

INSTRUCTION MANUAL

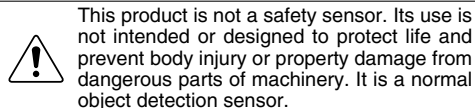
New-form Beam Sensor **Amplifier Built-in**
EX-30 Series

1 SPECIFICATIONS

Type	Thru-beam type	Diffuse reflective type
Model No.	NPN output	EX-31A EX-31B EX-32A EX-32B
Item	PNP output	EX-31A-PN EX-31B-PN EX-32A-PN EX-32B-PN
Sensing range	500mm	50mm (Note)
Sensing object	ø2mm or more opaque object	Opaque, translucent or transparent object
Hysteresis	—	15% or less of operation distance
Repeatability (perpendicular to sensing axis)	0.05mm or less	0.5mm or less
Supply voltage	12 to 24V DC±10%	Ripple P-P 10% or less
Current consumption	Emitter: 10mA or less Receiver: 15mA or less	20mA or less
Output	(NPN output type) NPN open-collector transistor • Maximum sink current: 50mA • Applied voltage: 30V DC or less (between output and 0V) • Residual voltage: 1V or less (at 50mA sink current) 0.4V or less (at 16mA sink current) (PNP output type) PNP open-collector transistor • Maximum source current: 50mA • Applied voltage: 30V DC or less (between output and +V) • Residual voltage: 1V or less (at 50mA source current) 0.4V or less (at 16mA source current)	
Output operation	Light ON	Dark ON
Short-circuit protection	Incorporated (restored automatically)	
Response time	0.5ms 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
Protection	IP67 (IEC)	
Ambient temperature	−25 to +55°C (No dew condensation or icing allowed), Storage: −30 to +70°C	
Ambient humidity	35 to 85% RH, Storage: 35 to 85% RH	
Emitting element	Red LED (modulated)	
Material	Enclosure: Die-cast zinc Lens: Polycarbonate (EX-31□), Acrylic (EX-32□) Enclosure cover: Polycarbonate	
Cable	0.1mm ² 3-core (thru-beam type sensor emitter: 2-core) cabtyre cable, 2m long	
Weight	Emitter/Receiver: 20g approx.	20g approx.
Accessories	Nut: 2 Nos. Toothed washer: 2 Nos.	Nut: 1 No. Toothed washer: 1 No.

Note: The sensing range is specified for white non-glossy paper (100 × 100mm) as the object.

Thank you very much for using SUNX sensors. Please read this Instruction Manual carefully and thoroughly for the correct and optimum use of this sensor. Kindly keep this manual in a convenient place for quick reference.

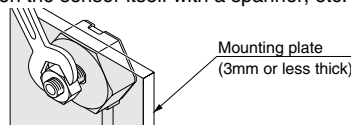


2 CAUTIONS

- Make sure to carry out the wiring in the power supply off condition.
- Take care that wrong wiring will damage the sensor.
- Verify that the supply voltage variation is within the rating.
- If power is supplied from a commercial switching regulator, ensure that the frame ground (F.G.) terminal of the power supply is connected to an actual ground.
- In case noise generating equipment (switching regulator, inverter motor, etc.) is used in the vicinity of this product, connect the frame ground (F.G.) terminal of the equipment to an actual ground.
- Do not use during the initial transient time (50ms) after the power supply is switched on.
- Extension up to total 50m (thru-beam type: both emitter and receiver) is possible with 0.3mm², or more, cable. However, in order to reduce noise, make the wiring as short as possible.
- Make sure that stress is not applied directly to the sensor cable joint.
- Do not run the wires together with high-voltage lines or power lines or put them in the same raceway. This can cause malfunction due to induction.
- Take care that the sensor is not directly exposed to fluorescent light from a rapid-starter lamp or a high frequency lighting device, as it may affect the sensing performance.
- Avoid dust, dirt, and steam.
- Take care that the sensor does not come in direct contact with water, oil, grease, or organic solvents, such as, thinner, etc.
- Make sure to use an isolation transformer for the DC power supply. If an auto-transformer (single winding transformer) is used, this product or the power supply may get damaged.
- In case a surge is generated in the used power supply, connect a surge absorber to the supply and absorb the surge.
- In case of using the sensor at a place where static electricity is generated, use a metal mounting plate. Also, ensure to ground the mounting plate.

