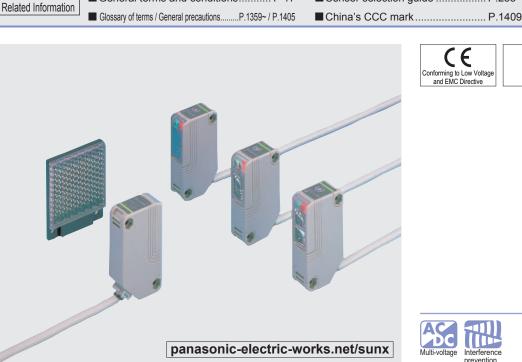
# Compact Multi-voltage Photoelectric Sensor Power Supply Built-in SERIES





General terms and conditions...... F-17



 $(\mathbf{w})$ 

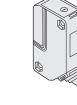
Certified

Sensor selection guide ..... P.283~

## 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.



Direct hook-up to an AC power supply

No need to arrange a DC power supply.

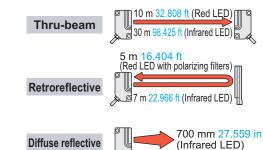
## Selection Guide Amplifier Built-in Amplifier-separated

VF

### Long sensing range

**BASIC PERFORMANCE** 

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



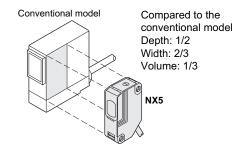
## **FUNCTIONS / MOUNTING**

## 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.

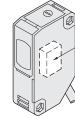
## **Compact size**

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)



## 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.



Hermetically sealed relay eliminates worries about bad contact

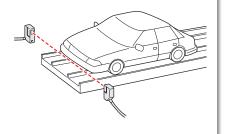
## Interference prevention

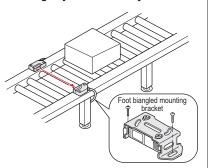
Two sensors can operate normally even if mounted close together. (Excluding the 30 m 98.425 ft thru-beam type sensor)

## **APPLICATIONS**

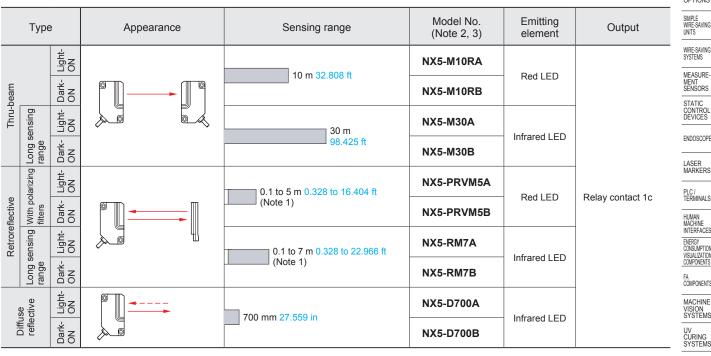
Detecting car position at parking garage

Detecting objects on conveyor line



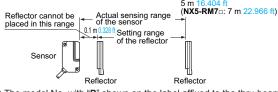


## ORDER GUIDE



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.



## 5 m 16.404 ft cable length type

Accessory

• RF-230 (Reflector)

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"

NX5	
/F	

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. (e.g.) Emitter of NX5-M10RA: NX5-M10RP Receiver of NX5-M10RA: NX5-M10RAD

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" 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)	<b>NX5-D700B</b> (Dark-ON)





INDUCTIVE PROXIMITY SENSORS

PARTICULAR USE SENSORS

SENSOR OPTIONS

WIRE-SAVING SYSTEMS

MEASURE-MENT SENSORS

CONTROL

ENDOSCOPE

LASER MARKERS

PLC / TERMINALS

HUMAN MACHINE INTERFACES

ENERGY CONSUMPTION VISUALIZATION COMPONENTS FA COMPONENTS

MACHINE SYSTEMS

UV CURING SYSTEMS

Selection Guide Amplifier Built-in

FIBER SENSORS

## **OPTIONS**

LASER SENSORS
PHOTO- ELECTRIC SENSORS
MICRO PHOTO- ELECTRIC SENSORS
AREA SENSORS
LIGHT CURTAINS
PRESSURE / FLOW SENSORS
INDUCTIVE PROXIMITY SENSORS
PARTICULAR USE SENSORS
SENSOR OPTIONS
SIMPLE WIRE-SAVING UNITS
WIRE-SAVING SYSTEMS
MEASURE- MENT SENSORS
STATIC CONTROL DEVICES
ENDOSCOPE
LASER MARKERS
PLC / TERMINALS
HUMAN MACHINE INTERFACES
ENERGY CONSUMPTION VISUALIZATION COMPONENTS
FA COMPONENTS
MACHINE VISION SYSTEMS
UV CURING SYSTEMS

