

# NX5 SERIES

## Compact Multi-voltage Photoelectric Sensor

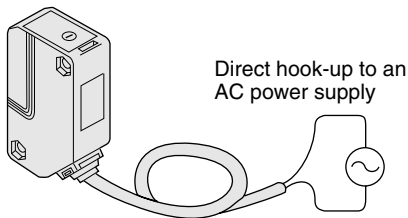


**Multi-voltage  
Photoelectric Sensor  
Usable Worldwide**

**CE Marked**  
Conforming to Low Voltage  
and EMC Directives

### Multi-voltage

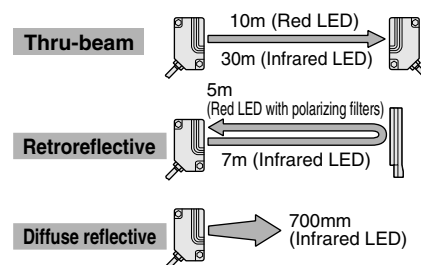
The **NX5** series can operate at 24 to 240V AC or 12 to 240V DC, which makes it suitable for supply voltages all over the world.



No need to arrange a DC power supply.

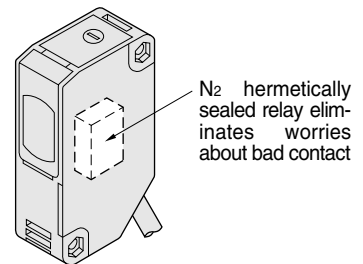
### Long Sensing Range

Most suitable for conveyor lines and parking lot applications.



### High Reliability

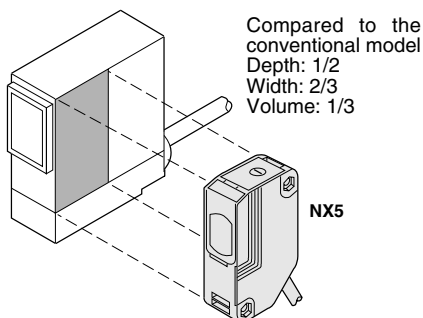
It has IP66 protection. Moderate dust or water splashes do not affect it. The new N<sub>2</sub> hermetically sealed output relay significantly increases its reliability.



### Compact Size

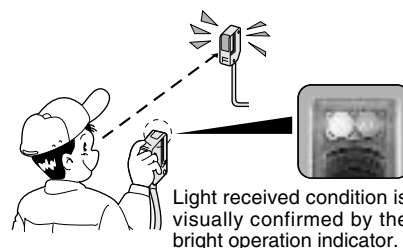
Despite being multi-voltage, it has a depth of just 35mm. (W18 × H62 × D35mm)

Conventional model



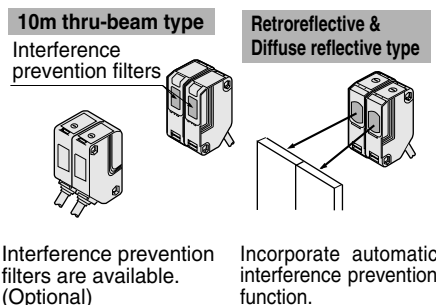
### Easy Alignment

The 10m thru-beam type sensor and the 5m retroreflective type sensor incorporate a red LED beam source. Beam alignment can be attained by visually checking the emitted beam.



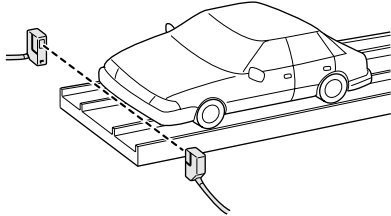
### Interference Prevention

Two sensors operate quite normally even if mounted closely. (Excluding the 30m thru-beam type sensor)

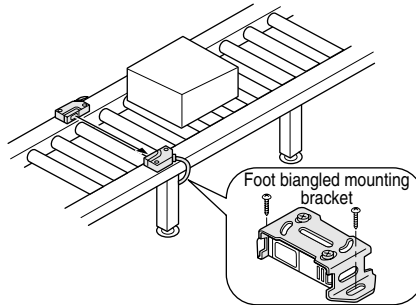


## APPLICATIONS

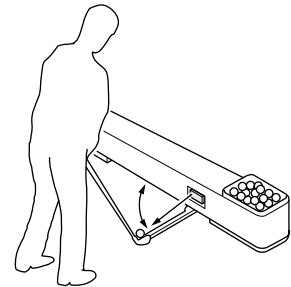
Detecting car position at parking garage



Detecting workpieces on conveyor line



Detecting golf balls

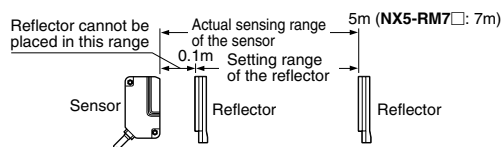


## ORDER GUIDE

Type	Appearance	Sensing range	Model No. (Note 2)	Emitting element
Thru-beam		10m	NX5-M10RA	Red LED
			NX5-M10RB	
		30m	NX5-M30A	Infrared LED
			NX5-M30B	
Retroreflective		0.1 to 5m (Note 1)	NX5-PRVM5A	Red LED
			NX5-PRVM5B	
		0.1 to 7m (Note 1)	NX5-RM7A	Infrared LED
			NX5-RM7B	
Diffuse reflective		700mm	NX5-D700A	Infrared LED
			NX5-D700B	

**NOTE: Mounting bracket is not supplied with the sensor. Please select from the range of optional sensor mounting brackets (three types).**

Notes: 1) The sensing range of 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.



