | 5 | 2 | 60 |
| 450 mm, with 90° offset head with rectangular light outlet | LM36-450 | 2015233 | 50 | 12 | 280 | 60 | 20 | 280 | 5 | 2 | 60 |
| 750 mm, with 90° offset head with rectangular light outlet | LM36-750 | 2015234 | 50 | 12 | 280 | 60 | 20 | 280 | 5 | 2 | 60 |
| 1000 mm, with 90° offset head with rectangular light outlet | LM36-1000 | 2016772 | 50 | 12 | 280 | 60 | 20 | 280 | 5 | 2 | 60 |
| 1250 mm, with 90° offset head with rectangular light outlet | LM36-1250 | 2016792 | 50 | 12 | 280 | 60 | 20 | 280 | 5 | 2 | 60 |
| 150 mm, as LM36, but with light outlet turned 90° | LM37-150 | 2015235 | 50 | 12 | 280 | 60 | 20 | 280 | 5 | 2 | 60 |
| 450 mm, as LM36, but with light outlet turned 90° | LM37-450 | 2015236 | 50 | 12 | 280 | 60 | 20 | 280 | 5 | 2 | 60 |
| 750 mm, as LM36, but with light outlet turned 90° | LM37-750 | 2015237 | 50 | 12 | 280 | 60 | 20 | 280 | 5 | 2 | 60 |
| 450 mm, up to 250 °C | LT31-450 | 2015227 | 50 | 12 | 280 | 60 | 20 | 280 | 5 | 2 | 60 |
| 750 mm, up to 250 °C | LT31-750 | 2015228 | 50 | 12 | 280 | 60 | 20 | 280 | 5 | 2 | 60 |
| 2200 mm, up to 250 °C | LT31-2200 | 2017871 | 50 | 12 | 280 | 60 | 20 | 280 | 5 | 2 | 60 |

Fibre-optic cables, through-beam systems

Scanning range in mm with photoelectric switches

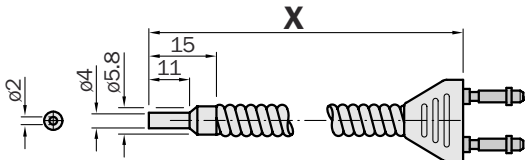
| Description | Type | Order no. | Scanning range in mm with photoelectric switches | | |
|---|----------|-----------|--|----------------|-------------|
| | | | WLL12-B5181 | WLL12-B5281 | WLL12-B5381 |
| | | | Red light | Infrared light | Green light |
| 450 mm | LM32-450 | 2014850 | 200 | 300 | 20 |
| 750 mm | LM32-750 | 2015038 | 200 | 300 | 20 |
| 150 mm, with 90° offset head | LM38-150 | 2016788 | 200 | 300 | 20 |
| 450 mm, with 90° offset head | LM38-450 | 2015049 | 200 | 300 | 20 |
| 750 mm, with 90° offset head | LM38-750 | 2015050 | 200 | 300 | 20 |
| 750 mm, with 90° offset head and front lens | LM38-751 | 2015970 | 330 | 550 | 32 |
| 450 mm, as LM38, but with light outlet turned 90° | LM39-450 | 2015047 | 200 | 300 | 20 |
| 750 mm, as LM38, but with light outlet turned 90° | LM39-750 | 2015048 | 200 | 300 | 20 |
| 450 mm, up to 250 °C | LT32-450 | 2015072 | 200 | 300 | 20 |
| 750 mm, up to 250 °C | LT32-750 | 2015073 | 200 | 300 | 20 |

- 1 With reference to standard white, 90 % remission
- 2 With reference to standard grey, 18 % remission
- 3 With reference to standard black, 6 % remission
- 4 On "diamond grade" reflective tape

