

# An ultra-thin type that can be mounted anywhere thanks to its angled cable and flexible mounting hole.

- Flexible mounting hole: Hole pitch of 8 to 11 mm
- Visible indicators even from back of the housing (Flat ON type)
- Angled cable



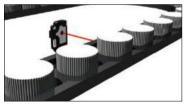




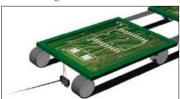
### **Detection of IC**



**Detection of plastic bottle caps** 



Positioning of substrate



**Detection of parts on parts feeder** 



# Selection table

# ■ Flat ON type

Туре		Chana	0	0	Model	
		Shape	Sensing distance	Output mode	NPN type	PNP type
Through-beam				Light ON	ET-500NL	ET-500PL
		Ų Ų	(a 500 mm	Dark ON	ET-500ND	ET-500PD
Diffu	no rofloativo	<u> </u>	100 mm	Light ON	<b>ED-100NL</b>	ED-100PL
Diffuse-reflective		Ų	100 11111	Dark ON	<b>ED-100ND</b>	ED-100PD
•	Short-range		3 to 8 mm	Light ON	EL-08NL	EL-08PL
imited diffuse reflective	type			Dark ON	EL-08ND	EL-08PD
	Mid-range	<u> </u>	2 to 15 mm	Light ON	EL-15NL	EL-15PL
	type	H		Dark ON	EL-15ND	EL-15PD
	Long-range	ong-range	5 to 30 mm	Light ON	EL-30NL	EL-30PL
	type		5 to 30 mm	Dark ON	EL-30ND	EL-30PD

# ■ Side ON type

Туре	Shape	Sensing distance	Output mode	Model		
Type	Snape	Sensing distance		NPN type	PNP type	
Through-beam		500 mm	Light ON	ET-S500NL	ET-S500PL	
Tillough-beam	H H		Dark ON	ET-S500ND	ET-S500PD	
Diffuse-reflective		30 mm	Light ON	ED-S30NL	ED-S30PL	
Dilluse-reliective			Dark ON	ED-S30ND	ED-S30PD	
Limited diffuse reflective 2 to 15 mm		2 to 15 mm	Light ON	EL-S15NL	EL-S15PL	
reflective	<b>#</b>	2 10 13 1111/1	Dark ON	EL-S15ND	EL-S15PD	

# Options/Accessories

Slit mask (Flat ON through-beam type for ET-500 ==)



### BL-W2F-1.5

Slit hole diameter: ø1.5 mm (2 pieces)

	Equipped on both sides	Equipped on one side (emitting side)			
Sensing distance	250 mm	350 mm			
Smallest detectable object	ø1.2 mm	ø1.5 mm			

### BL-W2F-1

Slit hole diameter: ø1.0 mm (2 pieces)

	Equipped on both sides	Equipped on one side (emitting side)
Sensing distance	200 mm	250 mm
Smallest detectable object	ø0.8 mm	ø1.2 mm



S

S2 C-R

PLN

# Can be mounted anywhere

Both Flat ON and Side ON types are available

When there is limited space in width, choose Side ON type. When height is limited, choose Flat ON type. Selections can be made based on the situation.

Side ON type

# Flat ON type



Through-beam type



Diffuse/limited diffuse reflective type



Through-beam type



Diffuse/limited diffuse reflective type

# **Ultra-thin type**

Thickness of only 3.5 mm (Flat ON type)

You can install this series into very narrow space.

\*Thickness of Side ON type is 5 mm.



# Angled cable design

prevents cable stress

The cable is angled coming out from the corner of the housing enabling it to be mounted in various positions without stress on the cable.

# Flexible mounting hole:

Mounting hole pitch: 8 to 11 mm

Flexible mounting is possible using holes whose pitch was altered during machining or holes that were already made.

Flat ON type



# Indicators visible even from back of the housing

(Flat ON type)

Equipped with a stability indicator (green) and output indicator (orange) to enable visibility from front and rear of sensors. When making light axis adjustments, indicators can be confirmed without being turned to the front every time.



<sup>\*</sup>The Side ON type is visible from the left and right.