	Designation	Model No.	Descript	ion	Sensor moun • MS-NX5-1
		MS-NX5-1	Foot angled mounting bracket (The thru-beam type sensor needs		
	Sensor mounting bracket	MS-NX5-2	Foot biangled mounting bracket (s (The thru-beam type sensor needs		
		MS-NX5-3	Back angled mounting bracket (The thru-beam type sensor needs	Two M4 (length 25 mm T 0.984 in) screws with 0	
	Slit mask (For thru-beam type sensor only	<b>OS-NX5-3×6</b> (Slit size 3 × 6 mm 0.118 × 0.236 in	Slit on one side • Min. sensing object • Sensing range: Slit on both sides	3 m 9.843 ft [NX5-M10R□] 16 m 52.493 ft [NX5-M30□] ≈ 010 mm Ø0.394 in [NX5-M10R□] Ø20 mm Ø0.787 in [NX5-M30□] 11 m 3.281 ft [NX5-M10R□] 6 m 19.685 ft [NX5-M30□] sct: 3 × 6 mm 0.118 × 0.236 in	washers and two M4 w nuts are attached. n Slit mask • OS-NX5-3×6 Fitted on the front face of the
	Interference prevention filter (For NX5-M10RA or NX5-M10RB	PF-NX5-V (Vertical,Silver) PF-NX5-H	1.787 in ference prevention filters.)	sensor with one touch.	
	Reflector	(Horizontal, Light brown)	<ul> <li>Sensing range: 0.1 to 1.5 m 0.32 0.1 to 2.5 m 0.32</li> <li>Min. sensing object: ø30 mm ø1</li> </ul>		
(flective type sensor only)	RF-220	<ul> <li>Sensing range: 0.1 to 3.5 m 0.32</li> <li>0.1 to 5 m 0.328</li> <li>Min. sensing object: ø35 mm ø1.</li> </ul>	• RF-210		
	Reflector	MS-RF21-1	Protective mounting bracket for <b>RF</b> It protects the reflector from damage	33.3 mm 1.311 in 0.504 in	
	mounting bracket	MS-RF22	For <b>RF-220</b>	Harman	
		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     Keen the tage free free stress	<ul> <li>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_]</li> </ul>	Reflector mot
	flective type sensor only	RF-12	<ul> <li>Keep the tape free from stress. If it is pressed too much, its capability may deteriorate.</li> <li>Do not cut the tape. It will deteriorate the sensing performance.</li> </ul>	<ul> <li>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 ]</li> </ul>	
	Sensor checker (Note)	CHX-SC2	It is useful for beam alignment of the optimum receiver position is g well as an audio signal.	Two M4 (length 10 mm 0.394 in) a screws with se	

Note: Refer to the sensor checker CHX-SC2 pages for details.

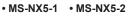
VF

Selection Guide

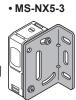
Amplifier Built-in

Amplifier-separated

## Sensor mounting bracket







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

## 0.984 in) screws with washers and two M4 nuts are attached.

Two M4 (length 25 mm

### 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.

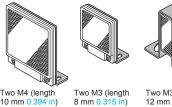


### Reflector



### Reflector mounting bracket

#### MS-RF23 • MS-RF22 • MS-RF21-1



screws with washers are

attached.

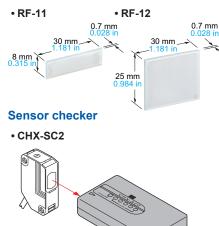
wo M4 (length 0 mm 0.394 in 4 in) screws with washers are attached.

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

attached.

