



INSTRUCTION MANUAL

Photoelectric Sensor Ultra-slim Type EX-10 Series

1 SPECIFICATIONS

Type	Thru-beam				Convergent reflective
	Front sensing	Side sensing	Front sensing	Side sensing	Front sensing
Model No. (Note 1)	EX-11A(-PN / -R)	EX-11EA(-PN / -R)	EX-13A(-PN / -R)	EX-13EA(-PN / -R)	EX-19A(-PN / -R)
Light-ON	EX-11A(-PN / -R)	EX-11EA(-PN / -R)	EX-13A(-PN / -R)	EX-13EA(-PN / -R)	EX-19A(-PN / -R)
Dark-ON	EX-11B(-PN / -R)	EX-11EB(-PN / -R)	EX-13B(-PN / -R)	EX-13EB(-PN / -R)	EX-14A(-PN / -R)
Item	EX-11B(-PN / -R)	EX-11EB(-PN / -R)	EX-13B(-PN / -R)	EX-13EB(-PN / -R)	EX-19B(-PN / -R)
Sensing range	150mm		500mm		1m
Min. sensing object	φ 1mm opaque object (Setting distance between emitter and receiver: 150mm)		φ 2mm opaque object (Setting distance between emitter and receiver: 500mm)		φ 2mm opaque object (Setting distance between emitter and receiver: 1m)
Hysteresis	—				15% or less of operation distance
Repeatability (perpendicular to sensing axis)	0.05mm or less				0.1mm 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	<EX-□A(-R), EX-□B(-R)> 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)		<EX-□A-PN, EX-□B-PN> 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)		
Short-circuit protection	Incorporated				
Response time	0.5ms or less				
Operation indicator	Red LED (lights up when the output is ON), located on the receiver for the thru-beam type sensor				
Stability indicator	Green LED (lights up under stable light received condition or stable dark condition), located on the receiver for the thru-beam type sensor				
Protection	IP67 (IEC)				
Ambient temperature	-25 to +55°C (Note 3) (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: Polyethylene terephthalate, Lens: Polyacrylate				
Cable	0.1mm ² 3-core (thru-beam type emitter: 2-core) cabtyre cable, 2m long (Note 4)				
Weight	Emitter, receiver: 20g approx. each				20g approx.
Accessories	Mounting screws: 2 sets				Mounting screws: 1 set

Notes: 1) Model Nos. having the suffix '-PN' are PNP output type. Further, model Nos. having suffix '-R' are inflection resistant cable type. (NPN output type only)
The model No. with suffix 'P' shown on the label affixed to the thru-beam type sensor is the emitter, 'D' shown on the label is the receiver.
Thru-beam type sensor emitter: EX-□P, Thru-beam type sensor receiver: EX-□D

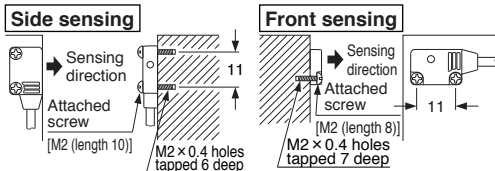
Thank you very much for using SUNX products. Please read this Instruction Manual carefully and thoroughly for the correct and optimum use of this product. Kindly keep this manual in a convenient place for quick reference.

WARNING

- Never use this product as a sensing device for personnel protection.
- In case of using sensing devices for personnel protection, use products which meet laws and standards, such as OSHA, ANSI or IEC etc., for personnel protection applicable in each region or country.

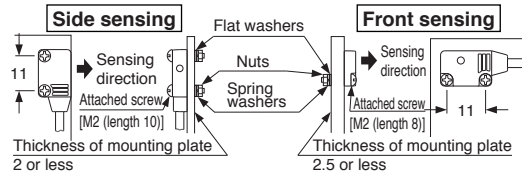
2 MOUNTING

- In case of mounting on tapped holes (Unit: mm)



- The tightening torque should be 0.2N·m or less.

- In case of using attached screws and nuts (Unit: mm)



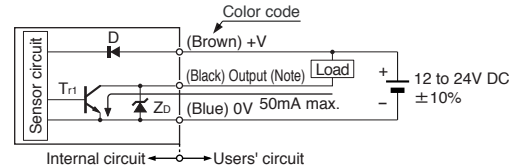
- The tightening torque should be 0.2N·m or less.