Dimensional drawings and order information

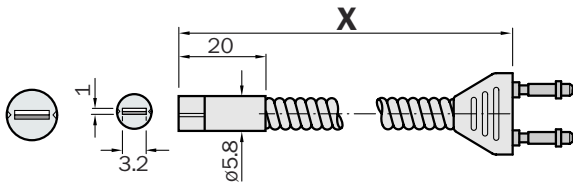
LM31 Fibre-optic cables, helical metal spring with PVC sheath

| Type | Order no. | Length X |
|-----------|-----------|----------|
| LM31-150 | 2015225 | 150 mm |
| LM31-450 | 2015223 | 450 mm |
| LM31-750 | 2015224 | 750 mm |
| LM31-1500 | 2017381 | 1500 mm |



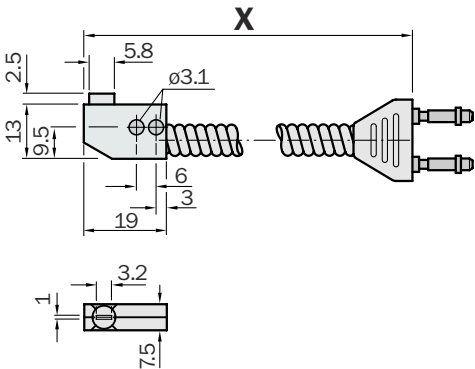
LM35 Fibre-optic cables, helical metal spring with PVC sheath

| Type | Order no. | Length X |
|----------|-----------|----------|
| LM35-150 | 2015226 | 150 mm |
| LM35-450 | 2015230 | 450 mm |
| LM35-750 | 2015231 | 750 mm |



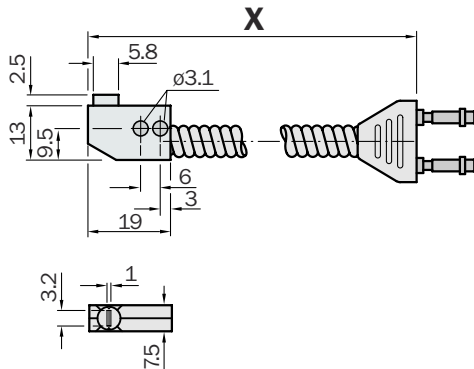
LM36 Fibre-optic cables, helical metal spring with PVC sheath

| Type | Order no. | Length X |
|-----------|-----------|----------|
| LM36-150 | 2015232 | 150 mm |
| LM36-450 | 2015233 | 450 mm |
| LM36-750 | 2015234 | 750 mm |
| LM36-1000 | 2016772 | 1000 mm |
| LM36-1250 | 2016792 | 1250 mm |



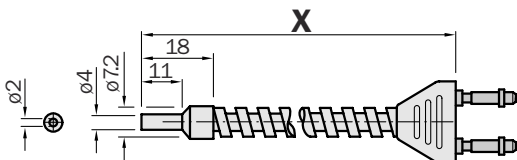
LM37 Fibre-optic cables, helical metal spring with PVC sheath

| Type | Order no. | Length X |
|----------|-----------|----------|
| LM37-150 | 2015235 | 150 mm |
| LM37-450 | 2015236 | 450 mm |
| LM37-750 | 2015237 | 750 mm |



LT31 Fibre-optic cables, helical metal spring, chrome-plated

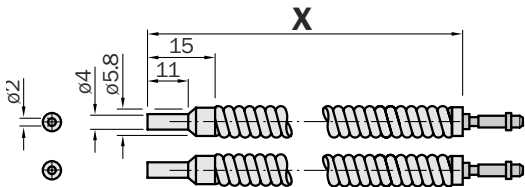
| Type | Order no. | Length X |
|-----------|-----------|----------|
| LT31-450 | 2015227 | 450 mm |
| LT31-750 | 2015228 | 750 mm |
| LT31-2200 | 2017871 | 2200 mm |



Dimensional drawings and order information

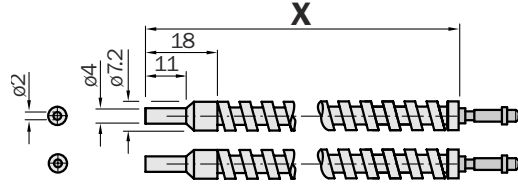
LM32 Fibre-optic cables, helical metal spring with PVC sheath

| Type | Order no. | Length X |
|----------|-----------|----------|
| LM32-450 | 2014850 | 450 mm |
| LM32-750 | 2015038 | 750 mm |



