

# W45: Farther than the eye can see

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



In harsh environmental conditions, photoelectric switches require a large safety margin in terms of their specification and performance. The W45 series of photoelectric switches easily meets this requirement.

The absolute highlight is the through-beam photoelectric switch with a range of up to 300 m.

A signal strength indicator in conjunction with an integrated viewfinder facilitates adjustment over such long scanning ranges.

The solid metal housing can withstand flying scale in steel and rolling mills, for example, and can be used in conjunction with cooling jacket accessories in temperatures up to +120°C.

A further plus is the simplicity of operation, e.g. easily accessible terminal chamber as well as the additional functionality provided by timing elements.

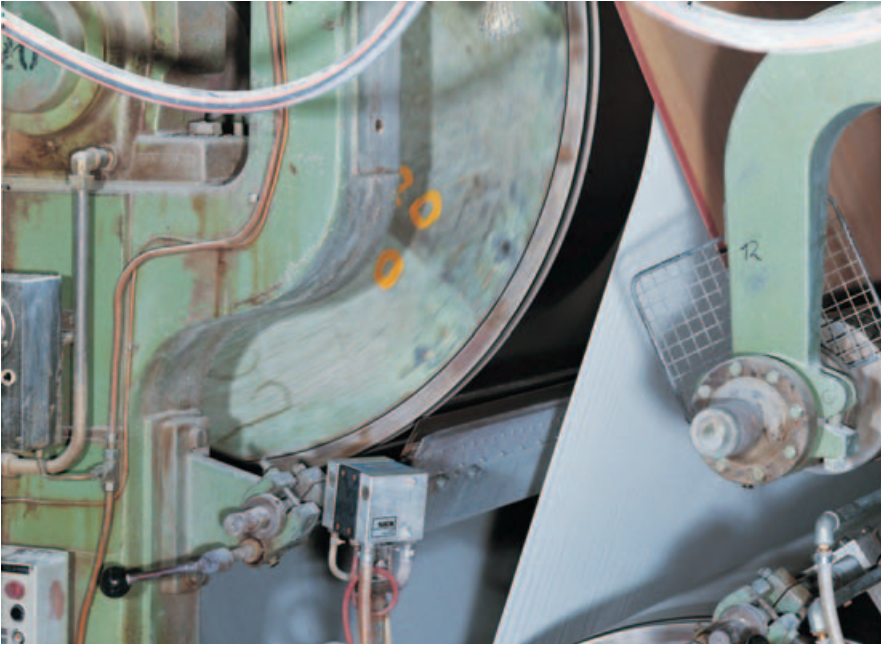
The comprehensive range of accessories such as cooling plates, weather hood and dust shield means that the performance is further increased and the range of applications is further extended.

Overview of W45:

- Solid metal housing for harsh industrial applications,
- Super range of the through-beam photoelectric switch of 300 m,
- Accessories for specialist applications,
- Universal supply voltage,
- On request: specialist devices for detecting very hot surfaces (>800 °C).

Main industries:

- Steel industry,
- Plant construction,
- Crane systems,
- Transport technology.



◀ The robust design and large scanning distance are of advantage to the WT45 photoelectric proximity switch when used to check for tear-off on a paper rolling machine.




▶ A WS/WE45 through-beam photoelectric switch monitors tear-off on a paper web.



▶ Scale, steam and heat in a rolling mill does not affect the WT45 – here used to detect the presence of steel slabs.

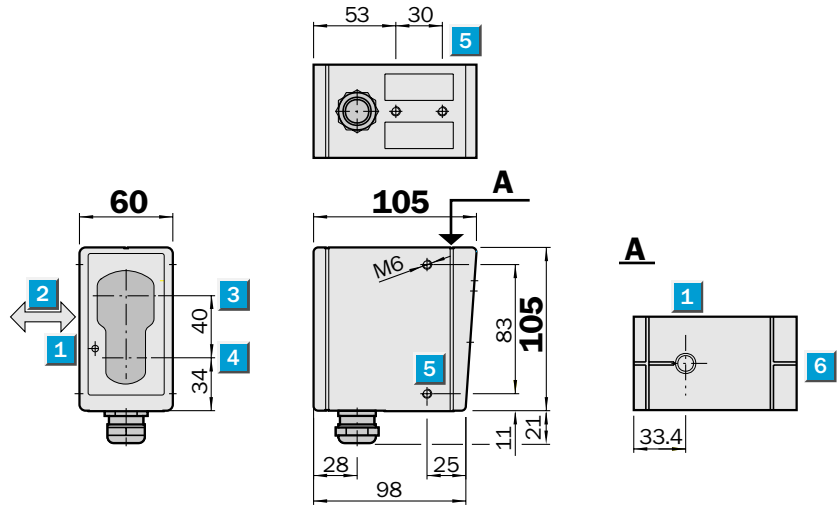
▲ Extreme operating conditions exist in steel making plants – the WT45 photoelectric proximity switch is ideal for many applications, such as detecting metal sheets before they are wound onto coils.

 **Scanning distance**  
400 ... 2000 mm

Photoelectric proximity switches

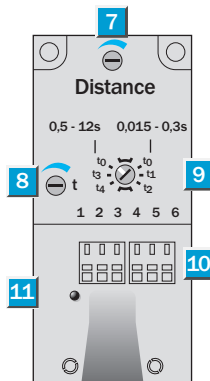
- Robust metal housing
- Infrared light, very long scanning range
- Adjustable background suppression
- Front lens heating, optional

**Dimensional drawing**



**Adjustments possible**

- WT45-P250
- WT45-P260
- WT45-N250
- WT45-N260



- 1 LED signal strength indicator
- 2 Standard direction of the material being scanned
- 3 Centre of optical axis, receiver
- 4 Centre of optical axis, sender
- 5 Threaded mounting hole M6 – 8 mm deep
- 6 Alignment sight
- 7 Scanning distance adjustment
- 8 Time adjustment
- 9 Time delay selector switch
- 10 Terminal strip
- 11 Status indicator

**Switch-selectable time delay**

**0.5 – 12 s**

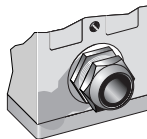
- t<sub>0</sub> without time delay
- t<sub>3</sub> ON-delay when object enters detection zone
- t<sub>4</sub> OFF-delay when object leaves detection zone

**0.015 – 0.3 s**

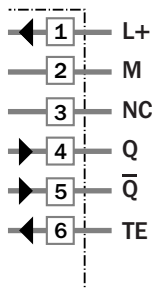
- t<sub>0</sub> without time delay
- t<sub>1</sub> ON-delay when object enters detection zone
- t<sub>2</sub> OFF-delay when object leaves detection zone

