



Z sensor

Variety in a miniature size,
for standard short range applications

The Z sensor is a miniature photo-electric sensor with basic functions packed into different housings, which can be optimized for customer demands. Standard applications reside in the short range.

Examples of applications are conveyor systems, vending machines, automated garment handling, packaging lines, or other simple on/off applications. The Z sensor does not have adjustment possibilities or additional functions which is common in other SICK devices. However, these features are not necessary for simple on/off applications, the Z sensor is also economically attractive.

The integrated ASIC-technology "made by SICK" guarantees the best optical performance. Background suppression (50 mm fixed) and cross-talk immunity are just two of many highlights.

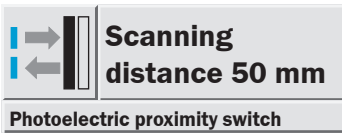
155 mm scanning range in an energetic switch and 5 m scanning range in a reflex type, these are impressive sensing ranges for a sensor which is not much bigger than a fingertip.

The possibility to integrate the optical and electronic elements into different housings, leads to a multi-functional use of the Z sensor.

The Z1 and Z2 models come with integrated M18 threads and additional mounting holes for conventional mounting (24 - 25.4 mm flange mount). The Z3 model, or the "Eyeball", can be aligned in any direction, just like the human eye.

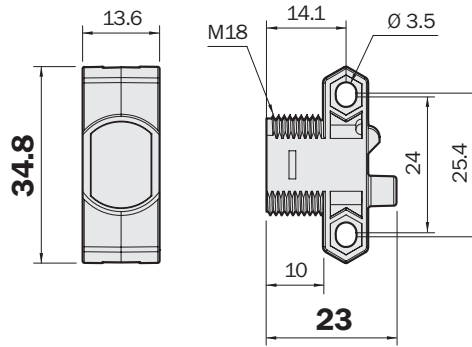
Finally, the Z sensor delights with its transparent design. And this is not just for the looks, it also serves an important function: It makes the indicator LED visible from any direction (360° around the sensor).

SICK
Sensor Intelligence.



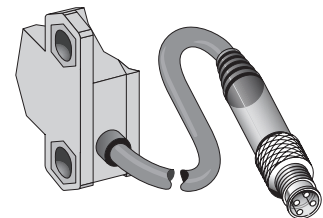
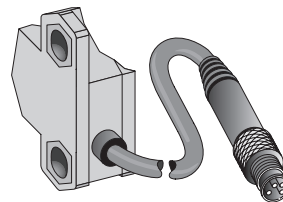
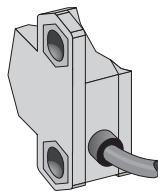
- Background suppression
- Infrared light
- Clear housing for perfect indicator LED visibility
- 18 mm front and flange mounting possibility
- Output indicator

Dimensional drawing



Connection type

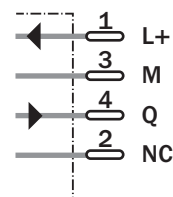
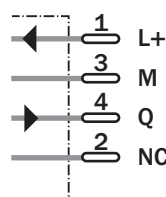
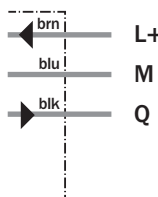
| | | |
|-----------|-----------|-----------|
| ZT1-N3215 | ZT1-N3231 | ZT1-N3221 |
| ZT1-P3215 | ZT1-P3231 | ZT1-P3221 |
| ZT1-F3215 | | |
| ZT1-E3215 | | |



3 x 0.23 mm²

M8, 4-pin

M12, 4-pin



Accessories

| |
|------------------|
| Reflectors |
| Mounting systems |

| Technical data | | ZT1- | N3215 | P3215 | F3215 | E3215 | N3221 | P3221 | N3231 | N3231 |
|---|------------------------------------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Scanning distance typ. | 0 ... 50 mm | | | | | | | | | |
| Light source ¹⁾, light type | LED, infrared light, 880 nm | | | | | | | | | |
| Light spot diameter | Approx. 10.5 mm at 50 mm | | | | | | | | | |
| Supply voltage V_S ²⁾ | 10 ... 30 V DC | | | | | | | | | |
| Ripple ³⁾ | < 5 V _{PP} | | | | | | | | | |
| Current consumption ⁴⁾ | < 20 mA | | | | | | | | | |
| Switching outputs | Q: NPN | | | | | | | | | |
| | Q: PNP | | | | | | | | | |
| Switching mode | Light switching | | | | | | | | | |
| | Dark switching | | | | | | | | | |
| Output current I_A max. | 50 mA | | | | | | | | | |
| Switching frequency ⁵⁾ | 200 Hz | | | | | | | | | |
| Connection type | Cable (PVC), 2 m, 3-wire | | | | | | | | | |
| | Cable with plug 150 mm, M8, 4-pin | | | | | | | | | |
| | Cable with plug 150 mm, M12, 4-pin | | | | | | | | | |
| VDE protection class ⁶⁾ | ⊕ | | | | | | | | | |
| Circuit protection ⁷⁾ | A, D | | | | | | | | | |
| Enclosure rating | IP 67 | | | | | | | | | |
| Ambient temperature | Operation -25 ... +50 °C | | | | | | | | | |
| | Storage -40 ... +70 °C | | | | | | | | | |
| Housing material | ABS, fibreglass reinforced | | | | | | | | | |
| Included with delivery | Mounting nut M18 | | | | | | | | | |

¹⁾ Average service life 100,000 h, at T_A = +25 °C
²⁾ Limit values
³⁾ Must be within V_S tolerances

⁴⁾ Without load
⁵⁾ With light/dark ratio 1:1
⁶⁾ Reference voltage 50 V DC

⁷⁾ A = V_S connections reverse-polarity protected
 D = Outputs overcurrent and short-circuit protected

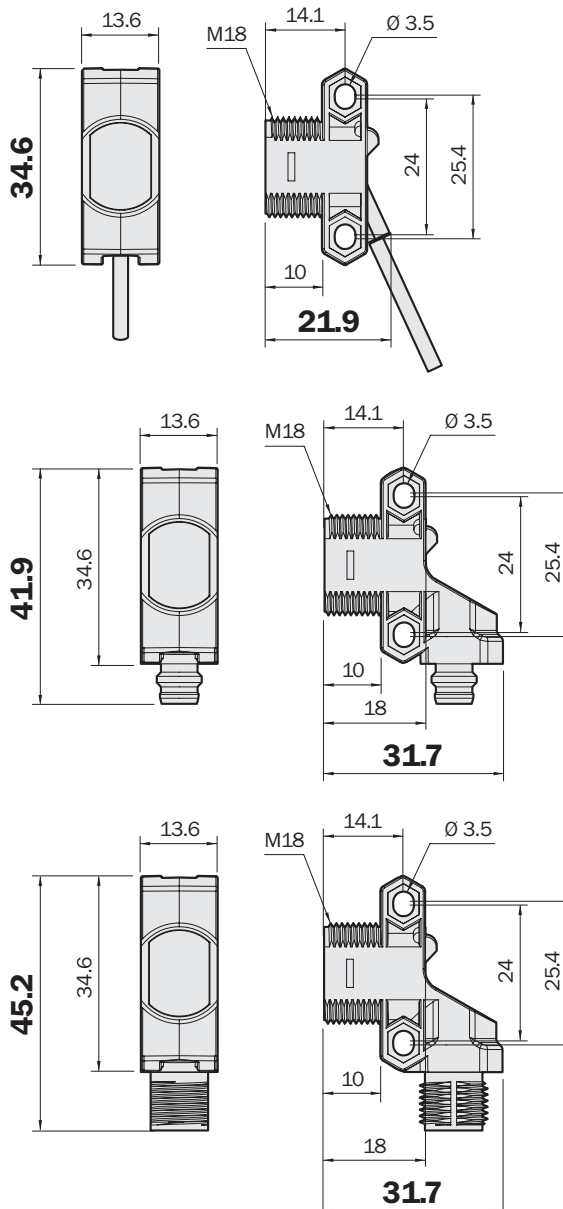
| Scanning distance | | Order information | |
|-------------------|--|-------------------|------------------|
| 1 | 0 50 | Type | Order no. |
| 2 | 2 48 | ZT1-N3215 | 1045562 |
| 3 | 5 46 | ZT1-P3215 | 1045563 |
| | | ZT1-F3215 | 1045564 |
| | | ZT1-E3215 | 1045565 |
| | | ZT1-N3221 | 1045578 |
| | | ZT1-P3221 | 1045579 |
| | | ZT1-N3231 | 1045594 |
| | | ZT1-P3231 | 1045595 |
| 1 | Scanning distance on white, 90 % remission | | |
| 2 | Scanning distance on grey, 18 % remission | | |
| 3 | Scanning distance on black, 6 % remission | | |