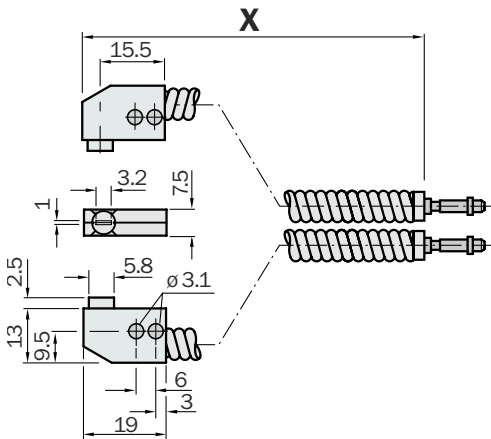
LT32 Fibre-optic cables, helical metal spring, chrome-plated

| Type | Order no. | Length X |
|----------|-----------|----------|
| LT32-450 | 2015072 | 450 mm |
| LT32-750 | 2015073 | 750 mm |



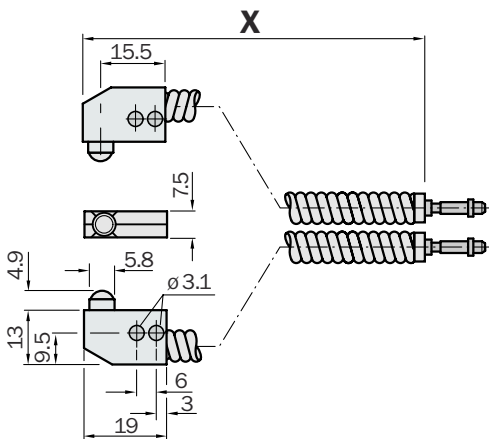
LM38 Fibre-optic cables, helical metal spring with PVC sheath

| Type | Order no. | Length X |
|----------|-----------|----------|
| LM38-150 | 2015788 | 150 mm |
| LM38-450 | 2015049 | 450 mm |
| LM38-750 | 2015050 | 750 mm |



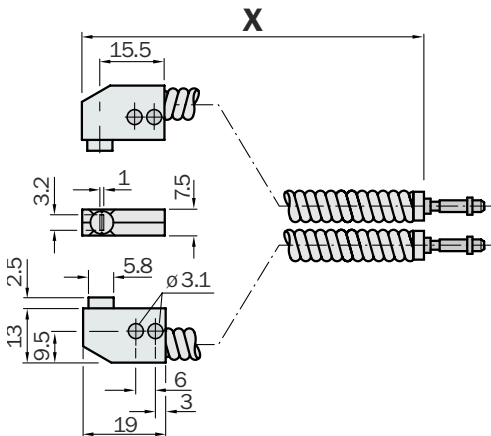
LM38 Fibre-optic cables, with front lens, helical metal spring w. PVC sheath

| Type | Order no. | Length X |
|----------|-----------|----------|
| LM38-751 | 2015970 | 750 mm |



LM39 Fibre-optic cables, helical metal spring with PVC sheath

| Type | Order no. | Length X |
|----------|-----------|----------|
| LM39-450 | 2015047 | 450 mm |
| LM39-750 | 2015048 | 750 mm |



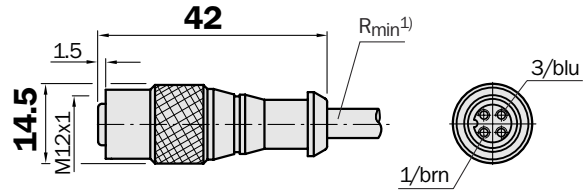
Dimensional drawings and order information

SENSICK screw-in system M12, 2-pin, enclosure rating IP 67

Female cable connector M12, 2-pin, straight

Cable diameter 4.5 mm, 2 x 0.34 mm², sheath PVC

| Type | Order no. | Cable length |
|---------------|-----------|--------------|
| DOL-1202-G02M | 6010728 | 2 m |

