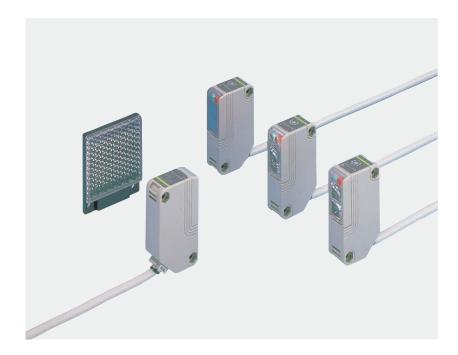


# Power Supply Built-in Compact Multi-voltage Photoelectric Sensor

NX5 SERIES



Compact Multi-voltage Photoelectric Sensor Power Supply Built-in

## NX5 SERIES



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

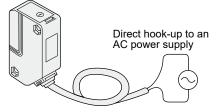




## Multi-voltage photoelectric sensor usable worldwide

## 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.

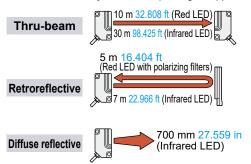


No need to arrange a DC power supply.

## **BASIC PERFORMANCE**

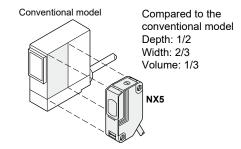
## Long sensing range

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



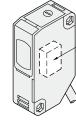
## Compact size

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

## **FUNCTIONS / MOUNTING**

## Easy alignment

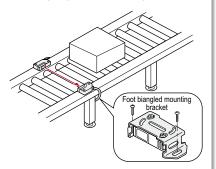
The 10 m 32.808 ft thru-beam type sensor and the 5 m 16.404 ft retroreflective type sensor incorporate a red LED beam source. Beam alignment can be attained by checking the emitted beam visually.

## Interference prevention

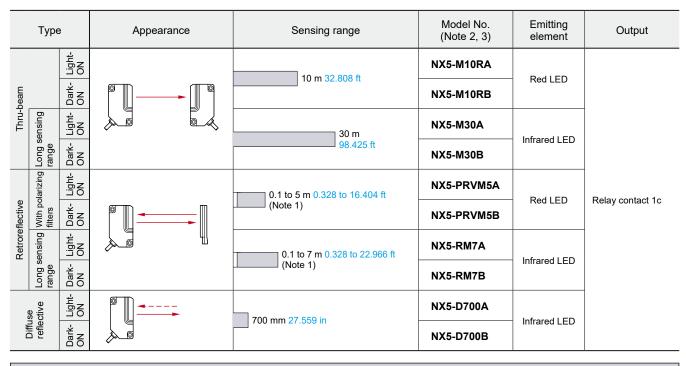
Two sensors can operate normally even if mounted close together. (Excluding the 30 m 98.425 ft thru-beam type sensor)

### **APPLICATIONS**

Detecting objects on conveyor line

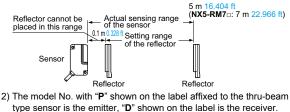


## ORDER GUIDE



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.



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.

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)

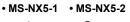


Thru-beam type	Retroreflective type	Diffuse reflective type
NX5-M10RA and NX5-M30A (Light-ON)	NX5-PRVM5A and NX5-RM7A (Light-ON)	<b>NX5-D700B</b> (Dark-ON)

