Miniature type

E series

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

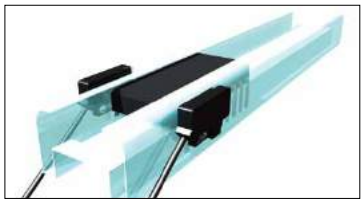
- Flexible mounting hole: Hole pitch of 8 to 11 mm
- Visible indicators even from back of the housing (Flat ON type)
- Angled cable

Related products

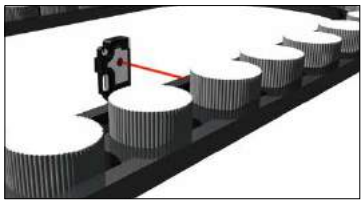
Types with potentiometer
S
● P.208

Fiber type
D3RF
● P.110

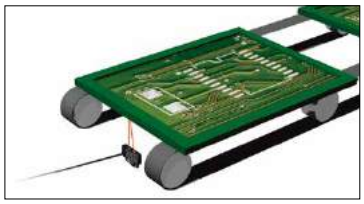
Detection of IC



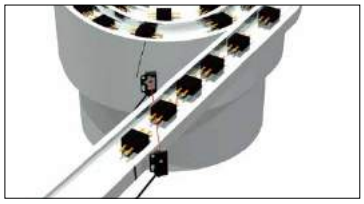
Detection of plastic bottle caps



Positioning of substrate



Detection of parts on parts feeder



Selection table

Flat ON type

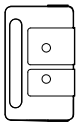
Type		Shape	Sensing distance	Output mode	Model	
					NPN type	PNP type
Through-beam			500 mm	Light ON	ET-500NL	ET-500PL
				Dark ON	ET-500ND	ET-500PD
Diffuse-reflective			100 mm	Light ON	ED-100NL	ED-100PL
				Dark ON	ED-100ND	ED-100PD
Limited diffuse reflective	Short-range type		3 to 8 mm	Light ON	EL-08NL	EL-08PL
				Dark ON	EL-08ND	EL-08PD
	Mid-range type		2 to 15 mm	Light ON	EL-15NL	EL-15PL
				Dark ON	EL-15ND	EL-15PD
	Long-range type		5 to 30 mm	Light ON	EL-30NL	EL-30PL
				Dark ON	EL-30ND	EL-30PD

Side ON type

Type	Shape	Sensing distance	Output mode	Model	
				NPN type	PNP type
Through-beam		500 mm	Light ON	ET-S500NL	ET-S500PL
			Dark ON	ET-S500ND	ET-S500PD
Diffuse-reflective		30 mm	Light ON	ED-S30NL	ED-S30PL
			Dark ON	ED-S30ND	ED-S30PD
Limited diffuse reflective		2 to 15 mm	Light ON	EL-S15NL	EL-S15PL
			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

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.

Flat ON type

Through-beam type

Diffuse/limited diffuse reflective type

Side ON type

Through-beam type

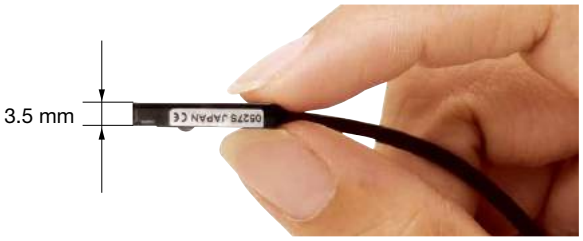
Diffuse/limited diffuse reflective type

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.

Front

Rear

*The Side ON type is visible from the left and right.