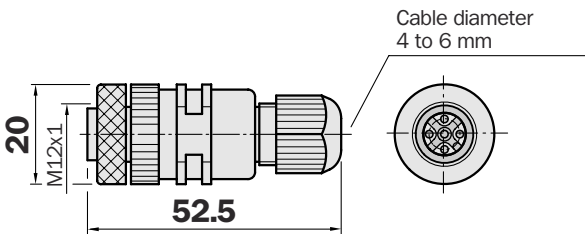


¹⁾ Minimum bend radius in dynamic use
 $R_{min} = 20 \times \text{cable diameter}$

SENSICK screw-in system M12, 4- or 5-pin, enclosure rating IP 67

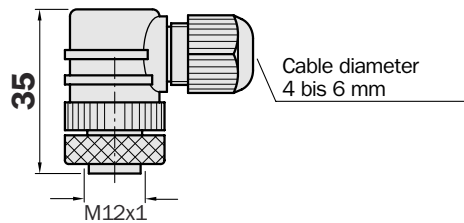
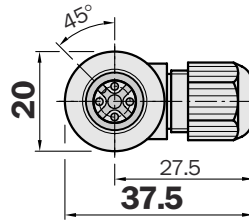
Female connector M12, 4- or 5-pin, straight

| Type | Order no. | Contacts |
|------------|-----------|----------|
| DOS-1204-G | 6007302 | 4 |
| DOS-1205-G | 6009719 | 5 |



Female connector M12, 4- or 5-pin, right angle

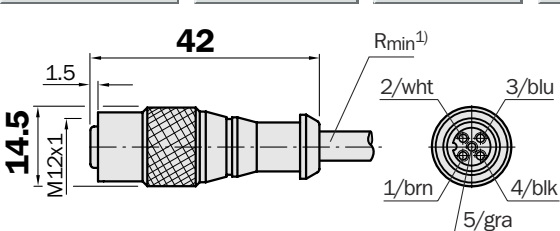
| Type | Order no. | Contacts |
|------------|-----------|----------|
| DOS-1204-W | 6007303 | 4 |
| DOS-1205-W | 6009720 | 5 |



Female connector M12, 4- or 5-pin, straight

Cable diameter 5/6 mm, 4/5 x 0.25 mm², sheath PVC

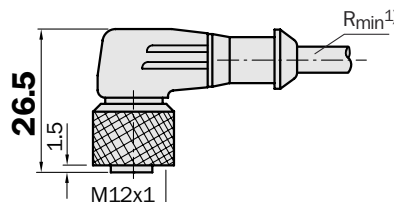
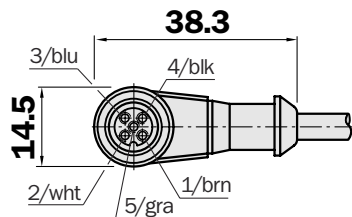
| Type | Order no. | Contacts | Cable length |
|---------------|-----------|----------|--------------|
| DOL-1204-G02M | 6009382 | 4 | 2 m |
| DOL-1204-G05M | 6009866 | 4 | 5 m |
| DOL-1204-G10M | 6010543 | 4 | 10 m |
| DOL-1204-G15M | 6010753 | 4 | 15 m |
| DOL-1205-G02M | 6008899 | 5 | 2 m |
| DOL-1205-G05M | 6009868 | 5 | 5 m |
| DOL-1205-G10M | 6010544 | 5 | 10 m |



Female connector M12, 4- or 6-pin, right angle

Cable diameter 5/6 mm, 4/5 x 0.25 mm², sheath PVC

| Type | Order no. | Contacts | Cable length |
|---------------|-----------|----------|--------------|
| DOL-1204-W02M | 6009383 | 4 | 2 m |
| DOL-1204-W05M | 6009867 | 4 | 5 m |
| DOL-1204-W10M | 6010541 | 4 | 10 m |
| DOL-1205-W02M | 6008900 | 5 | 2 m |
| DOL-1205-W05M | 6009869 | 5 | 5 m |
| DOL-1205-W10M | 6010542 | 5 | 10 m |



