NX5 SERIES
Compact Multi-voltage Photoelectric Sensor
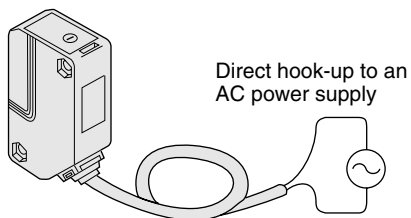
Multi-voltage Photoelectric Sensor Usable Worldwide

$C\epsilon$ **Marked**

Conforming to Low Voltage and EMC Directives

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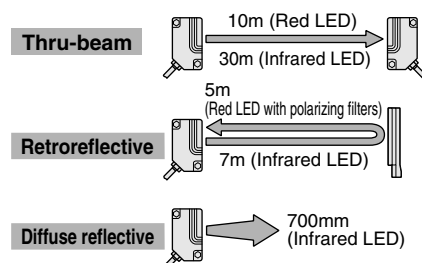
The **NX5** series can operate at 24 to 240V AC or 12 to 240V DC, which makes it suitable for supply voltages all over the world.

Direct hook-up to an AC power supply

No need to arrange a DC power supply.

Long Sensing Range

Most suitable for conveyor lines and parking lot applications.

Thru-beam
10m (Red LED)
30m (Infrared LED)

Retroreflective
5m (Red LED with polarizing filters)
7m (Infrared LED)

**Diffuse reflective**
700mm (Infrared LED)

High Reliability

It has IP66 protection. Moderate dust or water splashes do not affect it.
The new N2 hermetically sealed output relay significantly increases its reliability.

N2 hermetically sealed relay eliminates worries about bad contact
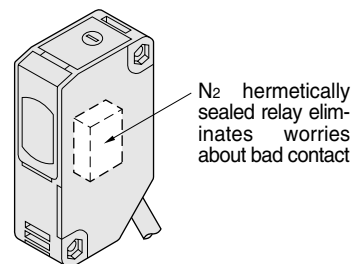
Compact Size

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

Conventional model

Compared to the conventional model
Depth: 1/2
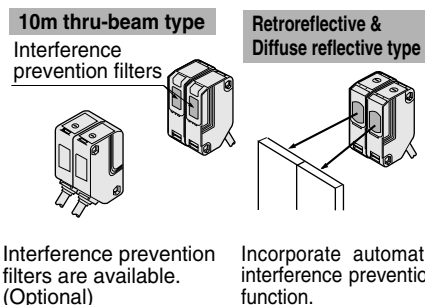Width: 2/3
Volume: 1/3

NX5
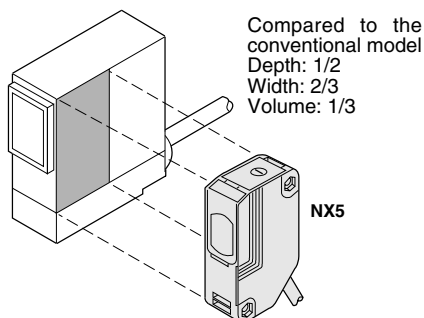
Easy Alignment

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.

Light received condition is visually confirmed by the bright operation indicator.
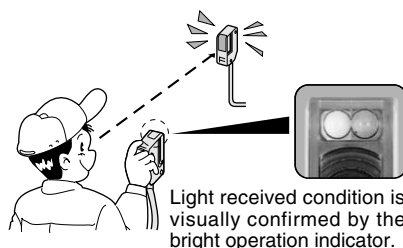
Interference Prevention

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

10m thru-beam type
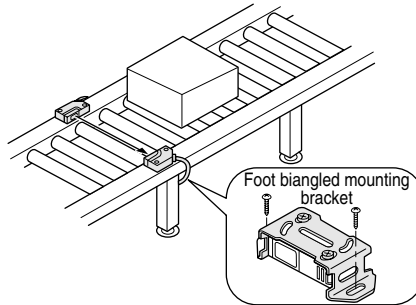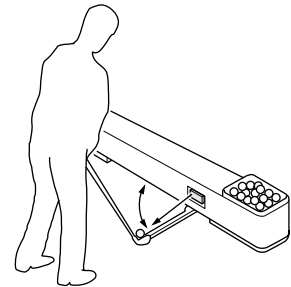Interference prevention filters

Retroreflective & Diffuse reflective type

Interference prevention filters are available. (Optional)

Incorporate automatic interference prevention function.

