

Flexible, low-cost presence detection solutions with clear housings



### Product description

The Z photoelectric sensor is a low-cost sensor for standard applications in conveyor lines, packaging machines, bin controls and hands-free systems. The sensor's transparent housing provides 360° status indication and has a straight cable outlet for easy connection. The Z1 and Z2 are offered in many differ-

ent sensing ranges and are available in three variants: retro-reflective, background suppression and energetic. The eyeball-shaped housing of the Z3 allows for infinite adjustability and the indicator LED to be seen from 360° around the device.

### At a glance

- Economical design with background suppression, retro-reflective or energetic variants available; non-adjustable
- Compact, transparent housing with 360° status indication
- M18 front mount and 24-25.4 mm slotted side through holes compatible with competitor devices
- Spherical eyeball-style housing with 24 mm ball mount allows for infinite adjustability (depending on type)
- Connection system: straight or angled cable outlet (60°) or M12 or M8 connector outlet
- IP 67 enclosure rating for harsh environments

### Your benefits

- High performance at a low cost
- Clear housing provides highly visible 360° of status indication, which simplifies troubleshooting
- Simple and unique mounting options lower installation costs
- Small size fits applications with limited space
- Customization options reduce material and labor costs
- Compatibility with competitor products for easy integration into existing systems



### Additional information

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→ [www.mysick.com/en/Z-Sensor](http://www.mysick.com/en/Z-Sensor)

For more information, just enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples and much more.



## Detailed technical data

### Features

	ZT1	ZT2	ZL1	ZL2	ZL3
<b>Sensor principle</b>	Photoelectric proximity sensor		Photoelectric retro-reflective sensor		
<b>Detection principle</b>	Background suppression / energetic (depending on type)		Standard optics		
<b>Dimensions (W x H x D)</b>	13.6 mm x 41.9 mm x 31.7 mm 13.6 mm x 45.2 mm x 31.7 mm 13.6 mm x 34.8 mm x 21.9 mm (depending on type)				
<b>Housing design (light emission)</b>	Hybrid				
<b>Thread diameter (housing)</b>	M18 x 1				-
<b>Sensing range max.</b>	0 mm ... 155 mm <sup>1)</sup> (depending on type)		0.1 m ... 4.8 m <sup>2)</sup>		
<b>Sensing range</b>	0 mm ... 155 mm (depending on type)		0.1 m ... 3 m <sup>2)</sup>		
<b>Type of light</b>	Infrared light		Visible red light		
<b>Light source <sup>3)</sup></b>	LED				
<b>Wave length</b>	880 nm		660 nm		

<sup>1)</sup> Object with 90 % reflectance (referred to standard white, DIN 5033)

<sup>2)</sup> PL80A.

<sup>3)</sup> Average service life of 100,000 h at T<sub>A</sub> = +25 °C.

### Mechanics/electronics

	ZT1	ZT2	ZL1	ZL2	ZL3
<b>Supply voltage <sup>1)</sup></b>	10 V DC ... 30 V DC				
<b>Ripple <sup>2)</sup></b>	< 5 V <sub>pp</sub>				
<b>Power consumption <sup>3)</sup></b>	< 20 mA				
<b>Output type</b>	PNP/NPN (depending on type)		PNP	PNP/NPN (depending on type)	
<b>Switching mode</b>	Light switching / Dark-switching (depending on type)				
<b>Output current I<sub>max</sub></b>	50 mA				
<b>Switching frequency <sup>4)</sup></b>	200 Hz		400 Hz		
<b>Connection type</b>	Cable with connector, M8, 150 mm <sup>5)</sup> Cable with connector, M12, 150 mm <sup>5)</sup> Cable, 2 m <sup>5)</sup> (depending on type)				
<b>Circuit protection</b>	A <sup>6)</sup> , D <sup>7)</sup>				
<b>Protection class <sup>8)</sup></b>	III				
<b>Polarisation filter</b>	-		✓		
<b>Housing material</b>	Glass fiber reinforced ABS plastic				
<b>Enclosure rating</b>	IP 67				
<b>Items supplied</b>	Mounting nut M18				-
<b>Ambient operating temperature</b>	-25 °C ... +50 °C				
<b>Ambient storage temperature</b>	-40 °C ... +70 °C				

<sup>1)</sup> Limit values.