¹⁾ Minimum bend radius in dynamic use
 $R_{min} = 20 \times \text{cable diameter}$

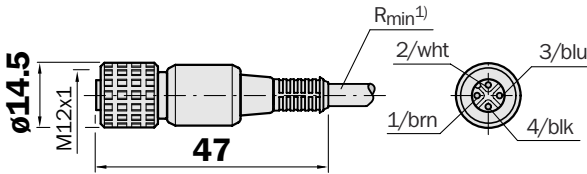
Dimensional drawings and order information

SENSICK screw-in system M12, 4- or 5-pin, enclosure rating IP 67

Female connector M12, 4-pin, straight

Cable diameter 4.5 mm, 4 x 0.34 mm², sheath PUR

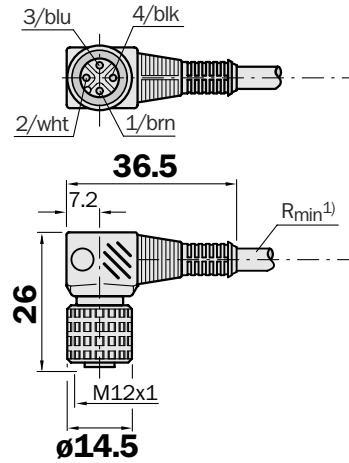
| Type | Order no. | Cable length |
|----------------|-----------|--------------|
| DOL-1204-G05MB | 7902084 | 5 m |



Female connector M12, 4-pin, right angle

Cable diameter 4.5 mm, 4 x 0.34 mm², sheath PUR

| Type | Order no. | Cable length |
|----------------|-----------|--------------|
| DOL-1204-W05MB | 7902085 | 5 m |

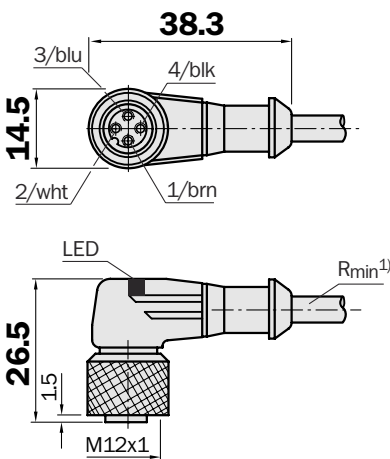


Female connector M12, 4-pin, right angle

Cable diameter 5 mm, 4 x 0.34 mm², sheath PUR/PVC

With built-in LED-operation and function indicators, PNP complementary²⁾

| Type | Order no. | Contacts | Cable length |
|----------------|-----------|----------|--------------|
| DOL-1204-W05ME | 6020398 | 4 | 5 m |



¹⁾ Minimum bend radius in dynamic use

$R_{min} = 20 \times \text{cable diameter}$

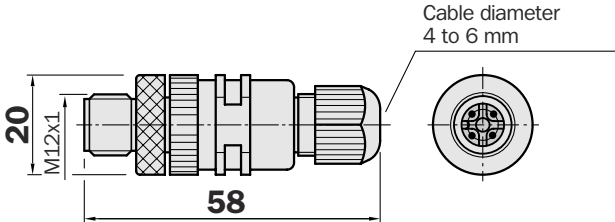
²⁾ Not suitable for sender in through-beam photoelectric switches

Dimensional drawings and order information

SENSICK screw-in system M12, 4- or 5-pin, enclosure rating IP 67

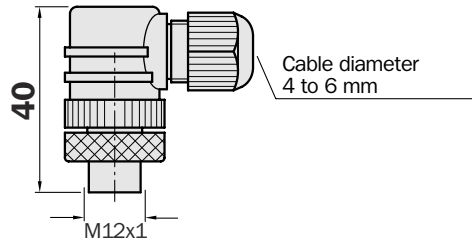
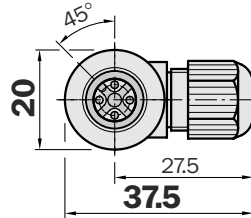
Male connector M12, 4- or 5-pin, straight

| Type | Order no. | Contacts |
|------------|-----------|----------|
| STE-1204-G | 6009932 | 4 |
| STE-1205-G | 6022083 | 5 |



