# Compact Multi-voltage Photoelectric Sensor Power Supply Built-in

FIBER SENSORS

LASER SENSORS

MICRO PHOTOELECTRIC **SENSORS** 

AREA SENSORS

SAFETY LIGHT CURTAINS / SAFETY COMPONENTS PRESSURE / FLOW

SENSORS INDUCTIVE PROXIMITY **SENSORS** 

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SENSOR OPTIONS

SIMPLE WIRE-SAVING UNITS

WIRE-SAVING SYSTEMS

MEASUREMENT SENSORS

STATIC CONTROL DEVICES

LASER MARKERS

PLC

HUMAN MACHINE INTERFACES

FNFRGY MANAGEMENT SOLUTIONS

FA COMPONENTS

MACHINE VISION SYSTEMS

UV CURING SYSTEMS

Amplifier Built-in separated

■ General terms and conditions...... F-3 Related Information

■ Selection guide ...... P.231~

Glossary of terms / General precautions......P.1549~ / P.1552~

■ China's CCC mark......P.1601







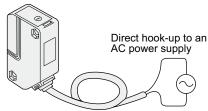
\*5 m 16.4041 ft cable length type: Certified (for sales in China only)



# Multi-voltage photoelectric sensor usable worldwide

#### Multi-voltage

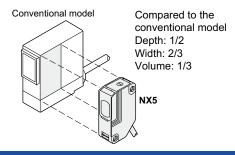
The NX5 series can operate at 24 to 240 V AC or 12 to 240 V DC, which is suitable for supply voltages around the world.



No need to arrange a DC power supply.

#### **Compact size**

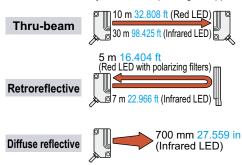
Despite of being multi-voltage, it has a depth of just 35 mm 1.378 in. (W18 × H62 × D35 mm W0.709 × H2.441 × D1.378 in)



#### **BASIC PERFORMANCE**

#### Long sensing range

It is most suitable for conveyor lines and parking lot applications.



#### High reliability

It has an IP66 protection. Moderate dust or water splashes will not affect the sensor.

The hermetically sealed output relay significantly increases its reliability.



#### **FUNCTIONS / MOUNTING**

#### Easy alignment

The 10 m 32.808 ft thru-beam type sensor and the 5 m 16.404 ft retroreflective type sensor incorporate a red LED beam source. Beam alignment can be attained by checking the emitted beam visually.

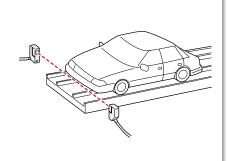
#### Interference prevention

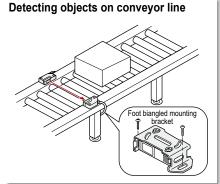
Two sensors can operate normally even if mounted close together.

(Excluding the 30 m 98.425 ft thru-beam type sensor)

#### **APPLICATIONS**

#### Detecting car position at parking garage



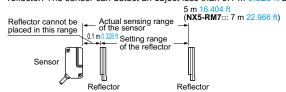


#### ORDER GUIDE

Туре		e	Appearance	Sensing range	Model No. (Note 2, 3)	Emitting element	Output
	sensing	Light- ON		10 m 32.808 ft	NX5-M10RA	Red LED	Relay contact 1c
Thru-beam		Dark- ON		10 III 021000 X	NX5-M10RB	Ned ELD	
		Light-		30 m	NX5-M30A	Infrared LED	
	Long s range	Dark- ON		98.425 ft	NX5-M30B		
Retroreflective	larizing	Light- ON		0.1 to 5 m 0.328 to 16.404 ft	NX5-PRVM5A	חייו	
	With po filters	Dark- ON		(Note 1)	NX5-PRVM5B	Red LED	
	sensing With polarizing filters	range Dark- Light- ON ON		0.1 to 7 m 0.328 to 22.966 ft	NX5-RM7A	1.611.50	
	Long s range			(Note 1)	NX5-RM7B	Infrared LED	
	se	Light- ON			NX5-D700A	lafacas d I ED	
Diffuse reflective	Diffu refle	Dark- ON		700 mm 27.559 in	NX5-D700B	Infrared LED	

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 0.1 m 0.328 ft away.



