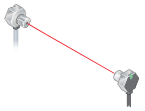
ENVIRONMENTAL RESISTANCE

Incorporated an inverter countermeasure circuit*

The **EX-30** series become significantly stronger against inverter light and other extraneous light.

*Effective from production in April 2011.



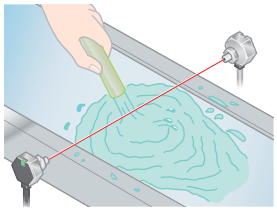
No protective tube needed

The **EX-30** series has high bending strength, so that the protective tube used to protect conventional fiber from breakage is not needed. This also adds up to excellent cost performance.

Waterproof IP67 (IEC)

The sensor can be hosed down because of its IP67 construction.

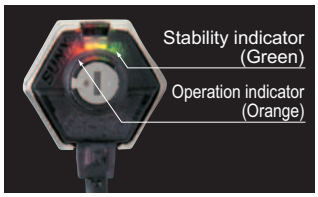
Note: However, take care that if it is exposed to water splashes during operation, it may detect a water drop itself.



FUNCTIONS

Bright 2-color indicator

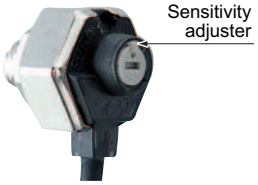
A bright 2-color indicator is incorporated in all types.



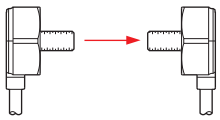
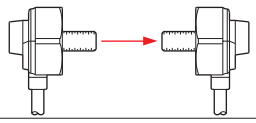
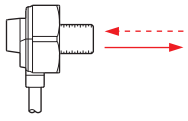
OPERABILITY

Incorporates a sensitivity adjuster (Excluding EX-31□)

The sensor incorporates a sensitivity adjuster. It is convenient when you need fine adjustment.



ORDER GUIDE

Type	Appearance	Sensing range	Model No. (Note)	Output	Output operation
Thru-beam		500 mm 19.685 in	**EX-31A**	NPN open-collector transistor	Light-ON
			EX-31B		Dark-ON
			EX-31A-PN	PNP open-collector transistor	Light-ON
			EX-31B-PN		Dark-ON
With operation mode switch		800 mm 31.496 in	**EX-33**	NPN open-collector transistor	Switchable either Light-ON or Dark-ON
			EX-33-PN	PNP open-collector transistor	
Diffuse reflective		50 mm 1.969 in	**EX-32A**	NPN open-collector transistor	Light-ON
			EX-32B		Dark-ON
			EX-32A-PN	PNP open-collector transistor	Light-ON
			EX-32B-PN		Dark-ON

Note: The model No. with "**P**" shown on the label affixed to the thru-beam type sensor is the emitter, "**D**" shown on the label is the receiver.

5 m 16.404 ft cable length type

5 m 16.404 ft cable length type(standard: 2 m 6.562 ft) is also available for NPN output type [excluding **EX-33**(**-PN**)].
When ordering this type, suffix "**-C5**" to the model No.
(e.g.) 5 m 16.404 ft cable length type of **EX-31A** is "**EX-31A-C5**".

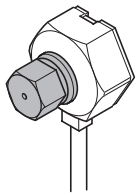
OPTIONS

Designation	Model No.	Description	
Slit mask (For thru-beam type sensor only)	**OS-EX30-1** (Slit size ø1 mm ø0.039 in)	Slit on one side	• Sensing range: 200 mm 7.874 in [**EX-31□(-PN)**] 320 mm 12.598 in [**EX-33(-PN)**] • Min. sensing object: ø2 mm ø0.079 in
		Slit on both sides	• Sensing range: 150 mm 5.906 in [**EX-31□(-PN)**] 240 mm 9.449 in [**EX-33(-PN)**] • Min. sensing object: ø1 mm ø0.039 in

Note: One slit and two spacers are provided per set. Two sets are required when installing on both sides.

Slit mask

• **OS-EX30-1**



Apply the optional slit mask when detecting small objects or for increasing the accuracy of sensing position.
However, the sensing range is reduced when the slit mask is mounted.