<sup>2)</sup> May not exceed or fall short of V<sub>S</sub> tolerances.

<sup>3)</sup> Without load.

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

<sup>5)</sup> Do not bend below 0 °C.

<sup>6)</sup> A = V<sub>S</sub> connections reverse-polarity protected.

<sup>7)</sup> D = outputs overcurrent and short-circuit protected.

<sup>8)</sup> Reference voltage: 50 V DC.

## Ordering information

Other models available at [www.mysick.com/en/Z-Sensor](http://www.mysick.com/en/Z-Sensor)

## ZT1

- **Sensor principle:** photoelectric proximity sensor
- **Type of light:** infrared light
- **Switching mode:** light switching

Detection principle	Sensing range max. <sup>1)</sup>	Light spot size (distance)	Output type	Connection	Connection diagram	Model name	Part no.
Background suppression	0 mm ... 50 mm	10.5 mm (50 mm)	PNP	Cable with connector M8, 4-pin 150 mm	Cd-067	ZT1-P3231	1045595
				Cable with connector M12, 4-pin 150 mm	Cd-067	ZT1-P3221	1045579
			NPN	Cable, 3-wire 2 m PVC	Cd-043	ZT1-P3215	1045563
Energetic	1 mm ... 100 mm	20 mm (100 mm)	PNP	Cable with connector M12, 4-pin 150 mm	Cd-067	ZT1-P4221	1045583
				Cable, 3-wire 2 m PVC	Cd-043	ZT1-P4215	1045567
	5 mm ... 155 mm	31 mm (100 mm)	PNP	Cable with connector M8, 4-pin 150 mm	Cd-067	ZT1-P5231	1045591
				Cable with connector M12, 4-pin 150 mm	Cd-067	ZT1-P5221	1045575
				Cable, 3-wire 2 m PVC	Cd-043	ZT1-P5215	1045559

<sup>1)</sup> Object with 90 % reflectance (referred to standard white, DIN 5033).

## ZT2

- **Sensor principle:** photoelectric proximity sensor
- **Type of light:** infrared light
- **Switching mode:** light switching

Detection principle	Sensing range max. <sup>1)</sup>	Light spot size (distance)	Output type	Connection	Connection diagram	Model name	Part no.		
Background suppression	0 mm ... 50 mm	10.5 mm (50 mm)	PNP	Connector M8, 4-pin	Cd-067	ZT2-P3238	1045489		
				Connector M12, 4-pin	Cd-067	ZT2-P3228	1045473		
			NPN	Cable, 3-wire 2 m PVC	Cd-043	ZT2-P3215	1045408		
Energetic	1 mm ... 100 mm	20 mm (100 mm)	PNP	Connector M8, 4-pin	Cd-067	ZT2-P4238	1045493		
				Connector M12, 4-pin	Cd-067	ZT2-P4228	1045477		
	5 mm ... 155 mm	31 mm (100 mm)	PNP	Connector M8, 4-pin	Cd-067	ZT2-P5238	1045485		
				Connector M12, 4-pin	Cd-067	ZT2-P5228	1045469		

<sup>1)</sup> Object with 90 % reflectance (referred to standard white, DIN 5033).

### ZL1

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** standard optics
- **Type of light:** visible red light

Sensing range max. <sup>1)</sup>	Light spot size (distance)	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
0.1 m ... 4.8 m	125 mm (1 m)	PNP	Light switching	Cable with connector M8, 4-pin 150 mm	Cd-067	ZL1-P2431	1045505
				Cable with connector M12, 4-pin 150 mm	Cd-067	ZL1-P2421	1045501
				Cable, 3-wire 2 m PVC	Cd-043	ZL1-P2415	1045497
			Dark-switching	Cable with connector M8, 4-pin 150 mm	Cd-067	ZL1-F2431	1045506
				Cable with connector M12, 4-pin 150 mm	Cd-067	ZL1-F2421	1045502
				Cable, 3-wire 2 m PVC	Cd-043	ZL1-F2415	1045498

<sup>1)</sup> PL80A.