3 CAUTIONS

- This product has been developed / produced for industrial use only.
- For the convergent reflective type EX-14□, if there is a reflective object (e.g., a conveyor, etc.) in the background of the sensing object, since it may affect the sensing, use by keeping enough distance from the reflective object.
- The thin cable (0.1mm²) is used for this product. Thus, take care that if the cable is pulled with excessive force, it may cause cable break.
- Make sure that the power supply is off while wiring.
- 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 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.
- Extension up to total 50m, is possible with 0.3mm², or more, cable for both, emitter and receiver. However, in order to reduce noise, make the wiring as short as possible.
- Do not use during the initial transient time (50ms) after the power supply is switched on.
- Take care that the sensor is not directly exposed to fluorescent lamp from a rapid-starter lamp, a high frequency lighting device or sunlight etc., as it may affect the sensing performance.
- This sensor is suitable for indoor use only.
- Avoid dust, dirt, and steam. Do not use it in places having excessive vapor, dust, etc., or where it may come in contact with corrosive gas.
- Take care that the sensor does not come in contact with water, oil, grease, organic solvents, such as, thinner etc., or strong acid, and alkaline.
- Make sure that stress by forcible bend or pulling is not applied directly to the sensor cable joint.
- Since the cable end is not waterproof, do not use the sensor in the application where water may seep in from the cable end.

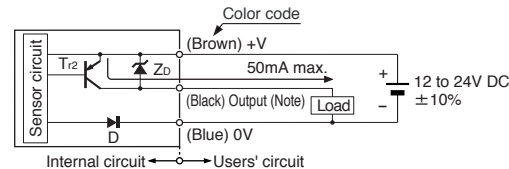
4 I/O CIRCUIT DIAGRAMS

- EX-□A(-R), EX-□B(-R) / NPN output type



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

- EX-□A-PN, EX-□B-PN / PNP output type



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

Symbols... D : Reverse supply polarity protection diode
Z_D : Surge absorption zener diode
T₁ : NPN output transistor
T₂ : PNP output transistor

5 OPTIONAL SENSOR MOUNTING BRACKET

- When mounting the sensor with the optional sensor mounting bracket, use the attached M2 screws and the tightening torque should be 0.2N·m or less.
- Six types of optional sensor mounting brackets are available.

Model No.	Description	Material
MS-EX10-1	Mounting bracket for front sensing type only Two M2 (length 4mm) pan head screws are attached.	Cold rolled carbon steel (SPCC)
MS-EX10-2	Mounting bracket for side sensing type only Two M2 (length 8mm) pan head screws are attached.	
MS-EX10-3	L-shaped mounting bracket Two M2 (length 4mm) pan head screws, and two M2 (length 8mm) pan head screws are attached.	Stainless steel (SUS304)
MS-EX10-11	Mounting bracket for front sensing type only Two M2 (length 4mm) pan head screws (stainless steel) are attached.	
MS-EX10-12	Mounting bracket for side sensing type only Two M2 (length 8mm) pan head screws (stainless steel) are attached.	
MS-EX10-13	L-shaped mounting bracket Two M2 (length 4mm) pan head screws (stainless steel), and two M2 (length 8mm) pan head screws (stainless steel) are attached.	

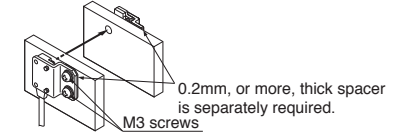
6 OPTIONAL SLIT MASK (EX-13□ and EX-19□ only)

- Apply a 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.

Model No.	Description	Material
OS-EX10-12	Slit mask for front sensing type only (hole diameter: φ 1.2mm)	Stainless steel (SUS304)
OS-EX10-15	Slit mask for front sensing type only (hole diameter: φ 1.5mm)	
OS-EX10E-12 (Note)	Slit mask for side sensing type only (hole diameter: φ 1.2mm)	

Note: Excluding EX-19□.

- The slit mask should be mounted on the sensor before mounting the sensor.
- If the front sensing type sensor is used along with the slit mask and the optional sensor mounting bracket for the front sensing type, MS-EX10-1 or MS-EX10-11, as shown in the figure below, a 0.2mm, or more, thick spacer is separately required.



7 INTENDED PRODUCTS FOR CE MARKING

- The models listed under '1 SPECIFICATIONS' come with CE Marking. As for all other models, please contact our office.



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