2) Light-ON type sensor (model No. with suffix 'A') and Dark-ON type sensor (model No. with suffix 'B') are available in the **NX5** series.

For the following models, in case of power off, the output relay condition is the same as when an object is detected.  
(In case of power supply line disconnection, the output operation is the same as when an object is detected.)

Thru-beam type	Retroreflective type	Diffuse reflective type
NX5-M10RA and NX5-M30A (Light-ON)	NX5-PRVM5A and NX5-RM7A (Light-ON)	NX5-D700B (Dark-ON)

### 5m cable length type

5m cable length models are available (Standard: 2m).  
When ordering this type, add suffix '-C5' to the model No.  
(e.g.) 5m cable length type of NX5-M10RA is 'NX5-M10RA-C5'.

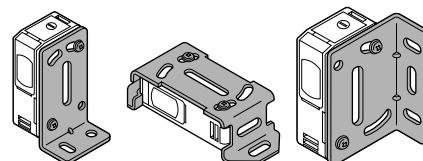
# NX5

## OPTIONS

Designation	Model No.	Description
Sensor mounting bracket	<b>MS-NX5-1</b>	Foot angled mounting bracket (The thru-beam type sensor needs two brackets.)
	<b>MS-NX5-2</b>	Foot biangled mounting bracket (sensor protection bracket) (The thru-beam type sensor needs two brackets.)
	<b>MS-NX5-3</b>	Back angled mounting bracket (The thru-beam type sensor needs two brackets.)
Slit mask (For thru-beam type sensor only)	<b>OS-NX5-3 × 6</b> (Slit size 3 × 6mm)	Slit on one side <ul style="list-style-type: none"> <li>• Sensing range: 3m [NX5-M10R□]</li> <li>16m [NX5-M30□]</li> <li>• Min. sensing object: <math>\phi</math>10mm</li> </ul>
		Slit on both sides <ul style="list-style-type: none"> <li>• Sensing range: 1m [NX5-M10R□]</li> <li>6m [NX5-M30□]</li> <li>• Min. sensing object: 3 × 6mm</li> </ul>
Interference prevention filter (For NX5-M10RA or NX5-M10RB only)	<b>PF-NX5-V</b> (Vertical)	Same type of filters on both sides <ul style="list-style-type: none"> <li>• Sensing range: 5m</li> <li>• Min. sensing object: <math>\phi</math>20mm</li> <li>(One set consists of 2 Nos. of interference prevention filters.)</li> </ul>
	<b>PF-NX5-H</b> (Horizontal)	
Reflector (For retro-reflective type sensor only)	<b>RF-210</b>	<ul style="list-style-type: none"> <li>• Sensing range: 0.1 to 1.5m [NX5-PRVM5□]</li> <li>0.1 to 2.5m [NX5-RM7□]</li> <li>• Min. sensing object: <math>\phi</math>30mm</li> </ul>
	<b>RF-220</b>	<ul style="list-style-type: none"> <li>• Sensing range: 0.1 to 3.5m [NX5-PRVM5□]</li> <li>0.1 to 5m [NX5-RM7□]</li> <li>• Min. sensing object: <math>\phi</math>35mm</li> </ul>
Reflector mounting bracket	<b>MS-RF21-1</b>	Protective mounting bracket for <b>RF-210</b> It protects the reflector from damage and maintains alignment.
	<b>MS-RF22</b>	For <b>RF-220</b>
	<b>MS-RF23</b>	For <b>RF-230</b>
Reflective tape (For retro-reflective type sensor only)	<b>RF-11</b>	<ul style="list-style-type: none"> <li>• Ambient temperature: -25 to +50°C</li> <li>• Ambient humidity: 35 to 85% RH</li> <li>Notes: i) Keep the tape free from stress. If it is pressed too much, its capability may deteriorate.</li> <li>ii) Do not cut the tape. It will deteriorate the sensing performance.</li> </ul>
	<b>RF-12</b>	
Sensor checker (Note)	<b>CHX-SC2</b>	It is useful for beam alignment of thru-beam type sensors. The optimum receiver position is given by indicators, as well as, an audio signal.

### Sensor mounting bracket

- MS-NX5-1
- MS-NX5-2
- MS-NX5-3



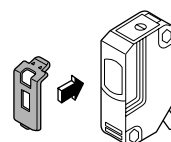
Two M4 (length 25mm) screws with washers and two M4 nuts are attached.

Two M4 (length 25mm) screws with washers and two M4 nuts are attached.

Two M4 (length 25mm) screws with washers and two M4 nuts are attached.

### Slit mask

Fitted on the front face of the sensor with one-touch.

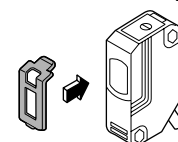


### Reflector

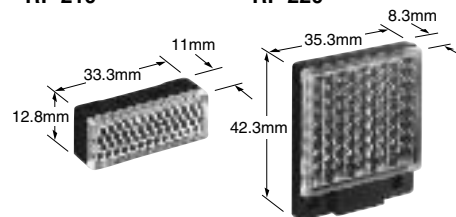
- RF-210

### Interference prevention filter

(For NX5-M10R□ only)  
Two sets of thru-beam type sensors (Red LED type) can be mounted closely.



