




W 4-2 series: Small but powerful

| | |
|--|---|
|  | Photoelectric proximity switches BGS |
|  | Photoelectric reflex switches |
|  | Through-beam photoelectric switches |



beverage and tobacco industries, the electronics sector and packaging machines.

The WT 4-2 photoelectric proximity switch can be adjusted to scanning ranges between 4 and 130 mm. Whatever the individual application, the sensor allows the appropriate background suppression to be selected.

WL 4-2 is the name of the photoelectric reflex switch in this series. It can detect objects reliably at a distance of up to 2.8 metres.

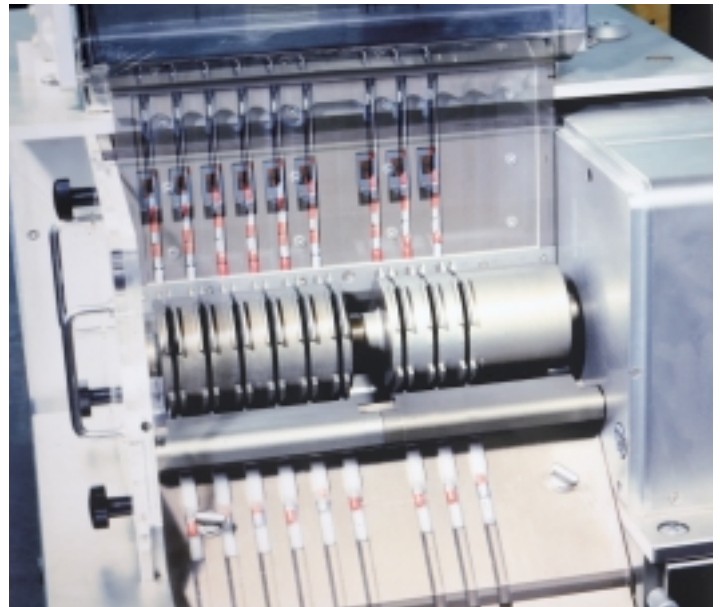
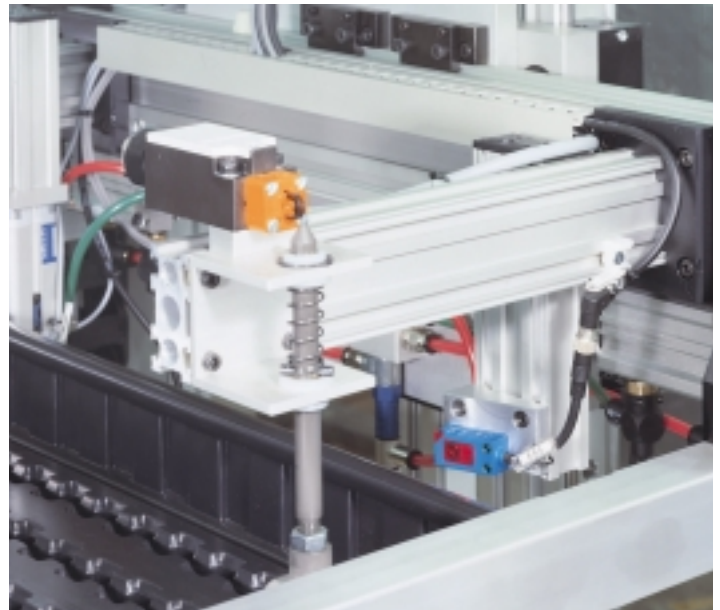
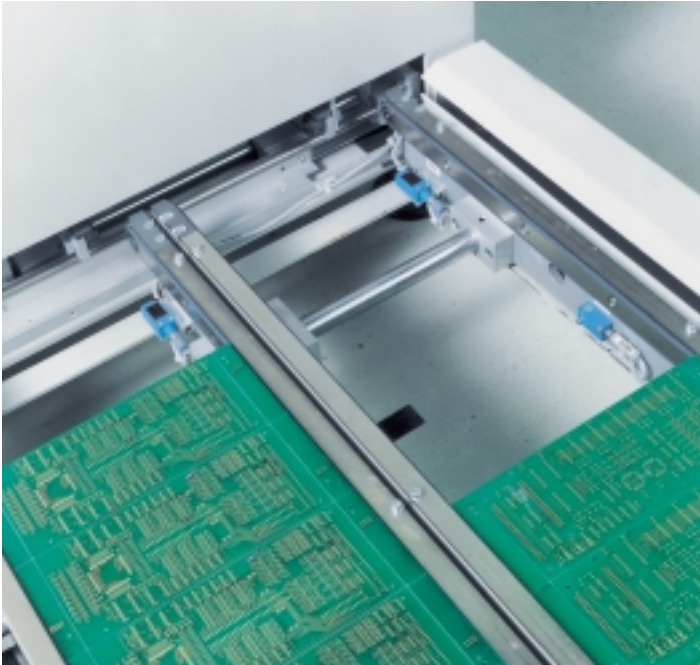
The WL 4G-2 glass photoelectric switch has been specially developed for use in the packaging and beverage industries. It is easier to install, simpler to calibrate and has a greater scanning range than fibre-optic sensors. If a polarising filter is used, it also allows reflective objects to be detected, e.g. partially printed or aluminised foils.

The WS/WE 4-2 through-beam photoelectric switch has a scanning range of 4 metres. Like the other sensors in this series it uses visible light which makes adjustment and alignment of the sensor during commissioning much easier.

As small as a sugar cube and as powerful as a "large" photoelectric switch – these are the two principal features of the W 4-2 photoelectric switch series. They are used in particularly narrow locations and where only limited mounting space is available. Insensitivity to ambient light (e.g. from HF or flashing warning lamps) and a high level of functional reliability if devices are installed opposite each other are particularly important for trouble-free operation. Sensor housings are made of fully welded plastic (ABS). Temperature variations between -40 and $+60$ °C, splash-water and dust do not reduce the reliability of object detection. Suitable areas of application are the food-processing,

► The presence of small containers in a lifting unit is determined by a WT 4-2.


▼ Photoelectric reflex switches controlling the transport systems used in printed circuit board production.



▲ In the pharmaceutical industry: WT 4-2 photoelectric proximity switches are used to detect individual pills in a precision balance.



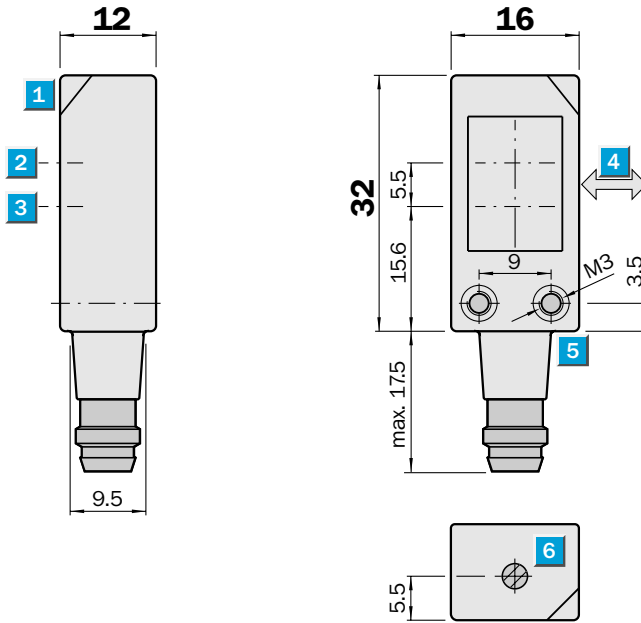
▲ The fully automatic soldering robot springs into action as soon as the WT 4-2 photoelectric proximity switches have detected the next workpiece – e.g. a photoelectric switch.