NX5

APPLICATIONS

Detecting car position at parking garage
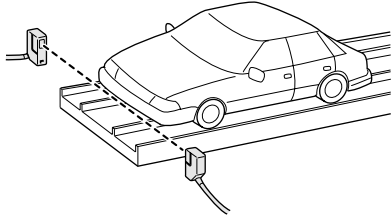
Detecting workpieces on conveyor line

Foot biangled mounting bracket

Detecting golf balls

ORDER GUIDE

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

Reflector cannot be placed in this range — Actual sensing range of the sensor — 0.1m — Setting range of the reflector — 5m (**NX5-RM7☐**: 7m) — Sensor — Reflector — Reflector
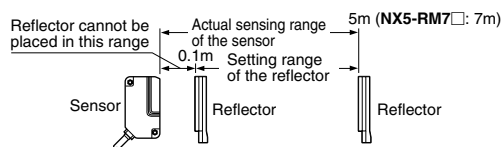
2) Light-ON type sensor (model No. with suffix '**A**') and Dark-ON type sensor (model No. with suffix '**B**') are available in the **NX5** series.
For the following models, in case of power off, the output relay condition is the same as when an object is detected.
(In case of power supply line disconnection, 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	**MS-NX5-1**	Foot angled mounting bracket (The thru-beam type sensor needs two brackets.)		
	MS-NX5-2	Foot biangled mounting bracket (sensor protection bracket) (The thru-beam type sensor needs two brackets.)		
	MS-NX5-3	Back angled mounting bracket (The thru-beam type sensor needs two brackets.)		
Slit mask (For thru-beam type sensor only)	**OS-NX5-3 ✕ 6** (Slit size 3 ✕ 6mm)	Slit on one side	• Sensing range: 3m [**NX5-M10R□**] 16m [**NX5-M30□**] • Min. sensing object: ϕ10mm	
		Slit on both sides	• Sensing range: 1m [**NX5-M10R□**] 6m [**NX5-M30□**] • Min. sensing object: 3 ✕ 6mm	
Interference prevention filter (For **NX5-M10RA** or **NX5-M10RB** only)	**PF-NX5-V** (Vertical)	Same type of filters on both sides • Sensing range: 5m • Min. sensing object: ϕ20mm (One set consists of 2 Nos. of interference prevention filters.)		
	PF-NX5-H (Horizontal)			
Reflector (For retrore- flective type sensor only)	**RF-210**	• Sensing range: 0.1 to 1.5m [**NX5-PRVM5□**] 0.1 to 2.5m [**NX5-RM7□**] • Min. sensing object: ϕ30mm		
	RF-220	• Sensing range: 0.1 to 3.5m [**NX5-PRVM5□**] 0.1 to 5m [**NX5-RM7□**] • Min. sensing object: ϕ35mm		
Reflector mounting bracket	**MS-RF21-1**	Protective mounting bracket for **RF-210** It protects the reflector from damage and maintains alignment.		
	MS-RF22	For **RF-220**		
	MS-RF23	For **RF-230**		
Reflective tape (For retrore- flective type sensor only)	**RF-11**	• Ambient temperature: −25 to +50°C • Ambient humidity: 35 to 85% RH Notes: i) Keep the tape free from stress. If it is pressed too much, its capability may deteriorate. ii) Do not cut the tape. It will deteriorate the sensing performance.	• Sensing range: 0.1 to 0.8m [**NX5-PRVM5□**] 0.1 to 1m [**NX5-RM7□**]	
	RF-12		• Sensing range: 0.1 to 1m [**NX5-PRVM5□**] 0.1 to 1.5m [**NX5-RM7□**]	
Sensor checker (Note)	**CHX-SC2**	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
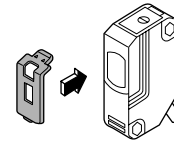• **MS-NX5-1**   • **MS-NX5-2**   • **MS-NX5-3**
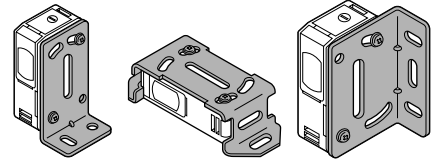
Two M4 (length 25mm) screws with washers and two M4 nuts are attached.

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

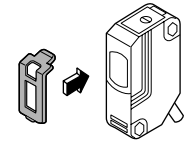Two M4 (length 25mm) screws with washers and two M4 nuts are attached.

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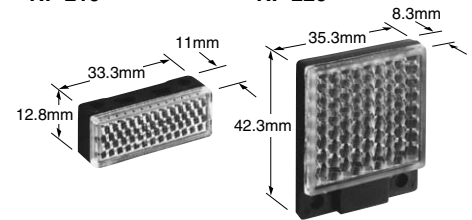Fitted on the front face of the sensor with one-touch.