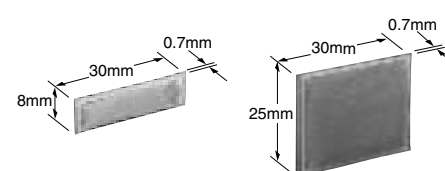
- RF-220



### Reflective tape

- RF-11

- RF-12

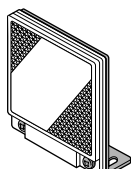


### Reflector mounting bracket

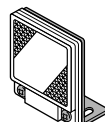
- MS-RF23

- MS-RF22

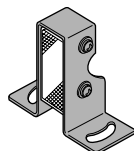
- MS-RF21-1



Two M4 (length 10mm) screws with washers are attached.

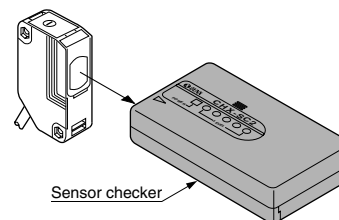


Two M3 (length 8mm) screws with washers are attached.



Two M3 (length 12mm) screws with washers are attached.

### Sensor checker

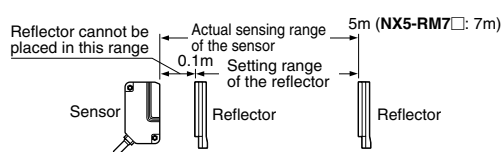


Sensor checker

## SPECIFICATIONS

Type	Thru-beam				Retroreflective				Diffuse reflective		
	Long sensing range		With polarizing filters		Long sensing range						
Item	Model No.	NX5-M10RA	NX5-M10RB	NX5-M30A	NX5-M30B	NX5-PRVM5A	NX5-PRVM5B	NX5-RM7A	NX5-RM7B	NX5-D700A	NX5-D700B
Sensing range		10m		30m		0.1 to 5m (Note 1)		0.1 to 7m (Note 1)		700mm (Note 2)	
Sensing object		φ20mm or more opaque object (Note 3)				φ50mm or more opaque, translucent or specular object (Note 1)		φ50mm or more opaque or translucent object (Note 1)		Opaque, translucent or transparent object	
Hysteresis		_____									15% or less of operation distance
Repeatability (perpendicular to sensing axis)		0.1mm or less		0.2mm or less				0.3mm or less			
Supply voltage		24 to 240V AC ± 10% or 12 to 240V DC ± 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 • Switching capacity: 250V AC 1A (resistive load) 30V DC 2A (resistive load) • Electrical life: 100,000 or more operations (at rated AC load) 500,000 or more operations (at rated DC load) • Mechanical life: 100,000,000 or more operations									
Utilization category		DC-12 or DC-13									
Output operation		Light-ON	Dark-ON	Light-ON	Dark-ON	Light-ON	Dark-ON	Light-ON	Dark-ON	Light-ON	Dark-ON
Response time		10ms or less									
Operation indicator		Red LED (lights up when the output is ON)									
Stability indicator		Green LED (lights up under stable light received condition or stable dark condition)									
Power indicator		_____		Red LED (lights up when the power is ON)		_____					
Sensitivity adjuster		Continuously variable adjuster		_____		Continuously variable adjuster		_____		Continuously variable adjuster	
Automatic interference prevention function		(Use optional interference prevention filters)		_____		Incorporated (Two units of sensors can be mounted closely.)					
Environmental resistance	Pollution degree	3 (Industrial environment)									
	Protection	IP66 (IEC)									
	Ambient temperature	- 20 to + 55°C (No dew condensation or icing allowed) (Note 4), Storage: - 30 to + 70°C									
	Ambient humidity	35 to 85% RH, Storage: 35 to 85% RH									
	Ambient illuminance	Sunlight: 11,000 lx at the light-receiving face, Incandescent light: 3,500 lx at the light-receiving face									
	EMC	Emission: EN50081-2, Immunity: EN50082-2									
	Voltage withstandability	1,500V AC for one min. between power supply and output terminals, 1,000V AC for one min. between relay contact terminals									
	Insulation resistance	20MΩ, or more, with 500V DC megger between power supply and output terminals and between relay contact terminals									
	Vibration resistance	10 to 55Hz frequency, 1.5mm amplitude in X, Y and Z directions for two hours each									
Shock resistance	500m/s <sup>2</sup> (50G approx.) in X, Y and Z directions for three times each										
Emitting element		Red LED (modulated)		Infrared LED (modulated)		Red LED (modulated)		Infrared LED (modulated)			
Material		Enclosure: Polycarbonate, Lens: Polycarbonate, Cover: Polycarbonate, Front cover: Acrylic (retroreflective type sensor only)									
Cable		0.3mm <sup>2</sup> 5-core (thru-beam type emitter: 2-core) cabtyre cable, 2m long									
Cable extension		Extension up to total 100m is possible with 0.3mm <sup>2</sup> , or more, cable (thru-beam type: both emitter and receiver).									
Weight		Emitter: 100g approx. Receiver: 140g approx.		Emitter: 125g approx. Receiver: 140g approx.		140g approx.					
Accessories		Adjusting screwdriver: 1 No.		_____		RF-230 (Reflector): 1 No. Adjusting screwdriver: 1 No.		RF-230 (Reflector): 1 No.		Adjusting screwdriver: 1 No.	