Scanning distance 50 mm

Photoelectric proximity switch

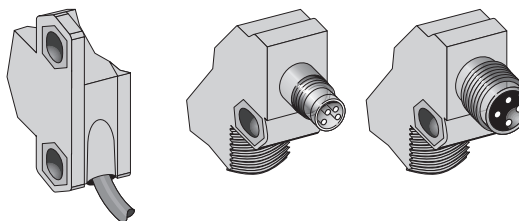
- Background suppression
- Infrared light
- Clear housing for perfect indicator LED visibility
- 18 mm front and flange mounting possibility
- Output indicator

Dimensional drawing

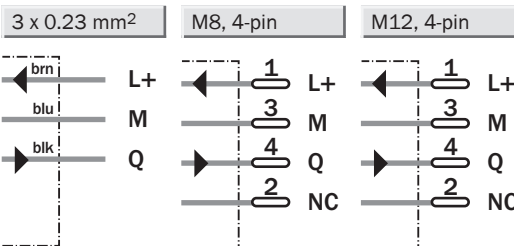


Connection type

| | | |
|-----------|-----------|-----------|
| ZT2-N3215 | ZT2-N3238 | ZT2-N3228 |
| ZT2-P3215 | ZT2-P3238 | ZT2-P3228 |



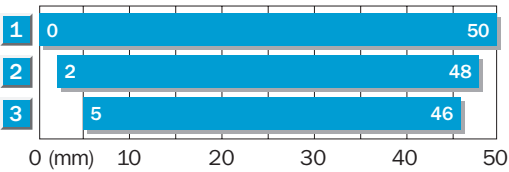
| |
|--------------------|
| Accessories |
| Reflectors |
| Mounting systems |



| Technical data | | ZT2- | N3215 | P3215 | N3238 | P3238 | N3228 | P3228 | | | | |
|--|-----------------------------|------|-------|-------|-------|-------|-------|-------|--|--|--|--|
| Scanning distance typ. | 0 ... 50 mm | | | | | | | | | | | |
| Light source ¹⁾, light type | LED, infrared light, 880 nm | | | | | | | | | | | |
| Light spot diameter | Approx. 10.5 mm at 50 mm | | | | | | | | | | | |
| Supply voltage V_S ²⁾ | 10 ... 30 V DC | | | | | | | | | | | |
| Ripple ³⁾ | < 5 V_{PP} | | | | | | | | | | | |
| Current consumption ⁴⁾ | < 20 mA | | | | | | | | | | | |
| Switching outputs | Q: NPN | | | | | | | | | | | |
| | Q: PNP | | | | | | | | | | | |
| Switching mode | Light switching | | | | | | | | | | | |
| Output current I_A max. | 50 mA | | | | | | | | | | | |
| Switching frequency ⁵⁾ | 200 Hz | | | | | | | | | | | |
| Connection type | Cable (PVC), 2 m, 3-wire | | | | | | | | | | | |
| | M8 plug, 4-pin | | | | | | | | | | | |
| | M12 plug, 4-pin | | | | | | | | | | | |
| VDE protection class ⁶⁾ | ⊕ | | | | | | | | | | | |
| Circuit protection ⁷⁾ | A, D | | | | | | | | | | | |
| Enclosure rating | IP 67 | | | | | | | | | | | |
| Ambient temperature | Operation -25 ... +50 °C | | | | | | | | | | | |
| | Storage -40 ... +70 °C | | | | | | | | | | | |
| Housing material | ABS, fibreglass reinforced | | | | | | | | | | | |
| Included with delivery | Mounting nut M18 | | | | | | | | | | | |

¹⁾ Average service life 100,000 h, at $T_A = +25$ °C
²⁾ Limit values
³⁾ Must be within V_S tolerances
⁴⁾ Without load
⁵⁾ With light/dark ratio 1:1
⁶⁾ Reference voltage 50 V DC
⁷⁾ A = V_S connections reverse-polarity protected
D = Outputs overcurrent and short-circuit protected

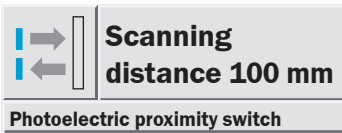
Scanning distance



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

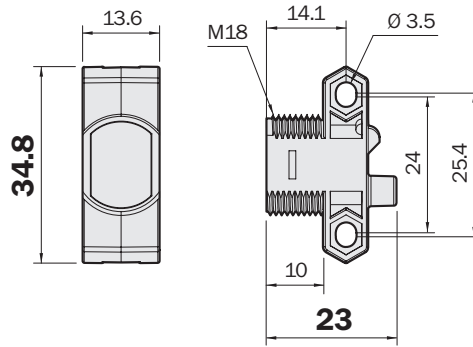
Order information

| Type | Order no. |
|-----------|-----------|
| ZT2-N3215 | 1045407 |
| ZT2-P3215 | 1045408 |
| ZT2-N3238 | 1045488 |
| ZT2-P3238 | 1045489 |
| ZT2-N3228 | 1045472 |
| ZT2-P3228 | 1045473 |



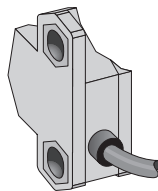
- Energetic type
- Infrared light
- Clear housing for perfect indicator LED visibility
- 18 mm front and flange mounting possibility
- Output indicator

Dimensional drawing

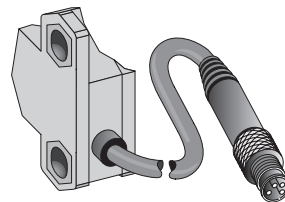
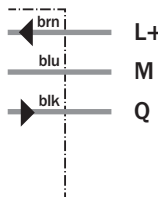


Connection type

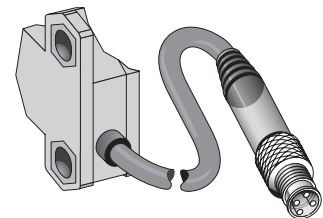
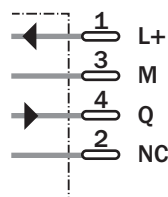
| | | |
|-----------|-----------|-----------|
| ZT1-N4215 | ZT1-N4231 | ZT1-N4221 |
| ZT1-P4215 | ZT1-P4231 | ZT1-P4221 |
| ZT1-F4215 | | |
| ZT1-E4215 | | |



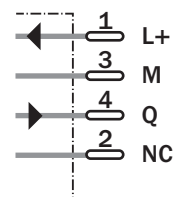
3 x 0.23 mm²



M8, 4-pin



M12, 4-pin



Accessories

- Reflectors
- Mounting systems

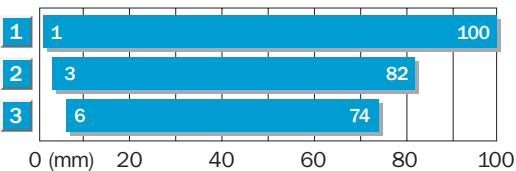
| Technical data | | ZT1- | N4215 | P4215 | F4215 | E4215 | N4221 | P4221 | N4231 | P4231 |
|---|------------------------------------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Scanning distance typ. | 1 ... 100 mm | | | | | | | | | |
| Light source ⁴⁾, light type | LED, infrared light, 880 nm | | | | | | | | | |
| Light spot diameter | Approx. 20 mm at 100 mm | | | | | | | | | |
| Supply voltage V_S ²⁾ | 10 ... 30 V DC | | | | | | | | | |
| Ripple ³⁾ | < 5 V _{PP} | | | | | | | | | |
| Current consumption ⁴⁾ | < 20 mA | | | | | | | | | |
| Switching outputs | Q: NPN | | | | | | | | | |
| | Q: PNP | | | | | | | | | |
| Switching mode | Light switching | | | | | | | | | |
| | Dark switching | | | | | | | | | |
| Output current I_A max. | 50 mA | | | | | | | | | |
| Switching frequency ⁵⁾ | 200 Hz | | | | | | | | | |
| Connection type | Cable (PVC), 2 m, 3-wire | | | | | | | | | |
| | Cable with plug 150 mm, M8, 4-pin | | | | | | | | | |
| | Cable with plug 150 mm, M12, 4-pin | | | | | | | | | |
| VDE protection class ⁶⁾ | ⊕ | | | | | | | | | |
| Circuit protection ⁷⁾ | A, D | | | | | | | | | |
| Enclosure rating | IP 67 | | | | | | | | | |
| Ambient temperature | Operation -25 ... +50 °C | | | | | | | | | |
| | Storage -40 ... +70 °C | | | | | | | | | |
| Housing material | ABS, fibreglass reinforced | | | | | | | | | |
| Included with delivery | Mounting nut M18 | | | | | | | | | |