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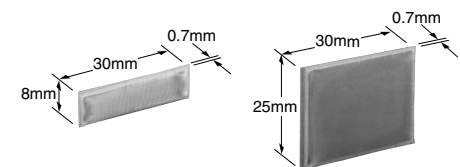Two sets of thru-beam type sensors (Red LED type) can be mounted closely.
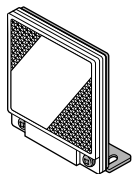

Reflector
• **RF-210**   • **RF-220**

Reflective tape
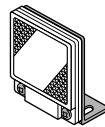• **RF-11**   • **RF-12**
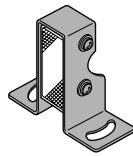

Reflector mounting bracket
• **MS-RF23**   • **MS-RF22**   • **MS-RF21-1**
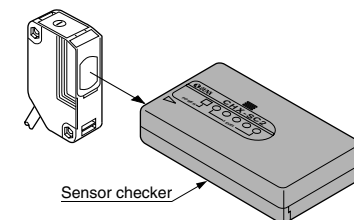

Two M4 (length 10mm) screws with washers are attached.

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

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

Sensor checker

Sensor checker

SUNX

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 $\pm$ 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 • 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^2 (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^2 5-core (thru-beam type emitter: 2-core) cabtyre cable, 2m long									
Cable extension	Extension up to total 100m is possible with 0.3mm^2, 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.
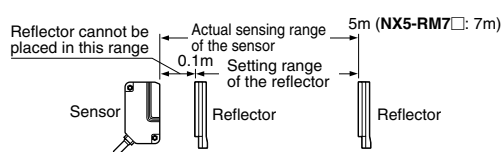
2) The sensing range of the diffuse reflective type sensor is specified for white non-glossy paper (200 $\times$ 200mm) as the object.
3) If slit masks (optional) are fitted, an object as small as 3 $\times$ 6mm can be detected.
4) In case the sensor is to be used at an ambient temperature of $-$15°C, or less, please contact our office.

NX5

I/O CIRCUIT DIAGRAM

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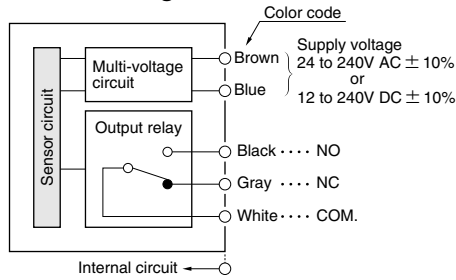
Note: The emitter of the thru-beam type sensor has two wires for power (＋V and 0V) only.

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)
Output condition	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
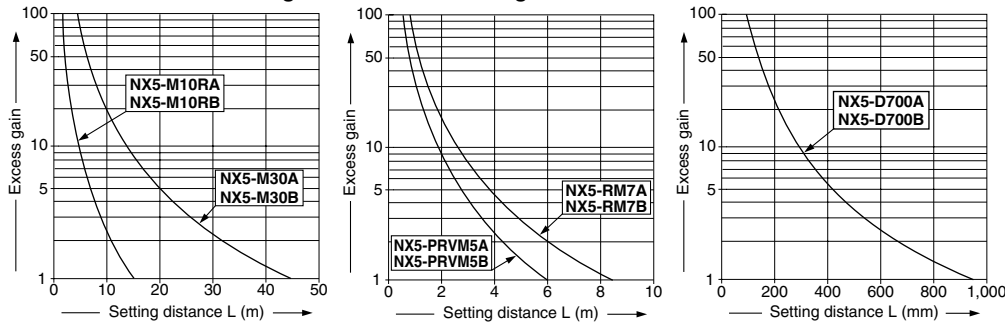
NX5-M10RA / NX5-M10RB — Thru-beam type

Parallel deviation
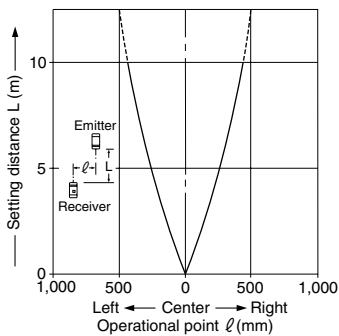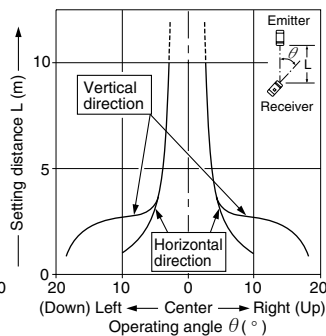
Angular deviation