Notes: 1) The sensing range and the sensing object of 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.

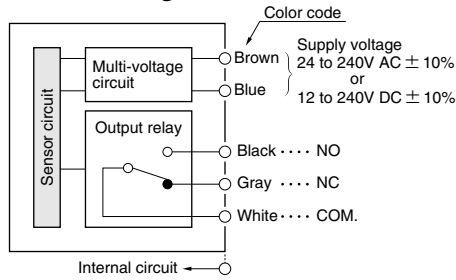


- 2) The sensing range of the diffuse reflective type sensor is specified for white non-glossy paper (200 × 200mm) as the object.  
3) If slit masks (optional) are fitted, an object as small as 3 × 6mm can be detected.  
4) In case the sensor is to be used at an ambient temperature of - 15°C, or less, please contact our office.

# NX5

## I/O CIRCUIT DIAGRAM

### I/O circuit diagram



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

### Output operation

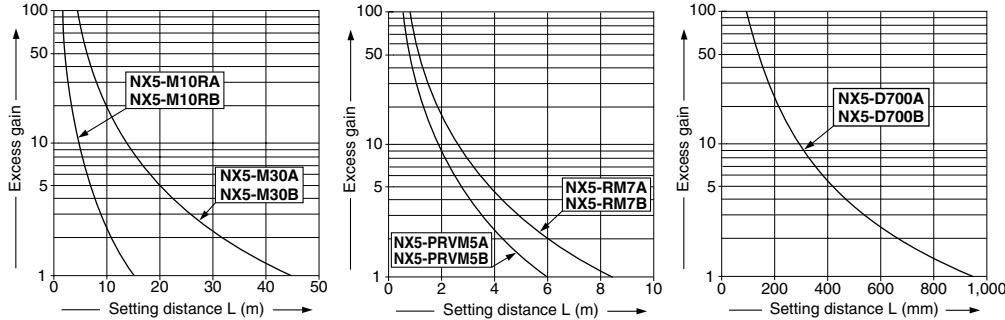
■ : Object detected state.

Sensing mode	Thru-beam & Retroreflective type				Diffuse reflective type			
	Light-ON (A) type		Dark-ON (B) type		Light-ON (A) type		Dark-ON (B) type	
Output	NO (Black cable)	NC (Gray cable)	NO (Black cable)	NC (Gray cable)	NO (Black cable)	NC (Gray cable)	NO (Black cable)	NC (Gray cable)
Power OFF	Open	Close	Open	Close	Open	Close	Open	Close
Beam-received	Close	Open	Open	Close	Close	Open	Open	Close
Beam-interrupted	Open	Close	Close	Open	Open	Close	Close	Open

## SENSING CHARACTERISTICS (TYPICAL)

### All models

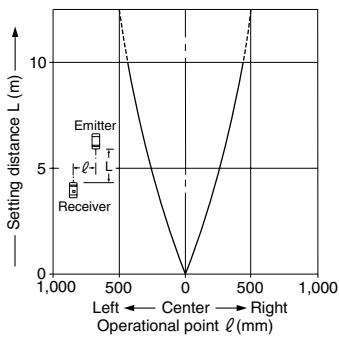
#### Correlation between setting distance and excess gain



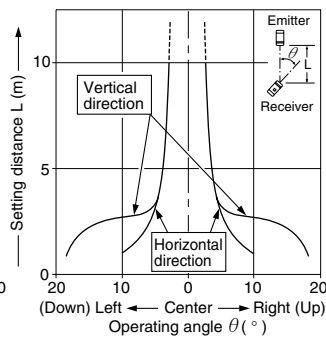
### NX5-M10RA NX5-M10RB

#### Thru-beam type

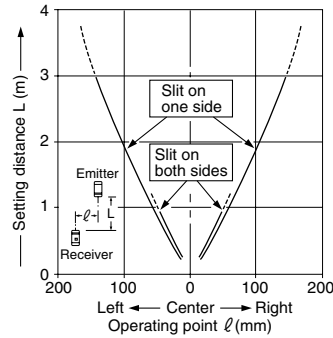
##### Parallel deviation



##### Angular deviation



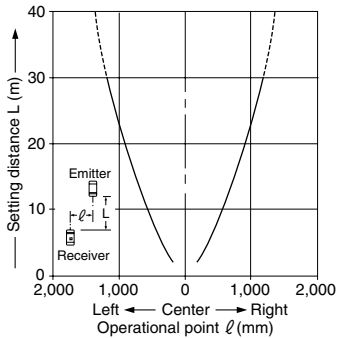
##### Parallel deviation with slit masks (3 x 6mm)