- 2) The model No. with "P" shown on the label affixed to the thru-beam type sensor is the emitter, "D" shown on the label is the receiver.
- 3) 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.) Refer to "I/O CIRCUIT DIAGRAM AND OUTPUT OPERATION (p.371)" for the output operation of each model.

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)		

#### 5 m 16.404 ft cable length type

5 m 16.404 ft cable length type (standard: 2 m 6.562 ft) is also available. When ordering this type, suffix "-C5" to the model No.

(e.g.) 5 m 16.404 ft cable length type of NX5-M10RA is "NX5-M10RA-C5"

#### **Accessory**

• RF-230 (Reflector)



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# Amplifier Built-in Amplifier-separated

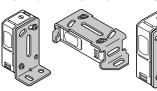
#### **OPTIONS**

Designation	Model No.	Description				
	MS-NX5-1	Foot angled mounting bracket (The thru-beam type sensor needs two brackets.)				
Sensor mounting bracket	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	OS-NX5-3×6	Sensing range: 3 m 9.843 ft [NX5-M10R□]     16 m 52.493 ft [NX5-M30□]     Min. sensing object: ø10 mm ø0.394 in [NX5-M10R□]     ø20 mm ø0.787 in [NX5-M30□]				
only	(Slit size 3 × 6 mm 0.118 × 0.236 in	Sensing range: 1 m 3.281 ft [NX5-M10R□]     6 m 19.685 ft [NX5-M30□]     Min. sensing object: 3 × 6 mm 0.118 × 0.236 in				
Interference prevention filter	PF-NX5-V (Vertical,Silver)	Same type of filters on both sides  • Sensing range: 5 m 16.404 ft  • Min. sensing object: ø20 mm ø0.787 in (One set consists of 2 pcs. of interference prevention filters.)				
For NX5-M10RA or NX5-M10RB only	PF-NX5-H (Horizontal, Light brown)					
Reflector	RF-210	Sensing range: 0.1 to 1.5 m 0.328 to 4.921 ft [NX5-PRVM5□]     0.1 to 2.5 m 0.328 to 8.202 ft [NX5-RM7□]     Min. sensing object: ø30 mm ø1.181 in				
flective type sensor only	RF-220	Sensing range: 0.1 to 3.5 m 0.328 to 11.483 ft [NX5-PRVM5□]     0.1 to 5 m 0.328 to 16.404 ft [NX5-RM7□]     Min. sensing object: ø35 mm ø1.378 in				
Reflector mounting	MS-RF21-1	Protective mounting bracket for <b>RF-210</b> It protects the reflector from damage and maintains alignmen				
bracket	MS-RF22	For <b>RF-220</b>				
	MS-RF23	For <b>RF-230</b>				
Reflective tape	RF-11	Ambient temperature:     -25 to +50 °C -13 to +122 °F     Ambient humidity: 35 to 85 % RH     Notes     Keep the tape free from stress.	Sensing range:     0.1 to 0.8 m 0.328 to 2.625 ft     [NX5-PRVM5□]     0.1 to 1 m 0.328 to 3.281 ft     [NX5-RM7□]			
(flective type sensor only	RF-12	If it is pressed too much, its capability may deteriorate.  Do not cut the tape. It will deteriorate the sensing performance.	Sensing range:     0.1 to 1 m 0.328 to 3.281 ft     [NX5-PRVM5□]     0.1 to 1.5 m 0.328 to 4.921 ft     [NX5-RM7□]			
Sensor checker (Note)	CHX-SC2	It is useful for beam alignment of the optimum receiver position is gwell as an audio signal.				

Note: Refer to p.959~ for the sensor checker CHX-SC2.

#### Sensor mounting bracket

• MS-NX5-1 • MS-NX5-2 • MS-NX5-3



Two M4 (length 25 mm nuts are attached.

