

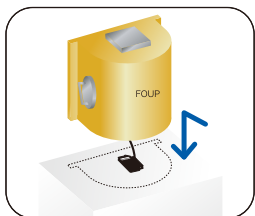
Photoelectric Sensor

E series

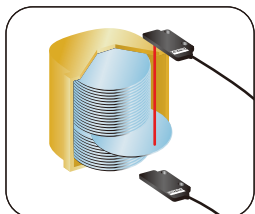


- Super Side-sense Type projects the beam from the 5mm (0.19 inch) of wide edge of the sensor.
- M8 pig-tail connector types are available for all models.
- Tough mechanics. 100G Shock Resistance and IP67 Water tightness.
- Easily visible indicator LED can be seen even from the back.

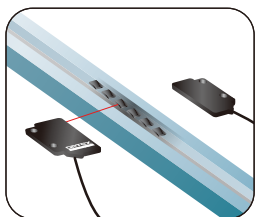
Applications



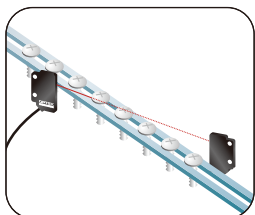
Detecting presence of FOUF



Detection of wafer extending from cassette

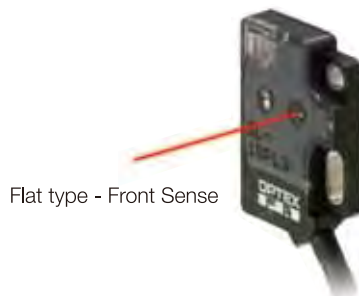


Detecting parts presence from parts feeder



Detecting screws at output of feeder

2 type select



M8 pig-Tail connector for easy maintenance.



M8 Pig-Tail

IP67 rating

RoHS compliant



Operating LED visible in the back

It's convenient. Verifying the operation of the sensor is easy.

Front view



Back view



Universal mounting holes.

Flexible mounting for easy installation.



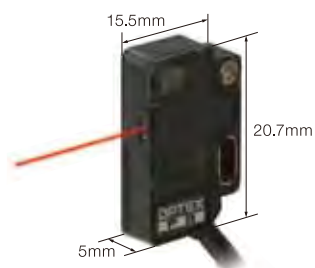
3.5mm thin dimensions (Flat type)

Leading edge of sensing functions are designed in this thin size. Ideal for space saving.
(Side sense type : 5mm)

3.5mm



Super Side-Sense type



Unique Side-Sensing Type available in Diffuse, Convergent and Thru-Beam.
M8 Pigtail models in both 3 and 4 pin types.

EL-S series Convergent Type

15mm (0.6 inch) sensing distance.
Light-On/Dark-On models available.
+/-0.1mm (0.004 inch) repeat accuracy.
2mm (0.07 inch) project spot diameter at 15mm distance.
0.5 msec. response speed.

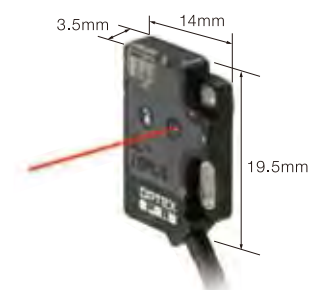
ED-S series Diffuse Reflective Type

30mm sensing distance.
Light-On/Dark-On models available.
+/-0.05mm (0.002 inch) repeat accuracy.
30mm sensing distance with 10% Hysteresis.

ET-S series Thru-Beam Type

500mm (19.7 inch) sensing distance.
Light-On/Dark-On models available.
+/-0.1mm (0.004 inch) repeat accuracy.
0.25 msec. response speed.

Flat type - Front Sense



Thin and flat design for space saving. Three different models of Convergent models.

EL - series Convergent Type

3 different sensing distance are available.
30mm (1.18 inch), 15mm (0.6 inch), and 8mm (0.31 inch) for close installation.
Compact housing is ideal for space saving.

ED - series Diffuse Reflective Type

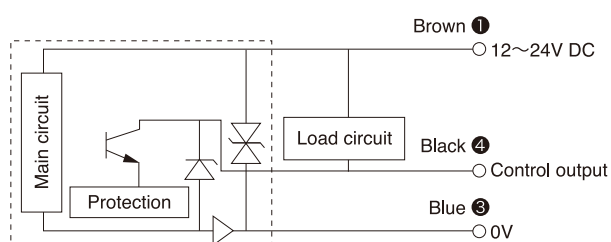
Standard diffuse reflective type with 100mm (3.94 inch) sensing distance.

