

INSTRUCTION MANUAL

Multiple Voltage Beam Sensor NX5 Series

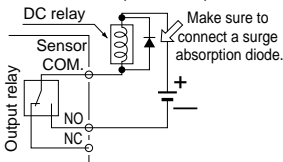
1 SPECIFICATIONS

Model No.	Type	Thru-beam		Retroreflective		Diffuse reflective
		Long sensing range	With polarizing filters (Note 1)	Long sensing range		
Light-ON		NX5-M10RA	NX5-M30A	NX5-PRVM5A	NX5-RM7A	NX5-D700A
Dark-ON		NX5-M10RB	NX5-M30B	NX5-PRVM5B	NX5-RM7B	NX5-D700B
Sensing range		10m	30m	0.1 to 5m (Note 2)	0.1 to 7m (Note 2)	700mm (Note 3)
Sensing object		Opaque object of ≥ 20 mm or more (Note 4)	Opaque, translucent or specular objects of ≥ 30 mm or more (Note 2)	Opaque or translucent object of ≥ 50 mm or more (Note 2)	Opaque or translucent transparent object	Opaque, translucent or transparent object
Hysteresis						15% or less of operation distance
Supply voltage		24 to 240V AC $\pm 10\%$ or 12 to 240V DC $\pm 10\%$, Ripple P-P: 10% or less				
Power consumption		Emitter: 1VA or less Receiver: 2VA or less	Emitter: 1.5VA or less Receiver: 2VA or less	2VA or less		
Output		Relay contact 1c Δ E Switching capacity: 250V AC 1A (resistive load) 30V DC 2A (resistive load) Δ E Electrical life: 100,000 or more operations (at AC rated load) 500,000 or more operations (at DC rated load) Δ E Mechanical life: 100,000,000 or more operations				
Response time		10ms or less				
Operation indicator		Red LED (lights up when the output is ON)				
Stability indicator		Green LED (lights up during the stable Light or the stable Dark condition)				
Power indicator			Red LED (lights up when power is on)			
Sensitivity adjuster		Variable adjuster		Variable adjuster		Variable adjuster
Automatic interference prevention function		Use optional interference prevention filters		Incorporated (Two units of sensors can be mounted closely.)		
Protection		IP66 (IEC)				
Ambient temperature		-25 to +55°C (No dew condensation or icing allowed) (Note 5), Storage: -30 to +70°C				
Ambient humidity		35 to 85% RH, Storage: 35 to 85% RH				
Emitting element		Red LED	Infrared LED	Red LED	Infrared LED	
Material		Enclosure, Lens and Cover: Polycarbonate, Front cover: Acrylic (retroreflective type sensor only)				
Cable		0.3mm ² 5-core (emitter of thru-beam type sensor: 2-core) cable, 2m long				
Weight		Emitter: 100g approx. Receiver: 140g approx.	Emitter: 125g approx. Receiver: 140g approx.	140g approx.		
Accessories		Screwdriver for sensitivity adjustment: 1 No.		RF-230 (reflector): 1 No. Screwdriver for sensitivity adjustment: 1 No. (NX5-PRVM5)	Screwdriver for sensitivity adjustment: 1 No.	

- Notes: 1) The retroreflective type sensor with polarizing filters may not stably detect specular or glossy objects through transparent film since light is polarized by the transparent film. (Example of sensing objects) Δ E Can wrapped by clear film
 Δ E Aluminum sheet covered by plastic film
 Δ E Gold or silver color (glossy) labels or wrapping paper
- 2) The sensing range and sensing object for the retroreflective type sensor is specified for the RF-230 reflector. Further, the sensing range is the possible setting range for the reflector. The sensor can detect an object less than 0.1m away.
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- 3) The sensing range of the diffuse reflective type sensor is specified for white non-glossy paper (200 208mm).
- 4) If slit masks (optional) are fitted, an object as small as 3×6mm can be detected.
- 5) In case the sensor is to be used at an ambient temperature of -15...C, or less, please contact our office.