Two M4 (length 25 mm 0.984 in) screws with washers and two M4 nuts are attached.

Two M4 (length 25 mm 0.984 in) screws with washers and two M4 nuts are attached.

#### Slit mask

#### • OS-NX5-3×6

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

#### Interference prevention filter (For NX5-M10R□ only)

- PF-NX5-V(Vertical, Silver color)
- PF-NX5-H(Horizontal, Light brown)

Two sets of thru-beam type sensors (Red LED type) can be mounted close together.







#### Reflector



#### Reflector mounting bracket

• MS-RF23

• MS-RF22

• MS-RF21-1



Two M4 (length 10 mm 0.394 in

Two M3 (length 8 mm 0.315 in) screws with washers are

attached.



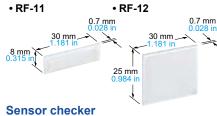
Two M3 (length 12 mm 0.472 in) screws with washers are attached.

#### Reflective tape

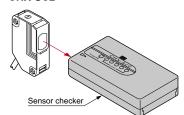
screws with

washers are

attached.



• CHX-SC2



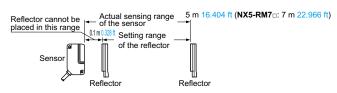
#### **SPECIFICATIONS**

		Thru-beam				Retroreflective					
	Туре			Long sensing range		With polarizing filters		Long sensing range		Diffuse reflective	
Item	n Model No.	NX5-M10RA	NX5-M10RB	NX5-M30A	NX5-M30B	NX5-PRVM5A	NX5-PRVM5B	NX5-RM7A	NX5-RM7B	NX5-D700A	NX5-D700B
CE n	marking directive compliance	Low Voltage Directive, EMC Directive, RoHS Directive									
Sens	sing range	10 m 32.808 ft 30 m 98.425 ft			0.1 to 5 m 0.328 to 16.404 ft (Note 2)			22.966 ft (Note 2)	700 mm 27.559 in (Note 3)		
Sens	sing object	ø20 mm ø0.787 in or more opaque object (Note 4)		ø20 mm ø0.787 in or more opaque object (Completely beam interrupted object) (Note 4)		ø50 mm ø1.969 in or more opaque, translucent or specular object (Note 2, 5)		ø50 mm ø1.969 in or more opaque or translucent object (Note 2, 5)		Opaque, translucent or transparent object (Note 5)	
Hyst	teresis			15 % or less of operation distance (Note 3)							
Repea	atability (perpendicular to sensing axis)	0.1 mm 0.004 in or less 0.2 mm 0.008 in or less						0.3 mm 0.012 in or less			
Supp	ply voltage	24-240 V AC <sup>+10</sup> <sub>-15</sub> % or 12 to 240 V DC <sup>+10</sup> <sub>-15</sub> % Ripple P-P 10 % or less									
Pow	er consumption	Emitter: 1 V Receiver: 2		Emitter: 1.5 Receiver: 2	VA or less VA or less			2 VA (	or less		
Output		R	Relay contact 1 c  • Switching capacity: 250 V AC 1 A (resistive load) 30 V DC 2 A (resistive load)  • Electrical life: 500,000 or more switching operations (switching frequency 3,600 operations/hour) 100,000 or more switching operations (switching frequency 3,600 operations/hour) • Mechanical life: 100 million or more switching operations (switching frequency 36,000 operations/hour)								
	Output operation	Light-ON	Dark-ON	Light-ON	Dark-ON	Light-ON	Dark-ON	Light-ON	Dark-ON	Light-ON	Dark-ON
Res	ponse time	10 ms or less									
Ope	ration 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)									
Pow	er indicator			Red LED (lights up when the power is ON)							
Sens	sitivity adjuster	Continuously va	ariable adjuster	г —		Continuously variable adjuster ————		Continuously variable adjuster			
	omatic interference rention function	Use optional prevention fil		)		Incorporated (Two units of sensors can be mounted close together.)					
	Pollution degree	3 (Industrial environment)									
æ	Protection		IP66 (IEC)								
Environmental resistance	Ambient temperature	–20 to	-20 to +55 °C - 4 to +131 °F (No dew condensation or icing allowed) (Note 6), Storage: -30 to +70 °C -22 to +158 °F								
resi	Ambient humidity	35 to 85 % RH, Storage: 35 to 85 % RH									
ental	Ambient illuminance	Incandescent light: 3,500 & or less at the light-receiving face									
onme	Voltage withstandability	1,500 V AC for one min. between power supply and output terminals, 1,000 V AC for one min. between relay						en relay conta	ct terminals		
invir	Insulation resistance	20 MΩ, or more, with 500 V DC megger between power supply and output terminals, and between relay contact termin							terminals		
ш	Vibration resistance	10 to 55 Hz frequency, 1.5 mm 0.059 in double amplitude in X, Y and Z directions for two hours each									
	Shock resistance			500 m/	's² (50 G app	orox.) in X, Y and Z directions three times each					
Emit	tting element	Red LED (I	Red LED (modulated) Infrared LED (modulated)			Red LED (modulated) Infrared LED			D (modulated)		
	Peak emission wavelength	660 nm 0.026 mil 880 nm 0.035 mil 660 nm 0.026 mil 880 nm 0.035 mil									
Mate	erial	Enclosure: Polycarbonate, Lens: Polycarbonate, Cover: Polycarbonate, Front cover (retroreflective type sensor only): Acrylic									
Cable		0.3 mm² 5-core (thru-beam type emitter: 2-core) cabtyre cable, 2 m 6.562 ft long									
Cable extension		Extension up to total 100 m 328.084 ft is possible with 0.3 mm², or more, cable (thru-beam type: both emitter and receive						receiver).			
Net weight		Emitter: 100 Receiver: 14	g approx. 40 g approx.	Emitter: 125 Receiver: 14	g approx. 40 g approx.	140 g approx.					
Acce	essories	Adjusting scre	ewdriver: 1 pc.		_	RF-230 (Refle	ector): 1 pc. ewdriver: 1 pc.	<b>RF-230</b> (Ref	lector): 1 pc.	Adjusting scre	ewdriver: 1 pc.

Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +23 °C +73.4 °F.

2) 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 0.1 m 0.328 ft away.



- 3) The sensing range and the hysteresis of the diffuse reflective type sensor are specified for white non-glossy paper (200 × 200 mm 7.874 × 7.874 in) as the object.
- 4) If slit masks (optional) are fitted, an object as small as 3 × 6 mm 0.118 × 0.236 in can be detected.
- 5) Make sure to confirm detection with an actual sensor before use.
- 6) In case the sensor is to be used at an ambient temperature of –15 °C +5 °F, or less, please contact our office.

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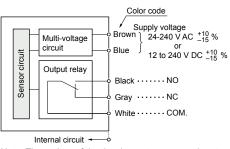
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Amplifier Built-in

# Amplifier-separated

#### ■ I/O CIRCUIT DIAGRAM AND OUTPUT OPERATION

#### I/O circuit diagram



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

#### **Output operation**

Object detected state.

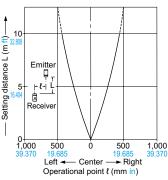
Canaina mada		Т	hru-beam & Re	troreflective typ	e	Diffuse reflective type				
36	ensing mode	Light-ON (A) type		Dark-ON ( <b>B</b> ) type		Light-ON (A) type		Dark-ON ( <b>B</b> ) type		
Output		NO (Black cable)	NC (Gray cable)	NO (Black cable)	NC (Gray cable)	NO (Black cable)	NC (Gray cable)	NO (Black 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	

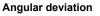
### **SENSING CHARACTERISTICS (TYPICAL)**

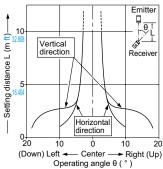
#### NX5-M10RA NX5-M10RB

Thru-beam type

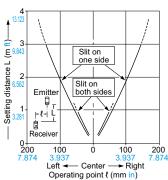








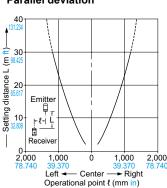
#### Parallel deviation with slit masks (3 × 6 mm 0.118 × 0.236 in)