SPECIFICATIONS

Item \ Type		Thru-beam		With operation mode switch	Diffuse reflective	
Model No.	NPN output	**EX-31A**	**EX-31B**	**EX-33**	**EX-32A**	**EX-32B**
	PNP output	**EX-31A-PN**	**EX-31B-PN**	**EX-33-PN**	**EX-32A-PN**	**EX-32B-PN**
Sensing range		500 mm 19.685 in		800 mm 31.496 in	50 mm 1.969 in (Note 2)	
Sensing object		ø2 mm ø0.079 in or more opaque object (Completely beam interrupted objects)			Opaque, translucent or transparent object (Note 3)	
Hysteresis		———			15 % or less of operation distance (Note 2)	
Repeatability (perpendicular to sensing axis)		0.05 mm 0.002 in or less			0.5 mm 0.020 in or less	
Supply voltage		12 to 24 V DC ±10 % Ripple P-P 10 % or less				
Current consumption		Emitter: 10 mA or less, Receiver: 10 mA or less			13 mA or less	
Output		<NPN output type> NPN open-collector transistor • Maximum sink current: 50 mA • Applied voltage: 30 V DC or less (between output and 0 V) • Residual voltage: 2 V or less (at 50 mA sink current) 1 V or less (at 16 mA sink current)			<PNP output type> PNP open-collector transistor • Maximum source current: 50 mA • Applied voltage: 30 V DC or less (between output and +V) • Residual voltage: 2 V or less (at 50 mA source current) 1 V or less (at 16 mA source current)	
	Utilization category	DC-12 or DC-13				
	Output operation	Light-ON	Dark-ON	Switchable either Light-ON or Dark-ON	Light-ON	Dark-ON
	Short-circuit protection	Incorporated				
Response time		0.5 ms or less				
Operation indicator		Orange LED (lights up when the output is ON) (incorporated on the receiver for thru-beam type)				
Stability indicator		Green LED (lights up under stable light received condition or stable dark condition, incorporated on the receiver)			Green LED (lights up under stable light received condition or stable dark condition)	
Sensitivity adjuster		———		Continuously variable adjuster		
Environmental resistance	Pollution degree	3 (Industrial environment)				
	Protection	IP67 (IEC)				
	Ambient temperature	–25 to +55 °C –13 to +131 °F (No dew condensation or icing allowed), Storage: –30 to +70 °C –22 to +158 °F				
	Ambient humidity	35 to 85 % RH, Storage: 35 to 85 % RH				
	Ambient illuminance	Incandescent light: 3,000 ℓx at the light-receiving face				
	EMC	EN 60947-5-2				
	Voltage withstandability	1,000 V AC for one min. between all supply terminals connected together and enclosure				
	Insulation resistance	20 MΩ, or more, with 250 V DC megger between all supply terminals connected together and enclosure				
	Vibration resistance	10 to 500 Hz frequency, 3 mm 0.118 in amplitude (20 G max.) in X, Y and Z directions for two hours each				
	Shock resistance	500 m/s² acceleration (50 G approx.) in X, Y and Z directions for three times each				
Emitting element		Red LED (modulated)				
Material		Enclosure: Die-cast zinc (Nickel plated), Lens: Polycarbonate [**EX-32□(-PN)**: Acrylic], Enclosure cover: Polycarbonate				
Cable		0.1 mm² 3-core (thru-beam type sensor emitter: 2-core) cabtyre cable, 2 m 6.562 ft long				
Cable extension		Extension up to total 50 m 164.042 ft is possible with 0.3 mm², or more, cable (thru-beam type: both emitter and receiver).				
Weight		Net weight (each emitter and receiver): 20 g approx. Gross weight: 65 g approx.			Net weight: 20 g approx., Gross weight: 45 g approx.	
Accessories		Nut: 2 pcs., Toothed lock washer: 2 pcs.			Nut: 1 pc., Toothed lock washer: 1 pc.	

Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +23 °C +73.4 °F.
2) The sensing range and the hysteresis are specified for white non-glossy paper (100 × 100 mm 3.937 × 3.937 in) as the object.
3) Make sure to confirm detection with an actual sensor before use.