2 CAUTIONS

- Make sure to carry out wiring in the power supply off condition.
- Take care that wrong wiring will damage the sensor.
- 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.
- 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.
- Do not use during the initial transient time (50ms) after the power supply is switched on.
- 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.
- Extension up to total 100m, or less, is possible with 0.3mm², or more, cable.
- When connecting an inductive load, such as a DC relay, connect a surge absorber as shown in the right figure.
- 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.
- This sensor is suitable for indoor use only.
- 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.



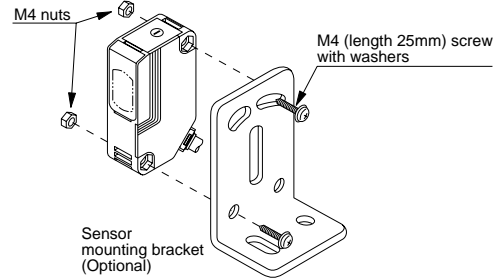
Thank you very much for using SUNX sensors. Please read this Instruction Manual carefully and thoroughly for the correct and optimum use of this sensor. Kindly keep this manual in a convenient place for quick reference.



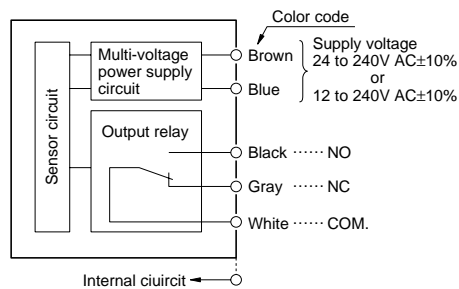
This product is not a safety sensor. Its use is not intended or designed to protect life and prevent body injury or property damage from dangerous parts of machinery. It is a normal object detection sensor.

3 MOUNTING

- The tightening torque should be 0.8N·m or less.



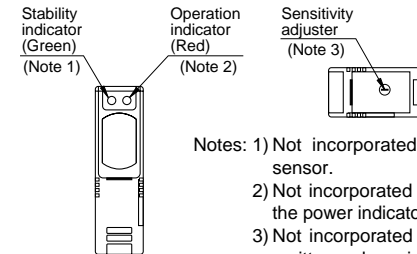
4 TYPICAL WIRING DIAGRAM



Note: The emitter of thru-beam type sensor has two wires for the power supply (+V and 0V) only.

5 ADJUSTMENTS

- Top face



- Notes: 1) Not incorporated on the emitter of thru-beam type sensor.
- 2) Not incorporated on the emitter of NX5-M10R. It is the power indicator (red) on the emitter of NX5-M30.
- 3) Not incorporated on the emitter of NX5-M10R, the emitter and receiver of NX5-M30, or NX5-RM7.

- Sensitivity adjustment (excluding NX5-M30, NX5-RM7)

①		Turn the sensitivity adjuster fully counterclockwise to the minimum sensitivity position, MIN.
②		In the light received condition, turn the sensitivity adjuster slowly clockwise and confirm the point A where the sensor enters the 'Light' state operation.
③		In the light interrupted state, turn the sensitivity adjuster further clockwise until the sensor enters the 'Light' state operation and then bring it back to confirm point B 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 B.)
④		The position at the middle of points A and B is the optimum sensing position.

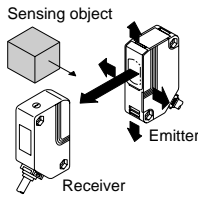
Note: Use the accessory adjuster screwdriver to turn the adjuster slowly. Turning with excessive strength will damage the adjuster.