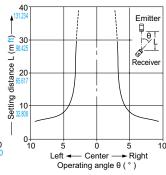
#### NX5-M30A NX5-M30B

Thru-beam type

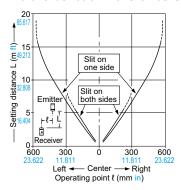
#### Parallel deviation



#### Angular deviation



#### Parallel deviation with slit masks (3 × 6 mm 0.118 × 0.236 in)



#### SENSING CHARACTERISTICS (TYPICAL)

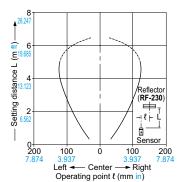
#### NX5-PRVM5A NX5-PRVM5B

Retroreflective type

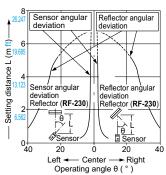
#### NX5-RM7A NX5-RM7B

Retroreflective type

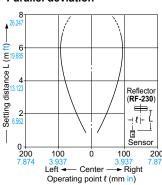
#### Parallel deviation



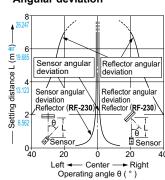
#### Angular deviation



#### Parallel deviation



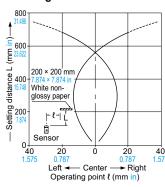
#### Angular deviation



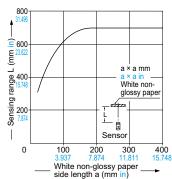
#### NX5-D700A NX5-D700B

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  $200 \times 200$  mm  $7.874 \times 7.874$  in), the sensing range shortens, as shown in the left graph.

For plotting the left graph, the sensitivity has been set such that a 200 × 200 mm 7.874 × 7.874 in white non-glossy paper is just detectable at a distance of 700 mm 27.559 in.

#### PRECAUTIONS FOR PROPER USE

Refer to p.1552~ for general precautions.

<u>^</u>

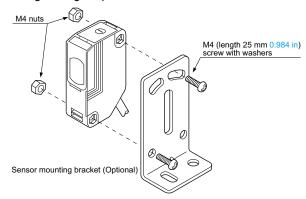
• Never use this product as a sensing device for personnel protection.

 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.

#### Mounting

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

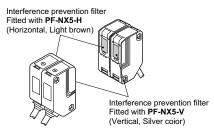


#### Others

- Do not use during the initial transient time (50 ms) after the power supply is switched on.
- Although the protection degree is specified for the sensor including the cable, the cable end is not waterproof, and is not covered by the protection specified. Hence, make sure that water does not seep in from the cable end.

#### Interference prevention filter (Exclusively for NX5-M10R<sub>□</sub>)

- Use the interference prevention filters (optional) when two units of thru-beam type sensors are mounted close together. However, take note that the sensing range will become short.
- There are 2 types of interference prevention filters. Install PF-NX5-H (Horizontal, Light brown) for 1 set, and install PF-NX5-V (Vertical, Silver color) for the other set.



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

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Built-in

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PARTICULAR USE SENSORS

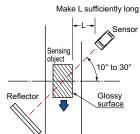
PLC

#### PRECAUTIONS FOR PROPER USE

Refer to p.1552~ for general precautions.

#### 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 $_{\square}$ )

 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 (specular) label or wrapping paper

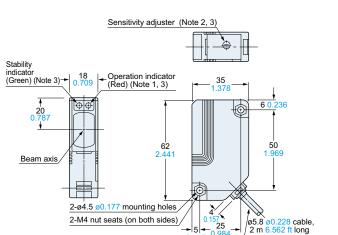
#### Steps

- 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 in)

The CAD data can be downloaded from our website.