1) Average service life 100,000 h, at T_A = +25 °C
 2) Limit values
 3) Must be within V_S tolerances

4) Without load
 5) With light/dark ratio 1:1
 6) Reference voltage 50 V DC

7) A = V_S connections reverse-polarity protected
 D = Outputs overcurrent and short-circuit protected


Scanning distance



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

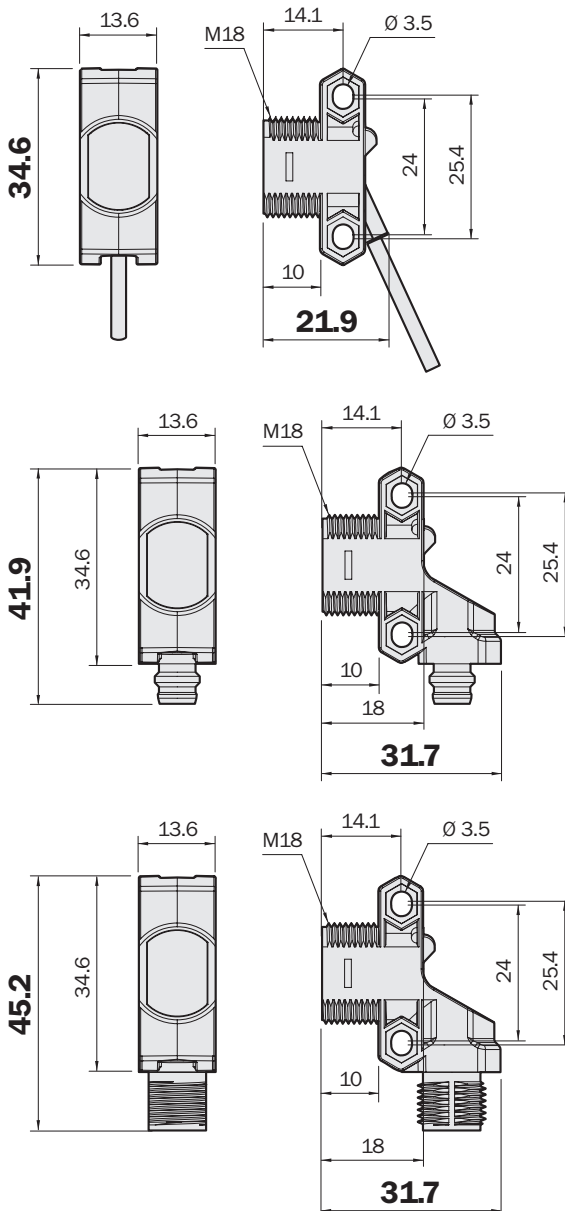
Order information

| Type | Order no. |
|-----------|-----------|
| ZT1-N4215 | 1045566 |
| ZT1-P4215 | 1045567 |
| ZT1-F4215 | 1045568 |
| ZT1-E4215 | 1045569 |
| ZT1-N4221 | 1045582 |
| ZT1-P4221 | 1045583 |
| ZT1-N4231 | 1045598 |
| ZT1-P4231 | 1045599 |


Scanning distance 100 mm
 Photoelectric proximity switch

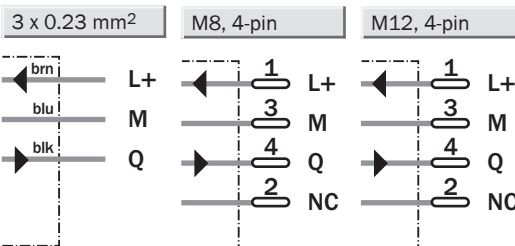
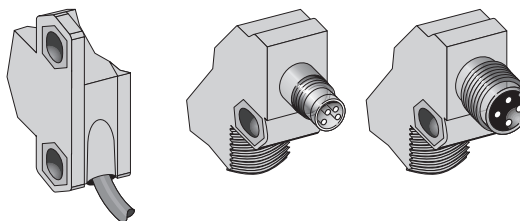
- Energetic type
- Infrared light
- Clear housing for perfect indicator LED visibility
- 18 mm front and flange mounting possibility
- Output indicator

Dimensional drawing



Connection type

| | | |
|-----------|-----------|-----------|
| ZT2-N4215 | ZT2-N4238 | ZT2-N4228 |
| ZT2-P4215 | ZT2-P4238 | ZT2-P4228 |



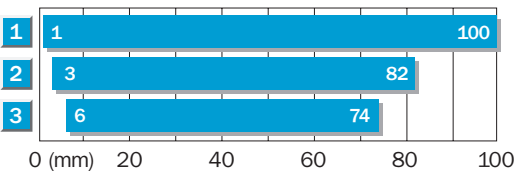
Accessories

| |
|------------------|
| Reflectors |
| Mounting systems |

| Technical data | | ZT2- | N4215 | P4215 | N4238 | P4238 | N4228 | P4228 | | | | |
|--|-----------------------------|------|-------|-------|-------|-------|-------|-------|--|--|--|--|
| Scanning distance typ. | 1 ... 100 mm | | | | | | | | | | | |
| Light source ¹⁾, light type | LED, infrared light, 880 nm | | | | | | | | | | | |
| Light spot diameter | Approx. 20 mm at 100 mm | | | | | | | | | | | |
| Supply voltage V_S ²⁾ | DC 10 ... 30 V | | | | | | | | | | | |
| Ripple ³⁾ | < 5 V_{PP} | | | | | | | | | | | |
| Current consumption ⁴⁾ | < 20 mA | | | | | | | | | | | |
| Switching outputs | Q: NPN | | | | | | | | | | | |
| | Q: PNP | | | | | | | | | | | |
| Switching mode | Light switching | | | | | | | | | | | |
| Output current I_A max. | 50 mA | | | | | | | | | | | |
| Switching frequency ⁵⁾ | 200 Hz | | | | | | | | | | | |
| Connection type | Cable (PVC), 2 m, 3-wire | | | | | | | | | | | |
| | M8 plug, 4-pin | | | | | | | | | | | |
| | M12 plug, 4-pin | | | | | | | | | | | |
| VDE protection class ⁶⁾ | ⊕ | | | | | | | | | | | |
| Circuit protection ⁷⁾ | A, D | | | | | | | | | | | |
| Enclosure rating | IP 67 | | | | | | | | | | | |
| Ambient temperature | Operation -25 ... +50 °C | | | | | | | | | | | |
| | Storage -40 ... +70 °C | | | | | | | | | | | |
| Housing material | ABS, fibreglass reinforced | | | | | | | | | | | |
| Included with delivery | Mounting nut M18 | | | | | | | | | | | |

¹⁾ Average service life 100,000 h, at $T_A = +25$ °C
²⁾ Limit values
³⁾ Must be within V_S tolerances
⁴⁾ Without load
⁵⁾ With light/dark ratio 1:1
⁶⁾ Reference voltage 50 V DC
⁷⁾ A = V_S connections reverse-polarity protected
D = Outputs overcurrent and short-circuit protected


Scanning distance



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

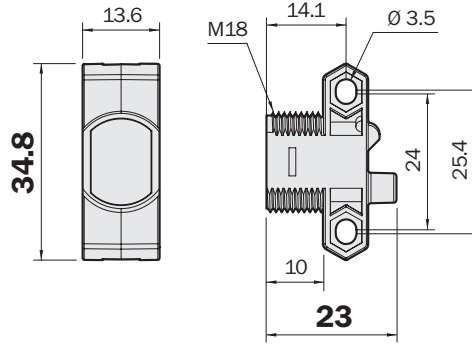
Order information

| Type | Order no. |
|-----------|-----------|
| ZT2-N4215 | 1045411 |
| ZT2-P4215 | 1045412 |
| ZT2-N4238 | 1045492 |
| ZT2-P4238 | 1045493 |
| ZT2-N4228 | 1045476 |
| ZT2-P4228 | 1045477 |