**Connection type**

- WT45-P250
- WT45-P260
- WT45-N250
- WT45-N260



PG 13.5; terminals



**See chapter Accessories**

- Mounting systems
- Special accessories

| Technical data   |                              | WT45- | P250 | P260 | N250 | N260 |  |  |  |  |  |  |
|--|------------------------------|-------|------|------|------|------|--|--|--|--|--|--|
| <b>Scanning distance</b>                                 | 400...2000 mm, adjustable    |       |      |      |      |      |  |  |  |  |  |  |
| <b>Light source<sup>1)</sup>, light type</b>             | LED, infrared light          |       |      |      |      |      |  |  |  |  |  |  |
| Light spot diameter                                      | Approx. 35 mm at 2000 mm     |       |      |      |      |      |  |  |  |  |  |  |
| <b>Supply voltage <math>V_S</math></b>                   | 10...60 V DC <sup>2)</sup>   |       |      |      |      |      |  |  |  |  |  |  |
| Residual ripple <sup>3)</sup>                            | < 5 $V_{SS}$                 |       |      |      |      |      |  |  |  |  |  |  |
| Current consumption <sup>4)</sup>                        | ≤ 50 mA                      |       |      |      |      |      |  |  |  |  |  |  |
|  | ≤ 250 mA, front lens heating |       |      |      |      |      |  |  |  |  |  |  |
| <b>Switching outputs</b>                                 | PNP, Q and $\bar{Q}$         |       |      |      |      |      |  |  |  |  |  |  |
|  | NPN, Q and $\bar{Q}$         |       |      |      |      |      |  |  |  |  |  |  |
| Output current $I_A$ max.                                | 200 mA                       |       |      |      |      |      |  |  |  |  |  |  |
| Response time <sup>5)</sup>                              | 6 ms                         |       |      |      |      |      |  |  |  |  |  |  |
| Max. switching frequency <sup>6)</sup>                   | 50/s                         |       |      |      |      |      |  |  |  |  |  |  |
| <b>Test input »TE«</b>                                   |                              |       |      |      |      |      |  |  |  |  |  |  |
| Sender OFF   | PNP: Test input to 0 V       |       |      |      |      |      |  |  |  |  |  |  |
|  | NPN: Test input to $V_S$     |       |      |      |      |      |  |  |  |  |  |  |
| <b>Connection type</b>                                   | Terminal connection          |       |      |      |      |      |  |  |  |  |  |  |
| <b>VDE protection class</b>                              | ⊕                            |       |      |      |      |      |  |  |  |  |  |  |
| <b>Circuit protection<sup>7)</sup></b>                   | A, B, C                      |       |      |      |      |      |  |  |  |  |  |  |
| <b>Enclosure rating</b>                                  | IP 67                        |       |      |      |      |      |  |  |  |  |  |  |
| <b>Ambient temperature <math>T_A</math><sup>8)</sup></b> | Operation - 25 °C...+ 55 °C  |       |      |      |      |      |  |  |  |  |  |  |
|  | Storage - 40 °C...+ 70 °C    |       |      |      |      |      |  |  |  |  |  |  |
| <b>Weight</b>  | Approx. 800 g                |       |      |      |      |      |  |  |  |  |  |  |
| <b>Front lens heating</b>                                |                              |       |      |      |      |      |  |  |  |  |  |  |
| <b>Housing material</b>                                  | Metal housing                |       |      |      |      |      |  |  |  |  |  |  |

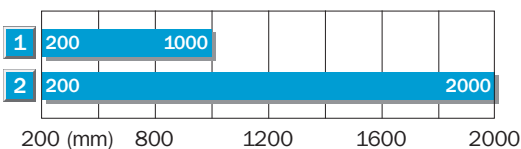
1) Average service life 100,000 h at  $T_A = + 25 °C$   
 2) Limit values  
 3) May not exceed or fall short of  $V_S$  tolerances

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

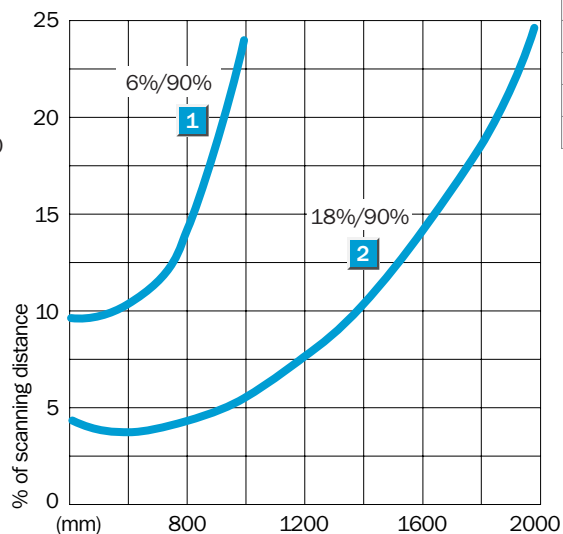
7) A =  $V_S$  connections reverse-polarity protected  
 B = Output Q and  $\bar{Q}$  short-circuit protected  
 C = Interference pulse suppression

8) Up to 140 °C with cooling plates (see Accessories)

**Scanning distance**




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



**Order Information**

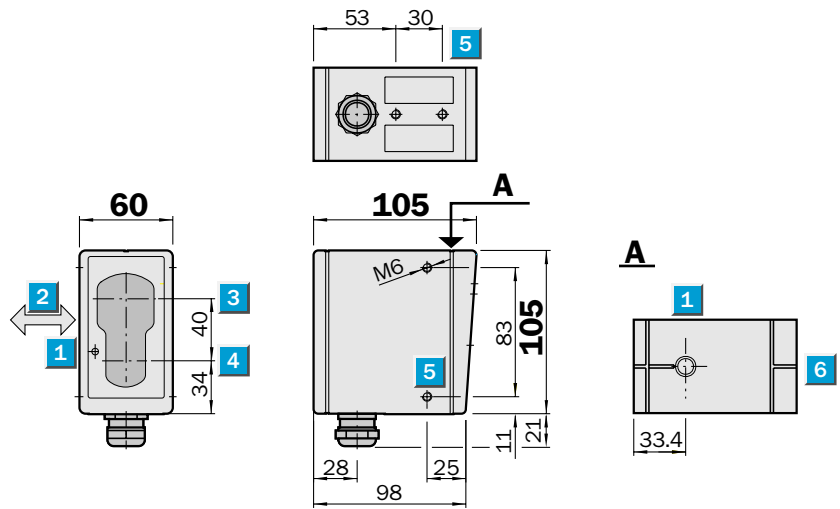
| Type      | Order no. |
|-----------|-----------|
| WT45-P250 | 1009117   |
| WT45-P260 | 1009108   |
| WT45-N250 | 1009116   |
| WT45-N260 | 1009109   |

 **Scanning distance**  
400 ... 2000 mm

Photoelectric proximity switches

- Universal voltage
- Robust metal housing
- Infrared light, very long scanning range
- Adjustable background suppression
- Front lens heating, optional

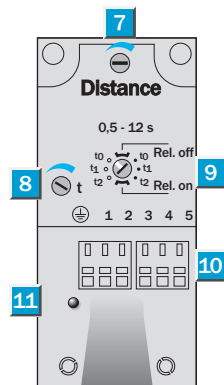
**Dimensional drawing**



**Adjustments possible**

WT45-R250

WT45-R260



- 1 LED signal strength indicator
- 2 Standard direction of the material being scanned
- 3 Centre of optical axis, receiver
- 4 Centre of optical axis, sender
- 5 M6 threaded mounting hole – 8 mm deep
- 6 Alignment sight
- 7 Scanning distance adjustment
- 8 Time adjustment
- 9 Time delay selector switch  
left: light-switching, right: dark-switching
- 10 Terminal strip
- 11 Status indicator

**Switch-selectable time delay**

0.5 – 12 s

t<sub>0</sub> without time delay

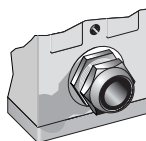
t<sub>1</sub> ON-delay when object enters detection zone