Parallel deviation with slit masks (3 × 6mm)
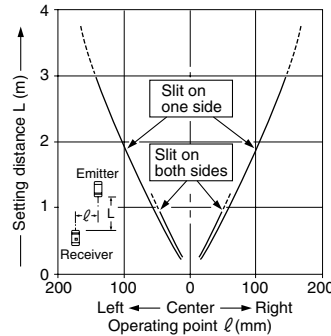
NX5-M30A / NX5-M30B — Thru-beam type

Parallel deviation
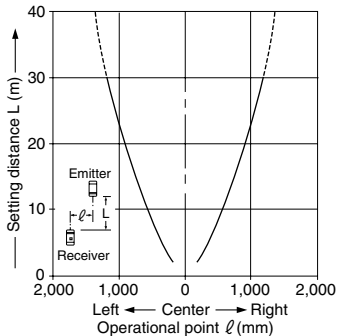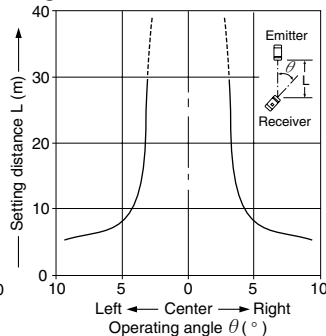
Angular deviation

Parallel deviation with slit masks (3 × 6mm)
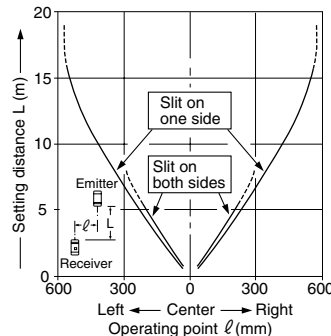
SENSING CHARACTERISTICS (TYPICAL)

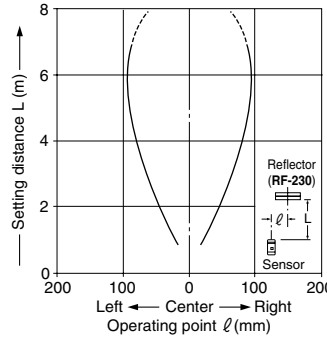### NX5-PRVM5A / NX5-PRVM5B — Retroreflective type

Parallel deviation

Setting distance L (m)
Reflector (**RF-230**)
Sensor
Operating point ℓ (mm)
Left ← Center → Right

Angular deviation

Sensor angular deviation | Reflector angular deviation
Setting distance L (m)
Sensor angular deviation Reflector (**RF-230**)
Reflector angular deviation Reflector (**RF-230**)
Operating angle θ (°)
Left ← Center → Right
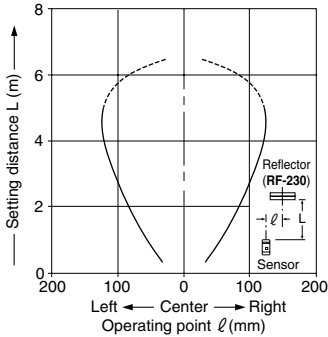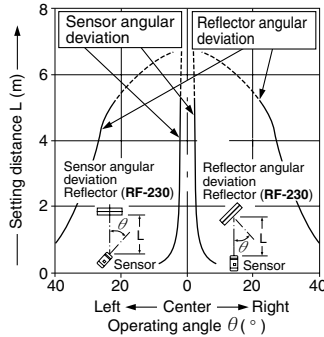
NX5-RM7A / NX5-RM7B — Retroreflective type

Parallel deviation

Setting distance L (m)
Reflector (**RF-230**)
Sensor
Operating point ℓ (mm)
Left ← Center → Right

Angular deviation

Sensor angular deviation | Reflector angular deviation
Setting distance L (m)
Sensor angular deviation Reflector (**RF-230**)
Reflector angular deviation Reflector (**RF-230**)
Operating angle θ (°)
Left ← Center → Right
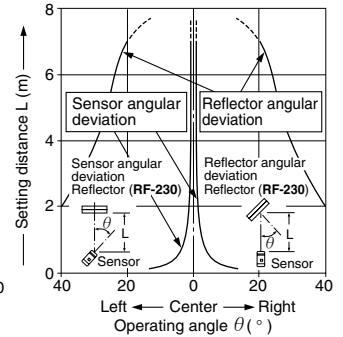
NX5-D700A / NX5-D700B — Diffuse reflective type