 **Scanning distance**
4...130 mm

Photoelectric proximity switches

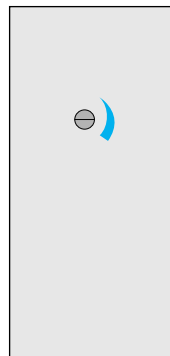
- Adjustable background suppression
- Insensitive to ambient light sources (HF lamps, flashing warning lamps)
- Reliable operation if devices are installed opposite each other
- Permissible operating temperature - 40 °C...+ 60 °C
- Rapid response time

Dimensional drawing



Adjustments possible

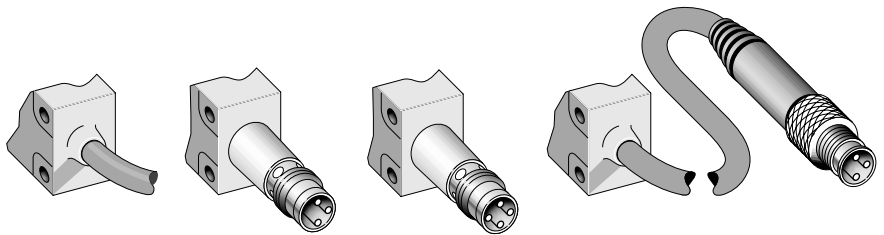
All types



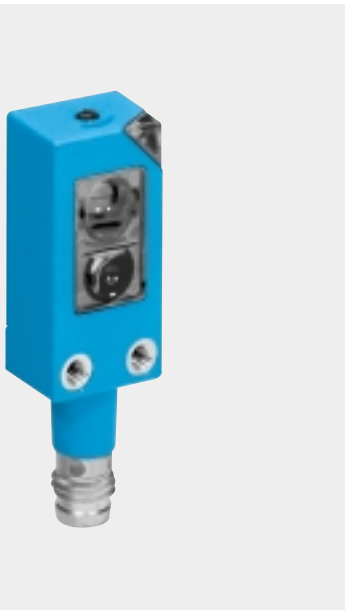
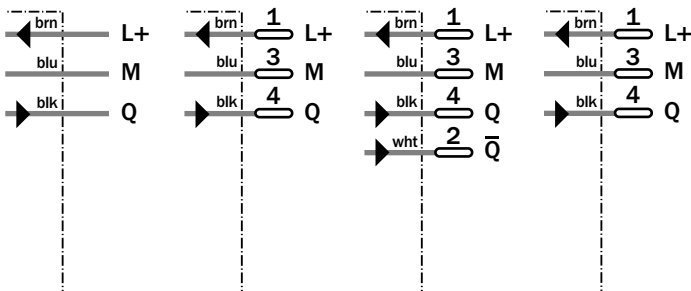
- 1** LED signal strength indicator
- 2** Optical axis, receiver
- 3** Optical axis, sender
- 4** Standard direction of the material being scanned
- 5** M 3 threaded mounting hole
- 6** Scanning distance adjustment

Connection types

| | | | |
|-------------|-------------|-------------|-------------|
| WT 4-2P 132 | WT 4-2P 330 | WT 4-2P 430 | WT 4-2P 331 |
| WT 4-2N 132 | WT 4-2N 330 | | WT 4-2N 331 |



| | | | |
|--------------------------|------------|------------|------------|
| 3 x 0.25 mm ² | 3-pin, M 8 | 4-pin, M 8 | 3-pin, M 8 |
|--------------------------|------------|------------|------------|



| | |
|--------------------|------|
| Accessories | page |
| Cable receptacles | 496 |

| Technical data | | WT 4-2 | P 132 | P 330 | P 331 | N 132 | N 330 | N 331 | P 430 |
|--|---|--------|-------|-------|-------|-------|-------|-------|-------|
| Scanning distance | 4...130 mm, adjustable | | | | | | | | |
| Background suppression | adjustable from 20 mm | | | | | | | | |
| Light source¹⁾, light type | LED, red light | | | | | | | | |
| Light spot diameter | 3 mm at 50 mm | | | | | | | | |
| Supply voltage V_S | 10...30 V DC ²⁾ | | | | | | | | |
| Ripple ³⁾ | 5 V_{SS} | | | | | | | | |
| Current consumption ⁴⁾ | < 20 mA | | | | | | | | |
| Switching outputs | PNP, Q | | | | | | | | |
| | NPN, Q | | | | | | | | |
| | PNP, Q and \bar{Q} | | | | | | | | |
| Switching mode | Light-switching | | | | | | | | |
| | Dark-switching | | | | | | | | |
| Output current I_A max. | 100 mA | | | | | | | | |
| PNP; signal voltage HIGH | $V_S - (< 2.5 V)$ | | | | | | | | |
| PNP; signal voltage LOW | Approx. 0 V | | | | | | | | |
| NPN; signal voltage HIGH | Approx. V_S | | | | | | | | |
| NPN; signal voltage LOW | < 1.5 V | | | | | | | | |
| Response time ⁵⁾ | < 500 μs | | | | | | | | |
| Max. switching frequency ⁶⁾ | 1000/s | | | | | | | | |
| Connection types | Cable ⁷⁾ , 2 m | | | | | | | | |
| | Plug M 8 | | | | | | | | |
| | Cable ⁷⁾ , 100 mm, with plug | | | | | | | | |
| VDE protection class | \diamond | | | | | | | | |
| Circuit protection⁸⁾ | A, B, C | | | | | | | | |
| Enclosure rating⁹⁾ | IP 67 | | | | | | | | |
| Ambient temperature T_A | Operation -40 °C...+60 °C | | | | | | | | |
| | Storage -40 °C...+75 °C | | | | | | | | |
| Weight | Approx. 20 g | | | | | | | | |
| Housing material | PC, polycarbonate | | | | | | | | |

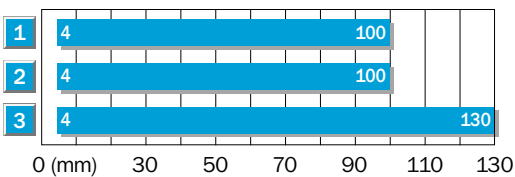
- 1) Average service life 100,000 h where $T_A = +25\text{ °C}$
- 2) Limit values
- 3) May not exceed or fall short of V_S tolerances

- 4) Without load
- 5) Signal transit time with resistive load
- 6) With light/dark ratio 1:1
- 7) Do not bend below 0 °C

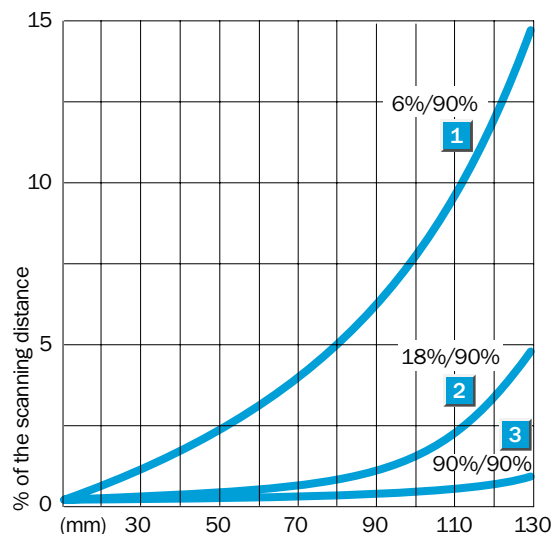
- 8) A = V_S connections reverse-polarity protected
- B = Output Q and \bar{Q} short-circuit protected
- C = Interference pulse suppression

- 9) IP 67: with screw-in cable receptacles
- IP 65: with plug-in cable receptacles