ET - series Thru-Beam Type

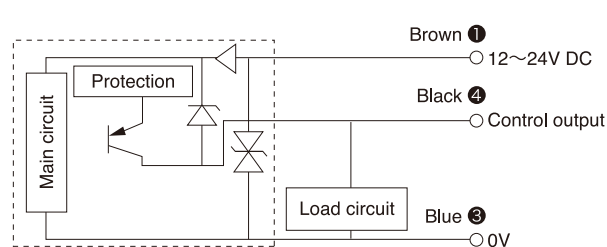
0.5msec response speed and sharp optical system designed in 12 x 20 x 3.5 mm dimensions.

Circuit diagram

NPN output



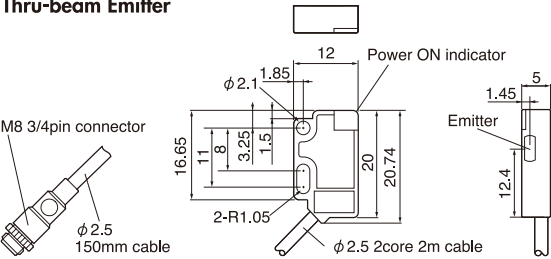
PNP output



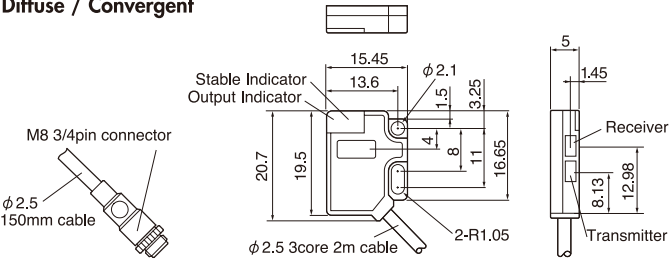
Dimensions

Super side - Sensing type

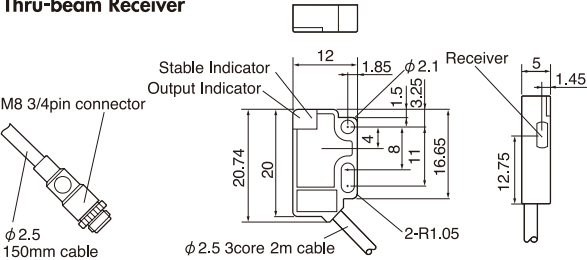
Thru-beam Emitter



Diffuse / Convergent



Thru-beam Receiver



<3 Pin configuration>

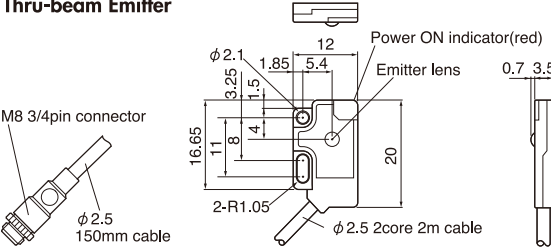


<4 Pin configuration>

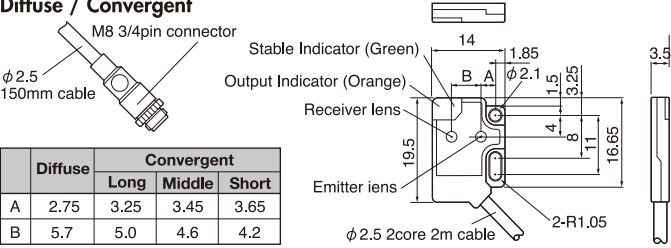


Flat type - Front Sensing

Thru-beam Emitter

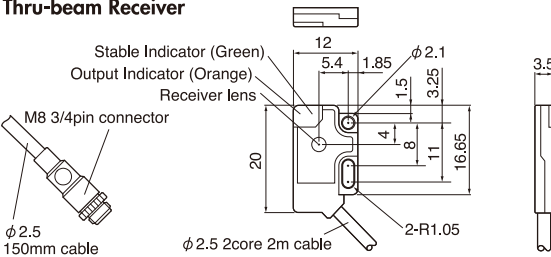


Diffuse / Convergent



	Diffuse	Convergent		
		Long	Middle	Short
A	2.75	3.25	3.45	3.65
B	5.7	5.0	4.6	4.2

Thru-beam Receiver



<3 Pin configuration>



<4 Pin configuration>



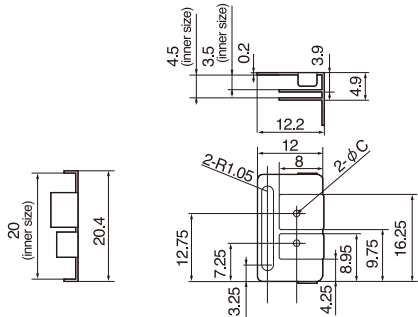
Options

Slit mask

BL-W2F-1 (= $\phi 1$ mm)
BL-W2F-1.5 (= $\phi 1.5$ mm)

	BL-W2F-1	BL-W2F-1.5
C	1	1.5
D	1	1.5

Material: SUS304 t=0.2



(Unit : mm)

Specifications

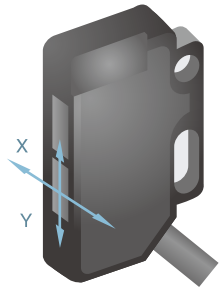
Super Side - Sensing type

Model			Diffuse 30mm	Convergent 15mm	Thru-beam 500mm
NPN type	Light ON	2m cable	ED-S30NL	EL-S15NL	ET-S500NL
		M8 pigtail - 3pin	ED-S30NL3	EL-S15NL3	ET-S500NL3
		M8 pigtail - 4pin	ED-S30NL4	EL-S15NL4	ET-S500NL4
	Dark ON	2m cable	ED-S30ND	EL-S15ND	ET-S500ND
		M8 pigtail - 3pin	ED-S30ND3	EL-S15ND3	ET-S500ND3
		M8 pigtail - 4pin	ED-S30ND4	EL-S15ND4	ET-S500ND4