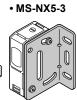
## **OPTIONS**

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 only	OS-NX5-3×6	Sensing range: 3 m 9.843 ft [NX5-M10R□] 16 m 52.493 ft [NX5-M30□] Min. sensing object: a10 mm ø0.394 in [NX5-M10R□] ø20 mm ø0.787 in [NX5-M30□]					
	$\left(\begin{array}{c} \text{Slit size 3 \times 6 mm} \\ 0.118 \times 0.236 \text{ in} \end{array}\right)$	Slit on both sides	1 m 3.281 ft [ <b>NX5-M10R</b> □] 5 m 19.685 ft [ <b>NX5-M30</b> □] ect: 3 × 6 mm 0.118 × 0.236 in				
Interference prevention filter For <b>NX5-M10RA</b>	<b>PF-NX5-V</b> (Vertical,Silver)	Same type of filters on both sides • Sensing range: 5 m 16.404 ft					
or NX5-M10RA only	<b>PF-NX5-H</b> (Horizontal, Light brown)	• Min. sensing object: ø20 mm ø0.787 in (One set consists of 2 pcs. of interference prevention filters.)					
Reflector For retrore- flective type sensor only	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					
	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 alignment.					
bracket	MS-RF22	For <b>RF-220</b>					
	MS-RF23	For <b>RF-230</b>					
Reflective tape For retrore- flective type sensor only	RF-11	<ul> <li>Ambient temperature: -25 to +50 °C -13 to +122 °F</li> <li>Ambient humidity: 35 to 85 % RH</li> <li>Notes</li> </ul>	• 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□]				
	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>	• 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	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







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

• OS-NX5-3×6

Slit mask

Fitted on the

sensor with

one touch.

front face of the

 125 mm
 Two M4 (length 25 mm

 s with
 0.984 in) screws with

 vo M4
 washers and two M4

 ed.
 nuts are attached.

#### th 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.

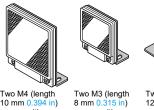


#### Reflector

• RF-210 • RF-220 11 mm 1.333 mm 1.331 m 1.330 m 1.311 m 1.390 m 1.390 m 1.390 m 1.390 m 1.390 m 1.390 m 1.665 m 1.665 m

#### Reflector mounting bracket

#### • MS-RF23 • MS-RF22 • MS-RF21-1



screws with washers are

attached.

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

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

#### Reflective tape

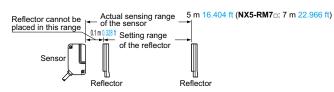
• RF-11 • RF-12 0.7 mm 0.028 in 0

## SPECIFICATIONS

$\swarrow$		-	Thru-beam				Retroreflective				Diffuse reflective			
	Туре	Long sensing range			sing range	With polarizing filters Long sensing range								
Item	1 \	Model No.	NX5-M10RA	NX5-M10RB	NX5-M30A	NX5-M30B	NX5-PRVM5A	NX5-PRVM5B	NX5-RM7A	NX5-RM7B	NX5-D700A	NX5-D700B		
CE n	narking direct	ive compliance			L	ow Voltage [	Directive, EM	C Directive, F	RoHS Directiv	e				
Sens	sing range		10 m 3	2.808 ft	30 m 9	8.425 ft	0.1 to 5 m 0.328 to	o 16.404 ft (Note 2)	0.1 to 7 m 0.328 to	22.966 ft (Note 2)	700 mm 27.559 in (Note 3			
Sens	sing object	ing object		20 mm ø0.787 in or more vaque object (Note 4) Ø20 mm ø0.787 in or m					ø50 mm ø1.969 ir or translucent obje		De Opaque, translucent or transparent object (Note 5)			
Hyst	teresis						·				15 % or less of opera	ation distance (Note 3)		
Repea	atability (perpendic	cular to sensing axis)	0.1 mm 0.0	04 in or less			0.2 mm 0.0	08 in or less			0.3 mm 0.0	0.3 mm 0.012 in or less		
Sup	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 consumpt	ion	Emitter: 1 \ Receiver: 2	/A or less 2 VA or less	Emitter: 1.5 Receiver: 2				2 VA c	or less				
Output         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)						ons/hour)	our)							
	Output ope	ration	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 indicat	tor	Red LED (lights up when the output is ON)											
Stab	ility 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 adjust	er	Continuously v	ariable adjuster	r <u> </u>		Continuously variable adjuster		Continuously variable adjuster					
Automatic interference prevention function			(Use optional interference prevention filters Incorporated (Two units of sensors can be mounted close toge						ogether.)					
	Pollution de	egree	3 (Industrial environment)											
ė	Protection						IP66	(IEC)						
stanc	Ambient ter	mperature	–20 to	+55 °C – 4 to	+131 °F (No	dew conden	sation or icin	g allowed) (N	lote 6), Stora	ge: –30 to +7	′0 °C <u>−22 to</u> ·	+158 °F		
resis	Ambient hu	midity				35 to 8	5 % RH, Sto	rage: 35 to 85	5 % RH					
ntal	Ambient illu	iminance			Inca	ndescent ligh	nt: 3,500 {x or	less at the li	ght-receiving	face				
nme	Voltage with	hstandability	1,500 V AC for one min. between power supply and output terminals, 1,000 V AC for one min. between relay contact terminals											
Environmental resistance	Insulation re	esistance	20 MΩ, or more, with 500 V DC megger between power supply and output terminals, and between relay contact terminals											
ш	Vibration re	sistance		10 to 55 Hz	frequency, 1	.5 mm 0.059	in double an	nplitude in X,	Y and Z direc	tions for two	hours each			
	Shock resis	stance	500 m/s² (50 G approx.) in X, Y and Z directions three times each											
Emit	tting element		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		0.026 mil	880 nm 0.035 mil										
Mate	erial		Enclosure	: Polycarbona	ate, Lens: Po	lycarbonate,	, Cover: Polycarbonate, Front cover (retroreflective type sensor only): 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 100 m 328.084 ft is possible with 0.3 mm <sup>2</sup> , or more, cable (thru-beam type: both emitter and red						receiver).					
Net	weight		Emitter: 100 Receiver: 14	) g approx. 40 g approx.	Emitter: 125 Receiver: 14				140 g a	approx.				
Acce	essories		Adjusting scre	ewdriver: 1 pc.			RF-230 (Refle	, ,	<b>RF-230</b> (Ref	ector): 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.