t<sub>2</sub> OFF-delay when object leaves detection zone

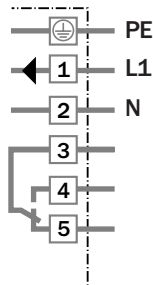
**Connection type**

WT45-R250

WT45-R260



PG 13.5; terminals



**See chapter Accessories**

Mounting systems

Special accessories

| Technical data                               |   | WT45- | R250 | R260 |  |  |  |  |  |  |  |  |
|--|---|-------|------|------|--|--|--|--|--|--|--|--|
| <b>Scanning distance</b>                     | 400...2000 mm, adjustable                 |       |      |      |  |  |  |  |  |  |  |  |
| <b>Light source<sup>1)</sup>, light type</b> | LED, infrared light                       |       |      |      |  |  |  |  |  |  |  |  |
| Light spot diameter                          | Approx. 35 mm at 2000 mm                  |       |      |      |  |  |  |  |  |  |  |  |
| <b>Supply voltage <math>V_S</math></b>       | 24...240 V UC (+ 10%, - 25%)              |       |      |      |  |  |  |  |  |  |  |  |
| Power consumption                            | ≤ 3 VA                                    |       |      |      |  |  |  |  |  |  |  |  |
|  | ≤ 6 VA, front lens heating                |       |      |      |  |  |  |  |  |  |  |  |
| <b>Switching outputs</b>                     | Relay, SPDT, isolated <sup>2)</sup>       |       |      |      |  |  |  |  |  |  |  |  |
| Max. switching voltage                       | AC: 250 V / DC: 120 V                     |       |      |      |  |  |  |  |  |  |  |  |
| Switching current                            | 4 A / 240 V AC o. 24 V DC <sup>3)</sup>   |       |      |      |  |  |  |  |  |  |  |  |
| Max. switching capacity                      | AC: 1000 VA / DC: 100 W                   |       |      |      |  |  |  |  |  |  |  |  |
| Response time                                | ≤ 20 ms                                   |       |      |      |  |  |  |  |  |  |  |  |
| Max. switching frequency <sup>4)</sup>       | 10/s                                      |       |      |      |  |  |  |  |  |  |  |  |
| <b>Connection type</b>                       | Terminal connection                       |       |      |      |  |  |  |  |  |  |  |  |
| <b>VDE protection class</b>                  | ⊕   |       |      |      |  |  |  |  |  |  |  |  |
| <b>Circuit protection<sup>5)</sup></b>       | A, C                                      |       |      |      |  |  |  |  |  |  |  |  |
| <b>Enclosure rating</b>                      | IP 67                                     |       |      |      |  |  |  |  |  |  |  |  |
| <b>Ambient temperature <math>T_A</math></b>  | Operation - 25 °C...+ 55 °C <sup>6)</sup> |       |      |      |  |  |  |  |  |  |  |  |
|  | Storage - 40 °C...+ 70 °C                 |       |      |      |  |  |  |  |  |  |  |  |
| <b>Weight</b>                                | Approx. 800 g                             |       |      |      |  |  |  |  |  |  |  |  |
| <b>Front lens heating</b>                    |   |       |      |      |  |  |  |  |  |  |  |  |
| <b>Housing material</b>                      | Metal housing                             |       |      |      |  |  |  |  |  |  |  |  |

<sup>1)</sup> Average service life 100,000 h at  $T_A = + 25 °C$

<sup>2)</sup> Provide suitable spark suppression for inductive or capacitive loads

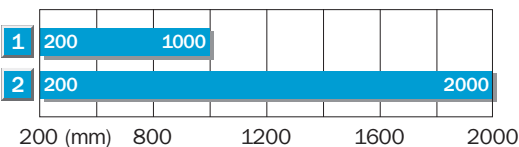
<sup>3)</sup> Usage Category to EN 60947-1, 15 AC, 13 DC

<sup>4)</sup> With light/dark ratio 1:1

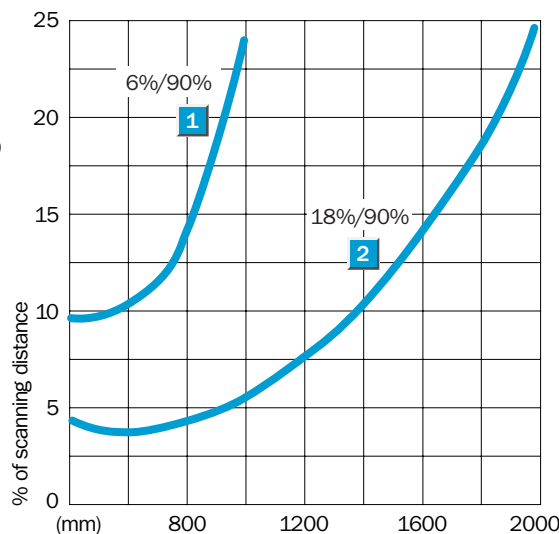
<sup>5)</sup> A =  $V_S$  connections reverse-polarity protected  
C = Interference pulse suppression

<sup>6)</sup> Up to 140 °C with cooling plates (see Accessories)

**Scanning distance**




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



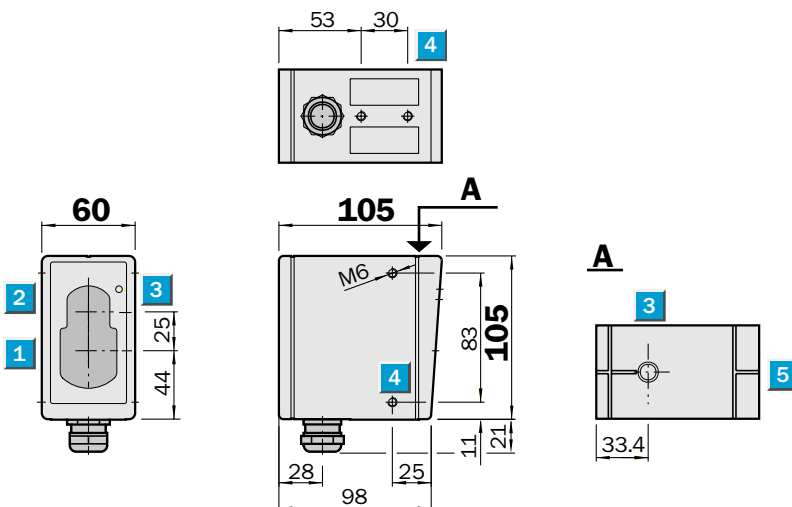
**Order information**

| Type      | Order no. |
|-----------|-----------|
| WT45-R250 | 1009118   |
| WT45-R260 | 1009107   |


**Scanning range**  
**0.01 ... 55 m**  
 Photoelectric reflex switches

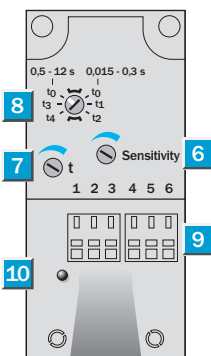
- Robust metal housing
- Red light
- Adjustable sensitivity
- Front lens heating, optional
- Pre-failure signalling output

**Dimensional drawing**



**Adjustments possible**

- WL45-P250
- WL45-P260
- WL45-N250
- WL45-N260



- 1 Centre of optical axis, sender
- 2 Centre of optical axis, receiver
- 3 LED signal strength indicator
- 4 M6 threaded mounting hole – 8 mm deep
- 5 Alignment sight
- 6 Sensitivity adjustment
- 7 Time adjustment
- 8 Time delay selector switch
- 9 Terminal strip
- 10 Status indicator

**Switch-selectable time delay**

**0.5 – 12 s**

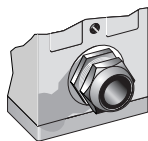
- $t_0$  without time delay
- $t_3$  ON-delay when object enters detection zone
- $t_4$  OFF-delay when object leaves detection zone

**0.015 – 0.3 s**

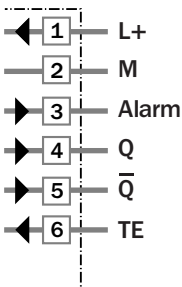
- $t_0$  without time delay
- $t_1$  ON-delay when object enters detection zone
- $t_2$  OFF-delay when object leaves detection zone