### ZL2

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** standard optics
- **Type of light:** visible red light

Sensing range max. <sup>1)</sup>	Light spot size (distance)	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
0.1 m ... 4.8 m	125 mm (1 m)	PNP	Dark-switching	Cable, 3-wire 2 m PVC	Cd-043	ZL2-F2415	1045389
				Connector M8, 4-pin	Cd-067	ZL2-F2438	1045385
				Connector M12, 4-pin	Cd-067	ZL2-F2428	1045371
		NPN	Dark-switching	Cable, 3-wire 2 m PVC	Cd-043	ZL2-E2415	1045390
				Connector M12, 4-pin	Cd-067	ZL2-E2428	1045372

<sup>1)</sup> PL80A.

### ZL3

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** standard optics
- **Type of light:** visible red light

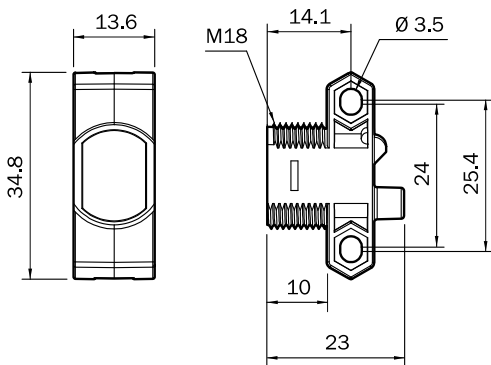
Sensing range max. <sup>1)</sup>	Light spot size (distance)	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
0.1 m ... 4.8 m	125 mm (1 m)	PNP	Dark-switching	Cable with connector M8, 4-pin 150 mm	Cd-067	ZL3-F2431	1045539
				Cable with connector M12, 4-pin 150 mm	Cd-067	ZL3-F2421	1045535
				Cable, 3-wire 2 m PVC	Cd-043	ZL3-F2415	1045531
		NPN	Dark-switching	Cable, 3-wire 2 m PVC	Cd-043	ZL3-P2415	1045530
				Cable with connector M8, 4-pin 150 mm	Cd-067	ZL3-E2431	1045540
				Cable with connector M12, 4-pin 150 mm	Cd-067	ZL3-E2421	1045536

<sup>1)</sup> PL80A.

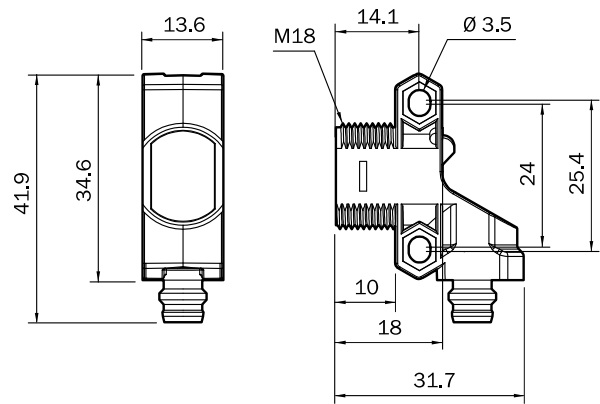
Dimensional drawings

Dimensions in mm (inch)