Scanning distance 155 mm
 Photoelectric proximity switch

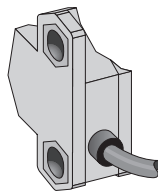
- Energetic type with V-optic
- Infrared light
- Clear housing for perfect indicator LED visibility
- 18 mm front and flange mounting possibility
- Power and output indicator

Dimensional drawing

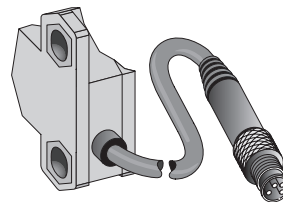
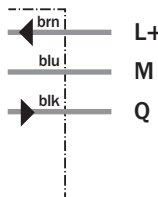


Connection type

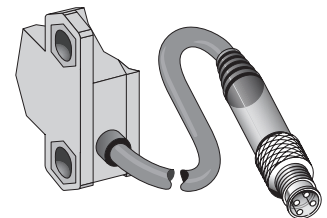
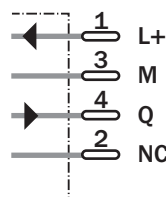
| | | |
|-----------|-----------|-----------|
| ZT1-N5215 | ZT1-N5231 | ZT1-N5221 |
| ZT1-P5215 | ZT1-P5231 | ZT1-P5221 |
| ZT1-F5215 | | |
| ZT1-E5215 | | |



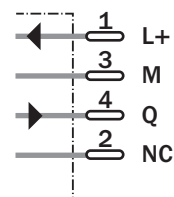
3 x 0.23 mm²



M8, 4-pin



M12, 4-pin



Accessories

| |
|------------------|
| Reflectors |
| Mounting systems |

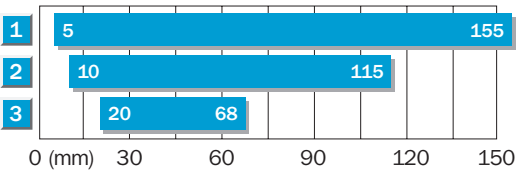
| Technical data | | ZT1- | N5215 | P5215 | F5215 | E5215 | N5221 | P5221 | N5231 | P5231 |
|--|------------------------------------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Scanning distance typ. | 5 ... 155 mm | | | | | | | | | |
| Light source ⁴⁾, light type | LED, infrared light, 880 nm | | | | | | | | | |
| Light spot diameter | Approx. 31 mm at 100 mm | | | | | | | | | |
| Supply voltage V_S ²⁾ | 10 ... 30 V DC | | | | | | | | | |
| Ripple ³⁾ | < 5 V _{PP} | | | | | | | | | |
| Current consumption ⁴⁾ | < 20 mA | | | | | | | | | |
| Switching outputs | Q: NPN | | | | | | | | | |
| | Q: PNP | | | | | | | | | |
| Switching mode | Light switching | | | | | | | | | |
| | Dark switching | | | | | | | | | |
| Output current I_A max. | 50 mA | | | | | | | | | |
| Switching frequency ⁵⁾ | 200 Hz | | | | | | | | | |
| Connection type | Cable (PVC), 2 m, 3-wire | | | | | | | | | |
| | Cable with plug 150 mm, M8, 4-pin | | | | | | | | | |
| | Cable with plug 150 mm, M12, 4-pin | | | | | | | | | |
| VDE protection class ⁶⁾ | ⊕ | | | | | | | | | |
| Circuit protection ⁷⁾ | A, D | | | | | | | | | |
| Enclosure rating | IP 67 | | | | | | | | | |
| Ambient temperature | Operation -25 ... +50 °C | | | | | | | | | |
| | Storage -40 ... +70 °C | | | | | | | | | |
| Housing material | ABS, fibreglass reinforced | | | | | | | | | |
| Included with delivery | Mounting nut M18 | | | | | | | | | |

1) Average service life 100,000 h, at T_A = +25 °C
 2) Limit values
 3) Must be within V_S tolerances

4) Without load
 5) With light/dark ratio 1:1
 6) Reference voltage 50 V DC

7) A = V_S connections reverse-polarity protected
 D = Outputs overcurrent and short-circuit protected


Scanning distance



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

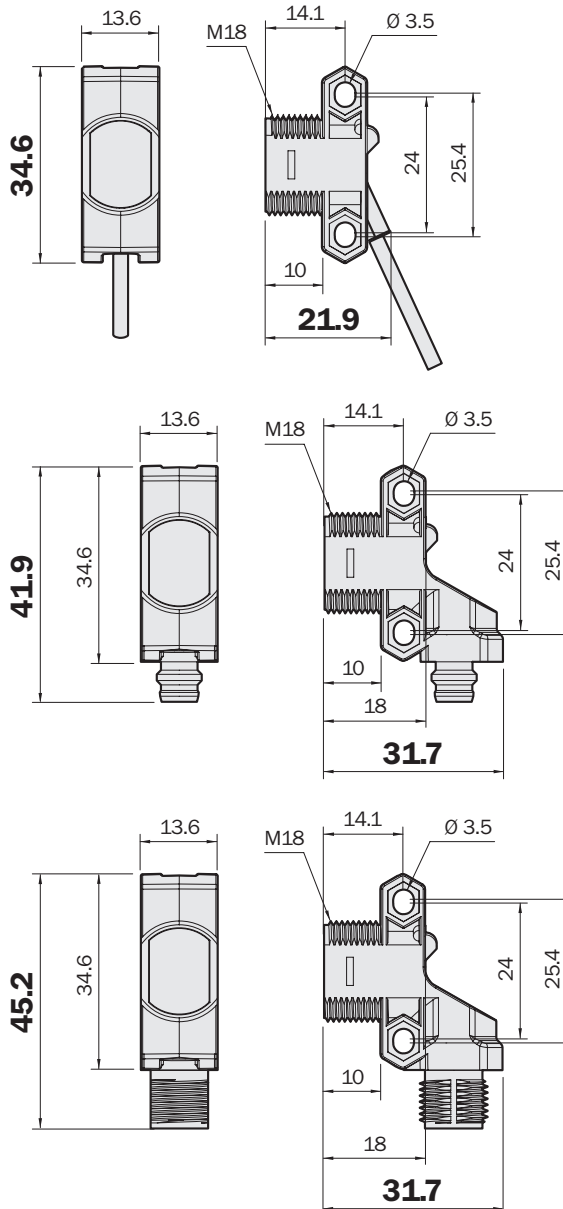
Order information

| Type | Order no. |
|-----------|-----------|
| ZT1-N5215 | 1045558 |
| ZT1-P5215 | 1045559 |
| ZT1-F5215 | 1045560 |
| ZT1-E5215 | 1045561 |
| ZT1-N5221 | 1045574 |
| ZT1-P5221 | 1045575 |
| ZT1-N5231 | 1045590 |
| ZT1-P5231 | 1045591 |


Scanning distance 155 mm
 Photoelectric proximity switch

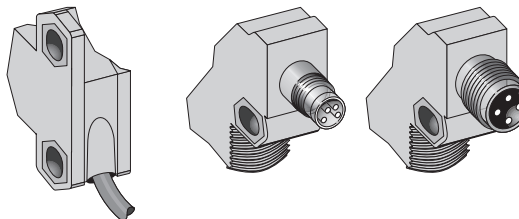
- Energetic type with V-optic
- Infrared light
- Clear housing for perfect indicator LED visibility
- 18 mm front and flange mounting possibility
- Power and output indicator

Dimensional drawing



Connection type

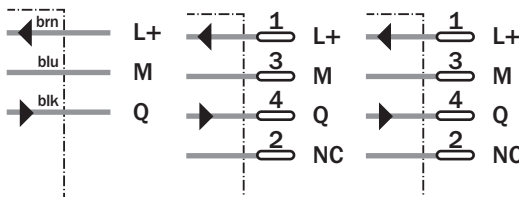
| | | |
|-----------|-----------|-----------|
| ZT2-N5215 | ZT2-N5238 | ZT2-N5228 |
| ZT2-P5215 | ZT2-P5238 | ZT2-P5228 |