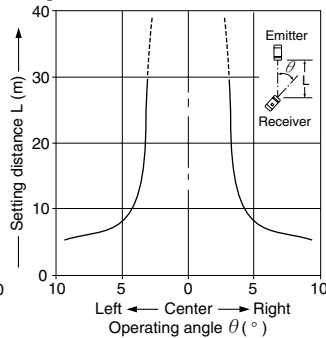
### NX5-M30A NX5-M30B

#### Thru-beam type

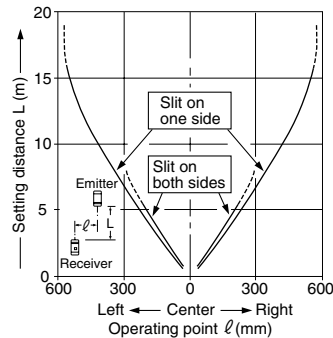
##### Parallel deviation



##### Angular deviation



##### Parallel deviation with slit masks (3 x 6mm)

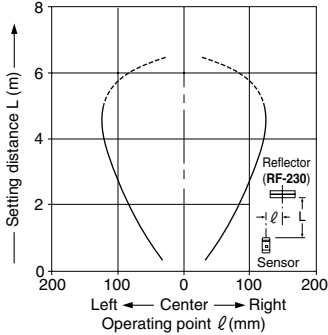


## SENSING CHARACTERISTICS (TYPICAL)

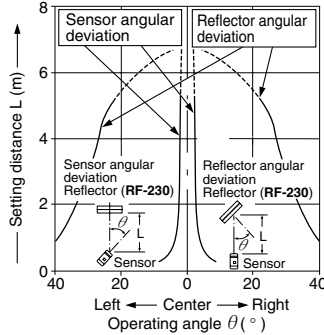
### NX5-PRVM5A NX5-PRVM5B

Retroreflective type

#### Parallel deviation



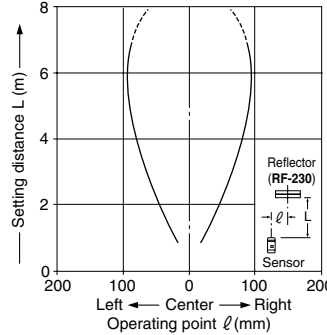
#### Angular deviation



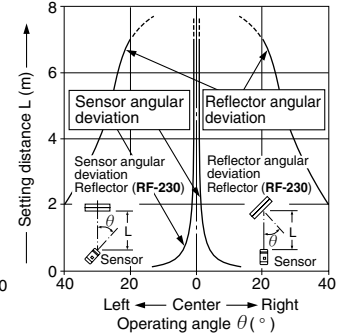
### NX5-RM7A NX5-RM7B

Retroreflective type

#### Parallel deviation



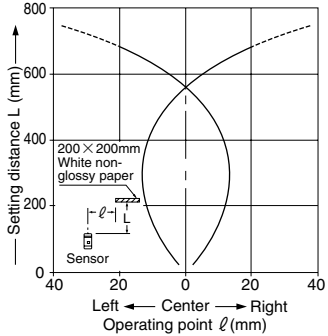
#### Angular deviation



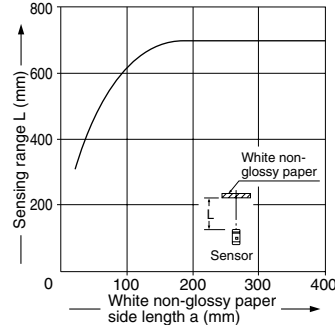
### NX5-D700A NX5-D700B

Diffuse reflective type

#### Sensing field



#### Correlation between sensing object size and sensing range



As the sensing object size becomes smaller than the standard size (white non-glossy paper 200 × 200mm), the sensing range shortens, as shown in the left graph.

(For plotting the left graph, the sensitivity has been set such that a 200 × 200mm white non-glossy paper is just detectable at a distance of 700mm.)

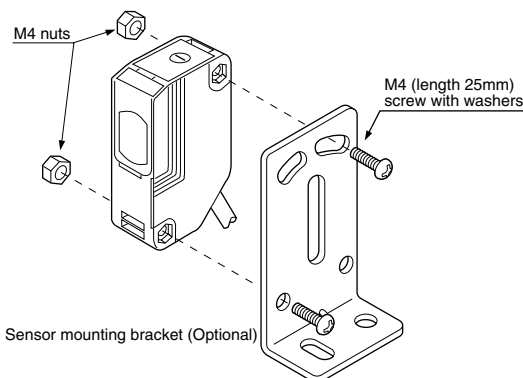
## PRECAUTIONS FOR PROPER USE



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.

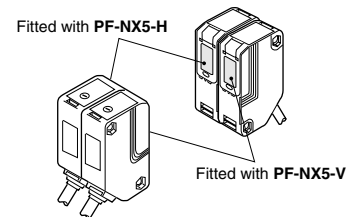
### Mounting

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



### Interference prevention filter (Exclusively for NX5-M10R□)

- Use the interference prevention filters (optional) when two units of thru-beam type sensors are mounted closely.



- 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-M30A or NX5-M30B.

### Others

- Do not use during the initial transient time (50ms) after the power supply is switched on.

# NX5

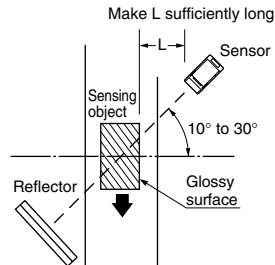
## PRECAUTIONS FOR PROPER USE

### Retroreflective type sensor (NX5-RM7□)

- Please take care of the following points when detecting materials having a gloss.

- ① Make L, shown in the diagram, sufficiently long.
- ② Install at an angle of 10 to 30 degrees to the sensing object.

※ NX5-PRVM5□ does not need the above adjustment.



### Retroreflective type sensor with polarizing filters (NX5-PRVM5□)

- If a shiny object is covered or wrapped with a transparent film, such as those described below, the retroreflective type sensor with polarizing filters may not be able to detect it.

In that case, follow the steps given below.