**Connection type**

- WL45-P250
- WL45-P260
- WL45-N250
- WL45-N260



PG 13.5; terminals



**See chapter Accessories**


- Mounting systems
- Reflectors
- Special accessories

| Technical data  |  | WL45- | P250 | P260 | N250 | N260 |  |  |  |  |  |  |
|---|--|-------|------|------|------|------|--|--|--|--|--|--|
| <b>Scanning range</b> , max. typical/on refl.         | 0.01...55 m/OP 60                                |       |      |      |      |      |  |  |  |  |  |  |
| Sensitivity   | Adjustable                                       |       |      |      |      |      |  |  |  |  |  |  |
| <b>Light source<sup>1)</sup>, light type</b>          | LED, visible red light                           |       |      |      |      |      |  |  |  |  |  |  |
| Light spot diameter                                   | Approx. 230 mm at 16 m                           |       |      |      |      |      |  |  |  |  |  |  |
| <b>Supply voltage V<sub>S</sub></b>                   | 10...60 V DC <sup>2)</sup>                       |       |      |      |      |      |  |  |  |  |  |  |
| Residual ripple <sup>3)</sup>                         | < 5 V <sub>SS</sub>                              |       |      |      |      |      |  |  |  |  |  |  |
| Current consumption <sup>4)</sup>                     | ≤ 50 mA  |       |      |      |      |      |  |  |  |  |  |  |
|   | ≤ 250 mA, front lens heating                     |       |      |      |      |      |  |  |  |  |  |  |
| <b>Switching outputs</b>                              | PNP, Q and $\bar{Q}$                             |       |      |      |      |      |  |  |  |  |  |  |
|   | NPN, Q and $\bar{Q}$                             |       |      |      |      |      |  |  |  |  |  |  |
| Output current I <sub>A</sub> max.                    | 200 mA   |       |      |      |      |      |  |  |  |  |  |  |
| Response time <sup>5)</sup>                           | ≤ 1.2 ms   |       |      |      |      |      |  |  |  |  |  |  |
| Max. switching frequency <sup>6)</sup>                | 400/s  |       |      |      |      |      |  |  |  |  |  |  |
| <b>Pre-failure signalling output</b>                  | Alarm  |       |      |      |      |      |  |  |  |  |  |  |
| Output current I <sub>A</sub> max.                    | 100 mA, open collector                           |       |      |      |      |      |  |  |  |  |  |  |
| Insufficient light received                           | Flashes at approx. 5/s, switch to V <sub>S</sub> |       |      |      |      |      |  |  |  |  |  |  |
| (Reserve < 50 %)                                      |  |       |      |      |      |      |  |  |  |  |  |  |
| <b>Test input »TE«</b>                                |  |       |      |      |      |      |  |  |  |  |  |  |
| Sender OFF  | PNP: Test input to 0 V                           |       |      |      |      |      |  |  |  |  |  |  |
|   | NPN: Test input to V <sub>S</sub>                |       |      |      |      |      |  |  |  |  |  |  |
| <b>Connection type</b>                                | Terminal connection                              |       |      |      |      |      |  |  |  |  |  |  |
| <b>VDE protection class<sup>7)</sup></b>              | ⊕  |       |      |      |      |      |  |  |  |  |  |  |
| <b>Circuit protection<sup>8)</sup></b>                | A, B, C  |       |      |      |      |      |  |  |  |  |  |  |
| <b>Enclosure rating</b>                               | IP 67  |       |      |      |      |      |  |  |  |  |  |  |
| <b>Ambient temperature T<sub>A</sub><sup>9)</sup></b> | Operation - 25 °C...+ 55 °C                      |       |      |      |      |      |  |  |  |  |  |  |
|   | Storage - 40 °C...+ 70 °C                        |       |      |      |      |      |  |  |  |  |  |  |
| <b>Weight</b>   | Approx. 800 g                                    |       |      |      |      |      |  |  |  |  |  |  |
| <b>Front lens heating</b>                             |  |       |      |      |      |      |  |  |  |  |  |  |
| <b>Polarising filter</b>                              |  |       |      |      |      |      |  |  |  |  |  |  |
| <b>Housing material</b>                               | Metal housing                                    |       |      |      |      |      |  |  |  |  |  |  |

- 1) Average service life 100,000 h at T<sub>A</sub> = + 25 °C
- 2) Limit values
- 3) May not exceed or fall short of V<sub>S</sub> 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) A = V<sub>S</sub> connections reverse-polarity protected  
B = Output Q and  $\bar{Q}$  short-circuit protected  
C = Interference pulse suppression
- 9) Up to 140 °C with cooling plates (see Accessories)

| Scanning range and operating reserve   |                 | Order information |   |           |   |           |   |         |   |       |   |       |   |       |   |                 |  |               |  |   |      |           |           |         |           |         |           |         |           |         |
|--|-----------------|-------------------|---|-----------|---|-----------|---|---------|---|-------|---|-------|---|-------|---|-----------------|--|---------------|--|---|------|-----------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|
| <table border="1" style="margin-top: 10px; width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Reflector type</th> <th>Operating range</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>OP 60 – ∞</td> </tr> <tr> <td>2</td> <td>4 x PL 80</td> </tr> <tr> <td>3</td> <td>PL 80 A</td> </tr> <tr> <td>4</td> <td>C 110</td> </tr> <tr> <td>5</td> <td>PL 50</td> </tr> <tr> <td>6</td> <td>PL 30</td> </tr> <tr> <td>7</td> <td>Reflective tape</td> </tr> <tr> <td></td> <td>Diamond Grade</td> </tr> </tbody> </table> | Reflector type  | Operating range   | 1 | OP 60 – ∞ | 2 | 4 x PL 80 | 3 | PL 80 A | 4 | C 110 | 5 | PL 50 | 6 | PL 30 | 7 | Reflective tape |  | Diamond Grade |  | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Type</th> <th>Order no.</th> </tr> </thead> <tbody> <tr> <td>WL45-P250</td> <td>1008840</td> </tr> <tr> <td>WL45-P260</td> <td>1008668</td> </tr> <tr> <td>WL45-N250</td> <td>1008839</td> </tr> <tr> <td>WL45-N260</td> <td>1008669</td> </tr> </tbody> </table> | Type | Order no. | WL45-P250 | 1008840 | WL45-P260 | 1008668 | WL45-N250 | 1008839 | WL45-N260 | 1008669 |
| Reflector type   | Operating range |                   |   |           |   |           |   |         |   |       |   |       |   |       |   |                 |  |               |  |   |      |           |           |         |           |         |           |         |           |         |
| 1  | OP 60 – ∞       |                   |   |           |   |           |   |         |   |       |   |       |   |       |   |                 |  |               |  |   |      |           |           |         |           |         |           |         |           |         |
| 2  | 4 x PL 80       |                   |   |           |   |           |   |         |   |       |   |       |   |       |   |                 |  |               |  |   |      |           |           |         |           |         |           |         |           |         |
| 3  | PL 80 A         |                   |   |           |   |           |   |         |   |       |   |       |   |       |   |                 |  |               |  |   |      |           |           |         |           |         |           |         |           |         |
| 4  | C 110           |                   |   |           |   |           |   |         |   |       |   |       |   |       |   |                 |  |               |  |   |      |           |           |         |           |         |           |         |           |         |
| 5  | PL 50           |                   |   |           |   |           |   |         |   |       |   |       |   |       |   |                 |  |               |  |   |      |           |           |         |           |         |           |         |           |         |
| 6  | PL 30           |                   |   |           |   |           |   |         |   |       |   |       |   |       |   |                 |  |               |  |   |      |           |           |         |           |         |           |         |           |         |
| 7  | Reflective tape |                   |   |           |   |           |   |         |   |       |   |       |   |       |   |                 |  |               |  |   |      |           |           |         |           |         |           |         |           |         |
|  | Diamond Grade   |                   |   |           |   |           |   |         |   |       |   |       |   |       |   |                 |  |               |  |   |      |           |           |         |           |         |           |         |           |         |
| Type   | Order no.       |                   |   |           |   |           |   |         |   |       |   |       |   |       |   |                 |  |               |  |   |      |           |           |         |           |         |           |         |           |         |
| WL45-P250  | 1008840         |                   |   |           |   |           |   |         |   |       |   |       |   |       |   |                 |  |               |  |   |      |           |           |         |           |         |           |         |           |         |
| WL45-P260  | 1008668         |                   |   |           |   |           |   |         |   |       |   |       |   |       |   |                 |  |               |  |   |      |           |           |         |           |         |           |         |           |         |
| WL45-N250  | 1008839         |                   |   |           |   |           |   |         |   |       |   |       |   |       |   |                 |  |               |  |   |      |           |           |         |           |         |           |         |           |         |
| WL45-N260  | 1008669         |                   |   |           |   |           |   |         |   |       |   |       |   |       |   |                 |  |               |  |   |      |           |           |         |           |         |           |         |           |         |