Scanning distance




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



Order information

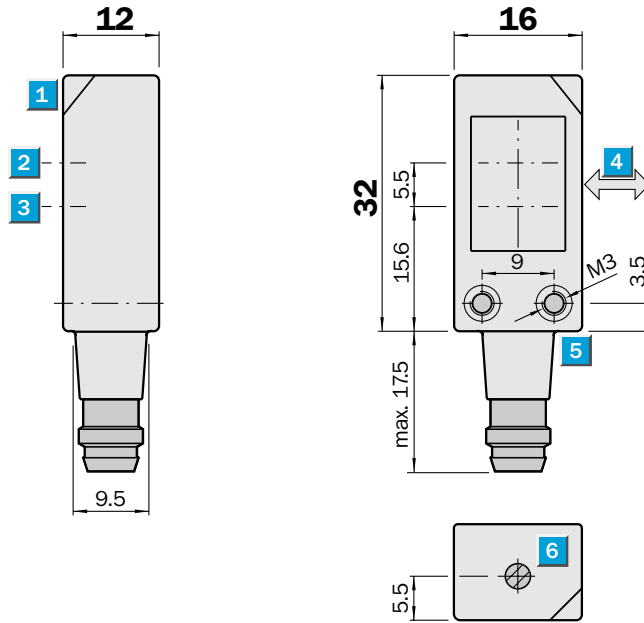
| Type | Part no. |
|-------------|-----------|
| WT 4-2P 132 | 1 015 150 |
| WT 4-2P 330 | 1 015 143 |
| WT 4-2P 331 | 1 015 145 |
| WT 4-2N 132 | 1 012 874 |
| WT 4-2N 330 | 1 012 920 |
| WT 4-2N 331 | 1 015 147 |
| WT 4-2P 430 | 1 015 957 |

 **Scanning distance**
4... 130 mm

Photoelectric proximity switches

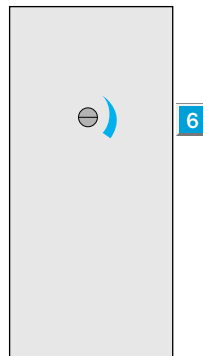
- Adjustable background suppression
- Insensitive to ambient light sources (HF lamps, flashing warning lamps)
- Reliable operation if devices are installed opposite each other
- Permissible operating temperature - 40 °C...+ 60 °C
- Rapid response time

Dimensional drawing



Adjustments possible

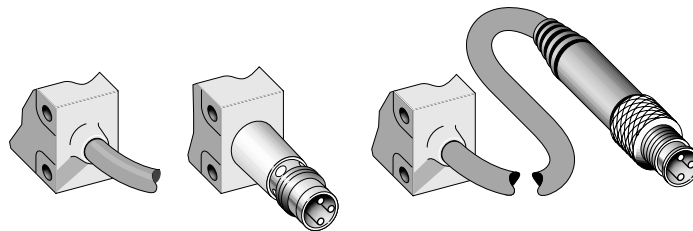
All types



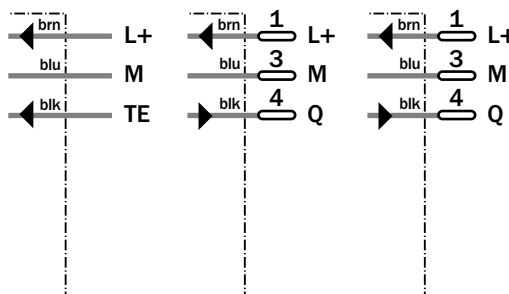
- 1 LED signal strength indicator
- 2 Optical axis, receiver
- 3 Optical axis, sender
- 4 Standard direction of the material being scanned
- 5 M 3 threaded mounting hole
- 6 Scanning distance adjustment

Connection types

| | | |
|-------------|-------------|-------------|
| WT 4-2E 132 | WT 4-2E 330 | WT 4-2E 331 |
| WT 4-2F 132 | WT 4-2F 330 | WT 4-2F 331 |



| | | |
|--------------------------|------------|------------|
| 3 x 0.25 mm ² | 3-pin, M 8 | 3-pin, M 8 |
|--------------------------|------------|------------|

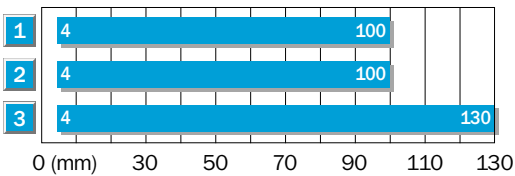


| | |
|--------------------|------|
| Accessories | page |
| Cable receptacles | 496 |

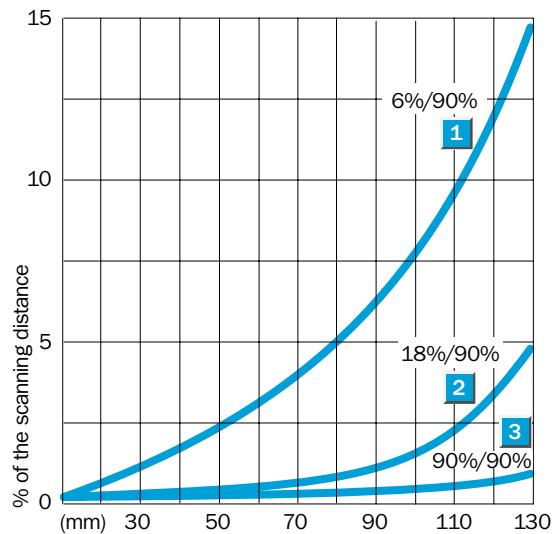
| Technical data | | WT 4-2 | E 132 | E 330 | E 331 | F 132 | F 330 | F 331 | | | | |
|--|--|--------|-------|-------|-------|-------|-------|-------|--|--|--|--|
| Scanning distance | 4...130 mm, adjustable | | | | | | | | | | | |
| Background suppression | adjustable from 20 mm | | | | | | | | | | | |
| Light source¹⁾, light type | LED, red light | | | | | | | | | | | |
| Light spot diameter | 3 mm at 50 mm | | | | | | | | | | | |
| Supply voltage V_S | 10...30 V DC ²⁾ | | | | | | | | | | | |
| Ripple ³⁾ | 5 V _{SS} | | | | | | | | | | | |
| Current consumption ⁴⁾ | < 20 mA | | | | | | | | | | | |
| Switching outputs | PNP, Q | | | | | | | | | | | |
| | NPN, Q | | | | | | | | | | | |
| Switching mode | Dark-switching | | | | | | | | | | | |
| Output current I _A max. | 100 mA | | | | | | | | | | | |
| PNP; signal voltage HIGH | V _S - (< 2.5 V) | | | | | | | | | | | |
| PNP; signal voltage LOW | Approx. 0 V | | | | | | | | | | | |
| NPN; signal voltage HIGH | Approx. V _S | | | | | | | | | | | |
| NPN; signal voltage LOW | < 1.5 V | | | | | | | | | | | |
| Response time ⁵⁾ | < 500 μs | | | | | | | | | | | |
| Max. switching frequency ⁶⁾ | 1000/s | | | | | | | | | | | |
| Connection types | Cable ⁷⁾ , 2 m | | | | | | | | | | | |
| | Plug M 8 | | | | | | | | | | | |
| | Cable ⁷⁾ , 100 mm, with plug | | | | | | | | | | | |
| VDE protection class | ⊠ | | | | | | | | | | | |
| Circuit protection⁸⁾ | A, B, C | | | | | | | | | | | |
| Enclosure rating⁹⁾ | IP 67 | | | | | | | | | | | |
| Ambient temperature T_A | Operation -40 °C...+60 °C Storage -40 °C...+75 °C | | | | | | | | | | | |
| Weight | Approx. 20 g | | | | | | | | | | | |
| Housing material | PC, polycarbonate | | | | | | | | | | | |

- 1) Average service life 100,000 h where 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) A = V_S connections reverse-polarity protected
B = Output Q short-circuit protected
C = Interference pulse suppression
- 9) IP 67: with screw-in cable receptacles
IP 65: with plug-in cable receptacles