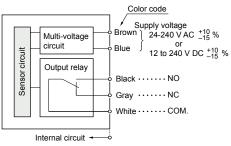


3) The sensing range and the hysteresis of the diffuse reflective type sensor are specified for white non-glossy paper (200 × 200 mm 7.874 × 7.874 in) as the object.

the object. 4) If slit masks (optional) are fitted, an object as small as  $3 \times 6 \text{ mm } 0.118 \times 0.236 \text{ in}$  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.

## 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**

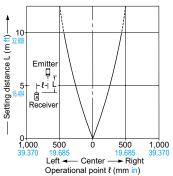
Object detected state.

Sensing mode Output		Thru-beam & Retroreflective type				Diffuse reflective type			
		Light-ON (A) type		Dark-ON	l ( <b>B</b> ) type	Light-ON (A) type		Dark-ON ( <b>B</b> ) type	
		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

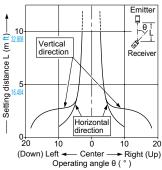
## SENSING CHARACTERISTICS (TYPICAL)

#### NX5-M10RA NX5-M10RB

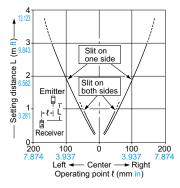
#### Parallel deviation



#### Angular deviation



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



Thru-beam type

Thru-beam type

#### Parallel deviation

40

30

20

10

Emitte

+ l - | L

Receive

1,000

Left -

Ó

Center

Operational point (mm in)

1,000

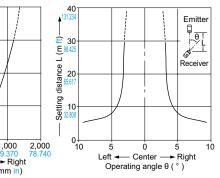
ħ.

0 2,000 78.740

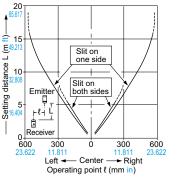
Setting distance L (m ft)-

NX5-M30A NX5-M30B

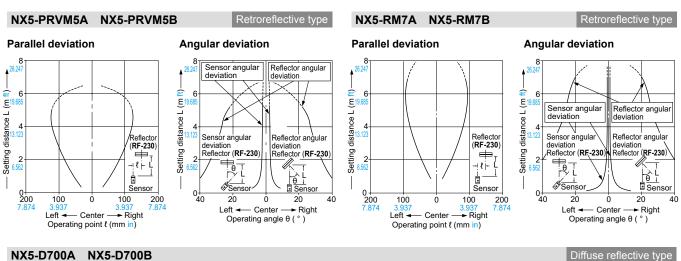
## Angular deviation



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



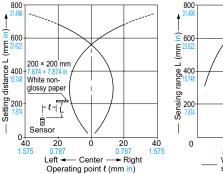
## SENSING CHARACTERISTICS (TYPICAL)