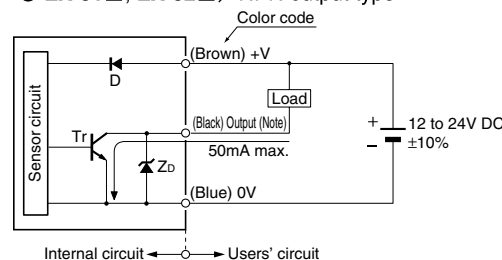
3 MOUNTING

- Mount the sensor on a mounting plate 3mm or less thick, using the enclosed nut and toothed washer. When tightening the nut, hold the sensor with hand or a spanner and make sure that the tightening torque is 0.6N·m (EX-32□: 1.0N·m) or less. Do not tighten the sensor itself with a spanner, etc.



4 I/O CIRCUIT DIAGRAMS

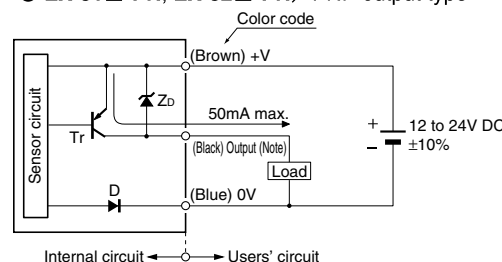
- EX-31□, EX-32□ / NPN output type



Note: The emitter of the thru-beam type sensor does not incorporate the output.

Symbols... D : Reverse supply polarity protection diode
Zd: Surge absorption zener diode
Tr: NPN output transistor

- EX-31□-PN, EX-32□-PN / PNP output type

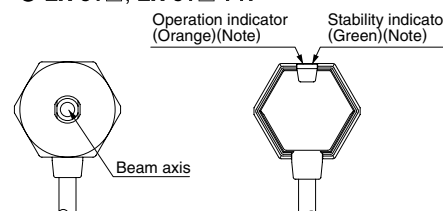


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Symbols... D : Reverse supply polarity protection diode
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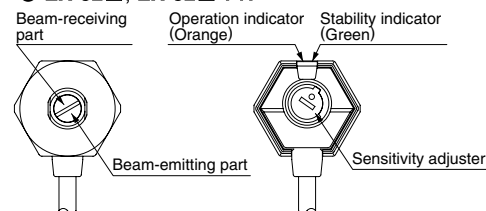
5 PART DESCRIPTION

- EX-31□, EX-31□-PN



Note: Not incorporated on the emitter.

- EX-32□, EX-32□-PN



6 SENSITIVITY ADJUSTMENT (Diffuse reflective type only)

Step	Sensitivity adjuster	Description
①		Turn the sensitivity adjuster fully counterclockwise to the minimum sensitivity position.
②		In the light received condition, turn the sensitivity adjuster slowly clockwise and confirm the point ② where the sensor enters the 'Light' state operation.
③		In the dark condition, turn the sensitivity adjuster further clockwise until the sensor enters the 'Light' state operation and then bring it back to confirm point ③ where the sensor just returns to the 'Dark' state operation. (If the sensor does not enter the 'Light' state operation even when the sensitivity adjuster is turned fully clockwise, this extreme position is point ③.)
④		The position at the middle of points ② and ③ is the optimum sensing position.

Note: Turn the sensitivity adjuster slowly. Turning with excessive strength will damage the adjuster.

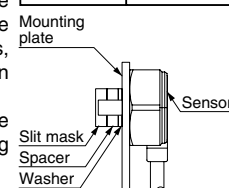
7 OPTIONAL SLIT MASK (Thru-beam type only)

- Apply the optional slit mask (OS-EX30-10) when detecting small objects or for increasing the accuracy of sensing position. However, the sensing range is reduced when the slit mask is mounted.

Mounting method

- ① Insert the sensor into the mounting plate.
- ② Fit the washer and spacers enclosed with the slit mask. Note that the number of spacers to be fitted differs with the mounting plate thickness, as given in the table on the right.
- ③ Mount the slit mask. Make sure that the tightening torque is 0.6N·m or less.

Mounting plate thickness	No. of spacers
3mm	0 No.
2mm	1 No.
1mm	2 Nos.



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