## **Reflective tape**

Sensor checker



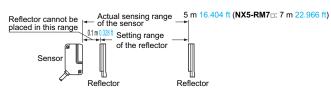
## SPECIFICATIONS

/		<b>T</b>	Thru-beam				Retroreflective					
Туре				Long sensing range		With polar	izing filters	Long sens	sing range	Diffuse r	eflective	
Iten	n 🔨 🚺	Model No.	NX5-M10RA	NX5-M10RB	NX5-M30A	NX5-M30B	NX5-PRVM5A	NX5-PRVM5B	NX5-RM7A	NX5-RM7B	NX5-D700A	NX5-D700B
Sen	ising range		10 m 32	2.808 ft	3 ft 30 m 98.425 ft 0.1 to 5 m		0.1 to 5 m 0.328 to	16.404 ft (Note 2)	0.1 to 7 m 0.328 to	22.966 ft (Note 2)	700 mm 27.5	59 in (Note 3)
Sen	ising object											
Hys	teresis										15 % or less of opera	tion distance (Note 3)
Repea	atability (perpendicular t	to sensing axis)	0.1 mm 0.00	04 in or less			0.2 mm 0.0	08 in or less			0.3 mm 0.0	12 in or less
Sup	ply voltage				24 to 240 V	′ AC <sup>+10</sup> <sub>-15</sub> % c	or 12 to 240 V	DC +10 %	Ripple P-P 1	0 % or less		
Pow	ver consumption		Emitter: 1 V Receiver: 2		Emitter: 1.5 Receiver: 2				2 VA (	or less		
			R	elay contact								
Out	put		<ul> <li>Switching capacity: 250 V AC 1 A (resistive load) 30 V DC 2 A (resistive load)</li> <li>Electrical life: 500,000 or more switching operations (switching frequency 3,600 operations/hour)</li> </ul>									
				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)						ur)		
	Output operatio	on	Light-ON	Dark-ON	Light-ON	Dark-ON	Light-ON	Dark-ON	Light-ON	Dark-ON	Light-ON	ur) Dark-ON
Res	ponse time			20.11 011	g., 011	20.001	10 ms			Dain ON		
	eration indicator					Red LE			ut is ON)			
· ·	bility indicator			Red LED (lights up when the output is ON) Green LED (lights up under stable light received condition or stable dark condition)								
			Red LED					,				
POW	ver indicator				(lights up when the power is ON)					1		
Sen	sitivity adjuster		Continuously va	ariable adjuster	<u> </u>		Continuously variable adjuster			Continuously v	ariable adjuster	
	omatic interferent vention function	ice		Use optional interference Incorporated (Two units of sensors can be mounted close together.)								
	Pollution degre	ee	3 (Industrial environment)									
	Protection		IP66 (IEC)									
nce	Ambient tempe	erature	-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								⊦158 °F	
sista	Ambient humid	dity	35 to 85 % RH, Storage: 35 to 85 % RH									
Environmental resistance	Ambient illumin	nance			Ir	ncandescent	light: 3,500 ł	x at the light-	receiving fac	e		
ment	EMC					E	N 61000-6-2,	EN 61000-6	-4			
/iron	Voltage withsta	andability	1,500 V AC for one min. between power supply and output terminals, 1,000 V AC for one min. between relay contact terminals								ct terminals	
Env	Insulation resis	stance	20 MΩ, o	20 MΩ, or more, with 500 V DC megger between power supply and output terminals, and between relay contact terminals								terminals
	Vibration resist	tance		10 to 55	5 Hz frequenc	y, 1.5 mm <mark>0</mark> .	059 in amplit	ude in X, Y a	nd Z directior	ns for two ho	urs each	
	Shock resistan	ice	500 m/s <sup>2</sup> (50 G 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)				0 (modulated)					
	Peak emission	wavelength	660 nm (	).026 mil	880 nm (	).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								ly): Acrylic	
Cab	le		0.3 mm <sup>2</sup> 5-core (thru-beam type emitter: 2-core) cabtyre cable, 2 m 6.562 ft long									
Cab	le extension		Extension	up to total 1	00 m 328.084	ft is possibl	e with 0.3 mn	n <sup>2</sup> , or more, o	able (thru-be	am type: bot	h emitter and	receiver).
Net	weight		Emitter: 100 Receiver: 14		Emitter: 125 Receiver: 14		140 g approx.					
Acc	essories		Adjusting scre	wdriver: 1 pc.			RF-230 (Refle Adjusting scre		RF-230 (Ref	flector): 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  $^{\circ}$ C +73.4  $^{\circ}$ 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.