Sensing field

Setting distance L (mm)
200 × 200mm White non-glossy paper
Sensor
Operating point ℓ (mm)
Left ← Center → Right
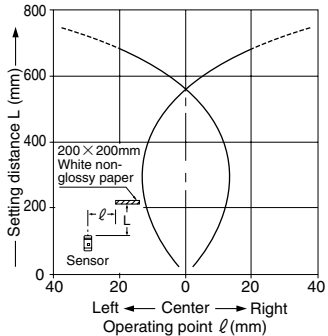
Correlation between sensing object size and sensing range

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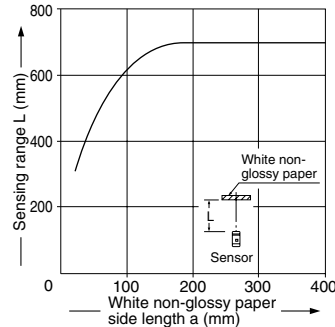
As the sensing object size becomes smaller than the standard size (white non-glossy paper 200 × 200mm), the sensing range shortens, as shown in the left graph.

(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.

M4 nuts
M4 (length 25mm) screw with washers
Sensor mounting bracket (Optional)

Others

• Do not use during the initial transient time (50ms) after the power supply is switched on.
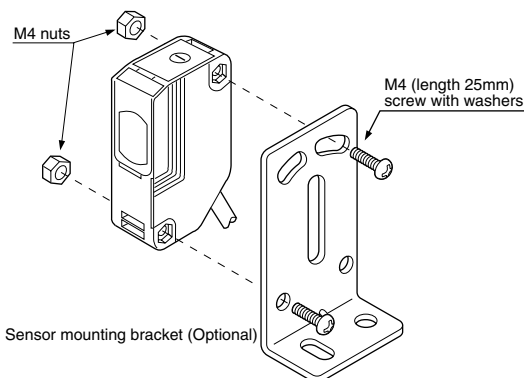
Interference prevention filter
(Exclusively for NX5-M10R☐)

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

Fitted with **PF-NX5-H**
Fitted with **PF-NX5-V**
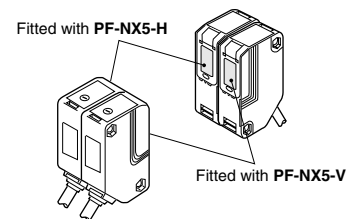
• There are two types of interference prevention filters. The two sets of thru-beam type sensors should be fitted with different types of interference prevention filters.

Note: The filters cannot be used for **NX5-M30A** or **NX5-M30B**.
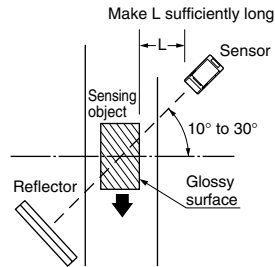
NX5

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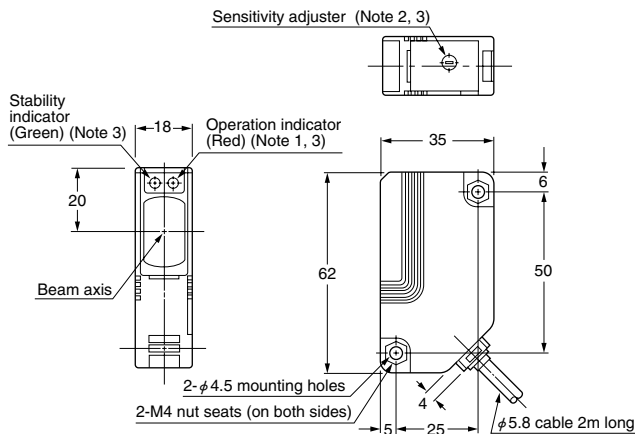
Notes: 1) It is the power indicator on the emitter of **NX5-M30☐**.
2) Not incorporated on **NX5-M30☐**.
3) Not incorporated on the emitter.

NX5-PRVM5A NX5-RM7A
NX5-PRVM5B NX5-RM7B Sensor
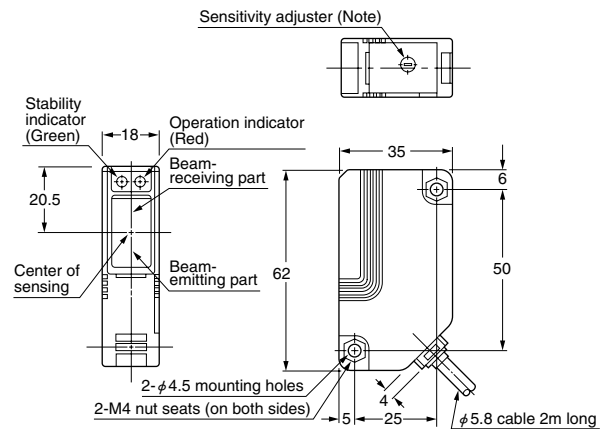
Note: Not incorporated on **NX5-RM7☐**.