PNP type	Light ON	2m cable	ED-S30PL	EL-S15PL	ET-S500PL
		M8 pigtail - 3pin	ED-S30PL3	EL-S15PL3	ET-S500PL3
		M8 pigtail - 4pin	ED-S30PL4	EL-S15PL4	ET-S500PL4
	Dark ON	2m cable	ED-S30PD	EL-S15PD	ET-S500PD
		M8 pigtail - 3pin	ED-S30PD3	EL-S15PD3	ET-S500PD3
		M8 pigtail - 4pin	ED-S30PD4	EL-S15PD4	ET-S500PD4
Supply voltage			DC 12 to 24V ±10% Inc. 10% ripple		
Power consumption			20mA Max		30mA Max
Sensing distance			30mm	2 - 15mm	500mm
Spot size			φ3mm @ 30mm	φ2mm @ 15mm	φ60mm @ 500mm
Objects			Not restricted		opaque object
Repeat accuracy			+/-0.05mm Max		+/-0.1mm Max
Response time			0.25msec(ET), 0.5msec(ED,EL)		
Light souce			Red LED		
Hysteresis			10%		—
Control output			NPN or PNP Open collector, 1.8V -50mA		
Environmental illuminance			50mA/DC24V Max		
			10,000 lx Max		
Sunlight		3,000 lx Max			
Incandescent lamp					
Operating temp / humidity			-25 up to 55 °C / 35 up to 85%		
Storage conditions			-40 up to 70 °C / 35 up to 95%		
Noise resistance			EN60947-5-2:1998 (Immunity) EN60947-5-2:1998 (radiation)		
Vibration resistance			10 to 55Hz, 1.5mm, X-Y-Z each for 2 hours		
Shock resistance			1000m/S ² , X-Y-Z each for 3 times		
Protection category			IP67		
Warm-up time			100ms		
LED Indicator			Green (stable), Orenges (output), Red (Power of emitter : ET type)		
Connector and cable			2m cable, φ2.5mm 3 cores (2 cores for emitter) / M8 Pigtail 150 mm		
Circuit protection			Over Current, Reverse Polarity, Short Circuit		
Material			PC		
Conformity			CE		