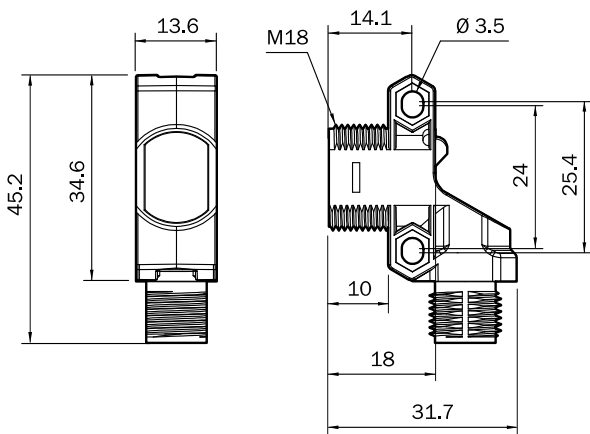
ZT1, ZL1



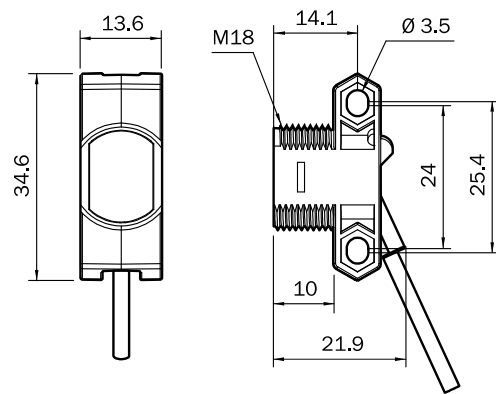
ZT2, ZL2, Connector M8, 4-pin



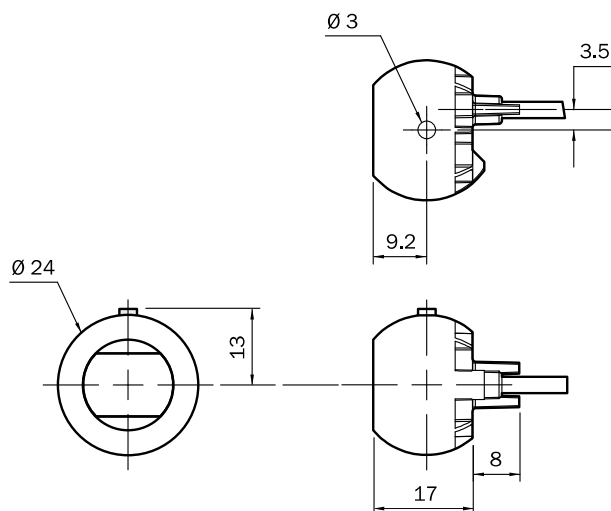
ZT2, ZL2, Connector M12, 4-pin



ZT2, ZL2, cable



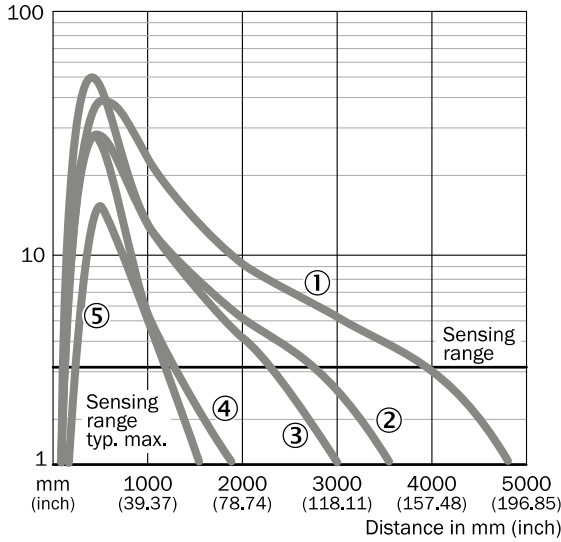
ZL3



Characteristic curves

Operating reserve

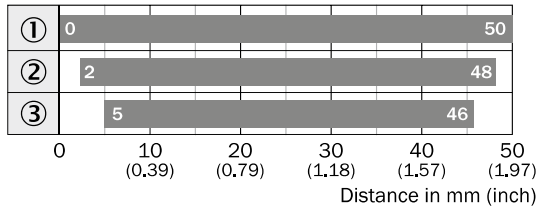
ZL1, ZL2, ZL3



- ① PL80A
- ② P250
- ③ PL40A
- ④ PL20A
- ⑤ Reflective tape REF-Plus

Bar diagrams

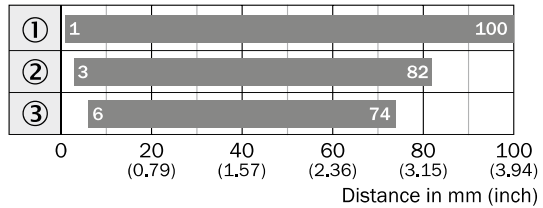
ZT1, 50 mm



■ Sensing range    ■ Sensing range max.