NX5-D700A
NX5-D700B Sensor

SUNX

NX5
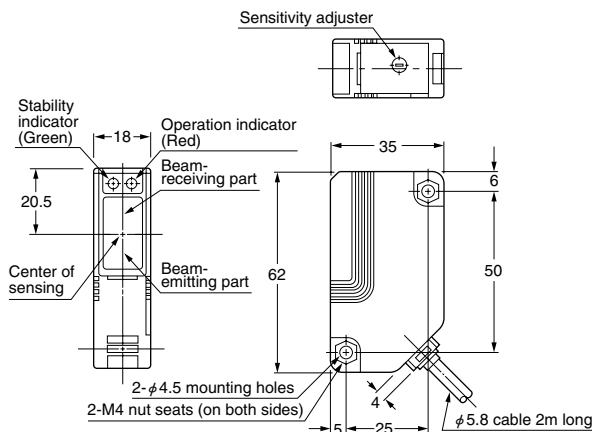
DIMENSIONS (Unit: mm)

RF-230 — Reflector (Accessory for the retroreflective type sensor)
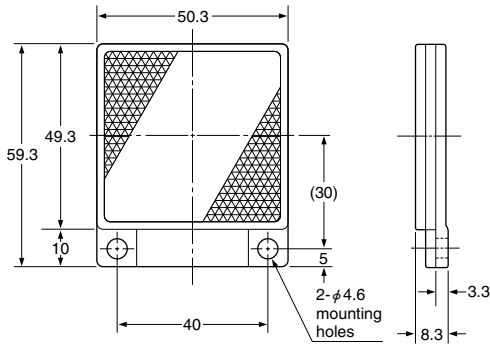
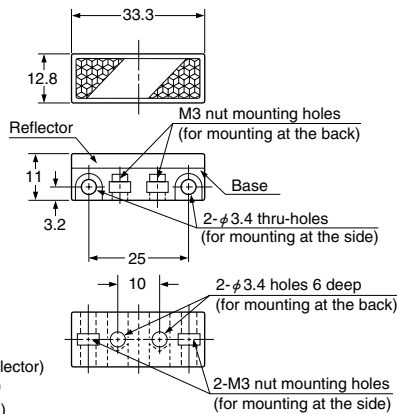Material: Acrylic (Reflector)
ABS (Base)

RF-220 — Reflector (Optional)
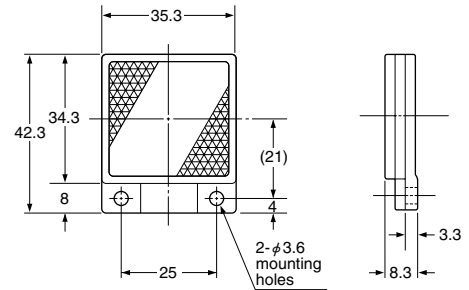
Material: Acrylic (Reflector)
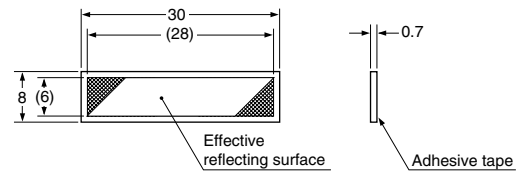ABS (Base)

RF-210 — Reflector (Optional)

Material: Acrylic (Reflector)
ABS (Base)

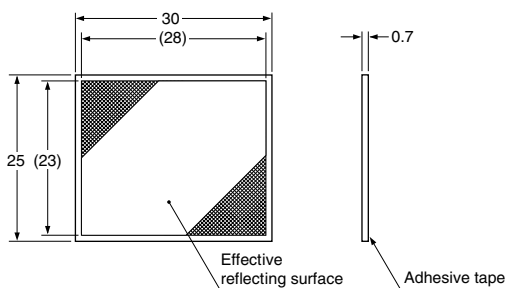Two M3 (length 8mm) screws with washers and two nuts are attached.