Specifications

■ Flat ON type

Type			Through-beam type	Diffuse-reflective type	Limited diffuse reflective type		
					Long-range	Mid-range	Short-range
Model	NPN	Light ON model	ET-500NL	ED-100NL	EL-30NL	EL-15NL	EL-08NL
		Dark ON model	ET-500ND	ED-100ND	EL-30ND	EL-15ND	EL-08ND
	PNP	Light ON model	ET-500PL	ED-100PL	EL-30PL	EL-15PL	EL-08PL
		Dark ON model	ET-500PD	ED-100PD	EL-30PD	EL-15PD	EL-08PD
Sensing distance			500 mm	100 mm*	5 to 30 mm*	2 to 15 mm*	3 to 8 mm*
Light source			Red LED				
Spot size			Approx. ø140 mm At distance of 500 mm	Approx. ø60 mm At distance of 100 mm	Approx. ø20 mm At distance of 30 mm	Approx. ø10 mm At distance of 15 mm	Approx. ø10 mm At distance of 10 mm
Smallest detectable object			ø1.2 mm	—			
Response time			0.5 ms or less				
Hysteresis			—	15%		10%	
Distance adjustment			None				
Indicators			Output indicator (orange LED), stability indicator (green LED), power indicator (red LED) (only through-beam type emitter)				
Control output			NPN/PNP type Open collector Max. 50 mA/24 VDC				
Output mode			Select a model from between Light ON models and Dark ON models				
Connection type			Cable type: Cable length: 2 m ø2.5 mm				
Rating	Supply voltage		12 to 24 VDC ±10%, including 10% ripple (p-p)				
	Current consumption		Emitter: 14 mA or less Receiver: 16 mA or less	20 mA or less			
Applicable regulations			EMC directive (2004/108/EC)				
Applicable standards			EN 60947-5-2				
Company standards			Noise resistance: Feilen Level 3 cleared				
Environmental resistance	Ambient temperature/humidity		-25 to +55°C (no freezing) / 35 to 85% RH (no condensation)				
	Ambient illuminance		Sunlight: 10,000 lx Incandescent lamp: 3,000 lx				
	Vibration resistance		10 to 55 Hz; double amplitude 1.5 mm; 2 hours in each of the X, Y, and Z directions				
	Shock resistance		Approx. 50 G (500 m/s^2); 3 times in each of the X, Y, and Z directions				
	Degree of protection		IP67				
Material			PC				
Weight without cable			Emitter: Approx. 2 g Receiver: Approx. 3 g	Approx. 3 g			
Included accessories			M2 screw, nut × 2 of each				

*Using a 50 × 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.

■ Side ON type

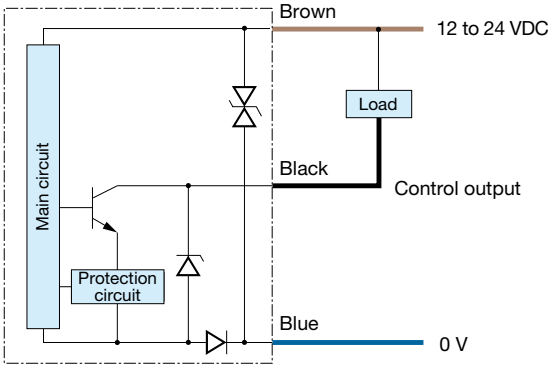
Type			Through-beam type	Diffuse-reflective type	Limited diffuse reflective type
					Mid-range
Model	NPN	Light ON model	**ET-S500NL**	**ED-S30NL**	**EL-S15NL**
		Dark ON model	**ET-S500ND**	**ED-S30ND**	**EL-S15ND**
	PNP	Light ON model	**ET-S500PL**	**ED-S30PL**	**EL-S15PL**
		Dark ON model	**ET-S500PD**	**ED-S30PD**	**EL-S15PD**
Sensing distance			500 mm	30 mm*	2 to 15 mm*
Light source			Red LED		
Spot size			Approx. ø60 mm At distance of 500 mm	Approx. ø3 mm At distance of 30 mm	Approx. ø2 mm At distance of 15 mm
Smallest detectable object			ø0.8 mm	—	
Response time			0.25 ms or less	0.5 ms or less	
Hysteresis			—	10%	
Distance adjustment			None		
Indicators			Output indicator (orange LED), stability indicator (green LED), power indicator (red LED) (only through-beam type emitter)		
Control output			NPN/PNP type Open collector Max. 50 mA/24 VDC		
Output mode			Select a model from between Light ON models and Dark ON models		
Connection type			Cable type: Cable length: 2 m ø2.5 mm		
Rating	Supply voltage		12 to 24 VDC ±10%, including 10% ripple (p-p)		
	Current consumption		Emitter: 14 mA or less Receiver: 16 mA or less	20 mA or less	
Applicable regulations			EMC directive (2004/108/EC)		
Applicable standards			EN 60947-5-2		
Company standards			Noise resistance: Feilen Level 3 cleared		
Environmental resistance	Ambient temperature/humidity		-25 to +55°C (no freezing) / 35 to 85% RH (no condensation)		
	Ambient illuminance		Sunlight: 10,000 lx Incandescent lamp: 3,000 lx		
	Vibration resistance		10 to 55 Hz; double amplitude 1.5 mm; 2 hours in each of the X, Y, and Z directions		
	Shock resistance		Approx. 50 G (500 m/s^2); 3 times in each of the X, Y, and Z directions		
	Degree of protection		IP67		
Material			PC		
Weight without cable			Emitter: Approx. 2 g Receiver: Approx. 3 g	Approx. 3 g	
Included accessories			M2 screw, nut × 2 of each		