#### NX5-D700A NX5-D700B

Sensing field

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



As the sensing object size becomes smaller

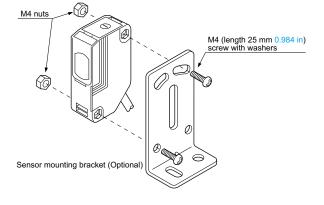
a × a mm White nonglossy pape ł ĥ Senso 100 200 300 400 White non-glossy paper side length a (mm in)

## **PRECAUTIONS FOR PROPER USE**

- · 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**

700 mm 27.559 in.

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

than the standard size (white non-glossy paper 200 × 200 mm 7.874 × 7.874 in), the sensing

For plotting the left graph, the sensitivity has been

set such that a 200  $\times$  200 mm 7.874  $\times$  7.874 in white

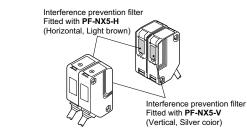
non-glossy paper is just detectable at a distance of

range shortens, as shown in the left graph.

· 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>D</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.

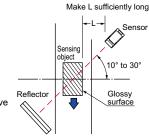


Note: The filters cannot be used for NX5-M30A or NX5-M30B.

## 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

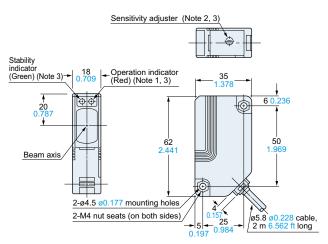
- Can wrapped by clear film
- Aluminum sheet covered by plastic film
- · Gold or silver color (specular) label or wrapping paper

#### 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.



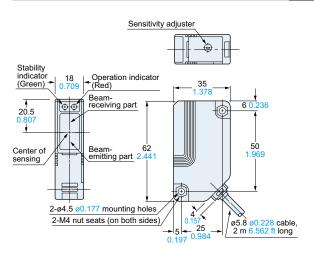
NX5-M10RA NX5-M10RB NX5-M30A NX5-M30B Sensor

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

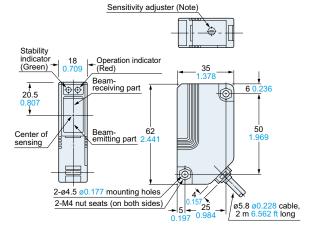
2) Not incorporated on NX5-M30 ...

3) Not incorporated on the emitter.

#### NX5-D700A NX5-D700B



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

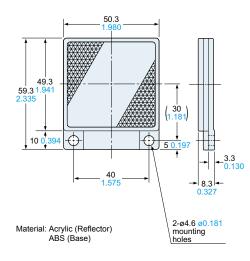


Note: Not incorporated on NX5-RM7 ...

Sensor

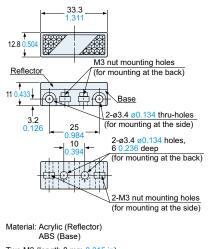
## DIMENSIONS (Unit: mm in)



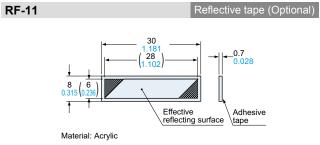


**RF-210** 

Reflector (Optional)



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

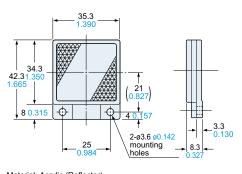


RF-12 Reflective tape (Optional)

#### The CAD data can be downloaded from our website.



#### Reflector (Optional)



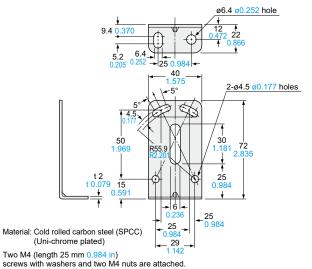
Material: Acrylic (Reflector) ABS (Base)

## DIMENSIONS (Unit: mm in)

The CAD data can be downloaded from our website.