RF-11 — Reflective tape (Optional)
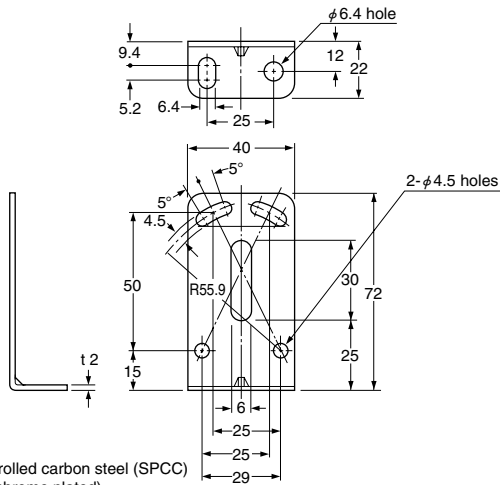
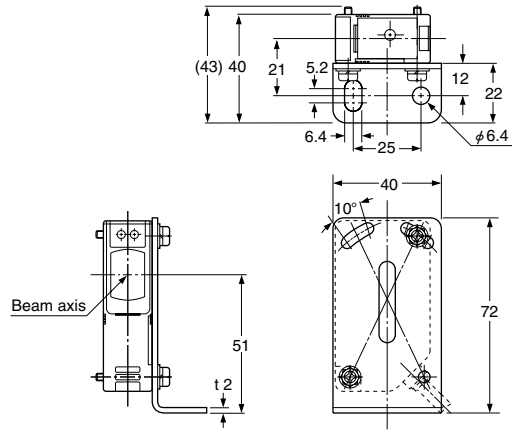

Material: Acrylic

RF-12 — Reflective tape (Optional)

Material: Acrylic

NX5
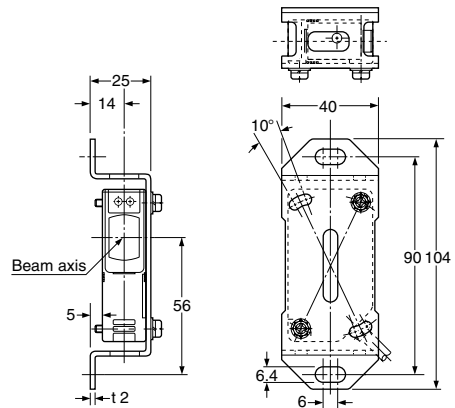
DIMENSIONS (Unit: mm)

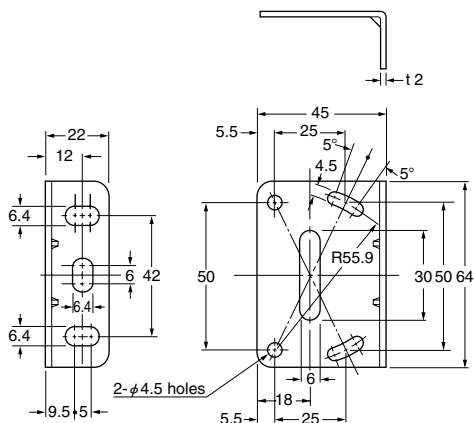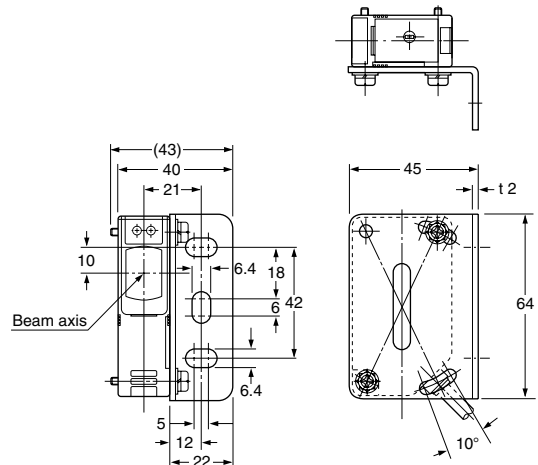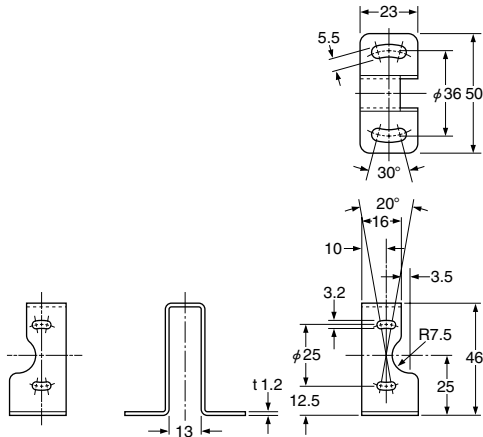### MS-NX5-1 Sensor mounting bracket (Optional)

