

FIBER
SENSORSLASER
SENSORSPHOTOELECTRIC
SENSORSMICRO
PHOTOELECTRIC
SENSORSAREA
SENSORSLIGHT CURTAINS /
SAFETY
COMPONENTSPRESSURE /
FLOW
SENSORSINDUCTIVE
PROXIMITY
SENSORSPARTICULAR
USE SENSORSSENSOR
OPTIONSSIMPLE
WIRE-SAVING
UNITSWIRE-SAVING
SYSTEMSMEASUREMENT
SENSORSSTATIC ELECTRICITY
PREVENTION
DEVICESLASER
MARKERS

PLC

HUMAN MACHINE
INTERFACESENERGY CONSUMPTION
VISUALIZATION
COMPONENTS

FA COMPONENTS

MACHINE VISION
SYSTEMSUV CURING
SYSTEMSSelection
GuideAmplifier
Built-inPower Supply
Built-inAmplifier-
separated

CX-400

CY-100

EX-10

EX-20

EX-30

EX-40

CX-440

EQ-30

EQ-500

MQ-W

RX-LS200

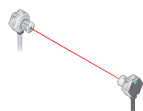
RX

RT-610

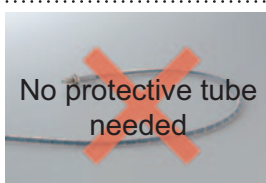
ENVIRONMENTAL RESISTANCE**Incorporated an inverter countermeasure circuit***

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

*Effective from production in April 2011.

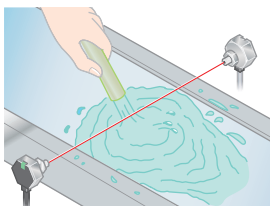
**No protective tube needed**

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.

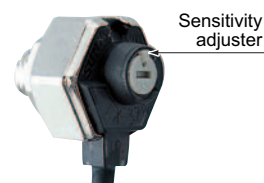
Note: However, take care that if it is exposed to water splashes during operation, it may detect a water drop itself.

**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			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			EX-33	NPN open-collector transistor	Switchable either Light-ON or Dark-ON
			EX-33-PN	PNP open-collector transistor	
Diffuse reflective			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)**].

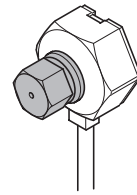
When ordering this type, suffix "**-C5**" to the model No.

(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 $\phi 1$ mm) $\phi 0.039$ 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: $\phi 2$ mm $\phi 0.079$ 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: $\phi 1$ mm $\phi 0.039$ 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

Type		Thru-beam			Diffuse reflective		
		With operation mode switch					
Item	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/s ² 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 mm ² 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 mm ² , 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.

FIBER
SENSORSLASER
SENSORSPHOTO-
ELECTRIC
SENSORSMICRO
PHOTO-
ELECTRIC
SENSORSAREA
SENSORSLIGHT
CURTAINS /
SAFETY
COMPONENTSPRESSURE /
FLOW
SENSORSINDUCTIVE
PROXIMITY
SENSORSPARTICULAR
USE
SENSORSSENSOR
OPTIONSSIMPLE
WIRE-
SAVING
UNITSWIRE-
SAVING
SYSTEMSMEASURE-
MENT
SENSORSSTATIC
ELECTRICITY
PREVENTION
DEVICESLASER
MARKERS

PLC

HUMAN
MACHINE
INTERFACESENERGY
CONSUMPTION
VISUALIZATION
COMPONENTSFA
COMPONENTSMACHINE
VISION
SYSTEMSUV
CURING
SYSTEMSSelection
GuideAmplifier
Built-inPower Supply
Built-inAmplifier-
separated**CX-400****CY-100****EX-10****EX-20****EX-30****EX-40****CX-440****EQ-30****EQ-500****MQ-W****RX-LS200****RX****RT-610**