3 x 0.23 mm²

M8, 4-pin

M12, 4-pin



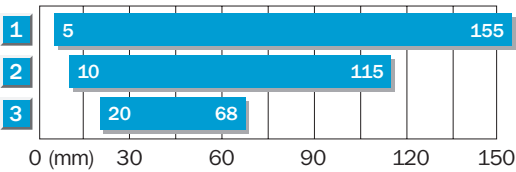
Accessories

| |
|------------------|
| Reflectors |
| Mounting systems |

| Technical data | | ZT2- | N5215 | P5215 | N5238 | P5238 | N5228 | P5228 | | | | |
|--|-----------------------------|------|-------|-------|-------|-------|-------|-------|--|--|--|--|
| Scanning distance typ. | 1 ... 155 mm | | | | | | | | | | | |
| Light source ¹⁾, light type | LED, infrared light, 880 nm | | | | | | | | | | | |
| Light spot diameter | Approx. 31 mm at 100 mm | | | | | | | | | | | |
| Supply voltage V_S ²⁾ | 10 ... 30 V DC | | | | | | | | | | | |
| Ripple ³⁾ | < 5 V_{PP} | | | | | | | | | | | |
| Current consumption ⁴⁾ | < 20 mA | | | | | | | | | | | |
| Switching outputs | Q: NPN | | | | | | | | | | | |
| | Q: PNP | | | | | | | | | | | |
| Switching mode | Light switching | | | | | | | | | | | |
| Output current I_A max. | 50 mA | | | | | | | | | | | |
| Switching frequency ⁵⁾ | 200 Hz | | | | | | | | | | | |
| Connection type | Cable (PVC), 2 m, 3-wire | | | | | | | | | | | |
| | M8 plug, 4-pin | | | | | | | | | | | |
| | M12 plug, 4-pin | | | | | | | | | | | |
| VDE protection class ⁶⁾ | ⊕ | | | | | | | | | | | |
| Circuit protection ⁷⁾ | A, D | | | | | | | | | | | |
| Enclosure rating | IP 67 | | | | | | | | | | | |
| Ambient temperature | Operation -25 ... +50 °C | | | | | | | | | | | |
| | Storage -40 ... +70 °C | | | | | | | | | | | |
| Housing material | ABS, fibreglass reinforced | | | | | | | | | | | |
| Included with delivery | Mounting nut M18 | | | | | | | | | | | |

¹⁾ Average service life 100,000 h, at $T_A = +25$ °C
²⁾ Limit values
³⁾ Must be within V_S tolerances
⁴⁾ Without load
⁵⁾ With light/dark ratio 1:1
⁶⁾ Reference voltage 50 V DC
⁷⁾ A = V_S connections reverse-polarity protected
D = Outputs overcurrent and short-circuit protected


Scanning distance



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

Order information

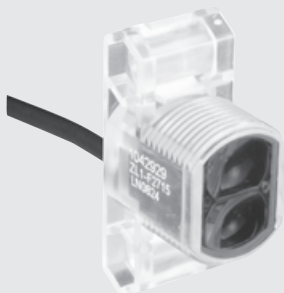
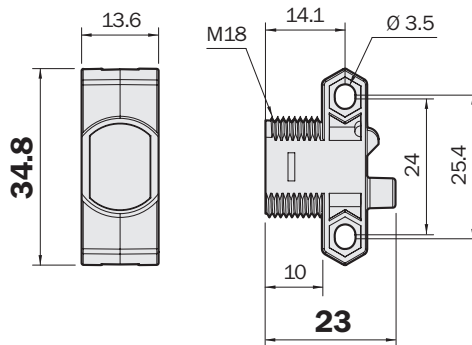
| Type | Order no. |
|-----------|-----------|
| ZT2-N5215 | 1045403 |
| ZT2-P5215 | 1045404 |
| ZT2-N5238 | 1045484 |
| ZT2-P5238 | 1045485 |
| ZT2-N5228 | 1045468 |
| ZT2-P5228 | 1045469 |


Scanning range
0.1 ... 4.8 m

Photoelectric reflex switch

- Visible red light
- With polarization filter
- Cross talk immunity
- 18 mm front and flange mounting possibility
- Power and output indicator
- Clear housing for perfect indicator LED visibility

Dimensional drawing



Connection type

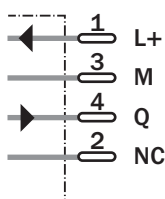
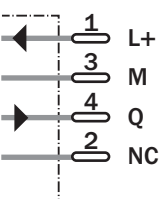
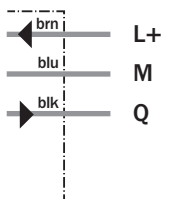
| | | |
|-----------|-----------|-----------|
| ZL1-N2415 | ZL1-F2431 | ZL1-F2421 |
| ZL1-P2415 | ZL1-E2431 | ZL1-E2421 |
| ZL1-F2415 | | |
| ZL1-E2415 | | |



3 x 0.23 mm²

M8, 4-pin

M12, 4-pin



Accessories

| |
|------------------|
| Reflectors |
| Mounting systems |

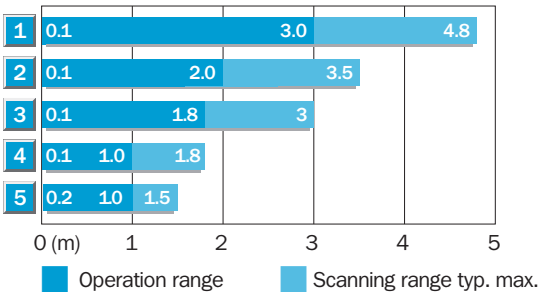
| Technical data | | ZL1- | N2415 | P2415 | F2415 | E2415 | F2421 | E2421 | F2431 | E2431 |
|--|------------------------------------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Scanning range typ. max. | 0.1 ... 4.8 m (on PL80A) | | | | | | | | | |
| Operating range, recommended | 0.1 ... 3 m (on PL80A) | | | | | | | | | |
| Light source ¹⁾, light type | LED, red light, 660 nm | | | | | | | | | |
| Light spot diameter | Approx. 125 mm at 1 m | | | | | | | | | |
| Polarization filter | ✓ | | | | | | | | | |
| Supply voltage V_S ²⁾ | 10 ... 30 V DC | | | | | | | | | |
| Ripple ³⁾ | < 5 V _{PP} | | | | | | | | | |
| Current consumption ⁴⁾ | < 20 mA | | | | | | | | | |
| Switching outputs | Q: NPN | | | | | | | | | |
| | Q: PNP | | | | | | | | | |
| Switching mode | Light switching | | | | | | | | | |
| | Dark switching | | | | | | | | | |
| Output current I_A max. | 50 mA | | | | | | | | | |
| Switching frequency ⁵⁾ | 400 Hz | | | | | | | | | |
| Connection type | Cable (PVC), 2 m, 3-wire | | | | | | | | | |
| | Cable with plug 150 mm, M8, 4-pin | | | | | | | | | |
| | Cable with plug 150 mm, M12, 4-pin | | | | | | | | | |
| VDE protection class ⁶⁾ | ⚡ | | | | | | | | | |
| Circuit protection ⁷⁾ | A, D | | | | | | | | | |
| Enclosure rating | IP 67 | | | | | | | | | |
| Ambient temperature | Operation -25 ... +50 °C | | | | | | | | | |
| | Storage -40 ... +70 °C | | | | | | | | | |
| Housing material | ABS, fibreglass reinforced | | | | | | | | | |
| Included with delivery | Mounting nut M18 | | | | | | | | | |

1) Average service life 100,000 h, at T_A = +25 °C
 2) Limit values
 3) Must be within V_S tolerances