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)
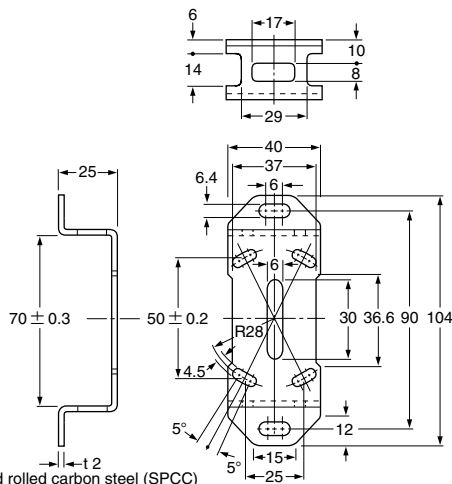
Material: Cold rolled carbon steel (SPCC)
(Uni-chrome plated)

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

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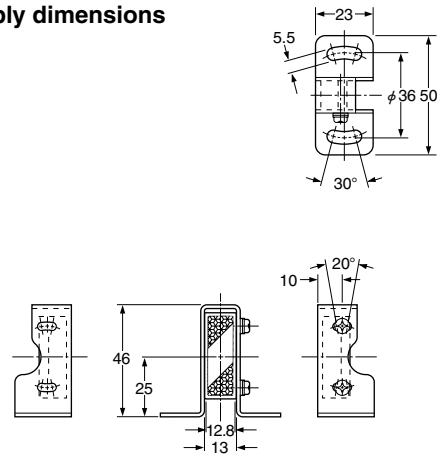Mounting drawing with the receiver of **NX5-M10R□**

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□**

SUNX

DIMENSIONS (Unit: mm)

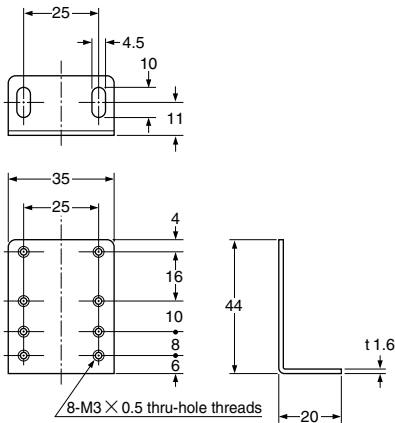### MS-RF21-1   Reflector mounting bracket for **RF-210** (Optional)
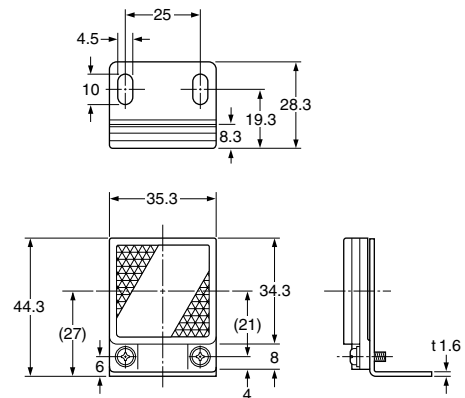
Assembly dimensions

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

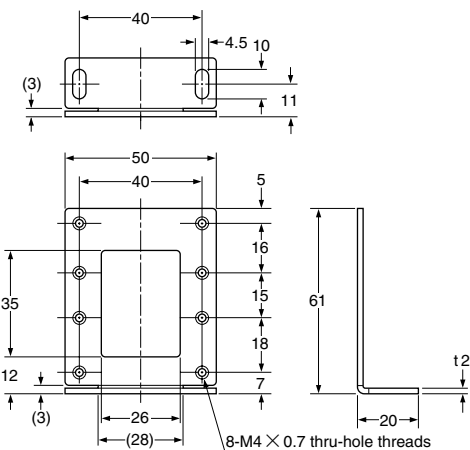### MS-RF22   Reflector mounting bracket for **RF-220** (Optional)

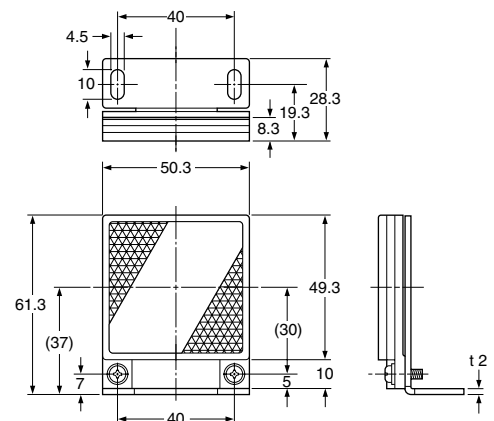**Assembly dimensions**

8-M3 × 0.5 thru-hole threads

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

8-M4 × 0.7 thru-hole threads

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

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