*Using a 50 × 50 mm white sheet of paper.

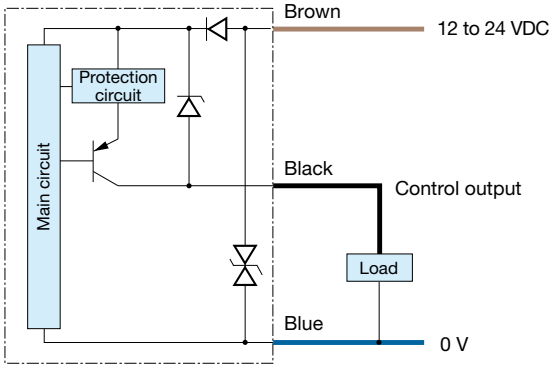
- Specifications are subject to change without prior notice for product improvement purposes.
- M8 pig tail connector type is also available. Please inquire separately.
- When mounting sensors, always use the included screws.

Output circuit diagram

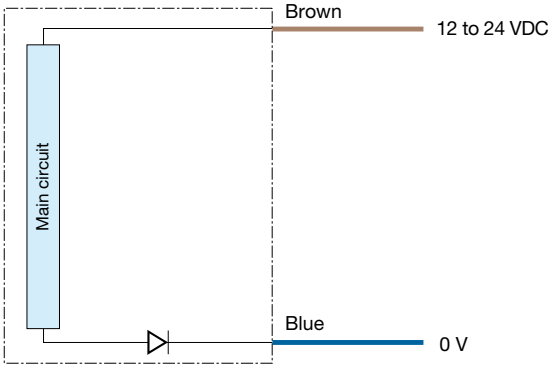
NPN output type



PNP output type



Through-beam type emitter



Notes

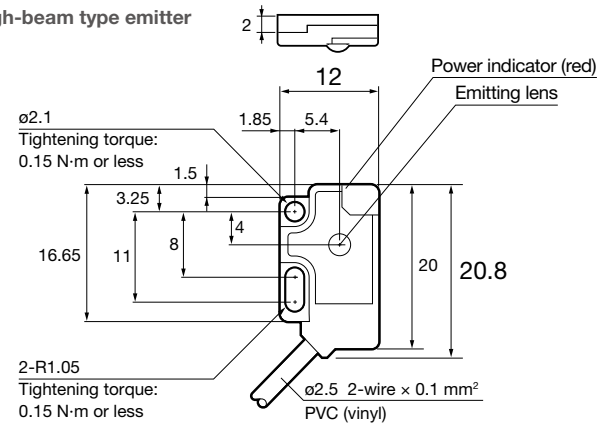
- When using a switching regulator for the power supply, be sure to ground the frame ground terminal.
- Because wiring sensor wires with high-voltage wires or power supply wires can result in malfunctions due to noise, which can cause damage, make sure to wire separately.
- Avoid using the transient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

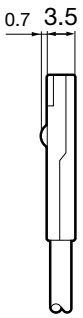
Dimensions

Flat ON type

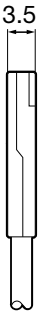
(Unit:mm)