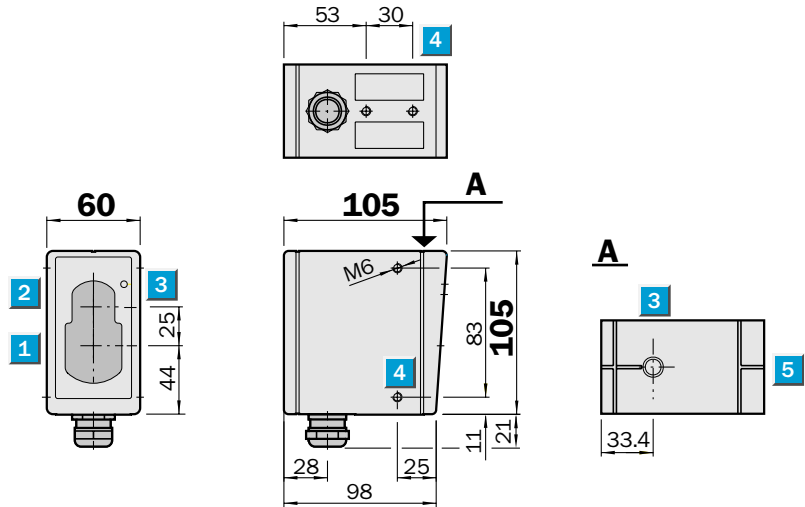



**Scanning range**  
**0.01 ... 55 m**

Photoelectric reflex switches

- Universal voltage
- Robust metal housing
- Red light
- Adjustable sensitivity
- Front lens heating, optional

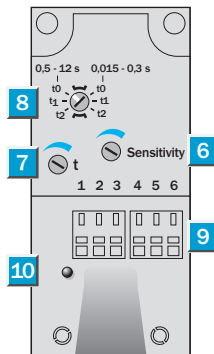
**Dimensional drawing**



**Adjustments possible**

WL45-R250

WL45-R260



- 1 Centre of optical axis, sender
- 2 Centre of optical axis, receiver
- 3 LED signal strength indicator
- 4 M6 threaded mounting hole – 8 mm deep
- 5 Alignment sight
- 6 Sensitivity adjustment
- 7 Time adjustment
- 8 Time delay selector switch  
left: light-switching, right: dark-switching
- 9 Terminal strip
- 10 Status indicator

**Switch-selectable time delay**

**0.5 – 12 s**

$t_0$  without time delay

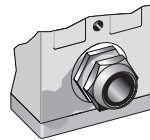
$t_1$  ON-delay when object enters detection zone

$t_2$  OFF-delay when object leaves detection zone

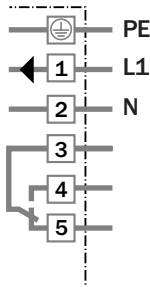
**Connection type**

WL45-R250

WL45-R260



PG 13.5; terminals



**See chapter Accessories**

|                     |
|---------------------|
| Mounting systems    |
| Reflectors          |
| Special accessories |

| Technical data                                 |   | WL45- | R250 | R260 |  |  |  |  |  |  |  |  |  |
|--|---|-------|------|------|--|--|--|--|--|--|--|--|--|
| <b>Scanning range</b> , max. typ./on reflector | 0.01...55 m/OP 60                         |       |      |      |  |  |  |  |  |  |  |  |  |
| Sensitivity                                    | Adjustable                                |       |      |      |  |  |  |  |  |  |  |  |  |
| <b>Light source<sup>1)</sup>, light type</b>   | LED, visible red light                    |       |      |      |  |  |  |  |  |  |  |  |  |
| Light spot diameter                            | Approx. 230 mm at 16 m                    |       |      |      |  |  |  |  |  |  |  |  |  |
| <b>Supply voltage <math>V_S</math></b>         | 24...240 V UC (+ 10 %, - 25 %)            |       |      |      |  |  |  |  |  |  |  |  |  |
| Power consumption                              | ≤ 3 VA                                    |       |      |      |  |  |  |  |  |  |  |  |  |
|  | ≤ 6 VA, front lens heating                |       |      |      |  |  |  |  |  |  |  |  |  |
| <b>Switching outputs</b>                       | Relay, SPDT, isolated <sup>2)</sup>       |       |      |      |  |  |  |  |  |  |  |  |  |
| Max. switching voltage                         | AC: 250 V / DC: 120 V                     |       |      |      |  |  |  |  |  |  |  |  |  |
| Switching current                              | 4 A / 240 V AC or 24 V DC <sup>3)</sup>   |       |      |      |  |  |  |  |  |  |  |  |  |
| Max. switching capacity                        | AC: 1000 VA / DC: 100 W                   |       |      |      |  |  |  |  |  |  |  |  |  |
| Response time                                  | ≤ 20 ms                                   |       |      |      |  |  |  |  |  |  |  |  |  |
| Max. switching frequency <sup>4)</sup>         | 10/s                                      |       |      |      |  |  |  |  |  |  |  |  |  |
| <b>Connection type</b>                         | Terminal connection                       |       |      |      |  |  |  |  |  |  |  |  |  |
| <b>VDE protection class</b>                    | ⊕   |       |      |      |  |  |  |  |  |  |  |  |  |
| <b>Circuit protection<sup>5)</sup></b>         | A, C                                      |       |      |      |  |  |  |  |  |  |  |  |  |
| <b>Enclosure rating</b>                        | IP 67                                     |       |      |      |  |  |  |  |  |  |  |  |  |
| <b>Ambient temperature <math>T_A</math></b>    | Operation - 25 °C...+ 55 °C <sup>6)</sup> |       |      |      |  |  |  |  |  |  |  |  |  |
|  | Storage - 40 °C...+ 70 °C                 |       |      |      |  |  |  |  |  |  |  |  |  |
| <b>Weight</b>                                  | Approx. 800 g                             |       |      |      |  |  |  |  |  |  |  |  |  |
| <b>Front lens heating</b>                      |   |       |      |      |  |  |  |  |  |  |  |  |  |
| <b>Polarising filter</b>                       |   |       |      |      |  |  |  |  |  |  |  |  |  |
| <b>Housing material</b>                        | Metal housing                             |       |      |      |  |  |  |  |  |  |  |  |  |

- 1) Average service life 100,000 h at  $T_A = + 25 °C$   
 2) Provide suitable spark suppression for inductive or capacitive loads  
 3) Usage Category to EN 60947-1, 15 AC, 13 DC  
 4) With light/dark ratio 1:1  
 5) A =  $V_S$  connections reverse-polarity protected  
 C = Interference pulse suppression  
 6) Up to 140 °C with cooling plates (see Accessories)