#### Example of sensing objects

- Can wrapped by clear film
- Aluminum sheet covered by plastic film
- Gold or silver color (glossy) label or wrapping paper

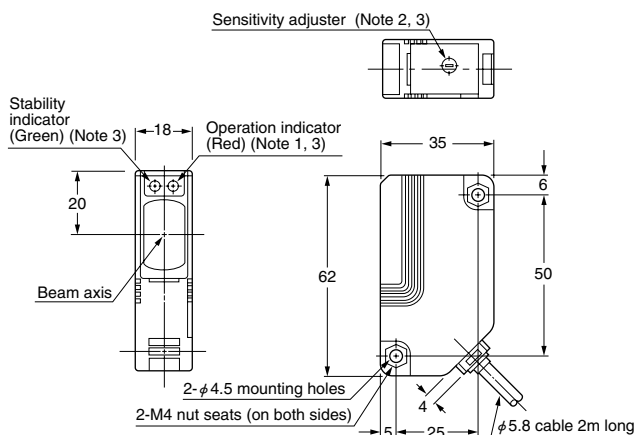
#### Steps

- Tilt the sensor with respect to the sensing object while fitting.
- Reduce the sensitivity.
- Increase the distance between the sensor and the sensing object.

## DIMENSIONS (Unit: mm)

NX5-M10RA NX5-M30A  
NX5-M10RB NX5-M30B

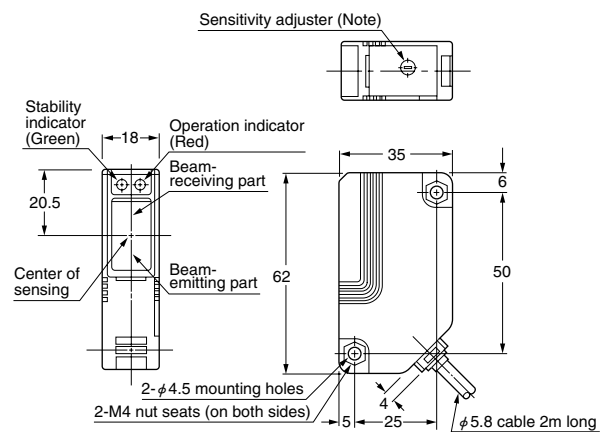
Sensor



- Notes: 1) It is the power indicator on the emitter of NX5-M30□.  
2) Not incorporated on NX5-M30□.  
3) Not incorporated on the emitter.

NX5-PRVM5A NX5-RM7A  
NX5-PRVM5B NX5-RM7B

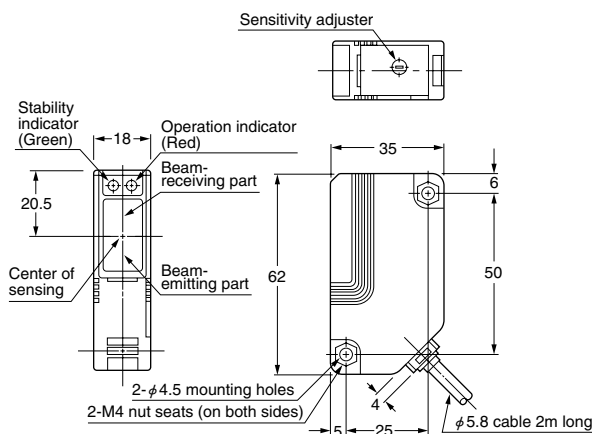
Sensor



Note: Not incorporated on NX5-RM7□.

NX5-D700A  
NX5-D700B

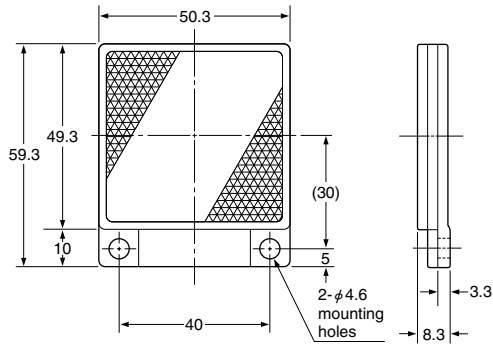
Sensor



## DIMENSIONS (Unit: mm)

### RF-230

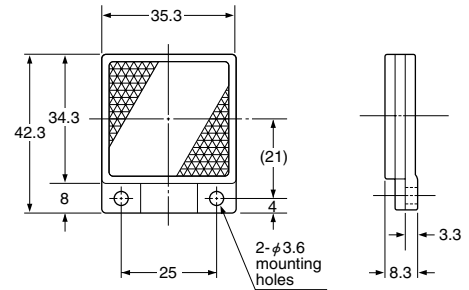
Reflector (Accessory for the retroreflective type sensor)



Material: Acrylic (Reflector)  
ABS (Base)

### RF-220

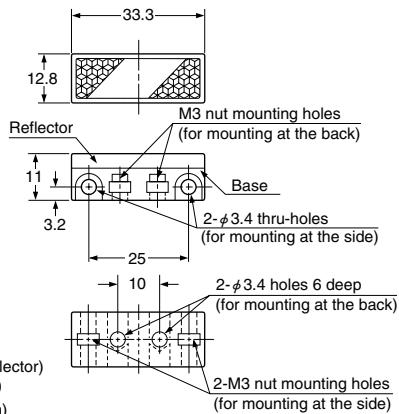
Reflector (Optional)



Material: Acrylic (Reflector)  
ABS (Base)

### RF-210

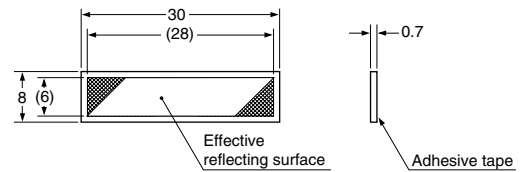
Reflector (Optional)



Material: Acrylic (Reflector)  
ABS (Base)  
Two M3 (length 8mm)  
screws with washers and  
two nuts are attached.