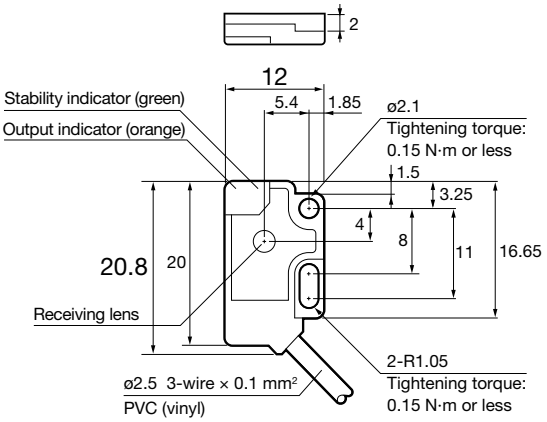
Through-beam type emitter



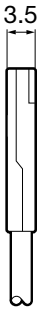


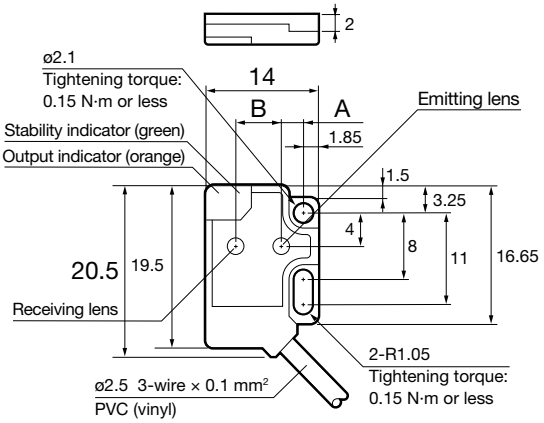
Through-beam type receiver





Diffuse-reflective type/limited diffuse reflective type





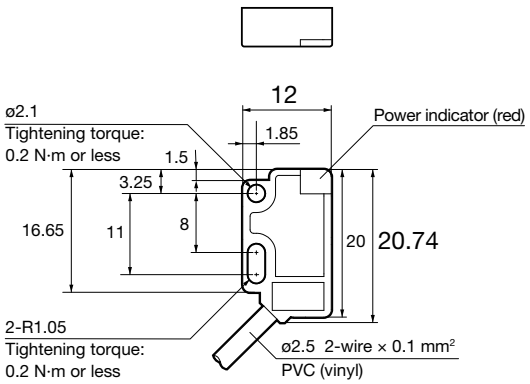
	Diffuse-reflective	Limited diffuse reflective		
		Long-range	Mid-range	Short-range
A	2.75	3.25	3.45	3.65
B	5.7	5.0	4.6	4.2

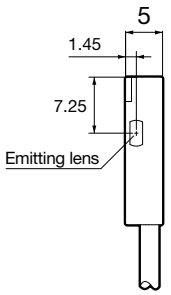
Dimensions

Side ON type

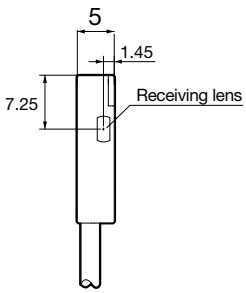
(Unit:mm)