FIBER SENSORS FIBER SENSORS

MICRO PHOTO-ELECTRIC SENSORS

AREA SENSORS

LIGHT

PRESSURE / SENSORS

INDUCTIVE PROXIMITY SENSORS

PARTICULAR USE SENSORS

SENSOR OPTIONS

SIMPLE WIRE-SAVING UNITS

WIRE-SAVING SYSTEMS MEASURE-MENT SENSORS

STATIC CONTROL DEVICES

ENDOSCOPE

LASER MARKERS

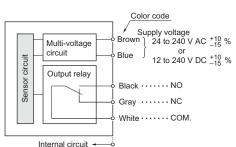
PLC / TERMINALS

Amplifier Built-in ower Supply Built-in

Amplifier-separated

## I/O CIRCUIT DIAGRAM AND OUTPUT OPERATION

#### LASER SENSORS I/O circuit diagram



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

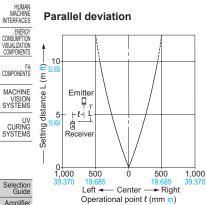
### **Output operation**

Object detected state.

Consister mode	Т	hru-beam & Re	troreflective typ	be	Diffuse reflective type				
Sensing mode		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)
dition	Power OFF	Open	Close	Open	Close	Open	Close	Open	Close
Output condition	Beam-received	Close	Open	Open	Close	Close	Open	Open	Close
Outpu	Beam-interrupted	Open	Close	Close	Open	Open	Close	Close	Open

## SENSING CHARACTERISTICS (TYPICAL)

### NX5-M10RA NX5-M10RB



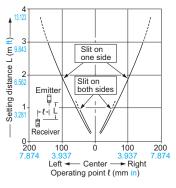
## 10 Setting distance L (m ft) Receiver Vertical direction

5

0∔ 20

Angular deviation

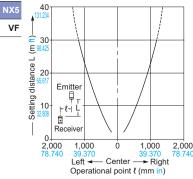
### Parallel deviation with slit masks (3 × 6 mm 0.118 × 0.236 in)



Thru-beam type

### NX5-M30A NX5-M30B

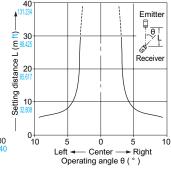




### Angular deviation

10

(Down) Left -



Horizonta

ò

- Center -

Operating angle θ (°)

10

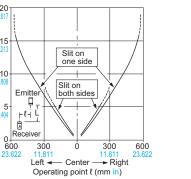
- Right (Up)