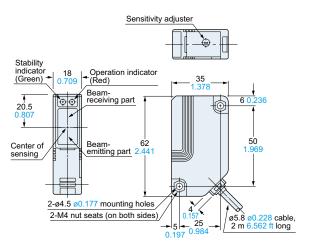
#### NX5-M10RA NX5-M10RB NX5-M30A NX5-M30B Sensor



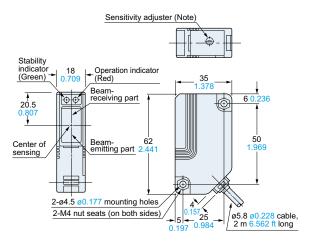
Notes: 1) It is the power indicator (red) on the emitter of NX5-M30□.

- 2) Not incorporated on **NX5-M30**...
- 3) Not incorporated on the emitter.

#### NX5-D700A NX5-D700B Senso



#### NX5-PRVM5A NX5-PRVM5B NX5-RM7A NX5-RM7B Sensor



Note: Not incorporated on NX5-RM7 $\square$ .

## DIMENSIONS (Unit: mm in)

Reflector (Accessory for the retroreflective type sensor)

RF-230

The CAD data can be downloaded from our website.

Reflector (Optional)

LASER SENSORS

SAFETY LIGHT CURTAINS / SAFETY COMPONENTS

PRESSURE / FLOW SENSORS

INDUCTIVE PROXIMITY SENSORS PARTICULAR USE SENSORS

SENSOR OPTIONS

MEASURE-MENT SENSORS

STATIC CONTROL DEVICES

LASER MARKERS

PLC

HUMAN MACHINE INTERFACES

FA COMPONENTS

MACHINE VISION SYSTEMS

Amplifier Built-in

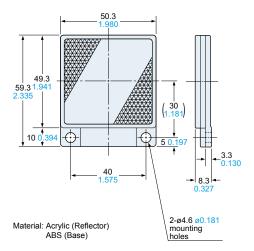
Reflective tape (Optional)

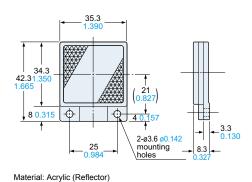
Amplifier-separate

**RF-220** 

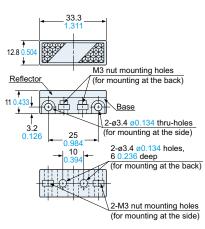
**RF-12** 

ABS (Base)





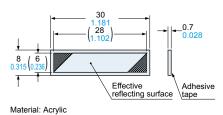
**RF-210** Reflector (Optional)



Material: Acrylic (Reflector) ABS (Base)

Two M3 (length 8 mm 0.315 in) screws with washers and two nuts are attached.

**RF-11** Reflective tape (Optional)



30 .18 28 1.102 0.7 Adhesive

> Effective reflecting surface

Material: Flexible polyvinyl chloride

40

5'

--|6|-25

29

2-ø4.5 ø0.177 holes

25

FIBER SENSORS LASER SENSORS

AREA SENSORS COMPONENTS PRESSURE / FLOW SENSORS

PARTICULAR USE SENSORS

SENSOR OPTIONS SIMPLE WIRE-SAVING UNITS

WIRE-SAVING SYSTEMS MEASURE-MENT SENSORS STATIC CONTROL DEVICES

LASER MARKERS

PLC HUMAN

MACHINE INTERFACES

FA COMPONENTS MACHINE VISION SYSTEMS

CURING SYSTEMS

Amplifier Built-in

Amplifier-separated

#### DIMENSIONS (Unit: mm in)

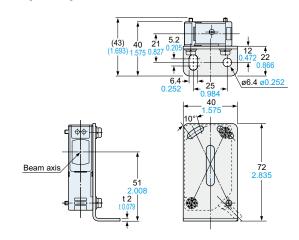
15

The CAD data can be downloaded from our website.