Flat type - Front Sensing

Model			Diffuse 100mm	Convergent 8/15/30mm			Thru-beam 500mm
NPN type	Light ON	2m cable	ED-100NL	EL-30NL	EL-15NL	EL-08NL	ET-500NL
		M8 pigtail - 3pin	ED-100NL3	EL-30NL3	EL-15NL3	EL-08NL3	ET-500NL3
		M8 pigtail - 4pin	ED-100NL4	EL-30NL4	EL-15NL4	EL-08NL4	ET-500NL4
	Dark ON	2m cable	ED-100ND	EL-30ND	EL-15ND	EL-08ND	ET-500ND
		M8 pigtail - 3pin	ED-100ND3	EL-30ND3	EL-15ND3	EL-08ND3	ET-500ND3
		M8 pigtail - 4pin	ED-100ND4	EL-30ND4	EL-15ND4	EL-08ND4	ET-500ND4
PNP type	Light ON	2m cable	ED-100PL	EL-30PL	EL-15PL	EL-08PL	ET-500PL
		M8 pigtail - 3pin	ED-100PL3	EL-30PL3	EL-15PL3	EL-08PL3	ET-500PL3
		M8 pigtail - 4pin	ED-100PL4	EL-30PL4	EL-15PL4	EL-08PL4	ET-500PL4
	Dark ON	2m cable	ED-100PD	EL-30PD	EL-15PD	EL-08PD	ET-500PD
		M8 pigtail - 3pin	ED-100PD3	EL-30PD3	EL-15PD3	EL-08PD3	ET-500PD3
		M8 pigtail - 4pin	ED-100PD4	EL-30PD4	EL-15PD4	EL-08PD4	ET-500PD4
Supply voltage			DC 12 to 24V ±10% Inc. 10% ripple				
Power consumption			20mA Max				
Sensing distance			100mm	5 - 30mm	2 - 15mm	3 - 8mm	30mA Max
Spot size			φ 60mm @ 100mm	φ 20mm @ 30mm	φ 10mm @ 15mm	φ 10mm @ 8mm	500mm
Objects			Not restricted				
Response time			0.5msec Max				
Hysteresis			White Paper : 10% (EL-08 and EL-15),15%(EL-30 and EL-100)				
Control output			NPN or PNP Open collector, 50mA Max / 24V DC				
Environmental illuminance			Sun light:10,000 lux Max,Incandescent lamp:3,000 lux Max				
Operating temp / humidity			-25 up to 55 °C / 35 up to 85%				
Storage temp / humidity			-40 up to 70 °C / 35 up to 95%				
Noise resistance			EN60947-5-2:1998 (Immunity) EN60947-5-2:1998 (radiation)				
Vibration resistance			10 to 55Hz, 1.5mm, X-Y-Z each for 2 hours				
Shock resistance			1000m/S ² , X-Y-Z each for 3 times				
Protection category			IP67				
Warm-up time			15msec				
LED Indicator			Green (stable), Orange (output), Red (Power of emitter : ET type)				
Operating mode			Light ON / Dark ON selectable				
Connector and cable			2m cable, φ 2.5mm 3 conductors (2 conductors for emitter) / M8 Pigtail 150 mm				
Circuit protection			Over Current, Reverse Polarity, Short Circuit				
Material			PC				
Conformity			CE				

Reference (typical)



Repeat Accuracy

ET-S500	
X	Y
0.1	0.1

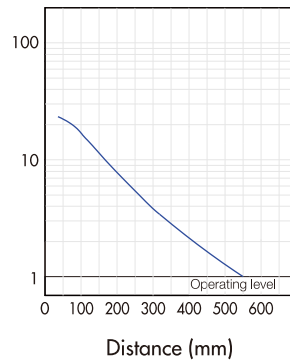
ED-S30	
X	Y
0.05	0.05

EL-S15	
X	Y
0.05	0.05

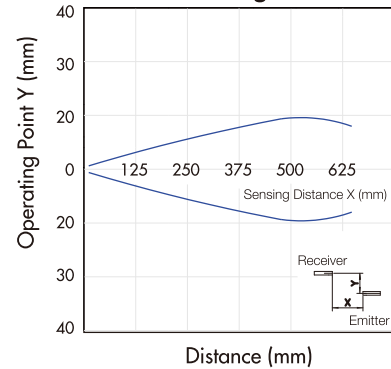
(Unit : mm)