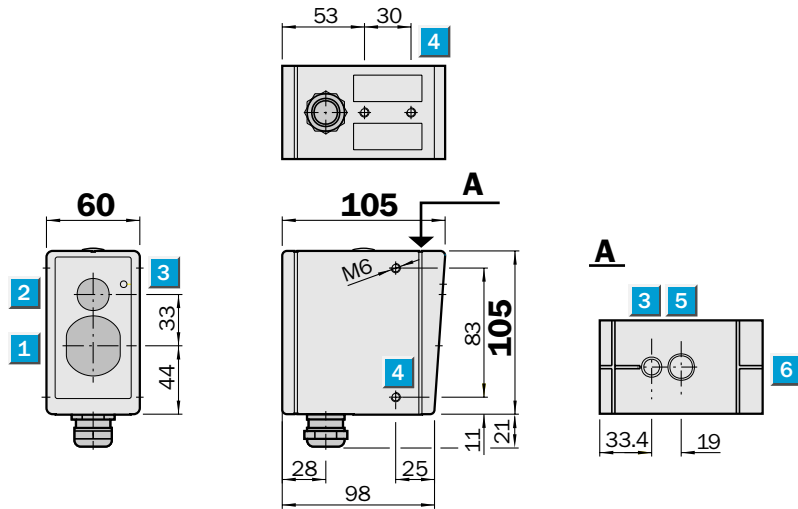
| Scanning range and operating reserve   |                                  | Order information                |                     |           |             |           |   |             |             |       |             |             |   |            |            |                 |             |               |   |             |            |   |            |           |  |   |      |           |           |         |           |         |
|--|----------------------------------|----------------------------------|---------------------|-----------|-------------|-----------|---|-------------|-------------|-------|-------------|-------------|---|------------|------------|-----------------|-------------|---------------|---|-------------|------------|---|------------|-----------|--|---|------|-----------|-----------|---------|-----------|---------|
| <table border="1"> <thead> <tr> <th>Reflector type</th> <th>Scanning range, max. typical (m)</th> <th>Operating range (m)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0.01 ... 55</td> <td>1 ... 45</td> </tr> <tr> <td>2</td> <td>0.01 ... 35</td> <td>0.01 ... 28</td> </tr> <tr> <td>3</td> <td>0.01 ... 30</td> <td>0.01 ... 25</td> </tr> <tr> <td>4</td> <td>0.1 ... 18</td> <td>0.1 ... 15</td> </tr> <tr> <td>5</td> <td>0.01 ... 14</td> <td>0.01 ... 11</td> </tr> <tr> <td>6</td> <td>0.01 ... 11</td> <td>0.01 ... 9</td> </tr> <tr> <td>7</td> <td>0.3 ... 10</td> <td>0.3 ... 8</td> </tr> </tbody> </table> | Reflector type                   | Scanning range, max. typical (m) | Operating range (m) | 1         | 0.01 ... 55 | 1 ... 45  | 2 | 0.01 ... 35 | 0.01 ... 28 | 3     | 0.01 ... 30 | 0.01 ... 25 | 4 | 0.1 ... 18 | 0.1 ... 15 | 5               | 0.01 ... 14 | 0.01 ... 11   | 6 | 0.01 ... 11 | 0.01 ... 9 | 7 | 0.3 ... 10 | 0.3 ... 8 |  | <table border="1"> <thead> <tr> <th>Type</th> <th>Order no.</th> </tr> </thead> <tbody> <tr> <td>WL45-R250</td> <td>1008841</td> </tr> <tr> <td>WL45-R260</td> <td>1008562</td> </tr> </tbody> </table> | Type | Order no. | WL45-R250 | 1008841 | WL45-R260 | 1008562 |
| Reflector type   | Scanning range, max. typical (m) | Operating range (m)              |                     |           |             |           |   |             |             |       |             |             |   |            |            |                 |             |               |   |             |            |   |            |           |  |   |      |           |           |         |           |         |
| 1  | 0.01 ... 55                      | 1 ... 45                         |                     |           |             |           |   |             |             |       |             |             |   |            |            |                 |             |               |   |             |            |   |            |           |  |   |      |           |           |         |           |         |
| 2  | 0.01 ... 35                      | 0.01 ... 28                      |                     |           |             |           |   |             |             |       |             |             |   |            |            |                 |             |               |   |             |            |   |            |           |  |   |      |           |           |         |           |         |
| 3  | 0.01 ... 30                      | 0.01 ... 25                      |                     |           |             |           |   |             |             |       |             |             |   |            |            |                 |             |               |   |             |            |   |            |           |  |   |      |           |           |         |           |         |
| 4  | 0.1 ... 18                       | 0.1 ... 15                       |                     |           |             |           |   |             |             |       |             |             |   |            |            |                 |             |               |   |             |            |   |            |           |  |   |      |           |           |         |           |         |
| 5  | 0.01 ... 14                      | 0.01 ... 11                      |                     |           |             |           |   |             |             |       |             |             |   |            |            |                 |             |               |   |             |            |   |            |           |  |   |      |           |           |         |           |         |
| 6  | 0.01 ... 11                      | 0.01 ... 9                       |                     |           |             |           |   |             |             |       |             |             |   |            |            |                 |             |               |   |             |            |   |            |           |  |   |      |           |           |         |           |         |
| 7  | 0.3 ... 10                       | 0.3 ... 8                        |                     |           |             |           |   |             |             |       |             |             |   |            |            |                 |             |               |   |             |            |   |            |           |  |   |      |           |           |         |           |         |
| Type   | Order no.                        |                                  |                     |           |             |           |   |             |             |       |             |             |   |            |            |                 |             |               |   |             |            |   |            |           |  |   |      |           |           |         |           |         |
| WL45-R250  | 1008841                          |                                  |                     |           |             |           |   |             |             |       |             |             |   |            |            |                 |             |               |   |             |            |   |            |           |  |   |      |           |           |         |           |         |
| WL45-R260  | 1008562                          |                                  |                     |           |             |           |   |             |             |       |             |             |   |            |            |                 |             |               |   |             |            |   |            |           |  |   |      |           |           |         |           |         |
| <table border="1"> <thead> <tr> <th>Reflector type</th> <th>Operating range</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>OP 60 - ∞</td> </tr> <tr> <td>2</td> <td>4 x PL 80</td> </tr> <tr> <td>3</td> <td>PL 80 A</td> </tr> <tr> <td>4</td> <td>C 110</td> </tr> <tr> <td>5</td> <td>PL 50</td> </tr> <tr> <td>6</td> <td>PL 30</td> </tr> <tr> <td>7</td> <td>Reflective tape</td> </tr> <tr> <td></td> <td>Diamond Grade</td> </tr> </tbody> </table>   | Reflector type                   | Operating range                  | 1                   | OP 60 - ∞ | 2           | 4 x PL 80 | 3 | PL 80 A     | 4           | C 110 | 5           | PL 50       | 6 | PL 30      | 7          | Reflective tape |             | Diamond Grade |   |             |            |   |            |           |  |   |      |           |           |         |           |         |
| Reflector type   | Operating range                  |                                  |                     |           |             |           |   |             |             |       |             |             |   |            |            |                 |             |               |   |             |            |   |            |           |  |   |      |           |           |         |           |         |
| 1  | OP 60 - ∞                        |                                  |                     |           |             |           |   |             |             |       |             |             |   |            |            |                 |             |               |   |             |            |   |            |           |  |   |      |           |           |         |           |         |
| 2  | 4 x PL 80                        |                                  |                     |           |             |           |   |             |             |       |             |             |   |            |            |                 |             |               |   |             |            |   |            |           |  |   |      |           |           |         |           |         |
| 3  | PL 80 A                          |                                  |                     |           |             |           |   |             |             |       |             |             |   |            |            |                 |             |               |   |             |            |   |            |           |  |   |      |           |           |         |           |         |
| 4  | C 110                            |                                  |                     |           |             |           |   |             |             |       |             |             |   |            |            |                 |             |               |   |             |            |   |            |           |  |   |      |           |           |         |           |         |
| 5  | PL 50                            |                                  |                     |           |             |           |   |             |             |       |             |             |   |            |            |                 |             |               |   |             |            |   |            |           |  |   |      |           |           |         |           |         |
| 6  | PL 30                            |                                  |                     |           |             |           |   |             |             |       |             |             |   |            |            |                 |             |               |   |             |            |   |            |           |  |   |      |           |           |         |           |         |
| 7  | Reflective tape                  |                                  |                     |           |             |           |   |             |             |       |             |             |   |            |            |                 |             |               |   |             |            |   |            |           |  |   |      |           |           |         |           |         |
|  | Diamond Grade                    |                                  |                     |           |             |           |   |             |             |       |             |             |   |            |            |                 |             |               |   |             |            |   |            |           |  |   |      |           |           |         |           |         |