- ① Sensing range on white, 90 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on black, 6 % remission

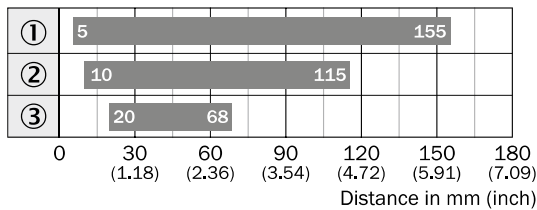
ZT1, 100 mm



■ Sensing range    ■ Sensing range max.

- ① Sensing range on white, 90 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on black, 6 % remission

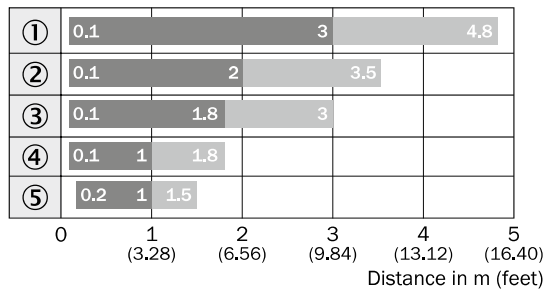
ZT1, 155 mm



■ Sensing range    ■ Sensing range max.

- ① Sensing range on white, 90 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on black, 6 % remission

ZL1, ZL2, ZL3

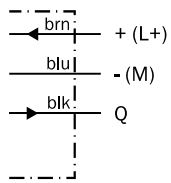


■ Sensing range    ■ Sensing range max.

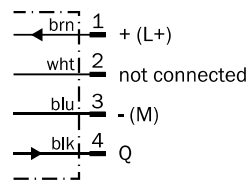
- ① PL80A
- ② P250
- ③ PL40A
- ④ PL20A
- ⑤ Reflective tape REF-Plus

## Connection diagram

### Cd-043



### Cd-067



## Recommended accessories

### Mounting brackets/plates

#### Mounting brackets

Figure	Material	Description	Model name	Part no.
	Steel, zinc coated	Mounting plate for M18 sensors	BEF-WG-M18	5321870
		Mounting bracket, M18 thread	BEF-WN-M18	5308446

### Plug connectors and cables

#### Connecting cable (female connector-open)

- Cable material: PVC

Figure	Connection type head A	Connection type head B	Connecting cable	Connector material	Enclosure rating	Model name	Part no.
	Female connector, M8, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	PVC	IP 67, IP 69K	DOL-0804-G02M	6009870
			5 m, 4-wire	PVC	IP 67, IP 69K	DOL-0804-G05M	6009872
	Female connector, M12, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	TPU	IP 67	DOL-1204-G02M	6009382
			5 m, 4-wire	TPU	IP 67	DOL-1204-G05M	6009866

#### Female connector (ready to assemble)






Figure	Connection type head A	Connection type head B	Connector material	Enclosure rating	Model name	Part no.
	Female connector, M8, 3-pin, straight	Screw-type terminals	PBT	IP 67	DOS-0803-G	7902077
	Female connector, M8, 3-pin, angled	Pin penetration	PBT	IP 67	DOS-0803-W	7902078

### Universal bar clamp systems

Figure	Material	Description	Model name	Part no.
	Zinc plated steel (sheet), Diecast zinc (clamp)	Plate N06 for universal clamp bracket	BEF-KHS-N06	2051612

Reflectors


**Angular**

Figure	Material	Description	Model name	Part no.
	PMMA/ABS	Rectangular, screw connection, 47 mm x 47 mm	P250	5304812
		Rectangular, screw connection, 38 mm x 15 mm	PL20A	1012719
		Rectangular, screw connection, 56 mm x 28 mm	PL30A	1002314
		Rectangular, screw connection, 37 mm x 56 mm	PL40A	1012720
		Rectangular, screw connection, 80 mm x 80 mm	PL80A	1003865

**Reflective tape**

Figure	Description	Model name	Part no.
	Self-adhesive, 50 mm x 60 mm	REF-IRF-56	5314244

**Round**

Figure	Material	Description	Model name	Part no.
	PMMA/ABS	Round, screw connection	C110A	5304549

→ For additional accessories, please see page L-861