	Light received condition		Dark condition	
Thru-beam	Emitter	Receiver	Emitter	Receiver
Retroreflective	Sensor	Reflector	Sensor	Reflector
Diffuse reflective	Sensor	Sensing object	Sensor	Sensing object

● Light beam alignment

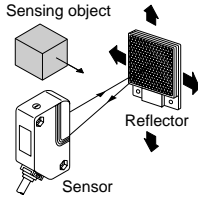
Thru-beam type sensor

- Placing the emitter and the receiver face to face along a straight line, move the emitter in the up, down, left and right directions, in order to determine the range of the light received condition with the help of the operation indicator. Then, set the emitter at the center of this range.
- Similarly, adjust for up, down, left and right angular movement of the emitter.
- Further, perform the angular adjustment for the receiver also.
- Check that the stability indicator lights up.



Retroreflective type sensor

- Placing the sensor and the reflector face to face along a straight line, move the reflector in the up, down, left and right directions, in order to determine the range of the light received condition with the help of the operation indicator. Then, set the reflector at the center of this range.
- Similarly, adjust for up, down, left and right angular movement of the reflector.
- Further, perform the angular adjustment for the sensor also.
- Check that the stability indicator lights up.



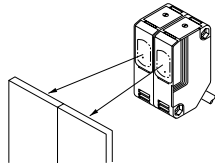
Relation between output and indicators

☀ lights up ● turns off

In case of Light-ON			In case of Dark-ON		
Stability indicator	Operation indicator	Output	Output	Operation indicator	Stability indicator
☀	☀	ON	OFF	●	☀
●	☀	OFF	ON	☀	●
☀	●				
☀	●	OFF	ON	☀	●
●	●	ON	OFF	●	●
●	☀	ON	OFF	●	☀

6 AUTOMATIC INTERFERENCE PREVENTION FUNCTION (Retroreflective type, diffuse reflective type only)

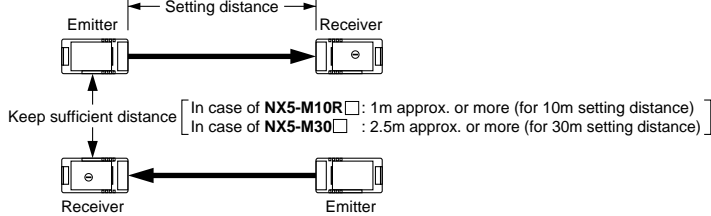
- The retroreflective type and the diffuse reflective type sensors are incorporated with an automatic interference prevention function, so that two sensors can be mounted closely.



7 COUNTERMEASURES FOR INTERFERENCE PREVENTION FOR THRU-BEAM TYPE

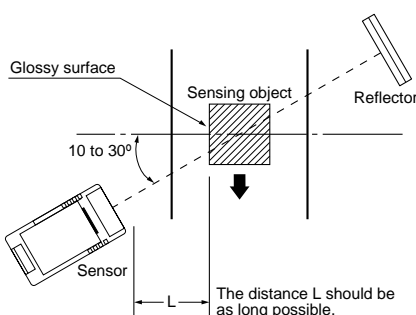
- If interference occurs when using **NX5-M10R**, use the optional interference filters (**PF-NX5**) to mount two sensors closely. [For details, refer to **11 INTERFERENCE PREVENTION FILTER (OPTIONAL)**.]
- In case interference occurs when **NX5-M10R**, without interference prevention filters, or **NX5-M30** are mounted closely, we recommend that the emitter and the receiver are placed alternatively at a distance, as given below. Further, if interference occurs even when the specified distance is kept, place light barriers, etc.

Example:



8 LONG SENSING RANGE RETROREFLECTIVE TYPE SENSOR (NX5-RM7)

- Please take care of the following points when detecting materials having a gloss.
- Make L, shown in the diagram, sufficiently long.
- Install at an angle of 10 to 30 degrees to the sensing object.
- The retroreflective type sensor with polarizing filters, **NX5-PRVM5**, does not need such adjustment.