**Scanning range**  
0 ... 350 m

Through-beam photoelectric switches

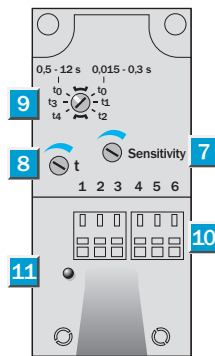
- Robust metal housing
- Red light, very long range
- Adjustable sensitivity
- Front lens heating, optional
- Pre-failure signalling output

**Dimensional drawing**



**Adjustments possible**

- WS/WE45-P250
- WS/WE45-P260
- WS/WE45-N250
- WS/WE45-N260



- 1 Centre of optical axis, sender (WS)  
Centre of optical axis, receiver (WE)
- 2 View finder lens
- 3 LED signal strength indicator
- 4 M6 threaded mounting hole – 8 mm deep
- 5 Eyepiece for alignment aid
- 6 Alignment sight
- 7 Sensitivity adjustment
- 8 Time adjustment
- 9 Time delay selector switch
- 10 Terminal strip
- 11 Status indicator

**Switch-selectable time delay**

**0.5 – 12 s**

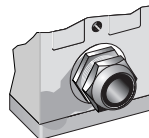
- $t_0$  without time delay
- $t_3$  ON-delay when object enters detection zone
- $t_4$  OFF-delay when object leaves detection zone

**0.015 – 0.3 s**

- $t_0$  without time delay
- $t_1$  ON-delay when object enters detection zone
- $t_2$  OFF-delay when object leaves detection zone

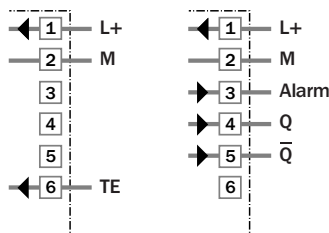
**Connection type**

- WS/WE45-P250
- WS/WE45-P260
- WS/WE45-N250
- WS/WE45-N260



**PG 13.5; terminals**

|        |          |
|--------|----------|
| Sender | Receiver |
|--------|----------|



**See chapter Accessories**

- Mounting systems
- Special accessories

| Technical data                               |  | WS/WE45- | P250 | P260 | N250 | N260 |
|--|--|----------|------|------|------|------|
| <b>Scanning range, max. typical</b>          | 0...350 m  |          |      |      |      |      |
| Sensitivity                                  | Adjustable                                       |          |      |      |      |      |
| <b>Light source<sup>1)</sup>, light type</b> | LED, infrared light                              |          |      |      |      |      |
| Light spot diameter                          | Approx. 4.5 m at 300 m                           |          |      |      |      |      |
| Angle of dispersion                          | Approx. 0.9°                                     |          |      |      |      |      |
| <b>Supply voltage V<sub>S</sub></b>          | 10...60 V DC <sup>2)</sup>                       |          |      |      |      |      |
| Residual ripple <sup>3)</sup>                | < 5 V <sub>SS</sub>                              |          |      |      |      |      |
| <b>Current consumption<sup>4)</sup></b>      |  |          |      |      |      |      |
| sender without heating                       | ≤ 50 mA  |          |      |      |      |      |
| sender with heating                          | ≤ 250 mA   |          |      |      |      |      |
| receiver without heating                     | ≤ 50 mA  |          |      |      |      |      |
| receiver with heating                        | ≤ 250 mA   |          |      |      |      |      |
| <b>Switching outputs</b>                     | PNP, Q and $\bar{Q}$                             |          |      |      |      |      |
|  | NPN, Q and $\bar{Q}$                             |          |      |      |      |      |
| Output current I <sub>A</sub> max.           | 200 mA   |          |      |      |      |      |
| Response time <sup>5)</sup>                  | ≤ 500 μs   |          |      |      |      |      |
| Max. switching frequency <sup>6)</sup>       | 1000/s   |          |      |      |      |      |
| <b>Pre-failure signalling output</b>         | Alarm  |          |      |      |      |      |
| Max. output current I <sub>Alarm</sub>       | 100 mA, open collector                           |          |      |      |      |      |
| Insufficient light received                  | Flashes at approx. 5/s, switch to V <sub>S</sub> |          |      |      |      |      |
| (Reserve < 50 %)                             |  |          |      |      |      |      |
| <b>Test input »TE«, sender OFF</b>           | PNP: Test input to 0 V                           |          |      |      |      |      |
| <b>Connection type</b>                       | Terminal connection                              |          |      |      |      |      |
| <b>VDE protection class</b>                  | ⊕  |          |      |      |      |      |
| <b>Circuit protection<sup>7)</sup></b>       | A, B, C  |          |      |      |      |      |
| <b>Enclosure rating</b>                      | IP 67  |          |      |      |      |      |
| <b>Ambient temperature T<sub>A</sub></b>     | Operation - 25 °C...+ 55 °C <sup>8)</sup>        |          |      |      |      |      |
|  | Storage - 40 °C...+ 70 °C                        |          |      |      |      |      |
| <b>Weight</b>                                | Approx. 800 g                                    |          |      |      |      |      |
| <b>Front lens heating</b>                    |  |          |      |      |      |      |
| <b>Housing material</b>                      | Metal housing                                    |          |      |      |      |      |

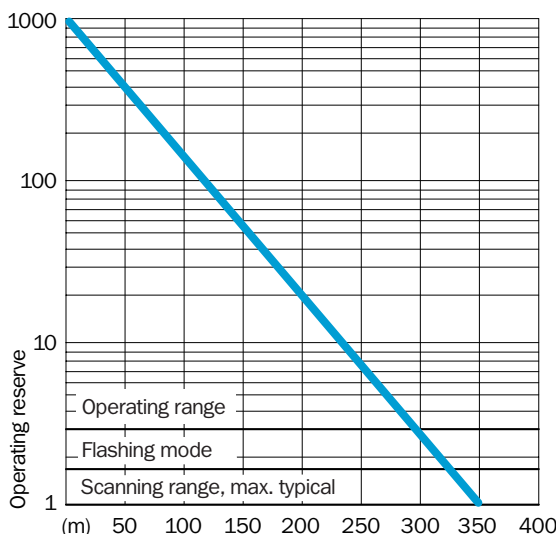
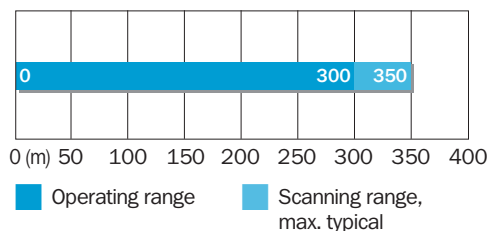
1) Average service life 100,000 h at T<sub>A</sub> = + 25 °C  
 2) Limit values  
 3) May not exceed or fall short of V<sub>S</sub> tolerances

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

7) A = V<sub>S</sub> connections reverse-polarity protected  
 B = Output Q and  $\bar{Q}$  short-circuit protected  
 C = Interference pulse suppression

8) Up to 140 °C with cooling plates (see Accessories)

**Scanning range and operating reserve**



**Order information**

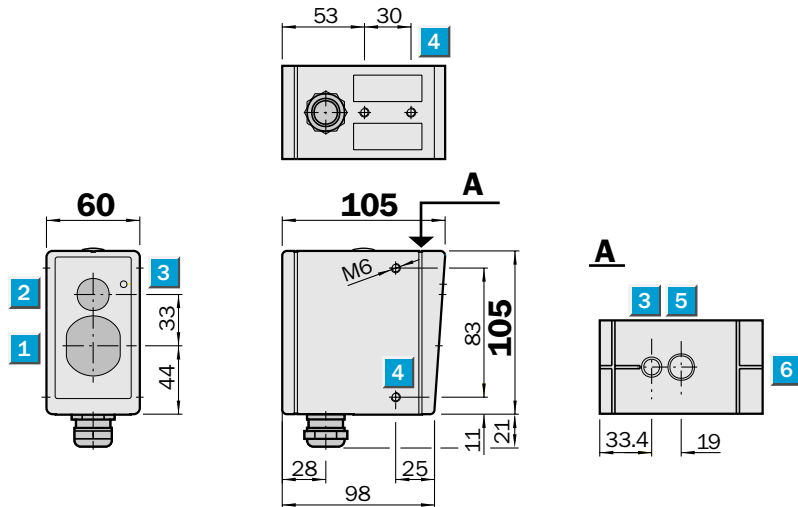
| Type         | Order no. |
|--------------|-----------|
| WS/WE45-P250 | 1010983   |
| WS/WE45-P260 | 1010985   |
| WS/WE45-N250 | 1010982   |
| WS/WE45-N260 | 1010984   |