20

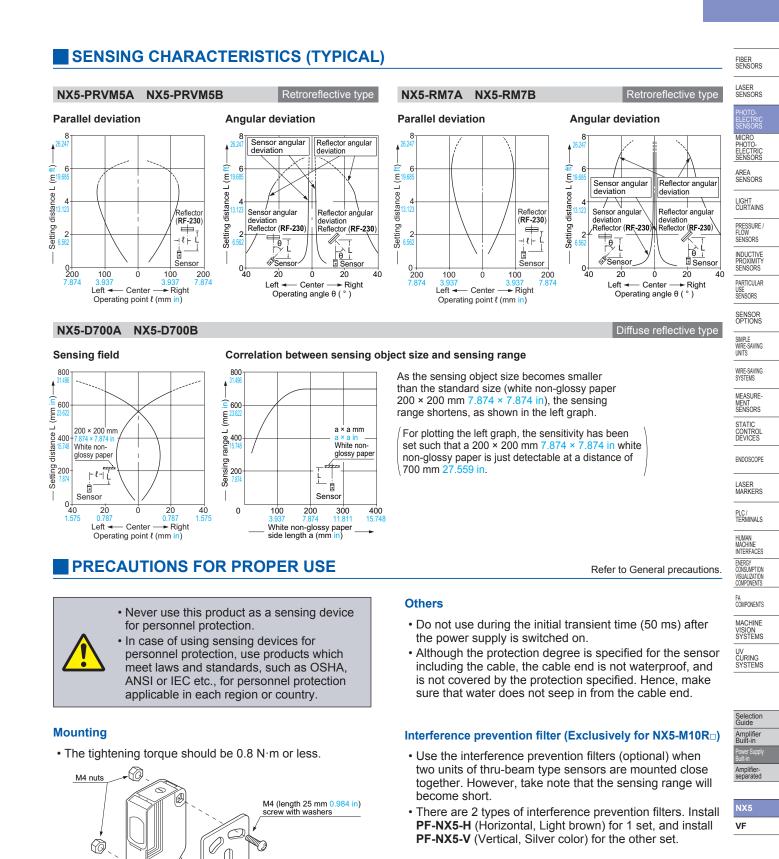
20

0

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



Thru-beam type

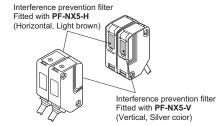


0

6

<sup>O</sup>

Sensor mounting bracket (Optional)



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

FIBER SENSORS

LASER SENSORS

MICRO PHOTO-ELECTRIC SENSORS

AREA SENSORS

LIGHT

PRESSURE /

INDUCTIVE PROXIMITY SENSORS

PARTICULAR USE SENSORS

SENSOR OPTIONS

SIMPLE WIRE-SAVING UNITS

MIRE-SAVING SYSTEMS MEASURE-MENT SENSORS

STATIC CONTROL DEVICES

ENDOSCOPE

LASER MARKERS

PLC / TERMINALS

HUMAN MACHINE INTERFACES

ENERGY

VISUALIZATION COMPONENTS

COMPONENTS

MACHINE VISION SYSTEMS

UV CURING SYSTEMS

Selection Guide

Amplifier Built-in

Amplifierseparated

VF

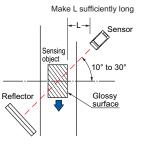
SENSORS

### Refer to General precautions.

## **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.
- Install at an angle of 10 to 30 degrees to the sensing object.



Sensor

\* 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 (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.

The CAD data in the dimensions can be downloaded from our website.

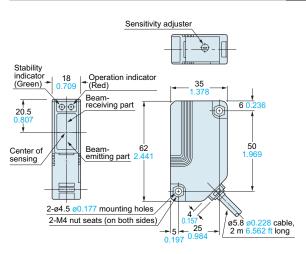
## DIMENSIONS (Unit: mm in)

### NX5-M10RA NX5-M10RB NX5-M30A NX5-M30B Sensor Sensitivity adjuster (Note 2, 3) Stability indicator Operation indicator (Red) (Note 1, 3) 18 0.709 (Green) (Note 3)-35 $\Phi | \Phi$ 6 ( łĐ 20 50 62 2 141 Beam axis Ħ 2-ø4.5 ø0.177 mounting holes 4 2-M4 nut seats (on both sides) ø5.8 ø0.228 cable, 2 m 6.562 ft long 25 5

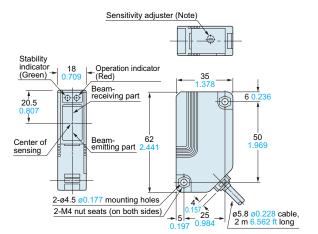
Notes: 1) It is the power indicator (red) on the emitter of NX5-M30 .. 2) Not incorporated on NX5-M30 ..

3) Not incorporated on the emitter.

### NX5-D700A NX5-D700B



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



Note: Not incorporated on NX5-RM7 ...

- ()

Material: Acrylic (Reflector) ABS (Base)

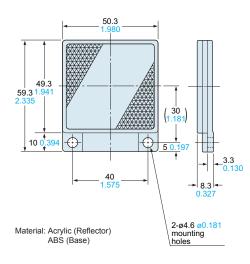
8 0.315

0

25

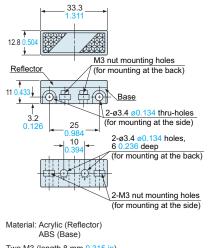
## DIMENSIONS (Unit: mm in)



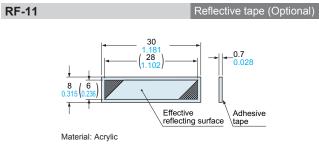


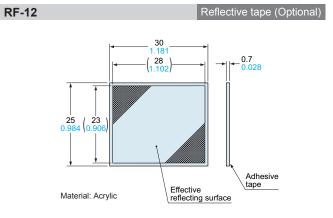
**RF-210** 

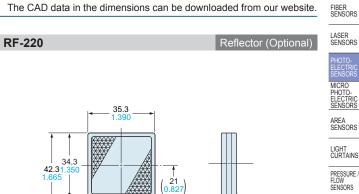




Two M3 (length 8 mm  $0.315\ \text{in})$  screws with washers and two nuts are attached.