Male connector M12, 4- or 5-pin, right angle

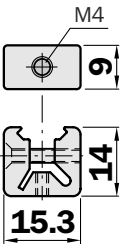
| Type | Order no. | Contacts |
|------------|-----------|----------|
| STE-1204-W | 6022084 | 4 |
| STE-1205-W | 6022082 | 5 |



Clamp/Mounting bracket

Clamp

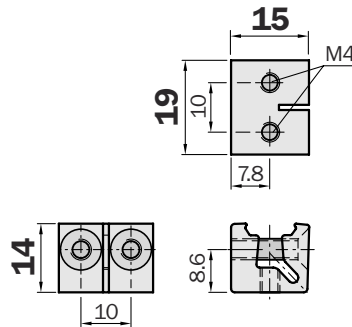
| Type | Order no. |
|------------|-----------|
| BEF-KH-W12 | 2013285 |



Countersunk screw M4 x 15 mm included with delivery

Double clamp

| Type | Order no. |
|-------------|-----------|
| BEF-DKH-W12 | 2013947 |



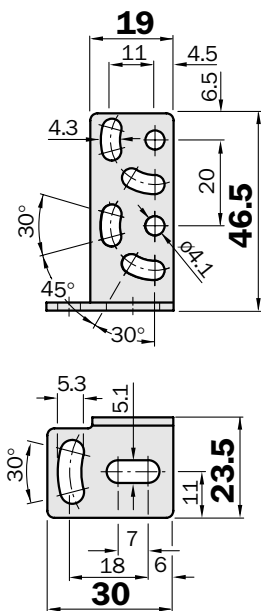
2 countersunk screws M4 x 15 mm included with delivery

Dimensional drawings and order information

Clamp/Mounting bracket

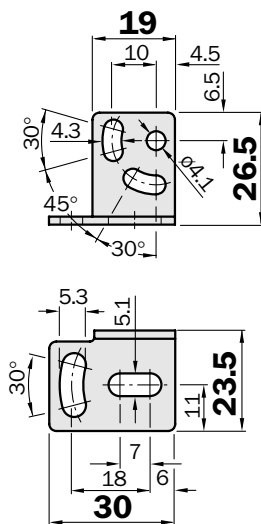
Mounting bracket, large (stainless steel)

| Type | Order no. |
|------------|-----------|
| BEF-WG-W12 | 2013942 |



Mounting bracket, small (stainless steel)