**Scanning range**  
0 ... 350 m

Through-beam photoelectric switches

- Robust metal housing
- Red light, very long range
- Adjustable sensitivity
- Front lens heating, optional

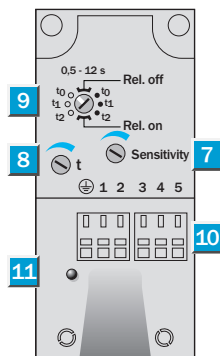
**Dimensional drawing**



**Adjustments possible**

WS/WE45-R250

WS/WE45-R260



- 1 Centre of optical axis, sender (WS)  
Centre of optical axis, receiver (WE)
- 2 View finder lens
- 3 LED signal strength indicator
- 4 M6 threaded mounting hole – 8 mm deep
- 5 Eyepiece for alignment aid
- 6 Alignment sight
- 7 Sensitivity adjustment
- 8 Time adjustment
- 9 Time delay selector switch  
left: light-switching, right: dark-switching
- 10 Terminal strip
- 11 Status indicator

**Switch-selectable time delay**

0.5 – 12 s

$t_0$  without time delay

$t_1$  ON-delay when object enters detection zone

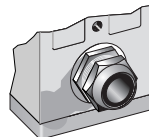
$t_2$  OFF-delay when object leaves detection zone



**Connection type**

WS/WE45-R250

WS/WE45-R260



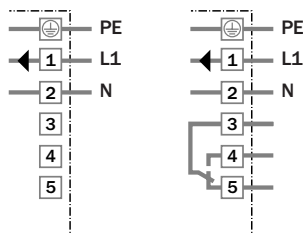
**See chapter Accessories**

Mounting systems

Special accessories

PG 13.5; terminals

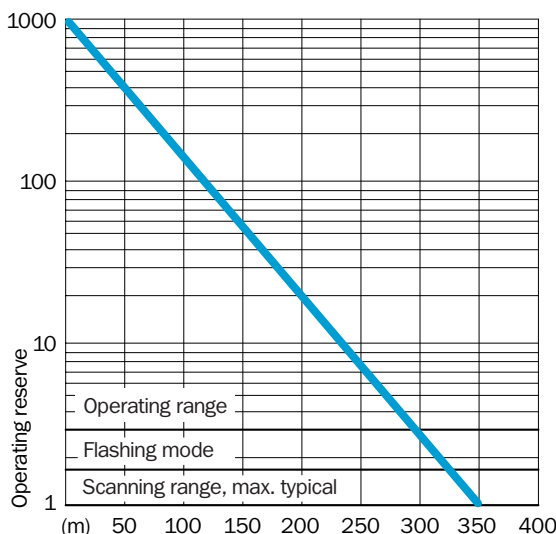
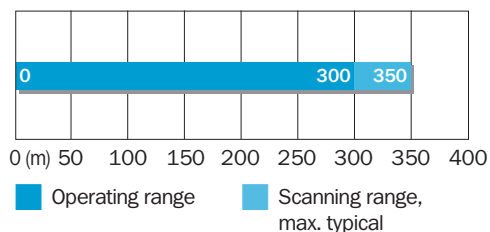
Sender Receiver



| Technical data                               |   | WS/WE45- | R250 | R260 |  |  |  |  |  |  |  |  |
|--|---|----------|------|------|--|--|--|--|--|--|--|--|
| <b>Scanning range, max. typical</b>          | 0...350 m                                 |          |      |      |  |  |  |  |  |  |  |  |
| Sensitivity                                  | Adjustable                                |          |      |      |  |  |  |  |  |  |  |  |
| <b>Light source<sup>1)</sup>, light type</b> | LED, infrared light, pulsating            |          |      |      |  |  |  |  |  |  |  |  |
| Light spot diameter                          | Approx. 4.5 m at 300 m                    |          |      |      |  |  |  |  |  |  |  |  |
| Angle of dispersion                          | Approx. 0.9°                              |          |      |      |  |  |  |  |  |  |  |  |
| <b>Supply voltage V<sub>S</sub></b>          | 24...240 V UC (+ 10 %, - 25 %)            |          |      |      |  |  |  |  |  |  |  |  |
| Power consumption                            |   |          |      |      |  |  |  |  |  |  |  |  |
| sender without heating                       | ≤ 3 VA                                    |          |      |      |  |  |  |  |  |  |  |  |
| sender with heating                          | ≤ 6 VA                                    |          |      |      |  |  |  |  |  |  |  |  |
| receiver without heating                     | ≤ 3 VA                                    |          |      |      |  |  |  |  |  |  |  |  |
| receiver with heating                        | ≤ 6 VA                                    |          |      |      |  |  |  |  |  |  |  |  |
| <b>Switching outputs</b>                     | Relay, SPDT, isolated <sup>2)</sup>       |          |      |      |  |  |  |  |  |  |  |  |
| Max. switching voltage                       | AC: 250 V / DC: 120 V                     |          |      |      |  |  |  |  |  |  |  |  |
| Switching current                            | 4 A / 240 V AC o. 24 V DC <sup>3)</sup>   |          |      |      |  |  |  |  |  |  |  |  |
| Max. switching capacity                      | AC: 1000 VA / DC: 100 W                   |          |      |      |  |  |  |  |  |  |  |  |
| Response time                                | ≤ 10 ms                                   |          |      |      |  |  |  |  |  |  |  |  |
| Max. switching frequency <sup>4)</sup>       | 10/s                                      |          |      |      |  |  |  |  |  |  |  |  |
| <b>Connection type</b>                       | Terminal connection                       |          |      |      |  |  |  |  |  |  |  |  |
| <b>VDE protection class</b>                  | ⊕   |          |      |      |  |  |  |  |  |  |  |  |
| <b>Circuit protection<sup>5)</sup></b>       | A, C                                      |          |      |      |  |  |  |  |  |  |  |  |
| <b>Enclosure rating</b>                      | IP 67                                     |          |      |      |  |  |  |  |  |  |  |  |
| <b>Ambient temperature T<sub>A</sub></b>     | Operation - 25 °C...+ 55 °C <sup>6)</sup> |          |      |      |  |  |  |  |  |  |  |  |
|  | Storage - 40 °C...+ 70 °C                 |          |      |      |  |  |  |  |  |  |  |  |
| <b>Weight</b>                                | Approx. 800 g                             |          |      |      |  |  |  |  |  |  |  |  |
| <b>Front lens heating</b>                    |   |          |      |      |  |  |  |  |  |  |  |  |
| <b>Housing material</b>                      | Metal housing                             |          |      |      |  |  |  |  |  |  |  |  |

- 1) Average service life 100,000 h at T<sub>A</sub> = + 25 °C
- 2) Provide suitable spark suppression for inductive or capacitive loads
- 3) Usage Category to EN 60947-1, 15 AC, 13 DC
- 4) With light/dark ratio 1:1
- 5) A = V<sub>S</sub> connections reverse-polarity protected  
C = Interference pulse suppression
- 6) Up to 140 °C with cooling plates (see Accessories)

**Scanning range and operating reserve**



**Order information**

| Type         | Order no. |
|--------------|-----------|
| WS/WE45-R250 | 1010994   |
| WS/WE45-R260 | 1010995   |