# otoelectric Sensors

# Photoelectric Sensors

Specialized Photoelectric Sensors

Laser Displacement Sensors

# Sensors with Built-in Amplifier

Z3 Z-M

Z-IVI	
Z2	
Е	
J	
K	
S	
S2	
C-R	
C2	

PLN

# Miniature type E series

# **Specifications**

# ■ Flat ON type

Туре		Through-beam	Diffuse-reflective	Limited	l diffuse reflecti	ve type		
туре		type	type	Long-range	Mid-range	Short-range		
	NPN	Light ON model	ET-500NL	ED-100NL	EL-30NL	EL-15NL	EL-08NL	
Mode		Dark ON model	ET-500ND	<b>ED-100ND</b>	EL-30ND	EL-15ND	EL-08ND	
IVIOU	PNP	Light ON model	ET-500PL	ED-100PL	EL-30PL	EL-15PL	EL-08PL	
	FINE	Dark ON model	ET-500PD	ED-100PD	EL-30PD	EL-15PD	EL-08PD	
Sens	sing distar	ice	500 mm	100 mm*	5 to 30 mm*	2 to 15 mm*	3 to 8 mm*	
Ligh	t source		Red LED					
Spot	size		Approx. ø140 mm	Approx. ø60 mm	Approx. ø20 mm	Approx. ø10 mm	Approx. ø10 mm	
Spoi	SIZE		At distance of 500 mm	At distance of 100 mm	At distance of 30 mm	At distance of 15 mm	At distance of 10 mm	
Sma	llest dete	table object	ø1.2 mm		_	_		
Resp	onse time	)			0.5 ms or less			
Hyst	eresis		_	15	%	10	%	
Dista	ance adjus	tment			None			
Indic	ators		Output indicator (orange LED), stability indicator (green LED), power indicator (red LED)					
maic	ators		(only through-beam type emitter)					
Conf	trol output		NPN/PNP type Open collector Max. 50 mA/24 VDC					
Outp	out mode		Select a model from between Light ON models and Dark ON models					
Coni	nection ty	ре	Cable type: Cable length: 2 m ø2.5 mm					
و و	Supply vo	oltage	12 to 24 VDC ±10%, including 10% ripple (p-p)					
Rating	Current c	onsumption	Emitter: 14 mA or less	or less 20 mA or less				
ш			Receiver: 16 mA or less					
Appl	icable reg	ulations	EMC directive (2004/108/EC)					
Appl	icable sta	ndards	EN 60947-5-2					
Com	pany star	dards	Noise resistance: Feilen Level 3 cleared					
ا تع	Ambient tem	perature/humidity	-25 to +55°C (no freezing) / 35 to 85% RH (no condensation)					
Environmental resistance	Ambient	lluminance	Sunlight: 10,000 lx Incandescent lamp: 3,000 lx					
onn ista	Vibration	resistance	10 to 55 Hz; double amplitude 1.5 mm; 2 hours in each of the X, Y, and Z directions					
n Vir	Shock re	sistance	Approx	c. 50 G (500 m/s²); 3 times in each of the X, Y, and Z directions				
Degree of protection		IP67						
Mate	erial				PC			
Weight without cable		Emitter: Approx. 2 g Receiver: Approx. 3 g	Approx. 3 g					
Included accessories		ssories		M2 screw, nut × 2 of each				

<sup>\*</sup>Using a  $50 \times 50$  mm white sheet of paper.

- Specifications are subject to change without prior notice for product improvement purposes.
- M8 pig tail connector type is also available. Please inquire separately.
- When mounting sensors, always use the included screws.

# isors with Built-in mplifier

# ■ Side ON type

Туре			Through-heam type	Through-beam type Diffuse-reflective type				
туре		·C	i ili ougii-bealli type	Diliuse-reflective type	Mid-range	Photoelec Sensora		
	NPN	Light ON model	ET-S500NL	ED-S30NL	EL-S15NL			
Model		Dark ON model	ET-S500ND	ED-S30ND	EL-S15ND	ည် လ		
IVIOC	PNP	Light ON model	ET-S500PL	ED-S30PL	EL-S15PL	둡		
	PINP	Dark ON model	ET-S500PD	ED-S30PD	EL-S15PD			
Sens	sing distar	ice	500 mm	30 mm*	2 to 15 mm*			
Ligh	t source			Red LED				
C	:		Approx. ø60 mm	Approx. ø3 mm	Approx. ø2 mm	Photoelectric Sensors		
Spo	t size		At distance of 500 mm	At distance of 30 mm	At distance of 15 mm	55115515		
Sma	allest detec	table object	ø0.8 mm		_	Specialized Photoelectri		
Res	ponse time	)	0.25 ms or less	0.5 ms	s or less	Sensors		
Hyst	teresis		=	10	0%	Laser		
Dista	ance adjus	tment		None		Displacemer Sensors		
المماا			Output indicator (orange LE	D), stability indicator (green LE	D), power indicator (red LED)			
inaid	cators		(	only through-beam type emitte	er)	Sensors with Built-in		
Control output			NPN/PNP	NPN/PNP type Open collector Max. 50 mA/24 VDC				
Outp	Output mode		Select a model from	Select a model from between Light ON models and Dark ON models				
Con	nection typ	ре	Cab	le type: Cable length: 2 m ø2.5	5 mm	Z3		
g	Supply vo	ltage	12 to 24	VDC ±10%, including 10% rip	Z-M			
Rating	Current	onsumption	Emitter: 14 mA or less	20 mA	or loss	Z2		
Œ	Current C	onsumption	Receiver: 16 mA or less	20 mA or less		Е		
App	licable reg	ulations	EMC directive (2004/108/EC)			E		
App	licable sta	ndards	EN 60947-5-2			J		
Com	npany stan	dards	Noise resistance: Feilen Level 3 cleared			K		
ल	Ambient temp	erature/humidity	-25 to +55°C (r	-25 to +55°C (no freezing) / 35 to 85% RH (no condensation)				
nent nce	Ambient i	lluminance	Sunlight	Sunlight: 10,000 lx Incandescent lamp: 3,000 lx				
vironment esistance	Vibration	resistance	10 to 55 Hz; double amplitude 1.5 mm; 2 hours in each of the X, Y, and Z directions			S2		
resi	Ambient illuminance Vibration resistance Shock resistance		Approx. 50 G (500 m/s²); 3 times in each of the X, Y, and Z directions			C-R		
Degree of protection		protection		IP67				
Mate	erial			PC		C2		
\\/a!	abt without	t ooblo	Emitter: Approx. 2 g	Λ	ov 2 a	PLN		
vveig	Weight without cable		Receiver: Approx. 3 g	Appro	ox. 3 g			
Inclu	uded acces	ssories		M2 screw, nut × 2 of each				