Scanning distance




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



Order information

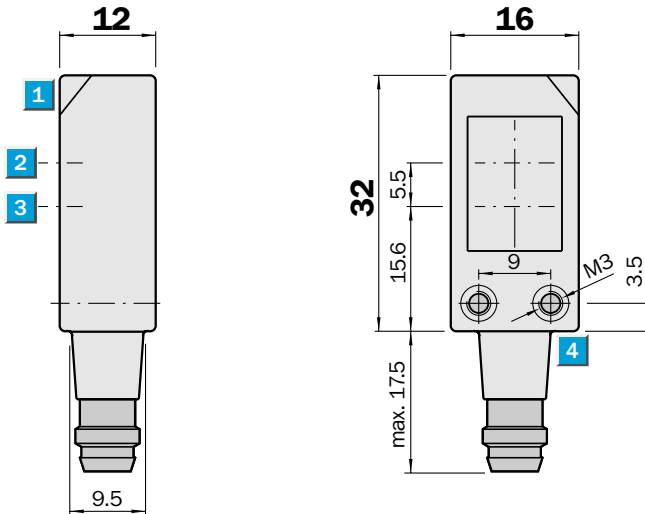
| Type | Part no. |
|-------------|-----------|
| WT 4-2E 132 | 1 012 875 |
| WT 4-2E 330 | 1 013 787 |
| WT 4-2E 331 | 1 015 148 |
| WT 4-2F 132 | 1 012 873 |
| WT 4-2F 330 | 1 015 144 |
| WT 4-2F 331 | 1 015 146 |


Scanning range
2.8 m

Photoelectric reflex switches

- Insensitive to ambient light sources (HF lamps, flashing warning lamps)
- Reliable operation if devices are installed opposite each other
- Permissible operating temperature - 40 °C...+ 60 °C
- Rapid response time

Dimensional drawing

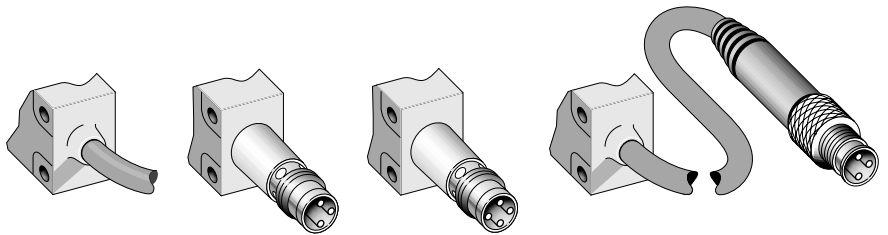


- 1 LED signal strength indicator
- 2 Optical axis, receiver
- 3 Optical axis, sender
- 4 M 3 threaded mounting hole



Connection types

| | | | |
|-------------|-------------|-------------|-------------|
| WL 4-2P 132 | WL 4-2P 330 | WL 4-2P 430 | WL 4-2P 331 |
| WL 4-2N 132 | WL 4-2N 330 | | WL 4-2N 331 |

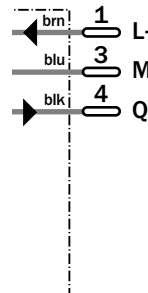
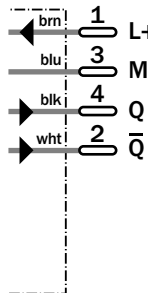
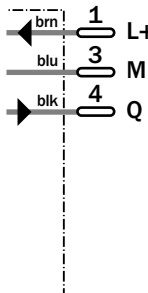
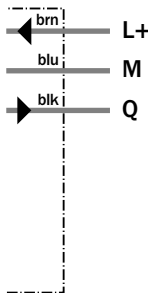


3 x 0.25 mm²

3-pin, M 8

4-pin, M 8

3-pin, M 8



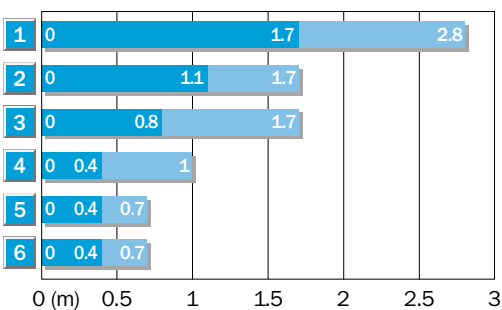
| Accessories | page |
|-------------------|------|
| Cable receptacles | 496 |
| Reflectors | 520 |

| | | | | | | | | | | | |
|-----------------------|--------|-------|-------|-------|-------|-------|-------|-------|--|--|--|
| Technical data | WL 4-2 | P 132 | P 330 | P 331 | N 132 | N 330 | N 331 | P 430 | | | |
|-----------------------|--------|-------|-------|-------|-------|-------|-------|-------|--|--|--|

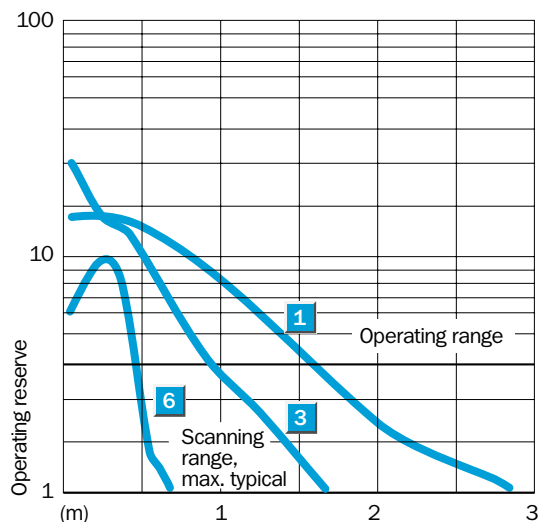
| | | | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|--|--|
| Scanning range , max. typical/ on reflector | 2.8 m/PL 80 A | | | | | | | | | | |
| Light source ¹⁾ , light type | LED, red light | | | | | | | | | | |
| Light spot diameter | 230 mm at 1.5 m | | | | | | | | | | |
| At focal point | Approx. 3.5 mm at 90 mm | | | | | | | | | | |
| Supply voltage V_S | 10...30 V DC ²⁾ | | | | | | | | | | |
| Ripple ³⁾ | 5 V_{SS} | | | | | | | | | | |
| Current consumption ⁴⁾ | < 20 mA | | | | | | | | | | |
| Switching outputs | PNP, Q NPN, \bar{Q} PNP, Q and \bar{Q} | | | | | | | | | | |
| Switching mode | Dark-switching Light-switching | | | | | | | | | | |
| Output current I_A max. | 100 mA | | | | | | | | | | |
| PNP; signal voltage HIGH | $V_S - (< 2.5 V)$ | | | | | | | | | | |
| PNP; signal voltage LOW | Approx. 0 V | | | | | | | | | | |
| NPN; signal voltage HIGH | Approx. V_S | | | | | | | | | | |
| NPN; signal voltage LOW | < 1.5 V | | | | | | | | | | |
| Response time ⁵⁾ | < 500 μs | | | | | | | | | | |
| Max. switching frequency ⁶⁾ | 1000/s | | | | | | | | | | |
| Connection types | Cable ⁷⁾ , 2 m Plug M 8 Cable ⁷⁾ , 100 mm, with plug | | | | | | | | | | |
| VDE protection class | ⓘ | | | | | | | | | | |
| Circuit protection ⁸⁾ | A, B, C | | | | | | | | | | |
| Enclosure rating ⁹⁾ | IP 67 | | | | | | | | | | |
| Ambient temperature T_A | Operation -40 °C...+60 °C Storage -40 °C...+75 °C | | | | | | | | | | |
| Weight | Approx. 20 g | | | | | | | | | | |
| Polarising filter | | | | | | | | | | | |
| Housing material | PC, polycarbonate | | | | | | | | | | |

- 1) Average service life 100,000 h where $T_A = +25\text{ °C}$
- 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) A = V_S connections reverse-polarity protected
B = Output Q and \bar{Q} short-circuit protected
C = Interference pulse suppression
- 9) IP 67: with screw-in cable receptacles
IP 65: with plug-in cable receptacles

Operating range and operating reserve



| Reflector type | Operating range |
|-------------------|-----------------|
| 1 PL 80 A | 0...1.7 m |
| 2 PL 50 A | 0...1.1 m |
| 3 PL 40 A | 0...0.8 m |
| 4 PL 30 A | 0...0.4 m |
| 5 PL 20 A | 0...0.4 m |
| 6 Reflective tape | 35...400 mm |
| Diamond Grade | |