ET-S500

Excess Gain

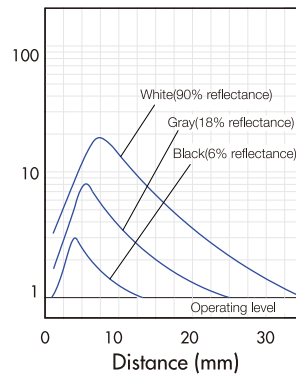


Sensing area

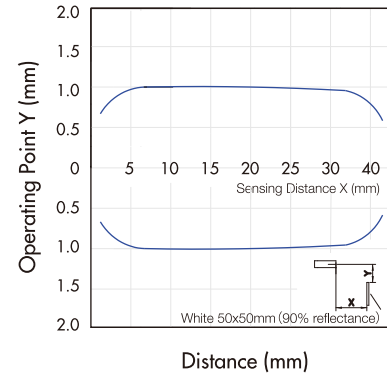


ED-S30

Excess Gain

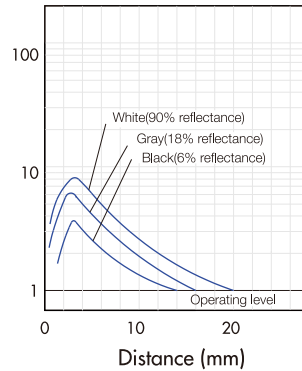


Sensing area

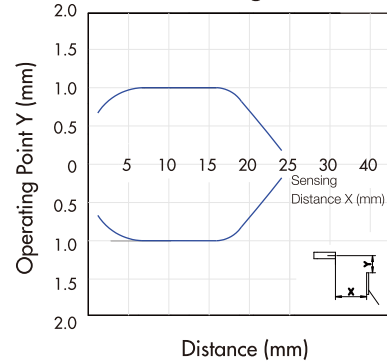


EL-S15

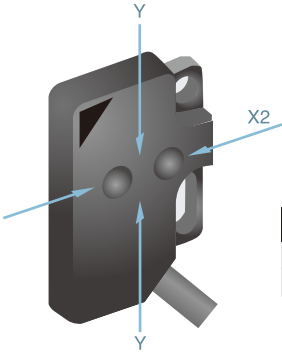
Excess Gain



Sensing area



Reference (typical)



Repeat Accuracy

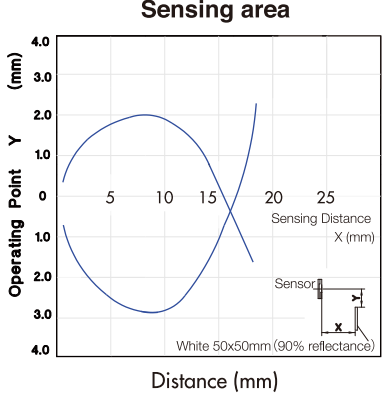
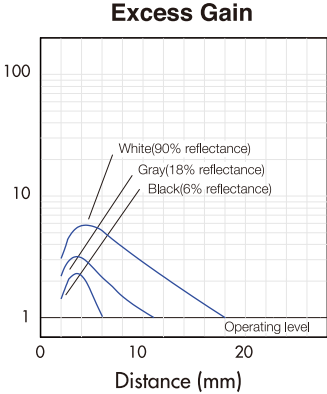
EL-30		
X1	X2	Y
0.8	0.8	0.8

EL-15		
X1	X2	Y
0.3	0.3	0.3

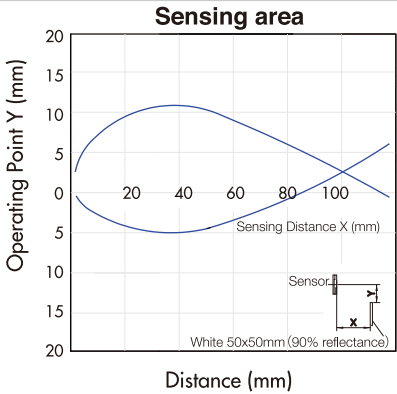
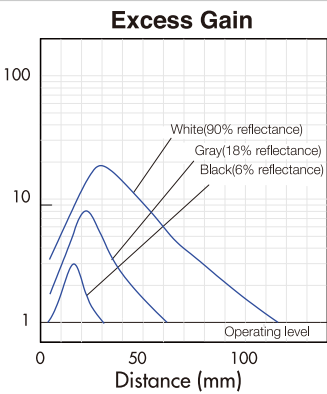
EL-08		
X1	X2	Y
0.1	0.1	0.1

(Unit : mm)

EL-15



ED-100



ET-500