<sup>\*</sup>Using a  $50 \times 50$  mm white sheet of paper.

- Specifications are subject to change without prior notice for product improvement purposes.
- M8 pig tail connector type is also available. Please inquire separately.
- When mounting sensors, always use the included screws.

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# Photoelectric Sensors

Specialized Photoelectric Sensors

Laser Displacement Sensors

# Sensors with Built-in Amplifier

Z3 Z-M

Z2

**E** J

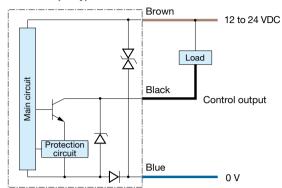
K S S2 C-R

> C2 PLN

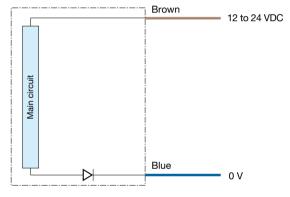
# Miniature type E series

# Output circuit diagram

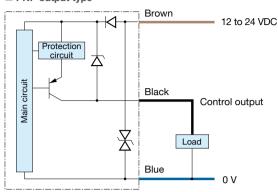
■ NPN output type



■ Through-beam type emitter



■ PNP output type



# Notes

- ■When using a switching regulator for the power supply, be sure to ground the frame ground terminal.
- Because wiring sensor wires with high-voltage wires or power supply wires can result in malfunctions due to noise, which can cause damage, make sure to wire separately.
- Avoid using the transient state while the power is on (approx. 100 ms).

Laser Displacement Sensors

# Sensors with Built-in Amplifier

Z3 Z-M

Z2

J K

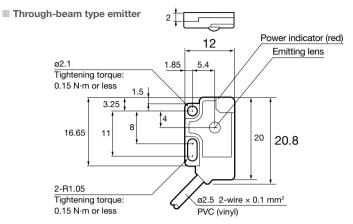
S S2

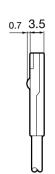
C-R

C2 PLN

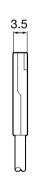
# **Dimensions**

Flat ON type (Unit:mm)

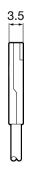




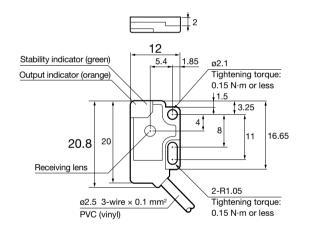
■ Through-beam type receiver

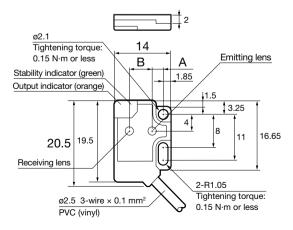


■ Diffuse-reflective type/limited diffuse reflective type



	Diffuse-	Limited diffuse reflective			
	reflective	Long-range	Mid-range	Short-range	
А	2.75	3.25	3.45	3.65	
В	5.7	5.0	4.6	4.2	





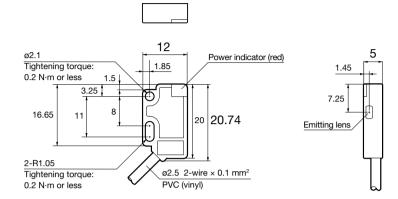
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# Miniature type E series

# Dimensions

Side ON type (Unit:mm)

■ Through-beam type emitter



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## Sensors with Built-in Amplifier