Order information

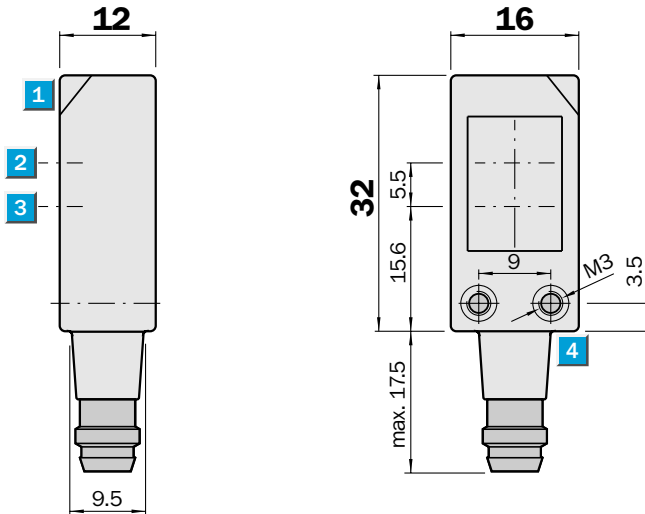
| Type | Part no. |
|-------------|-----------|
| WL 4-2P 132 | 1 015 767 |
| WL 4-2P 330 | 1 015 763 |
| WL 4-2P 331 | 1 015 759 |
| WL 4-2N 132 | 1 015 769 |
| WL 4-2N 330 | 1 015 765 |
| WL 4-2N 331 | 1 015 761 |
| WL 4-2P 430 | 1 015 958 |

Scanning range
2.8 m

Photoelectric reflex switches

- Insensitive to ambient light sources (HF lamps, flashing warning lamps)
- Reliable operation if devices are installed opposite each other
- Permissible operating temperature - 40 °C...+ 60 °C
- Rapid response time

Dimensional drawing

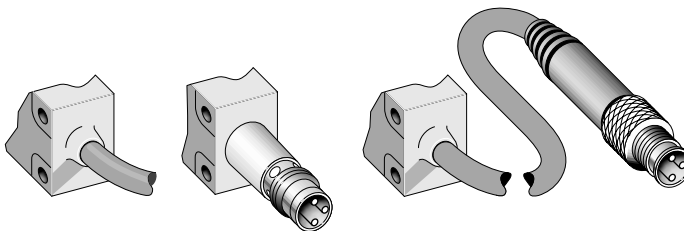


- 1 LED signal strength indicator
- 2 Optical axis, receiver
- 3 Optical axis, sender
- 4 M 3 threaded mounting hole

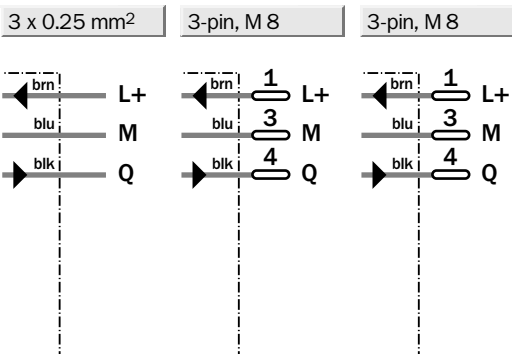


Connection types

| | | |
|-------------|-------------|-------------|
| WL 4-2E 132 | WL 4-2E 330 | WL 4-2E 331 |
| WL 4-2F 132 | WL 4-2F 330 | WL 4-2F 331 |



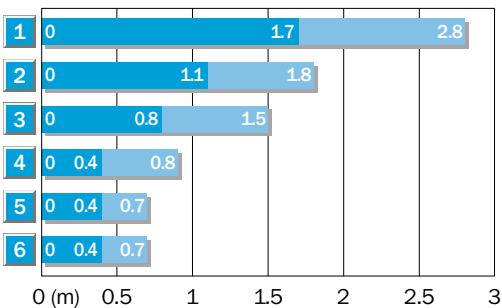
| Accessories | page |
|-------------------|------|
| Cable receptacles | 496 |
| Reflectors | 520 |



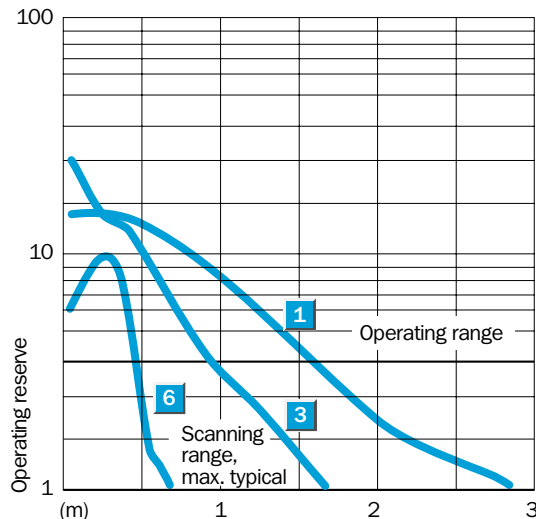
| Technical data | | WL 4-2 | E 132 | E 330 | E 331 | F 132 | F 330 | F 331 | | | | |
|---|--|--------|-------|-------|-------|-------|-------|-------|--|--|--|--|
| Scanning range , max. typical/ on reflector | 2.8 m/PL 80 A | | | | | | | | | | | |
| Light source ¹⁾ , light type | LED, red light | | | | | | | | | | | |
| Light spot diameter | 230 mm at 1.5 m | | | | | | | | | | | |
| At focal point | Approx. 3.5 mm at 90 mm | | | | | | | | | | | |
| Supply voltage V_S | 10...30 V DC ²⁾ | | | | | | | | | | | |
| Ripple ³⁾ | 5 V_{SS} | | | | | | | | | | | |
| Current consumption ⁴⁾ | < 20 mA | | | | | | | | | | | |
| Switching outputs | PNP, Q NPN, Q | | | | | | | | | | | |
| Switching mode | Dark-switching | | | | | | | | | | | |
| Output current I_A max. | 100 mA | | | | | | | | | | | |
| PNP; signal voltage HIGH | $V_S - (< 2.5 V)$ | | | | | | | | | | | |
| PNP; signal voltage LOW | Approx. 0 V | | | | | | | | | | | |
| NPN; signal voltage HIGH | Approx. V_S | | | | | | | | | | | |
| NPN; signal voltage LOW | < 1.5 V | | | | | | | | | | | |
| Response time ⁵⁾ | < 500 μs | | | | | | | | | | | |
| Max. switching frequency ⁶⁾ | 1000/s | | | | | | | | | | | |
| Connection types | Cable ⁷⁾ , 2 m Plug M 8 Cable ⁷⁾ , 100 mm, with plug | | | | | | | | | | | |
| VDE protection class | ⊠ | | | | | | | | | | | |
| Circuit protection ⁸⁾ | A, B, C | | | | | | | | | | | |
| Enclosure rating ⁹⁾ | IP 67 | | | | | | | | | | | |
| Ambient temperature T_A | Operation -40 °C...+60 °C Storage -40 °C...+75 °C | | | | | | | | | | | |
| Weight | Approx. 20 g | | | | | | | | | | | |
| Polarising filter | | | | | | | | | | | | |
| Housing material | PC, polycarbonate | | | | | | | | | | | |

- 1) Average service life 100,000 h where $T_A = +25\text{ °C}$
- 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) A = V_S connections reverse-polarity protected
B = Output Q short-circuit protected
C = Interference pulse suppression
- 9) IP 67: with screw-in cable receptacles
IP 65: with plug-in cable receptacles

Operating range and operating reserve




| Reflector type | Operating range |
|------------------------------------|-----------------|
| 1 PL80 A | 0...1.7 m |
| 2 PL50 A | 0...1.1 m |
| 3 PL40 A | 0...0.8 m |
| 4 PL30 A | 0...0.4 m |
| 5 PL20 A | 0...0.4 m |
| 6 Reflective tape Diamond Grade | 35...400 mm |