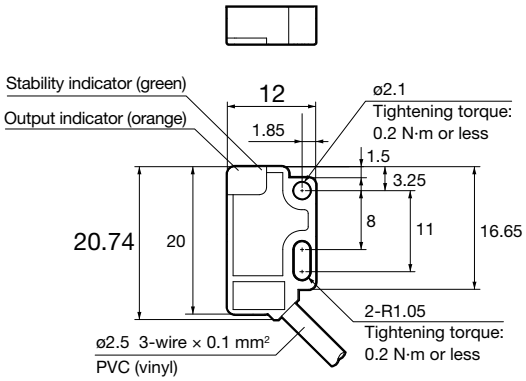
■ **Through-beam type emitter**



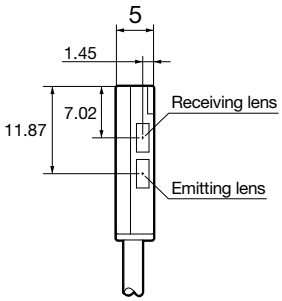


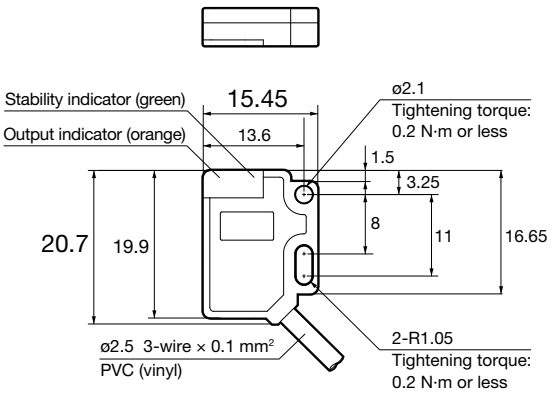
■ **Through-beam type receiver**





■ **Diffuse-reflective type/limited diffuse reflective type**

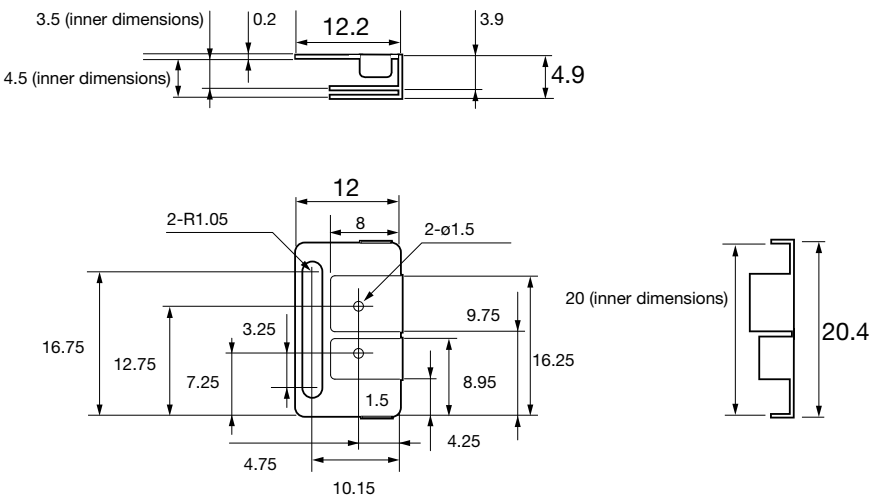




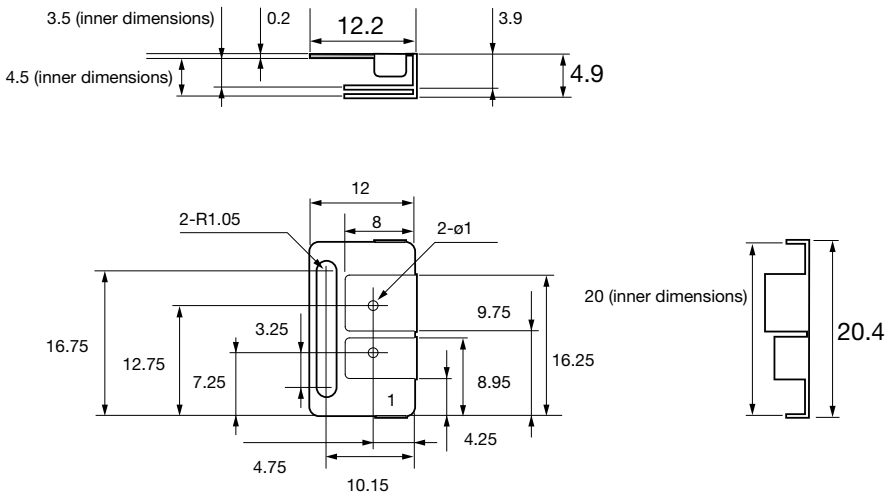
Slit mask (Flat ON through-beam type for ET-500□□)

(Unit: mm)