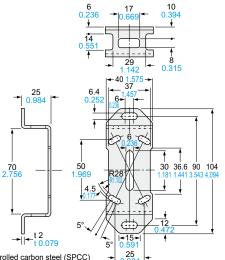
Sensor mounting bracket (Optional)

#### MS-NX5-1



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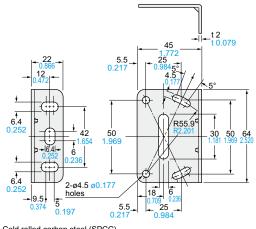
#### MS-NX5-2



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.

#### MS-NX5-3

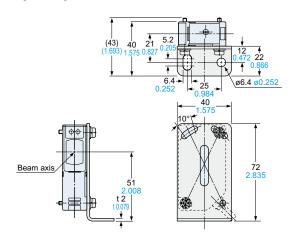


Material: Cold rolled carbon steel (SPCC) (Uni-chrome plated)

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

#### Assembly dimensions

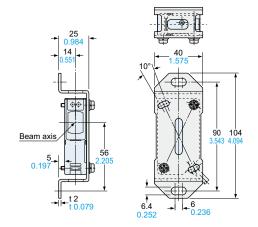
Mounting drawing with the receiver of NX5-M10R



Sensor mounting bracket (Optional)

#### Assembly dimensions

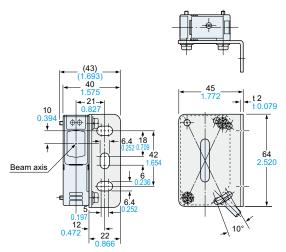
Mounting drawing with the receiver of  $\textbf{NX5-M10R}{\scriptstyle\square}$ 



#### Sensor mounting bracket (Optional)

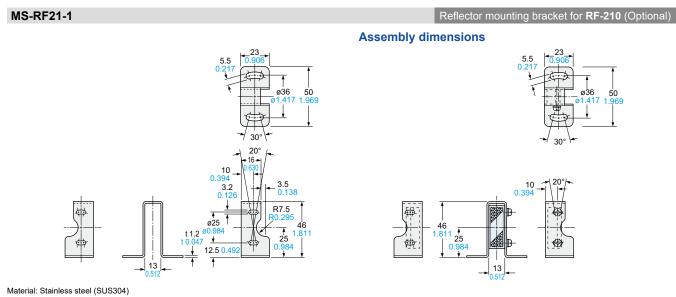
## Assembly dimensions

Mounting drawing with the receiver of NX5-M10R



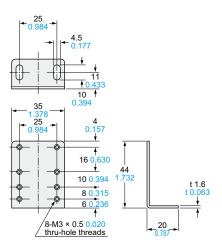
## DIMENSIONS (Unit: mm in)

The CAD data can be downloaded from our website.



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

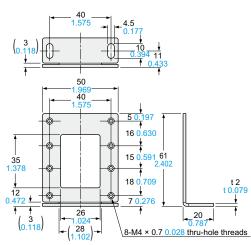
#### MS-RF22

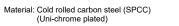


Material: Cold rolled carbon steel (SPCC) (Uni-chrome plated)

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

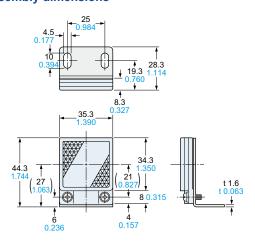
#### MS-RF23





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

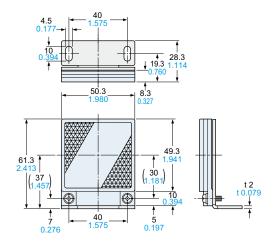
#### Assembly dimensions



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

Reflector mounting bracket for **RF-220** (Optional)

#### Assembly dimensions



#### Disclaimer

The applications described in the catalog are all intended for examples only. The purchase of our products described in the catalog shall not be regarded as granting of a license to use our products in the described applications. We do NOT warrant that we have obtained some intellectual properties, such as patent rights, with respect to such applications, or that the described applications may not infringe any intellectual property rights, such as patent rights, of a third party.



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