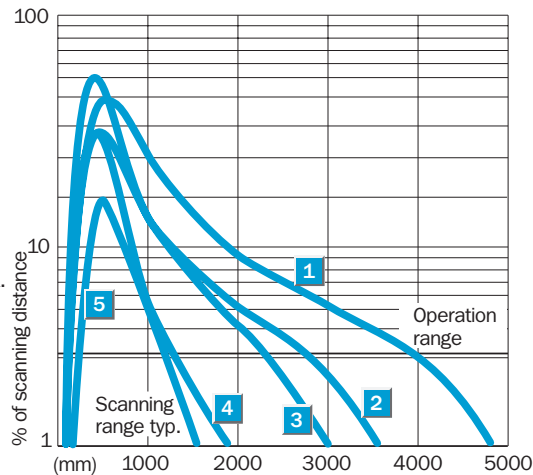
4) Without load
 5) With light/dark ratio 1:1
 6) Reference voltage 50 V DC

7) A = V_S connections reverse-polarity protected
 D = Outputs overcurrent and short-circuit protected

Scanning distance



| Reflector type | Operation range |
|----------------|-----------------|
| 1 PL80A | 0.1 ... 3.0 m |
| 2 P250 | 0.1 ... 2.0 m |
| 3 PL40A | 0.1 ... 1.8 m |
| 4 PL20A | 0.1 ... 1.0 m |
| 5 REF-PLUS | 0.2 ... 1.0 m |



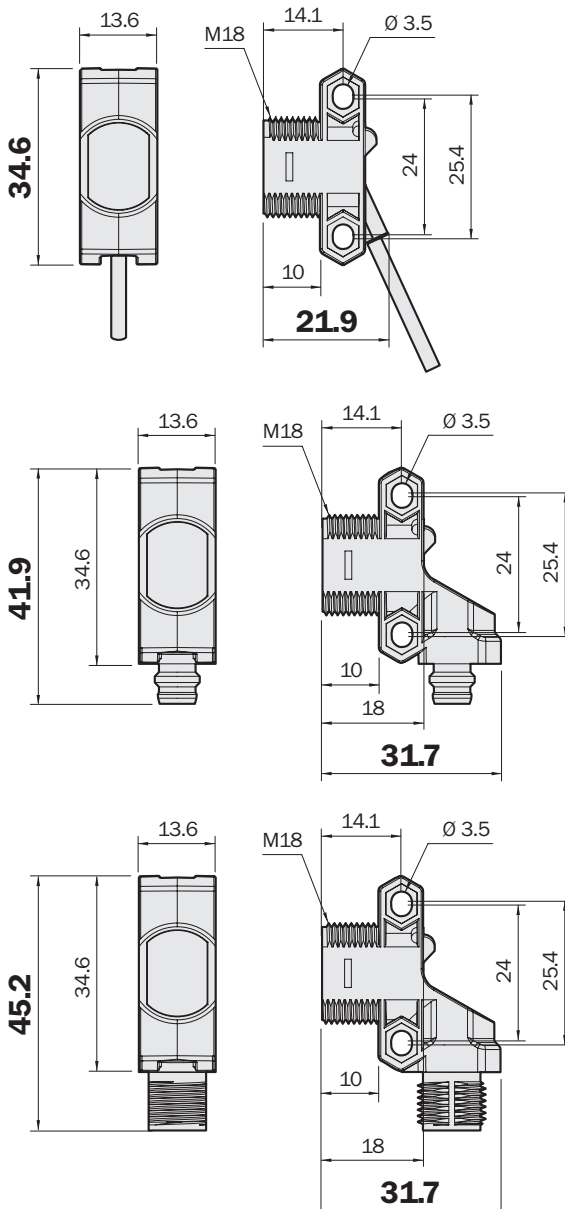
Order information

| Type | Order no. |
|-----------|-----------|
| ZL1-N2415 | 1045496 |
| ZL1-P2415 | 1045497 |
| ZL1-F2415 | 1045498 |
| ZL1-E2415 | 1045499 |
| ZL1-F2421 | 1045502 |
| ZL1-E2421 | 1045503 |
| ZL1-F2431 | 1045506 |
| ZL1-E2431 | 1045507 |

| | |
|------------------------------------|---|
| | Scanning range 0.1 ... 4.8 m |
| Photoelectric reflex switch | |

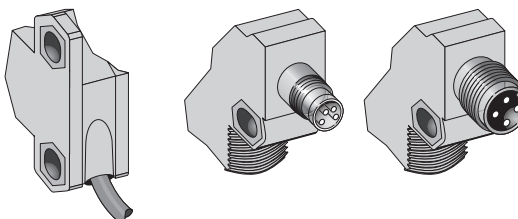
- Visible red light
- With polarization filter
- Cross talk immunity
- 18 mm front and flange mounting possibility
- Power and output indicator
- Clear housing for perfect indicator LED visibility

Dimensional drawing

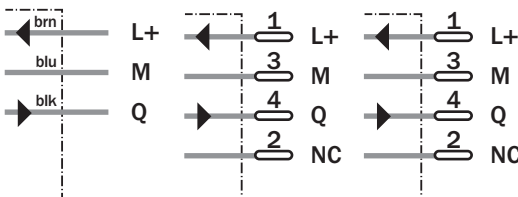


Connection type

| | | |
|-----------|-----------|-----------|
| ZL2-F2415 | ZL2-F2438 | ZL2-F2428 |
| ZL2-E2415 | ZL2-E2438 | ZL2-E2428 |



| | | |
|--------------------------|-----------|------------|
| 3 x 0.23 mm ² | M8, 4-pin | M12, 4-pin |
|--------------------------|-----------|------------|



| |
|--------------------|
| Accessories |
| Reflectors |
| Mounting systems |

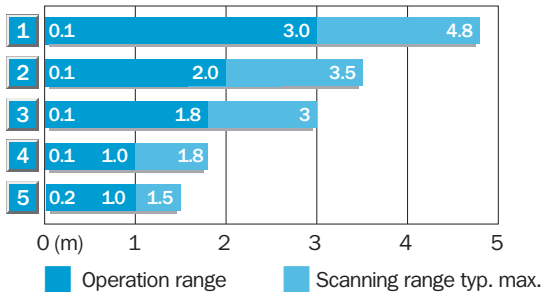
| Technical data | | ZL2- | N2415 | P2415 | F2415 | E2415 | F2431 | E2431 | | | | |
|--|----------------------------|------|-------|-------|-------|-------|-------|-------|--|--|--|--|
| Scanning range typ. max. | 0.1 ... 4.8 m (on PL80A) | | | | | | | | | | | |
| Operating range, recommended | 0.1 ... 3 m (on PL80A) | | | | | | | | | | | |
| Light source ¹⁾, light type | LED, red light, 660 nm | | | | | | | | | | | |
| Light spot diameter | Approx. 125 mm at 1 m | | | | | | | | | | | |
| Polarization filter | ✓ | | | | | | | | | | | |
| Supply voltage V_S ²⁾ | 10 ... 30 V DC | | | | | | | | | | | |
| Ripple ³⁾ | < 5 V _{pp} | | | | | | | | | | | |
| Current consumption ⁴⁾ | < 20 mA | | | | | | | | | | | |
| Switching outputs | Q: NPN | | | | | | | | | | | |
| | Q: PNP | | | | | | | | | | | |
| Switching mode | Light switching | | | | | | | | | | | |
| | Dark switching | | | | | | | | | | | |
| Output current I_A max. | 50 mA | | | | | | | | | | | |
| Switching frequency ⁵⁾ | 400 Hz | | | | | | | | | | | |
| Connection type | Cable (PVC), 2 m, 3-wire | | | | | | | | | | | |
| | M8 plug, 4-pin | | | | | | | | | | | |
| | M12 plug, 4-pin | | | | | | | | | | | |
| VDE protection class ⁶⁾ | ⓘ | | | | | | | | | | | |
| Circuit protection ⁷⁾ | A, D | | | | | | | | | | | |
| Enclosure rating | IP 67 | | | | | | | | | | | |
| Ambient temperature | Operation -25 ... +50 °C | | | | | | | | | | | |
| | Storage -40 ... +70 °C | | | | | | | | | | | |
| Housing material | ABS, fibreglass reinforced | | | | | | | | | | | |
| Included with delivery | Mounting nut M18 | | | | | | | | | | | |

1) Average service life 100,000 h, at T_A = +25 °C
 2) Limit values
 3) Must be within V_S tolerances