### RF-11

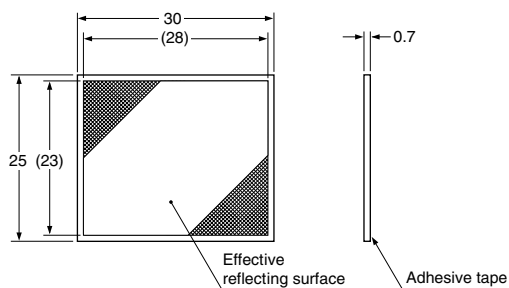
Reflective tape (Optional)



Material: Acrylic

### RF-12

Reflective tape (Optional)

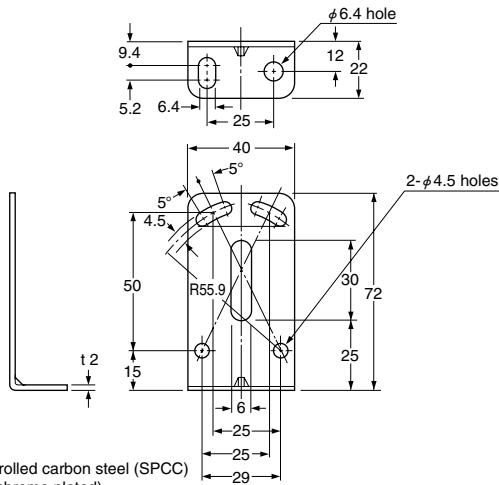


Material: Acrylic

# NX5

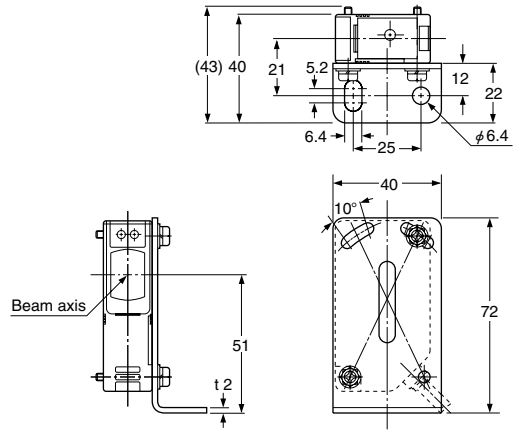
## DIMENSIONS (Unit: mm)

### MS-NX5-1 Sensor mounting bracket (Optional)

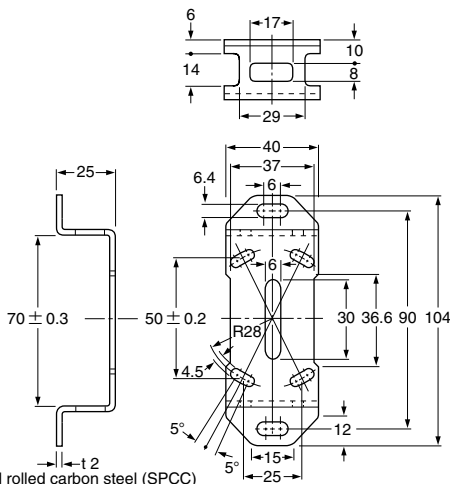


Material: Cold rolled carbon steel (SPCC)  
(Uni-chrome plated)  
Two M4 (length 25mm) screws with washers and  
two M4 nuts are attached.

### Assembly dimensions Mounting drawing with the receiver of NX5-M10R□

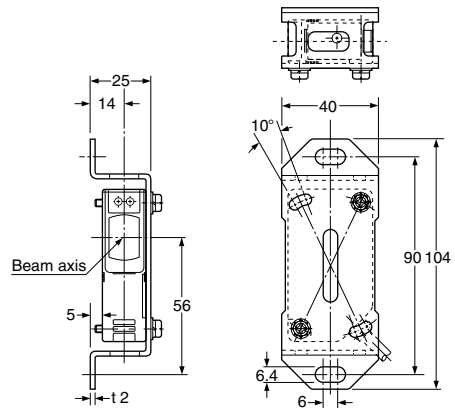


### MS-NX5-2 Sensor mounting bracket (Optional)

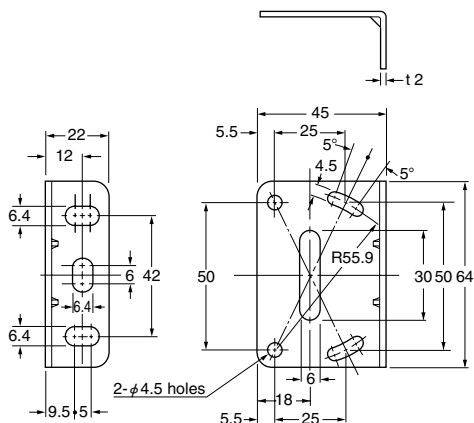


Material: Cold rolled carbon steel (SPCC)  
(Uni-chrome plated)  
Two M4 (length 25mm) screws with washers and  
two M4 nuts are attached.