Z3 Z-M

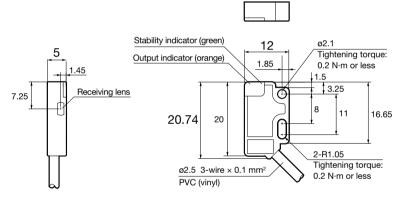
Z2

E J

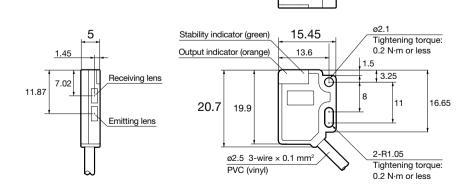
S

S2 C-R

C2 PLN ■ Through-beam type receiver



■ Diffuse-reflective type/limited diffuse reflective type



(Unit: mm)

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# Sensors with Built-in Amplifier

Z3 Z-M

Z2

J K

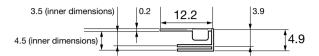
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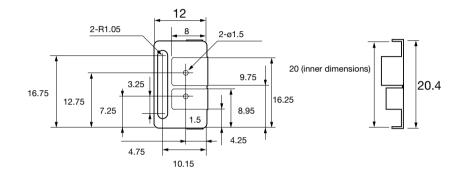
S2 C-R

C2 PLN

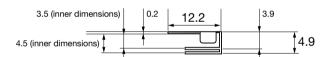
# Slit mask (Flat ON through-beam type for ET-500□□)

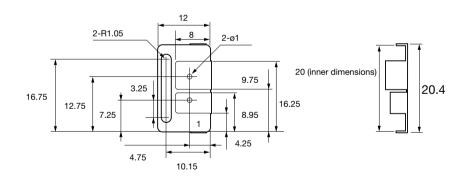
■ BL-W2F-1.5





### ■ BL-W2F-1





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### Sensors with Built-in Amplifier

Z3 Z-M

Z2

# J K S

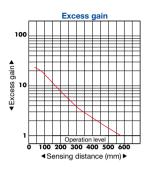
C-R

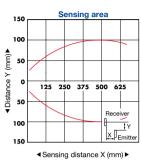
PLN

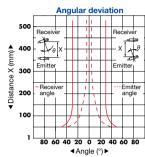
# Miniature type E series

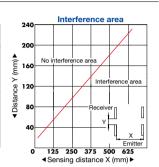
# Typical characteristic data

# ET-500

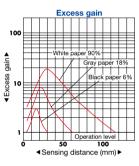


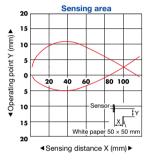


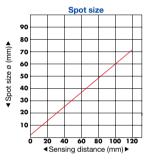


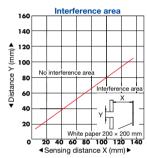


# **ED-100**

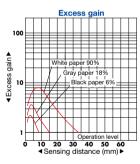


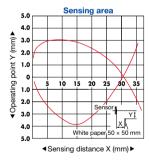


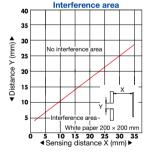


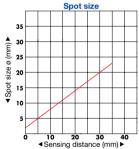


# **EL-30**□

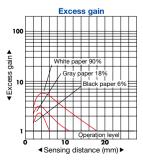


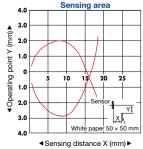


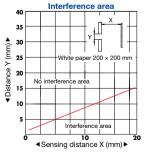


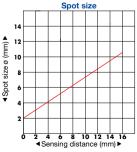


# EL-15□









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### Sensors with Built-in Amplifier

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Z-M

Z2

# Е

K

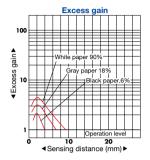
J

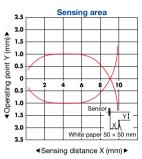
S S2

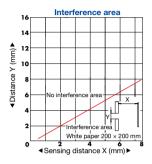
C-R C2

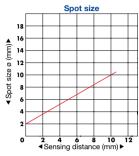
PLN

# **EL-08**□

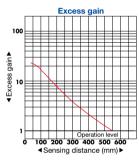


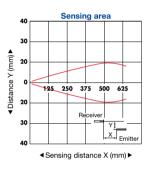


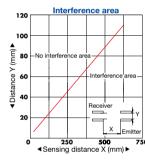


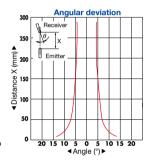


# ET-S500□

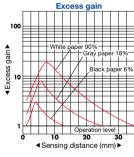


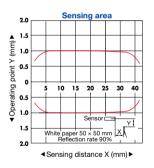


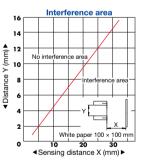


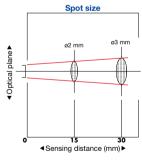


# **ED-S30**□









# EL-S15□