Order information

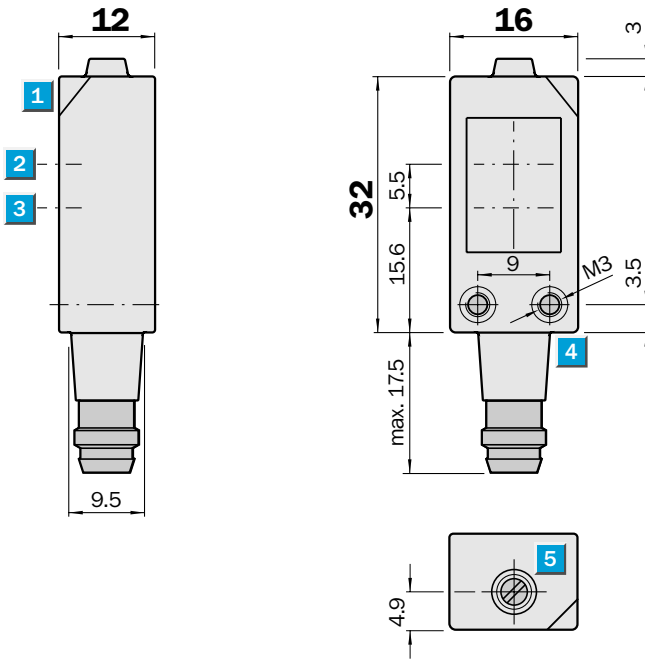
| Type | Part no. |
|-------------|-----------|
| WL 4-2E 132 | 1 015 770 |
| WL 4-2E 330 | 1 015 766 |
| WL 4-2E 331 | 1 015 762 |
| WL 4-2F 132 | 1 015 768 |
| WL 4-2F 330 | 1 015 764 |
| WL 4-2F 331 | 1 015 760 |

 **Scanning range**
1.6 m

Photoelectric reflex switches

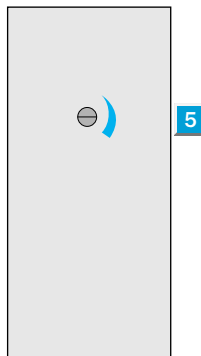
- Detects glass and transparent films
- Insensitive to ambient light sources (HF lamps, flashing warning lamps)
- Reliable operation if devices are installed opposite each other
- Permissible operating temperature - 40 °C...+ 60 °C
- Rapid response time

Dimensional drawing



Adjustments possible

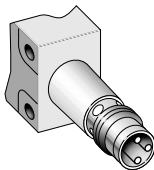
WL 4G-2F 330



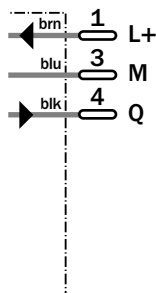
- 1 LED signal strength indicator
- 2 Optical axis, receiver
- 3 Optical axis, sender
- 4 M 3 threaded mounting hole
- 5 Sensitivity control

Connection type

WL 4G-2F 330



3-pin, M 8



| Accessories | page |
|-------------------|------|
| Cable receptacles | 496 |
| Reflectors | 520 |

| Technical data | | WL 4G-2 | F 330 |
|---|--|---------|-------|
| Scanning range , max. typical/ on reflector | 1.6 m/PL 80 A | | |
| Sensitivity | Adjustable | | |
| Light source ¹⁾ , light type | LED, red light | | |
| Light spot diameter | 230 mm at 1.5 m | | |
| Supply voltage V _S | 10...30 V DC ²⁾ | | |
| Ripple ³⁾ | 5 V _{SS} | | |
| Current consumption ⁴⁾ | < 20 mA | | |
| Switching outputs | PNP, Q | | |
| Switching mode | Dark-switching | | |
| Output current I _A max. | 100 mA | | |
| PNP; signal voltage HIGH | V _S - (< 2.5 V) | | |
| PNP; signal voltage LOW | Approx. 0 V | | |
| Response time ⁵⁾ | < 500 μs | | |
| Max. switching frequency ⁶⁾ | 1000/s | | |
| Connection type | Plug M 8 | | |
| VDE protection class | ⊠ | | |
| Circuit protection ⁷⁾ | A, B, C | | |
| Enclosure rating ⁸⁾ | IP 67 | | |
| Ambient temperature T _A | Operation - 40 °C...+ 60 °C Storage - 40 °C...+ 75 °C | | |
| Weight | Approx. 20 g | | |
| Polarising filter | | | |
| Housing material | PC, polycarbonate | | |

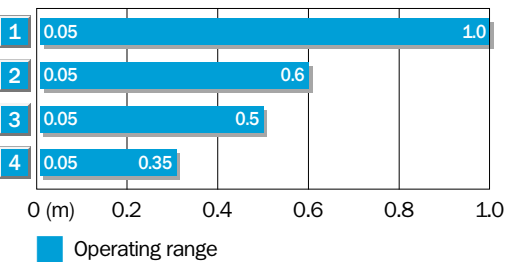
- 1) Average service life 100,000 h where T_A = + 25 °C
- 2) Limit values
- 3) May not exceed or fall short of V_S tolerances

- 4) Without load
- 5) Signal transit time with resistive load
- 6) With light/dark ratio 1:1

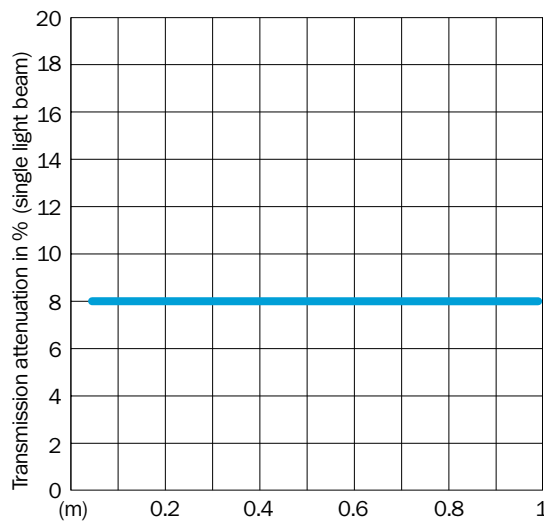
- 7) A = V_S connections reverse-polarity protected
B = Output Q short-circuit protected
C = Interference pulse suppression

- 8) IP 67: with screw-in cable receptacles
IP 65: with plug-in cable receptacles

Operating range and transmission attenuation



| Reflector type | Operating range |
|----------------|-----------------|
| 1 PL 80 A | 0.05...1.0 m |
| 2 PL 50 A | 0.05...0.6 m |
| 3 PL 40 A | 0.05...0.5 m |
| 4 PL 30 A | 0.05...0.35 m |



Order information

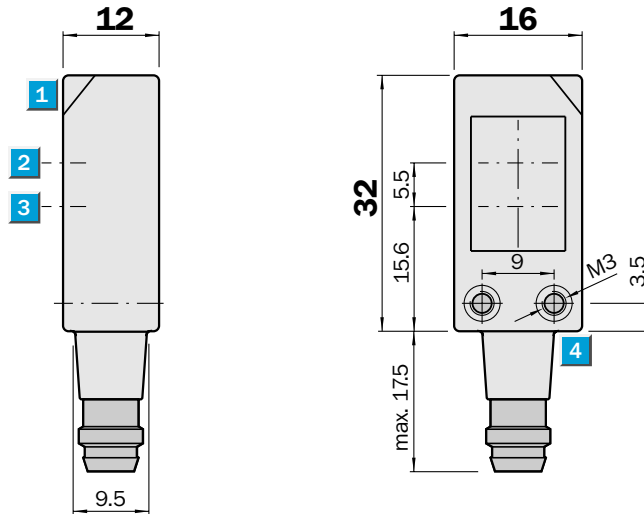
| Type | Part no. |
|--------------|-----------|
| WL 4G-2F 330 | 1 016 209 |

Scanning range
4 m

Through-beam photoelectric switches

- Insensitive to ambient light sources (HF lamps, flashing warning lamps)
- Permissible operating temperature - 40 °C... + 60 °C
- Rapid response time
- Test input for system diagnosis