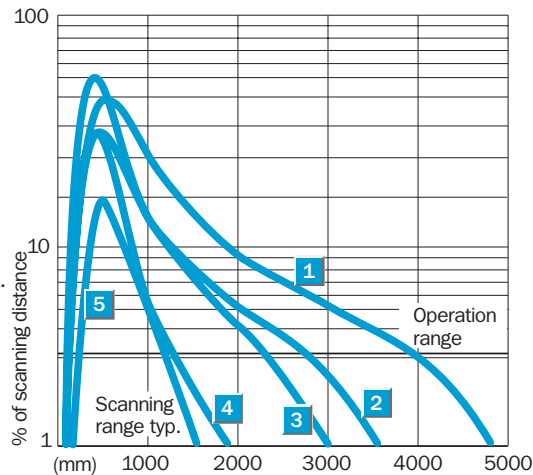
4) Without load
 5) With light/dark ratio 1:1
 6) Reference voltage 50 V DC

7) A = V_S connections reverse-polarity protected
 D = Outputs overcurrent and short-circuit protected

Scanning distance



| Reflector type | Operation range |
|----------------|-----------------|
| 1 PL80A | 0.1 ... 3.0 m |
| 2 P250 | 0.1 ... 2.0 m |
| 3 PL40A | 0.1 ... 1.8 m |
| 4 PL20A | 0.1 ... 1.0 m |
| 5 REF-PLUS | 0.2 ... 1.0 m |



Order information

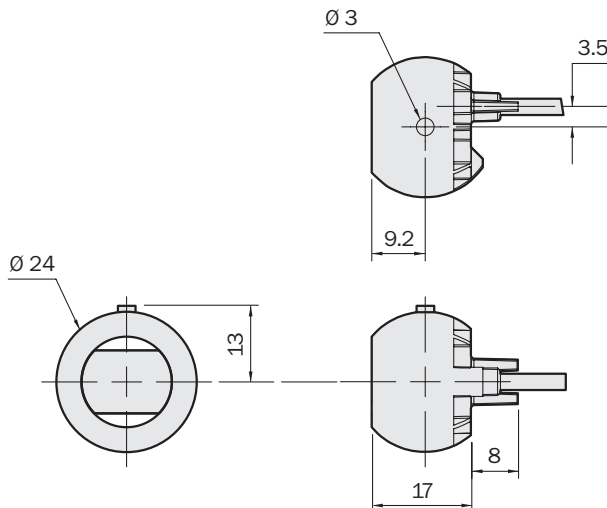
| Type | Order no. |
|-----------|-----------|
| ZL2-F2415 | 1045389 |
| ZL2-E2415 | 1045390 |
| ZL2-F2438 | 1045385 |
| ZL2-E2438 | 1045386 |
| ZL2-F2428 | 1045371 |
| ZL2-E2428 | 1045372 |

Scanning range
0.1 ... 4.8 m

Photoelectric reflex switch

- Visible red light
- With polarization filter
- Cross talk immunity
- 18 mm front and flange mounting possibility
- Power and output indicator
- Clear housing for perfect indicator LED visibility

Dimensional drawing



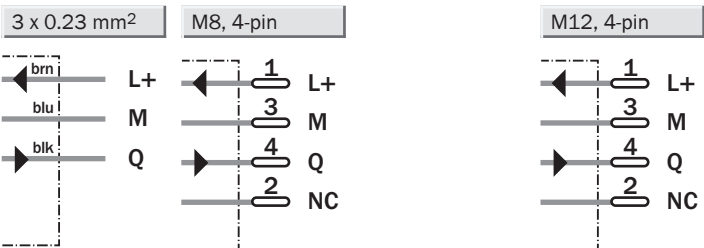
Connection type

| | | |
|-----------|-----------|-----------|
| ZL3-F2415 | ZL3-F2431 | ZL3-F2421 |
| ZL3-E2415 | ZL3-E2431 | ZL3-E2421 |
| ZL3-N2415 | | |
| ZL3-P2415 | | |



Accessories

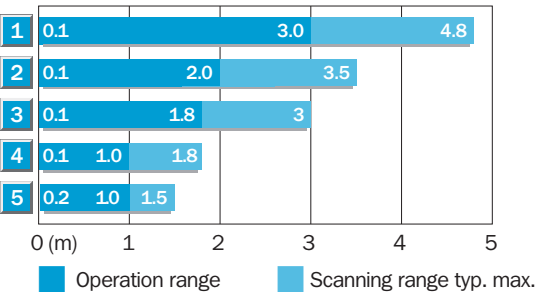
| |
|------------------|
| Reflectors |
| Mounting systems |



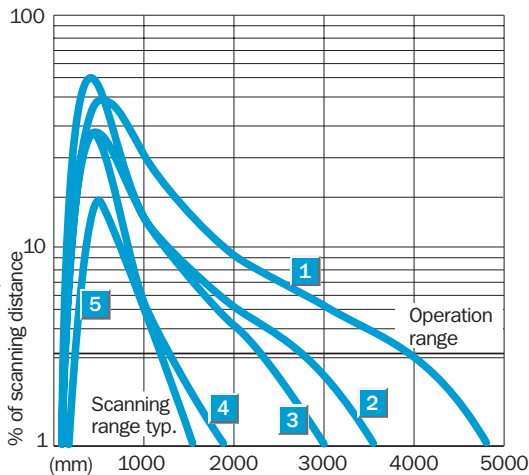
| Technical data | | ZL3- | F2415 | E2415 | N2415 | P2415 | F2421 | E2421 | F2431 | E2431 |
|--|------------------------------------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Scanning range typ. max. | 0.1 ... 4.8 m (on PL80A) | | | | | | | | | |
| Operating range, recommended | 0.1 ... 3 m (on PL80A) | | | | | | | | | |
| Light source ¹⁾, light type | LED, red light, 660 nm | | | | | | | | | |
| Light spot diameter | Approx. 125 mm at 1 m | | | | | | | | | |
| Polarization filter | ✓ | | | | | | | | | |
| Supply voltage V_S ²⁾ | 10 ... 30 V DC | | | | | | | | | |
| Ripple ³⁾ | < 5 V _{pp} | | | | | | | | | |
| Current consumption ⁴⁾ | < 20 mA | | | | | | | | | |
| Switching outputs | Q: NPN | | | | | | | | | |
| | Q: PNP | | | | | | | | | |
| Switching mode | Light switching | | | | | | | | | |
| | Dark switching | | | | | | | | | |
| Output current I_A max. | 50 mA | | | | | | | | | |
| Switching frequency ⁵⁾ | 400 Hz | | | | | | | | | |
| Connection type | Cable (PVC), 2 m, 3-wire | | | | | | | | | |
| | Cable with plug 150 mm, M8, 4-pin | | | | | | | | | |
| | Cable with plug 150 mm, M12, 4-pin | | | | | | | | | |
| VDE protection class ⁶⁾ | ⊖ | | | | | | | | | |
| Circuit protection ⁷⁾ | A, D | | | | | | | | | |
| Enclosure rating | IP 67 | | | | | | | | | |
| Ambient temperature | Operation -25 ... +50 °C | | | | | | | | | |
| | Storage -40 ... +70 °C | | | | | | | | | |
| Housing material | ABS, fibreglass reinforced | | | | | | | | | |
| Included with delivery | Mounting nut M18 | | | | | | | | | |

¹⁾ Average service life 100,000 h, at T_A = +25 °C
²⁾ Limit values
³⁾ Must be within V_S tolerances
⁴⁾ Without load
⁵⁾ With light/dark ratio 1:1
⁶⁾ Reference voltage 50 V DC
⁷⁾ A = V_S connections reverse-polarity protected
D = Outputs overcurrent and short-circuit protected

Scanning distance



| Reflector type | Operation range |
|----------------|-----------------|
| 1 PL80A | 0.1 ... 3.0 m |
| 2 P250 | 0.1 ... 2.0 m |
| 3 PL40A | 0.1 ... 1.8 m |
| 4 PL20A | 0.1 ... 1.0 m |
| 5 REF-PLUS | 0.2 ... 1.0 m |



Order information

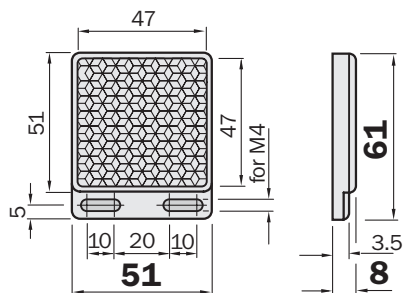
| Type | Order no. |
|-----------|-----------|
| ZL3-F2415 | 1045531 |
| ZL3-E2415 | 1045532 |
| ZL3-N2415 | 1045529 |
| ZL3-P2415 | 1045530 |
| ZL3-F2421 | 1045535 |
| ZL3-E2421 | 1045536 |
| ZL3-F2431 | 1045539 |
| ZL3-E2431 | 1045540 |