2-ø3.6 ø0.142 mounting holes ++:

8.3

→ 3.3 0.130 INDUCTIVE PROXIMITY SENSORS PARTICULAR USE SENSOR OPTIONS SENSORS SENSOR UNITS SENSORS SENSORS STATIC CONTROL DEVICES ENDOSCOPE ENDOSCOPE ENDOSCOPE ENDOSCOPE

> PLC / TERMINALS HUMAN MACHINE INTERFACES ENERGY CONSUMPTION VISIALIZATION VOLUTION VOLUTION VISION SYSTEMS UV CURING SYSTEMS



VF

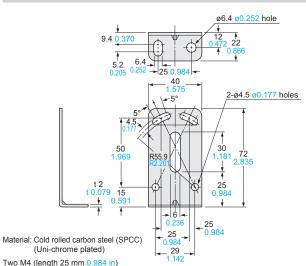
DIMENSIONS (Unit: mm in)

## FIBER SENSORS

LASER SENSORS

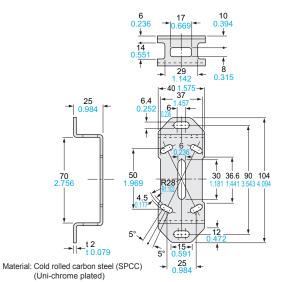
MS-NX5-1

## MIC PHOTO ELECTRIC SENSORS AREA SENSORS LIGHT PRESSURE / FLOW SENSORS INDUCTIVE PROXIMITY SENSORS PARTICULAR USE SENSOR OPTIONS SIMPLE WIRE-SAVING UNITS WIRE-SAVING SYSTEMS MEASURE-MENT SENSORS STATIC CONTROL DEVICES ENDOSCOPE LASER MARKERS PLC / TERMINALS HUMAN MACHINE INTERFACES ENERGY VISUALIZATION COMPONENTS COMPONENTS MACHINE VISION SYSTEMS UV CURING SYSTEMS



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

### MS-NX5-2



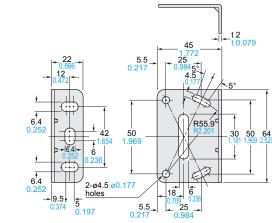
Two M4 (length 25 mm 0.984 in) screws with washers and two M4 nuts are attached.

## MS-NX5-3

Selection Guide Amplifier Built-in

Amplifier-separated

VF



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

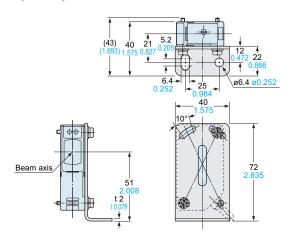
Two M4 (length 25 mm  $0.984\ \text{in})$  screws with washers and two M4 nuts are attached.

### The CAD data in the dimensions can be downloaded from our website.

## Sensor mounting bracket (Optional)

### Assembly dimensions

Mounting drawing with the receiver of NX5-M10R

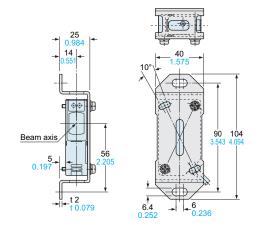


Sensor mounting bracket (Optional)

Sensor mounting bracket (Optional)

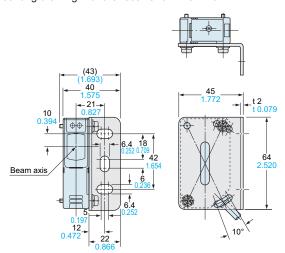
### Assembly dimensions

Mounting drawing with the receiver of NX5-M10R



## Assembly dimensions

Mounting drawing with the receiver of NX5-M10R



## DIMENSIONS (Unit: mm in)

The CAD data in the dimensions can be downloaded from our website.