| Type | Order no. |
|------------|-----------|
| BEF-WK-W12 | 2012938 |

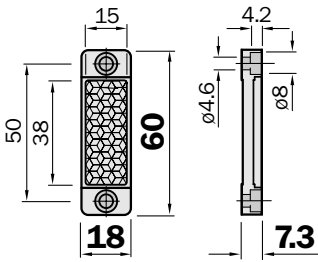


Dimensional drawings and order information

Plastic design for temperatures up to 65 °C

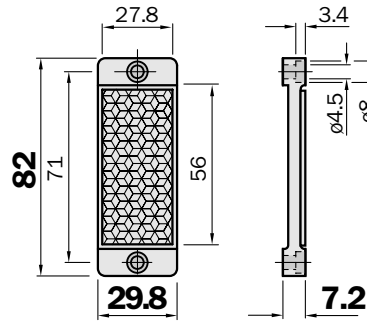
Reflector, 20 x 40 mm

| Type | Order no. |
|-------|-----------|
| PL20A | 1012719 |



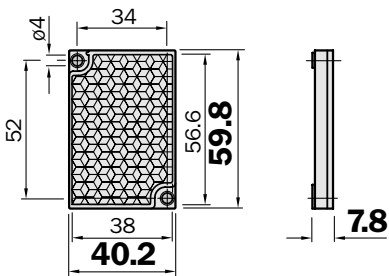
Reflector, 30 x 50 mm

| Type | Order no. |
|-------|-----------|
| PL30A | 1002314 |



Reflector, 40 x 60 mm

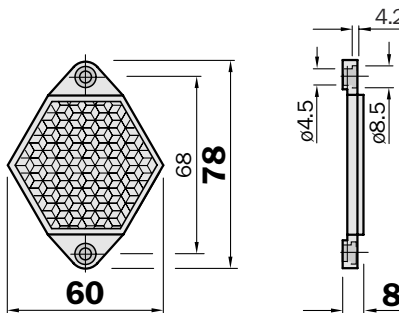
| Type | Order no. |
|-------|-----------|
| PL40A | 1012720 |



Reflector, 6-sided

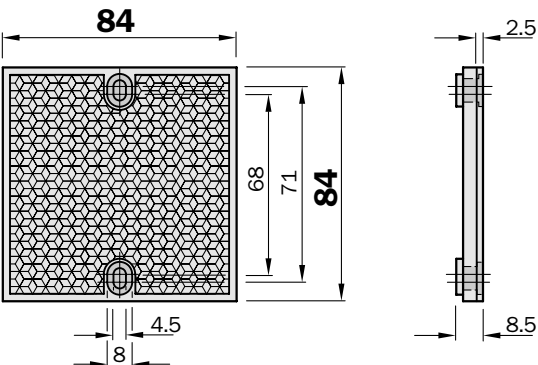
width across flats 48 mm

| Type | Order no. |
|-------|-----------|
| PL50A | 1000 132 |



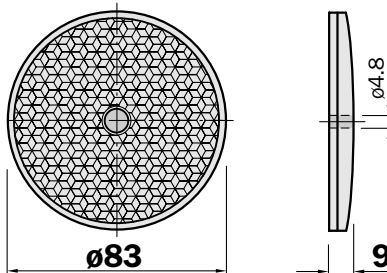
Reflector, 80 x 80 mm

| Type | Order no. |
|-------|-----------|
| PL80A | 1003865 |



Reflector, diameter 83 mm, centre hole mounting

| Type | Order no. |
|------|-----------|
| C110 | 5304549 |



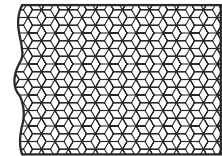
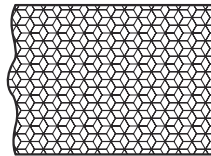
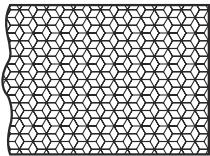
Dimensional drawings and order information

Self-adhesive reflective tape for photoelectric switches with polarisation filter

| | |
|----------------------------|-----------|
| Reflective tape APM | |
| Sheet 225 x 225 mm | |
| Type | Order no. |
| REF-APM | 4025097 |

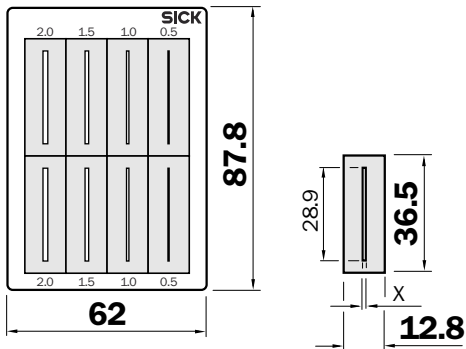
| | |
|--|-----------|
| Reflective tape "Diamond Grade" | |
| Sheet 749 x 914 mm | |
| Type | Order no. |
| REF-DG | 5304334 |

| | |
|--|-----------|
| Reflective tape "Diamond Grade" | |
| Cut to size | |
| Type | Order no. |
| REF-DG-K | 4019634 |



Masks

| | |
|---|-----------|
| Mask card for WS/WE 12-2 | |
| with 2 self-adhesive masks each for sender (WS) and receiver (WE) | |
| Slot width X: 0.5 mm/1.0 mm/1.5 mm/2.0 mm | |
| Type | Order no. |
| BL 12-SKN | 4031815 |



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