Dimensional drawing

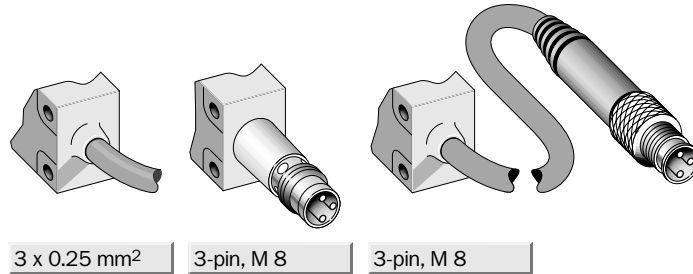


- 1 LED signal strength indicator
- 2 Optical axis, receiver
- 3 Optical axis, sender
- 4 M 3 threaded mounting hole



Connection types

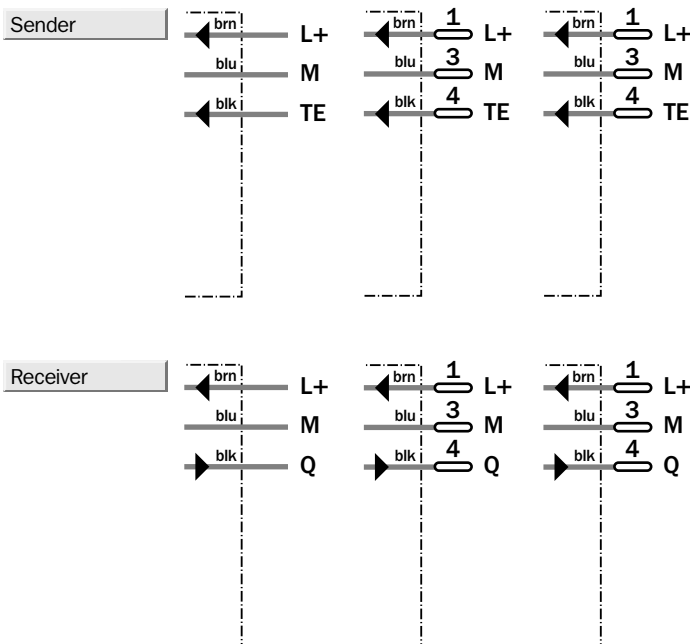
| | | |
|----------------|----------------|----------------|
| WS/WE 4-2P 132 | WS/WE 4-2P 330 | WS/WE 4-2P 331 |
| WS/WE 4-2N 132 | WS/WE 4-2N 330 | WS/WE 4-2N 331 |



3 x 0.25 mm²

3-pin, M 8

3-pin, M 8



| | |
|--------------------|------|
| Accessories | page |
| Cable receptacles | 496 |

| Technical data | | WS/WE 4-2 | P 132 | P 330 | P 331 | N 132 | N 330 | N 331 | | | | |
|--|--|-----------|-------|-------|-------|-------|-------|-------|--|--|--|--|
| Scanning range , max. typical | 0...4 m | | | | | | | | | | | |
| Light source¹⁾, light type | LED, red light | | | | | | | | | | | |
| Light spot diameter | Approx. 340 mm at 2 m | | | | | | | | | | | |
| Angle of dispersion | Approx. 12° | | | | | | | | | | | |
| Supply voltage V_S | 10...30 V DC ²⁾ | | | | | | | | | | | |
| Ripple ³⁾ | 5 V_{SS} | | | | | | | | | | | |
| Current consumption ⁴⁾ | < 50 mA | | | | | | | | | | | |
| sender | < 20 mA | | | | | | | | | | | |
| receiver | < 30 mA | | | | | | | | | | | |
| Switching outputs | PNP, Q NPN, Q | | | | | | | | | | | |
| Switching mode | Light-switching | | | | | | | | | | | |
| Output current I_A max. | 100 mA | | | | | | | | | | | |
| PNP; signal voltage HIGH | $V_S - (< 2.5 V)$ | | | | | | | | | | | |
| PNP; signal voltage LOW | Approx. 0 V | | | | | | | | | | | |
| NPN; signal voltage HIGH | Approx. V_S | | | | | | | | | | | |
| NPN; signal voltage LOW | < 1.5 V | | | | | | | | | | | |
| Response time ⁵⁾ | < 500 μs | | | | | | | | | | | |
| Max. switching frequency ⁶⁾ | 1000/s | | | | | | | | | | | |
| Test input "TE" Sender OFF | TE to 0 V | | | | | | | | | | | |
| Connection types | Cable ⁷⁾ , 2 m Plug M 8 Cable ⁷⁾ , 100 mm, with plug | | | | | | | | | | | |
| VDE protection class | ⊠ | | | | | | | | | | | |
| Circuit protection⁸⁾ | A, B, C | | | | | | | | | | | |
| Enclosure rating⁹⁾ | IP 67 | | | | | | | | | | | |
| Ambient temperature T_A | Operation -40 °C...+60 °C Storage -40 °C...+75 °C | | | | | | | | | | | |
| Weight | Approx. 20 g | | | | | | | | | | | |
| Housing material | PC, polycarbonate | | | | | | | | | | | |

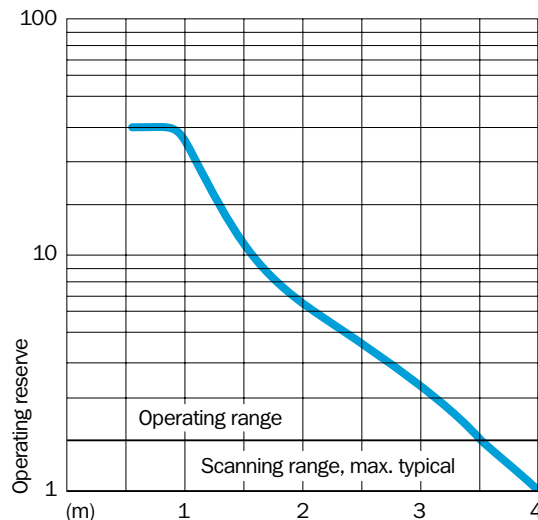
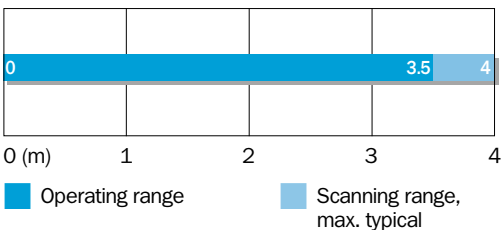
- 1) Average service life 100,000 h where $T_A = +25\text{ °C}$
- 2) Limit values
- 3) May not exceed or fall short of V_S tolerances

- 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) A = V_S connections reverse-polarity protected
B = Output Q short-circuit protected
C = Interference pulse suppression

- 9) IP 67: with screw-in cable receptacles
IP 65: with plug-in cable receptacles

Operating range and operating reserve



Order information

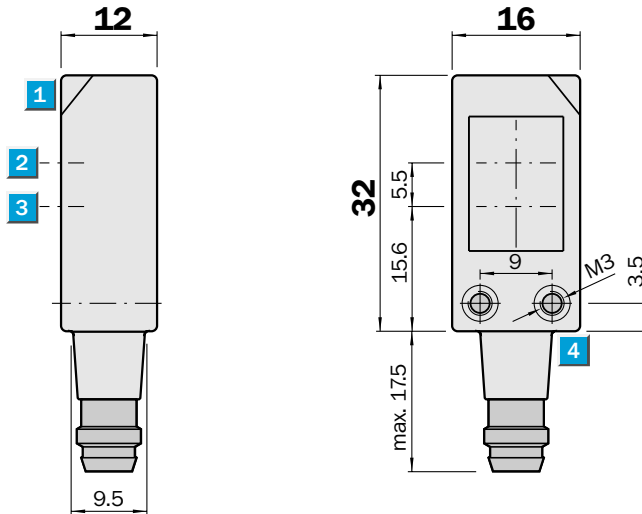
| Type | Part no. |
|----------------|-----------|
| WS/WE 4-2P 132 | 1 015 779 |
| WS/WE 4-2P 330 | 1 015 775 |
| WS/WE 4-2P 331 | 1 015 771 |
| WS/WE 4-2N 132 | 1 015 781 |
| WS/WE 4-2N 330 | 1 015 777 |
| WS/WE 4-2N 331 | 1 015 773 |