Dimensional drawings and order information

Reflectors, plastic design, for temperatures 65 °C

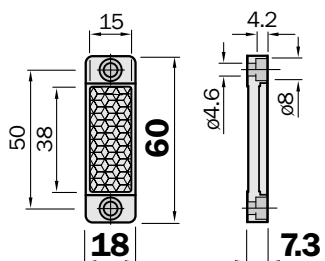
Reflector 47 x 47 mm, screwable

| Type | Order no. |
|------|-----------|
| P250 | 5304812 |



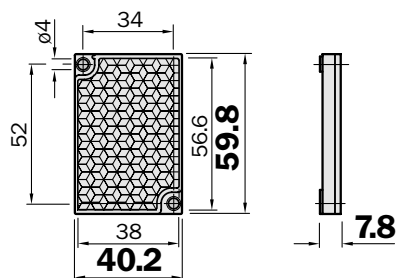
Reflector 20 x 40 mm, screwable

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



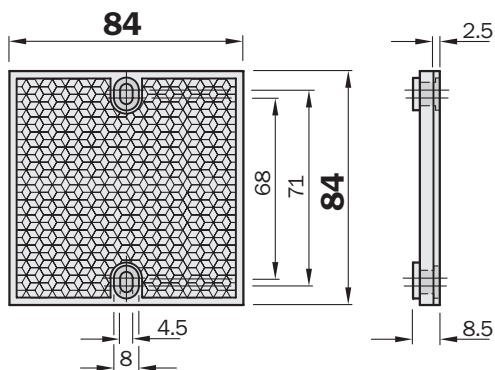
Reflector 40 x 60 mm, screwable

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



Reflector 80 x 80 mm, screwable

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

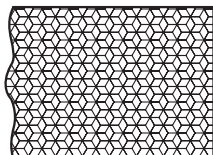


Dimensional drawings and order information

Reflectors, plastic design, for temperatures 65 °C

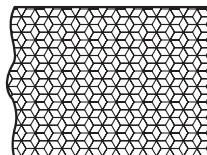
Reflective tape, self-adhesive, length of roll 22.8 m

| Type | Order no. | Width |
|--------------|-----------|-------|
| REF-PLUS-R25 | 5319929 | 25 mm |
| REF-PLUS-R50 | 5319981 | 50 mm |



Reflective tape, self-adhesive, cut to size

| Type | Order no. |
|----------------|-----------|
| REF-PLUS-R25-K | 4051184 |
| REF-PLUS-R50-K | 4051185 |

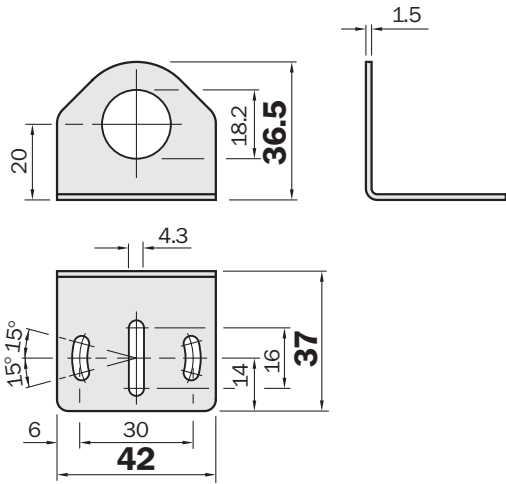


Dimensional drawings and order information

Mounting systems

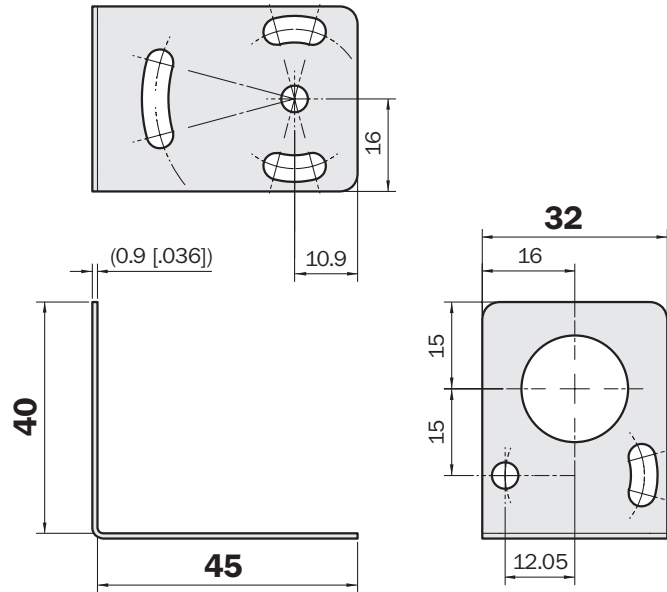
Mounting bracket for ZT1, ZT2, ZL1, ZL2

| Type | Order no. |
|------------|-----------|
| BEF-WN-M18 | 5308446 |



Mounting bracket for ZT1, ZT2, ZL1, ZL2

| Type | Order no. |
|----------|-----------|
| MB-W1000 | 7023800 |

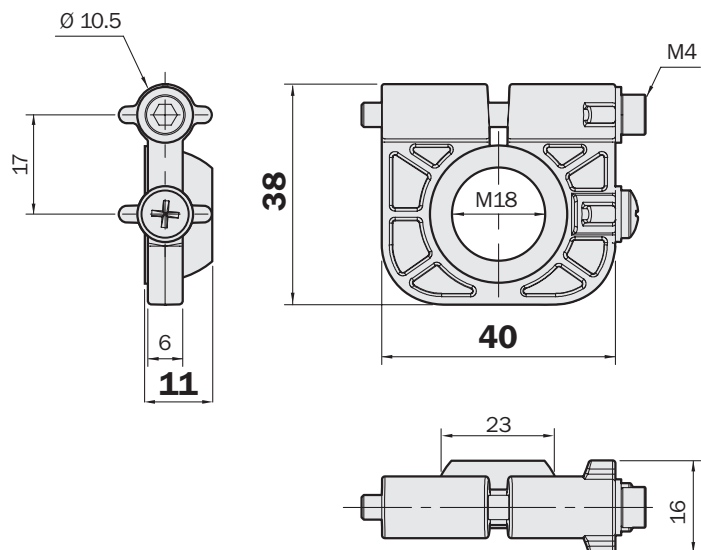


Dimensional drawings and order information

Mounting systems

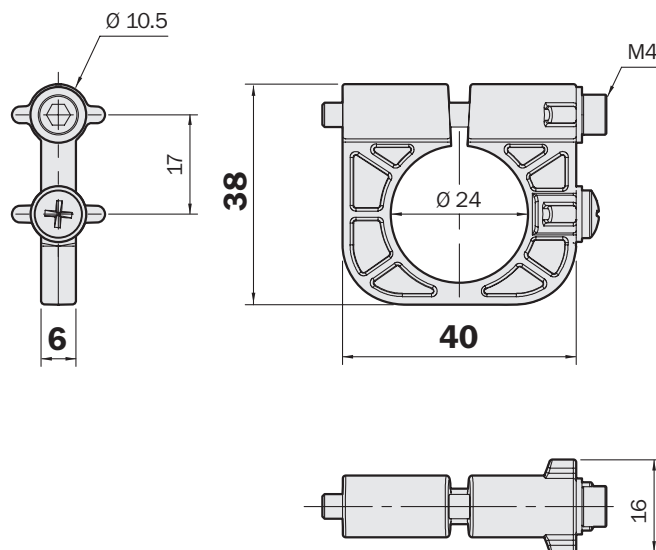
Mounting bracket with rotary insert, for ZT1, ZT2, ZT3, ZL1, ZL2, ZL3

| Type | Order no. |
|-----------|-----------|
| MB-BS18MM | 7028403 |



Mounting bracket for ZT3, ZL3

| Type | Order no. |
|--------------|-----------|
| MB-BS18MMS01 | 7029350 |



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