### Assembly dimensions Mounting drawing with the receiver of NX5-M10R□

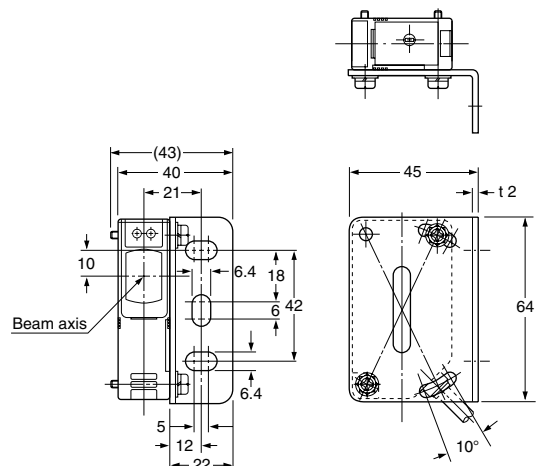


### MS-NX5-3 Sensor mounting bracket (Optional)



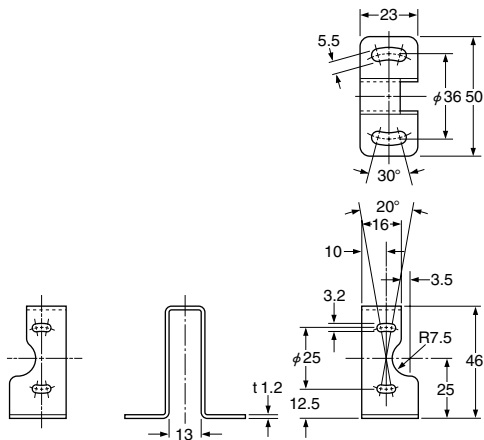
Material: Cold rolled carbon steel (SPCC)  
(Uni-chrome plated)  
Two M4 (length 25mm) screws with washers and  
two M4 nuts are attached.

### Assembly dimensions Mounting drawing with the receiver of NX5-M10R□

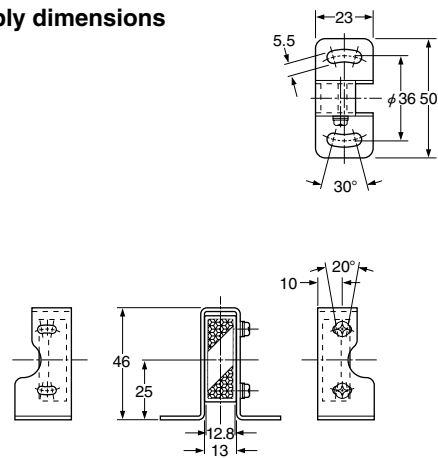


## DIMENSIONS (Unit: mm)

### MS-RF21-1 Reflector mounting bracket for RF-210 (Optional)

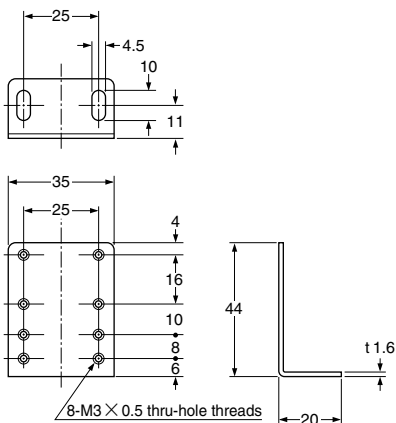


#### Assembly dimensions

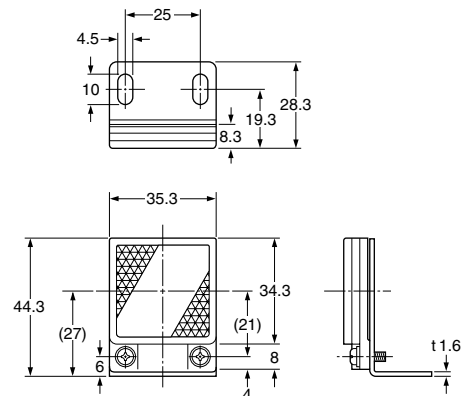


Material: Stainless steel (SUS304)  
Two M3 (length 12mm) screws with washers are attached.

### MS-RF22 Reflector mounting bracket for RF-220 (Optional)

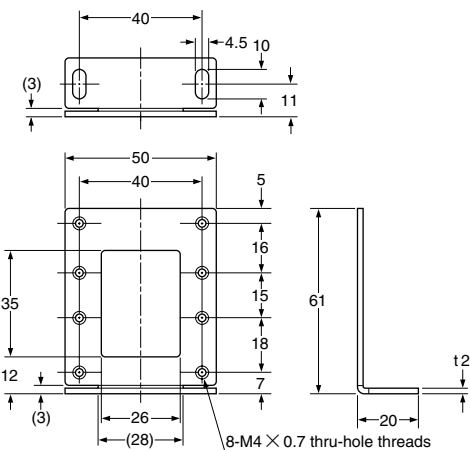


#### Assembly dimensions



Material: Cold rolled carbon steel (SPCC)  
(Uni-chrome plated)  
Two M3 (length 8mm) screws with washers are attached.

### MS-RF23 Reflector mounting bracket for RF-230 (Optional)



#### Assembly dimensions



Material: Cold rolled carbon steel (SPCC)  
(Uni-chrome plated)  
Two M4 (length 10mm) screws with washers are attached.