 **Scanning range**
4 m

Through-beam photoelectric switches

- Insensitive to ambient light sources (HF lamps, flashing warning lamps)
- Permissible operating temperature - 40 °C... + 60 °C
- Rapid response time
- Test input for system diagnosis

Dimensional drawing

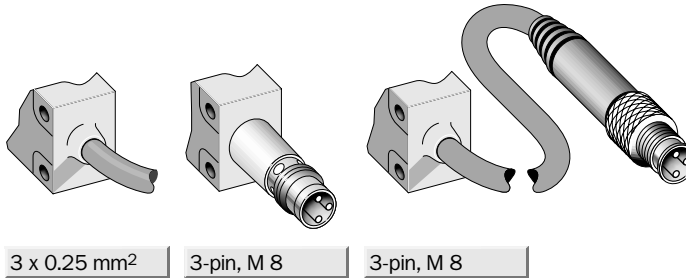


- 1 LED signal strength indicator
- 2 Optical axis, receiver
- 3 Optical axis, sender
- 4 M 3 threaded mounting hole



Connection types

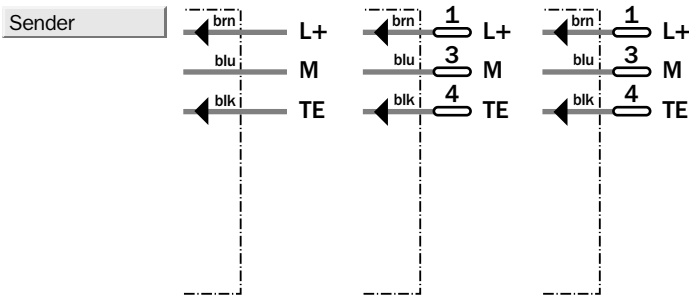
| | | |
|----------------|----------------|----------------|
| WS/WE 4-2E 132 | WS/WE 4-2E 330 | WS/WE 4-2E 331 |
| WS/WE 4-2F 132 | WS/WE 4-2F 330 | WS/WE 4-2F 331 |



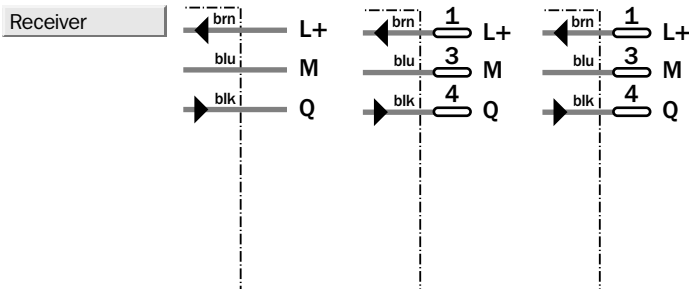
3 x 0.25 mm²

3-pin, M 8

3-pin, M 8



| | |
|--------------------|------|
| Accessories | page |
| Cable receptacles | 496 |



| Technical data | | WS/WE 4-2 | E 132 | E 330 | E 331 | F 132 | F 330 | F 331 | | | | |
|--|---|-----------|-------|-------|-------|-------|-------|-------|--|--|--|--|
| Scanning range , max. typical | 0...4 m | | | | | | | | | | | |
| Light source¹⁾, light type | LED, red light | | | | | | | | | | | |
| Light spot diameter | Approx. 340 mm at 2 m | | | | | | | | | | | |
| Angle of dispersion | Approx. 12° | | | | | | | | | | | |
| Supply voltage V_S | 10...30 V DC ²⁾ | | | | | | | | | | | |
| Ripple ³⁾ | 5 V_{SS} | | | | | | | | | | | |
| Current consumption ⁴⁾ | < 50 mA | | | | | | | | | | | |
| sender | < 50 mA | | | | | | | | | | | |
| receiver | < 30 mA | | | | | | | | | | | |
| Switching outputs | PNP, Q | | | | | | | | | | | |
| | NPN, Q | | | | | | | | | | | |
| Switching mode | Dark-switching | | | | | | | | | | | |
| Output current I_A max. | 100 mA | | | | | | | | | | | |
| PNP; signal voltage HIGH | $V_S - (< 2.5 V)$ | | | | | | | | | | | |
| PNP; signal voltage LOW | Approx. 0 V | | | | | | | | | | | |
| NPN; signal voltage HIGH | Approx. V_S | | | | | | | | | | | |
| NPN; signal voltage LOW | < 1.5 V | | | | | | | | | | | |
| Response time ⁵⁾ | < 500 μs | | | | | | | | | | | |
| Max. switching frequency ⁶⁾ | 1000/s | | | | | | | | | | | |
| Test input "TE" Sender OFF | TE to 0 V | | | | | | | | | | | |
| Connection types | Cable ⁷⁾ , 2 m | | | | | | | | | | | |
| | Plug | | | | | | | | | | | |
| | Cable ⁷⁾ , 100 mm, with plug | | | | | | | | | | | |
| VDE protection class | ⓘ | | | | | | | | | | | |
| Circuit protection⁸⁾ | A, B, C | | | | | | | | | | | |
| Enclosure rating⁹⁾ | IP 67 | | | | | | | | | | | |
| Ambient temperature T_A | Operation -40 °C...+60 °C | | | | | | | | | | | |
| | Storage -40 °C...+75 °C | | | | | | | | | | | |
| Weight | Approx. 20 g | | | | | | | | | | | |
| Housing material | PC, polycarbonate | | | | | | | | | | | |

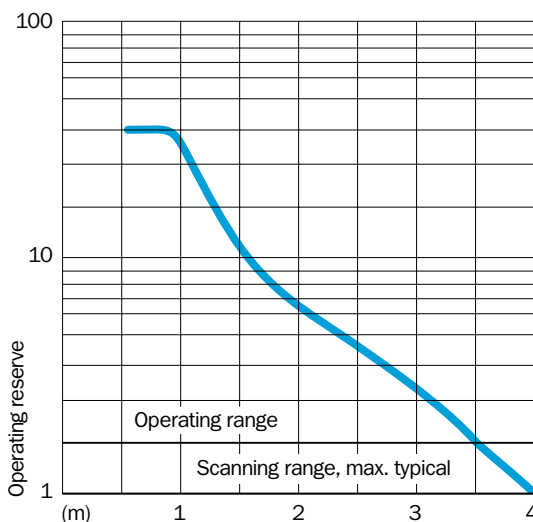
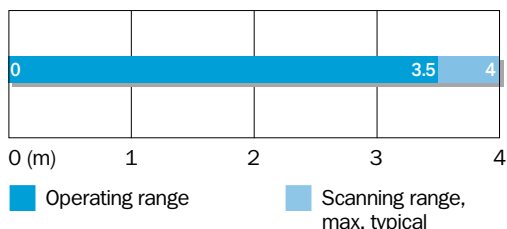
- 1) Average service life 100,000 h where $T_A = +25\text{ °C}$
- 2) Limit values
- 3) May not exceed or fall short of V_S tolerances

- 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) A = V_S connections reverse-polarity protected
- B = Output Q short-circuit protected
- C = Interference pulse suppression

- 9) IP 67: with screw-in cable receptacles
- IP 65: with plug-in cable receptacles

Operating range and operating reserve



Order information

| Type | Part no. |
|----------------|-----------|
| WS/WE 4-2E 132 | 1 015 782 |
| WS/WE 4-2E 330 | 1 015 778 |
| WS/WE 4-2E 331 | 1 015 774 |
| WS/WE 4-2F 132 | 1 015 780 |
| WS/WE 4-2F 330 | 1 015 776 |
| WS/WE 4-2F 331 | 1 015 772 |