9 RETROREFLECTIVE TYPE SENSOR WITH POLARIZING FILTERS (NX5-PRVM5)

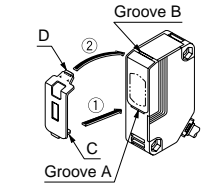
- As light is polarized by a transparent film or membrane, **NX5-PRVM5** may not detect an object covered or wrapped by transparent film. In that case, take the following steps.
- (Example of sensing objects)
 - Can wrapped by clear film
 - Aluminum sheet covered by plastic film
 - Gold or silver color (glossy) labels or wrapping paper
- (Steps)
 - Tilt the sensor with respect to the sensing object upon fitting.
 - Reduce the sensitivity.
 - Increase the distance between the sensor and the sensing object.

10 SLIT MASK (OPTIONAL) (Exclusively for thru-beam type sensor)

- With the slit mask, the sensor can detect an object as small as 3×6 mm. However, the sensing range is reduced when the slit mask is mounted.

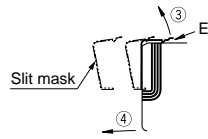
How to mount

- Fit the C portion of the slit mask in the groove A of the main body case.
- Then press the slit mask against the main body to fit the slit mask hook D portion in the groove B of the main body case.



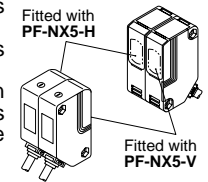
How to remove

- Insert a 'minus' screwdriver into the E portion of the slit mask.
- Lift the E portion up to remove the slit mask from the main body case.



11 INTERFERENCE PREVENTION FILTER (OPTIONAL) (Exclusively for NX5-M10R)

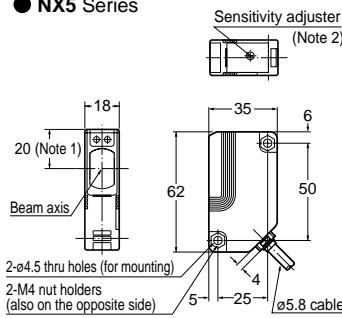
- By mounting interference prevention filters, two sets of **NX5-M10R** can be mounted close together.
- The filters can be mounted by the same method as for the slit masks.
- There are two types of interference prevention filters. The two sets of thru-beam type sensors should be fitted with different types of interference prevention filters.



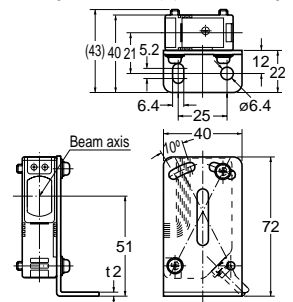
Note: The filters cannot be used for **NX5-M30**.

12 DIMENSIONS (Unit: mm)

● **NX5 Series**



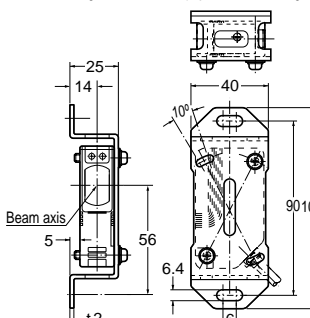
● **Mounting of MS-NX5-1 (Optional mounting bracket)**



- Notes: 1) 20.5 for the retroreflective type sensor and the diffuse reflective type sensor.
2) Not incorporated on the emitter of **NX5-M10R**, the emitter and receiver of **NX5-M30**, or **NX5-RM7**.

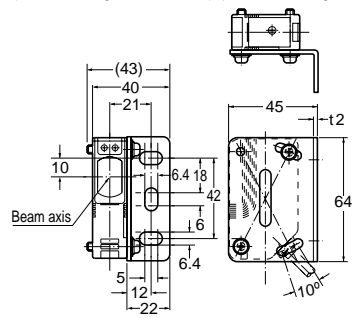
Note: The drawing shows mounting of the receiver of **NX5-M10R**.

● **Mounting of MS-NX5-2 (Optional mounting bracket)**



Note: The drawing shows mounting of the receiver of **NX5-M10R**.

● **Mounting of MS-NX5-3 (Optional mounting bracket)**



Note: The drawing shows mounting of the receiver of **NX5-M10R**.

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