BL-W2F-1.5

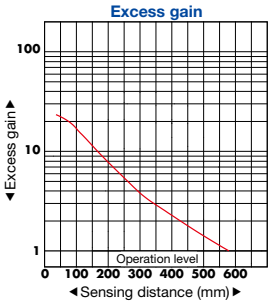


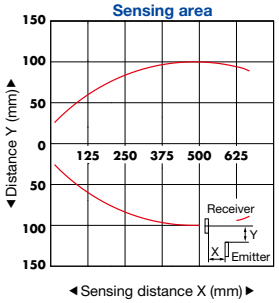
BL-W2F-1

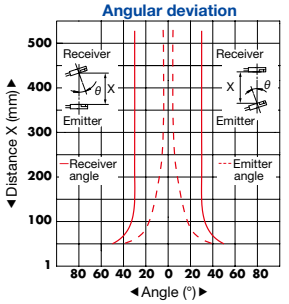


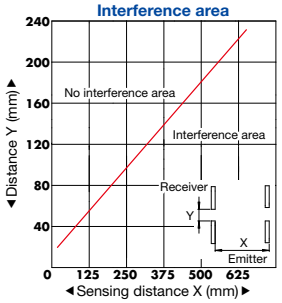
Typical characteristic data

ET-500□

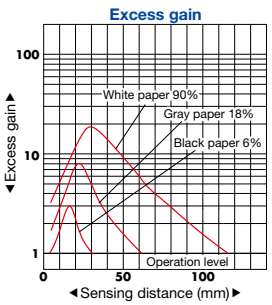


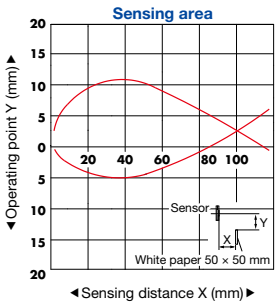


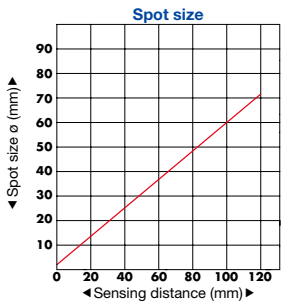


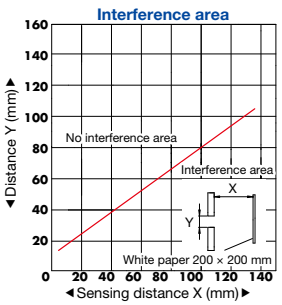


ED-100□

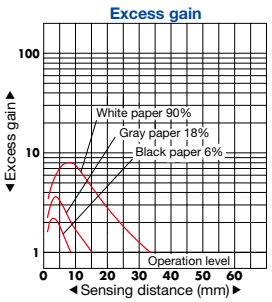