Sensor mounting bracket (Optional)

Sensor mounting bracket (Optional)

Mounting drawing with the receiver of NX5-M10R□



#### **Assembly dimensions**

#### MS-NX5-2

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

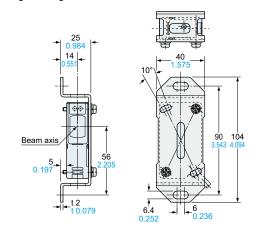
screws with washers and two M4 nuts are attached

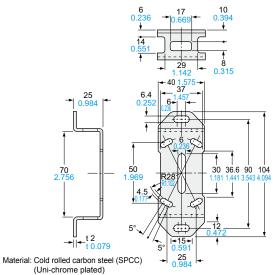
Two M4 (length 25 mm 0.984 in)

MS-NX5-1

**Assembly dimensions** 

Mounting drawing with the receiver of NX5-M10R□

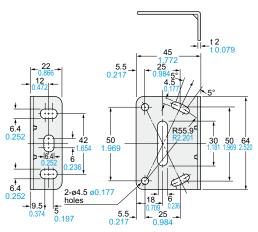




Two M4 (length 25 mm 0.984 in) screws with washers and two M4 nuts are attached.

#### MS-NX5-3

Sensor mounting bracket (Optional)

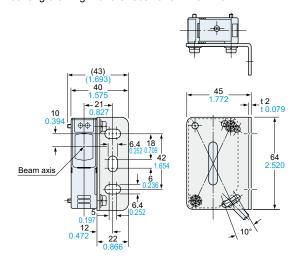


Material: Cold rolled carbon steel (SPCC) (Uni-chrome plated)

Two M4 (length 25 mm 0.984 in) screws with washers and two M4 nuts are attached.

#### **Assembly dimensions**

Mounting drawing with the receiver of NX5-M10R□



#### DIMENSIONS (Unit: mm in)

The CAD data can be downloaded from our website.

SAFETY LIGHT CURTAINS / SAFETY COMPONENTS

PRESSURE / FLOW SENSORS

PARTICULAR USE SENSORS

SENSOR OPTIONS

MEASURE-MENT SENSORS

STATIC CONTROL DEVICES

LASER MARKERS

PLC

HUMAN MACHINE INTERFACES

FA COMPONENTS

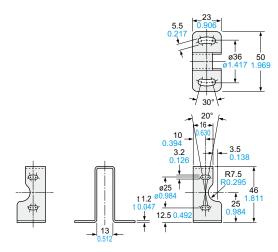
MACHINE VISION SYSTEMS

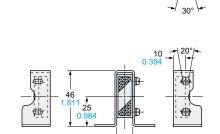
Amplifie Built-in

#### MS-RF21-1

Reflector mounting bracket for RF-210 (Optional)

#### **Assembly dimensions**



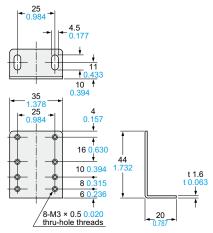


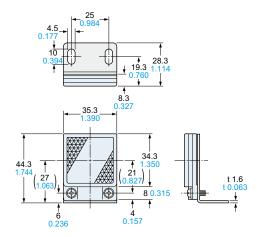
Material: Stainless steel (SUS304)

Two M3 (length 12 mm 0.472 in) screws with washers are attached.

#### MS-RF22

#### **Assembly dimensions**



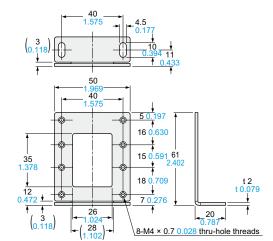


Material: Cold rolled carbon steel (SPCC) (Uni-chrome plated)

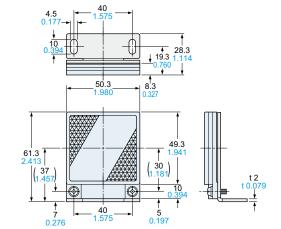
Two M3 (length 8 mm 0.315 in) screws with washers are attached.

#### MS-RF23

Reflector mounting bracket for **RF-230** (Optional)



#### **Assembly dimensions**



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

Two M4 (length 10 mm 0.394 in) screws with washers are attached.