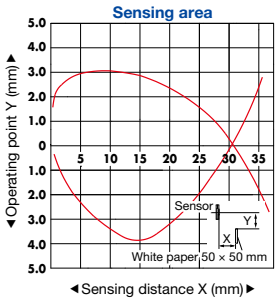


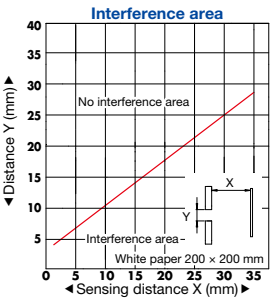


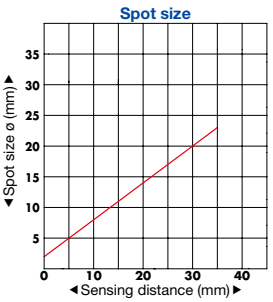


EL-30□

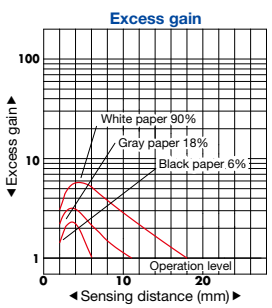


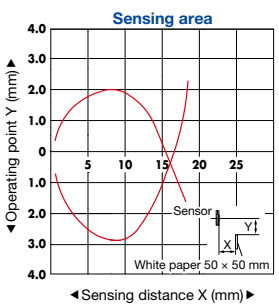


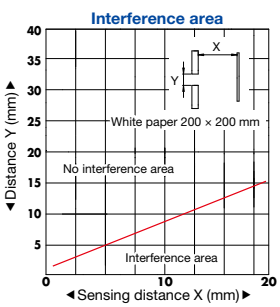


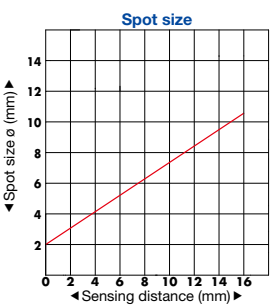


EL-15□

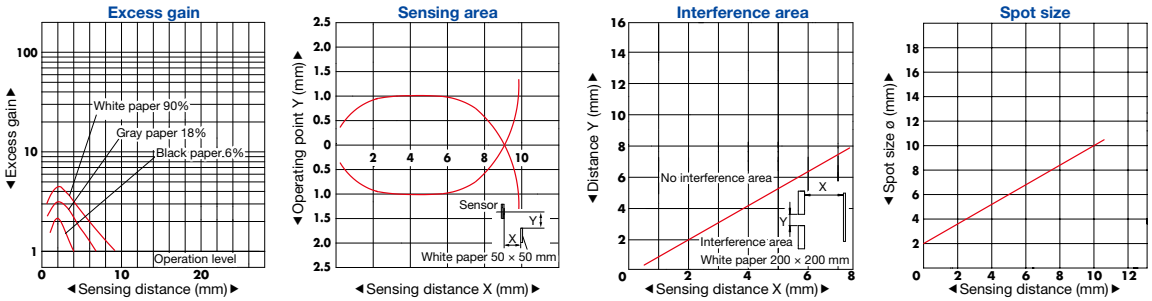




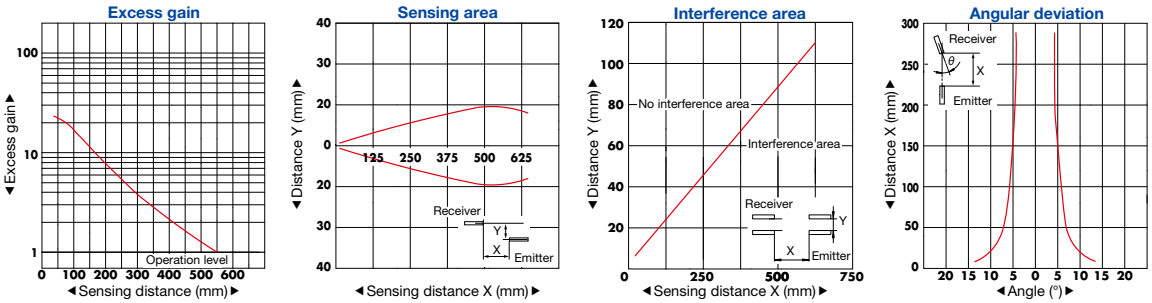




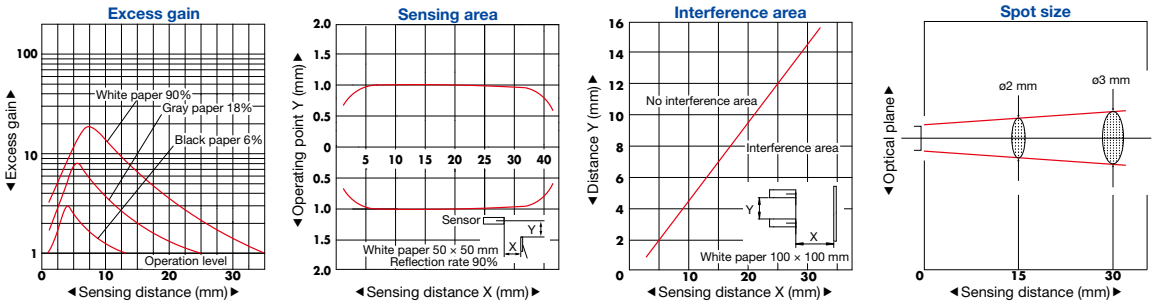
EL-08□



ET-S500□



ED-S30□



EL-S15□