

RX SERIES

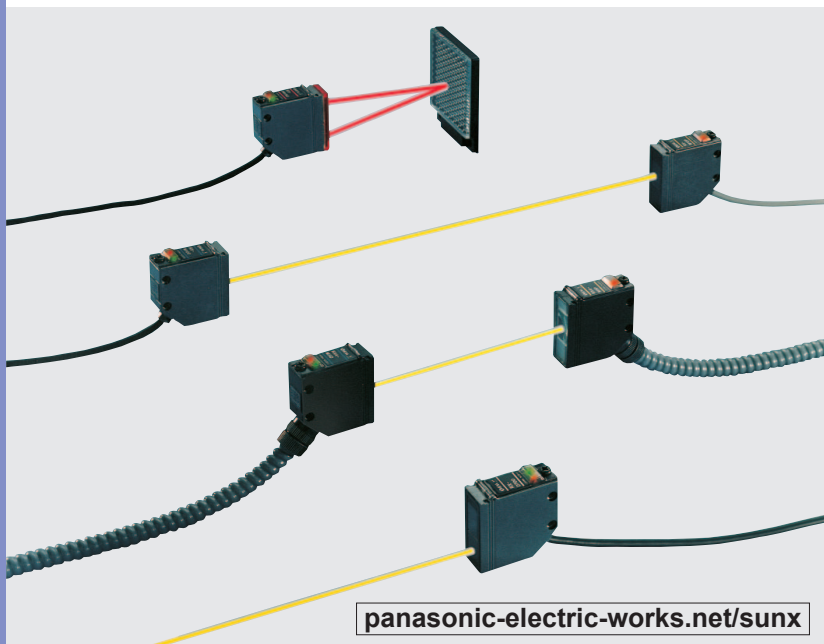
Related Information

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

■ Sensor selection guide..... P.283~

■ Glossary of terms..... P.1359~

■ General precautions..... P.1405



Sturdy photoelectric sensor made of die-cast zinc alloy

Robust

The enclosure is robust as it is made of die-cast zinc alloy.

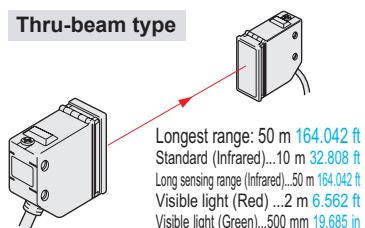
VARIETIES

Standard type

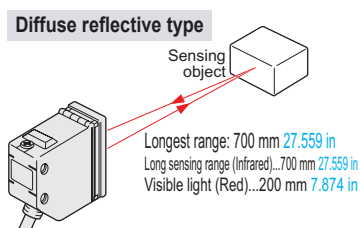
RX

Wide variety

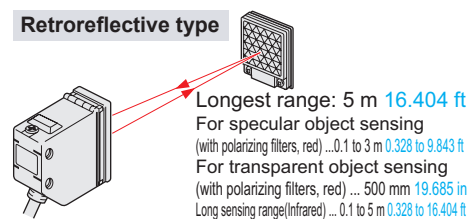
Thru-beam type



Diffuse reflective type



Retroreflective type



DC 2-wire type

RX2

Wiring reduced by 1/3

Wiring can be completed by using only two, instead of three wires.

Power supply cost: reduced to 1/30 or less

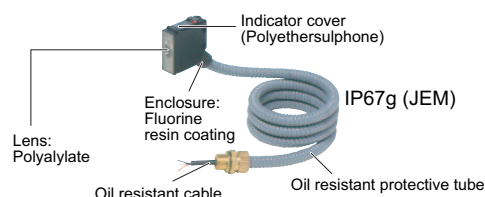
Current consumption: 1 mA or less
An additional power supply for the sensors is not required.

Heavy duty type

RX4

Durable against oil

This sensor can be used in a harsh environment.



MAINTENANCE

Test input (emission halt input)

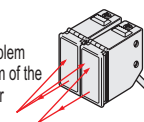
Convenient for operation check before start-up.
(Excluding **RX2** types)

FUNCTIONS

Automatic interference prevention function **Retroreflective / diffuse reflective types**

Two sensors can be mounted side by side because of the automatic interference prevention function. (Excluding **RX2** types)

There is no problem even if the beam of the adjoining sensor is incident.



Selection Guide
Amplifier Built-in
Power Supply Built-in
Amplifier-separated

CX-400

EX-10

EX-20

EX-30

EX-40

CX-440

EQ-30

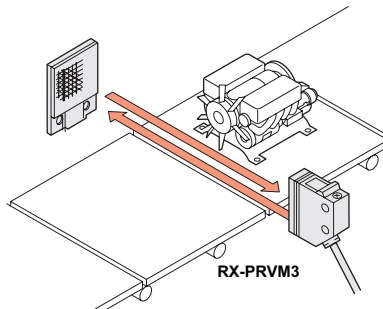
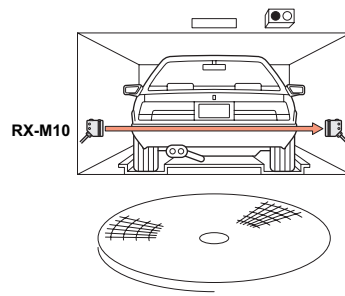
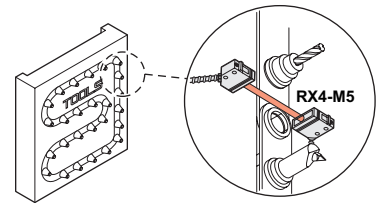
EQ-500

MQ-W

RX-LS200

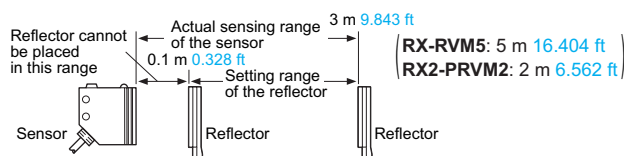
RX

RT-610

APPLICATIONS**Detecting engines****Confirming car position at parking garage****Sensing machine tools****ORDER GUIDE**

Type		Appearance	Sensing range	Model No. (Note 2)	Output
RX (Standard type)	Thru-beam	Infrared	10 m 32.808 ft	RX-M10	NPN open-collector transistor
			50 m 164.062 ft	RX-M50	
		For mark sensing	2 m 6.562 ft	RX-M2R	
			500 mm 19.685 in	RX-500G	
	Retroreflective	Red (with polarizing filters)	0.1 to 3 m 0.328 to 9.843 ft (Note 1)	RX-PRVM3	
		Infrared (long sensing range)	0.1 to 5 m 0.328 to 16.404 ft (Note 1)	RX-RVM5	
	Diffuse reflective	Infrared	700 mm 27.559 in	RX-D700	
		Red	200 mm 7.874 in	RX-D200R	
RX2 (DC 2-wire type)	Thru-beam	Infrared	5 m 16.404 ft	RX2-M5	Non contact DC 2-wire type
	Retroreflective	Red (with polarizing filters)	0.1 to 2 m 0.328 to 6.562 ft (Note 1)	RX2-PRVM2	
	Diffuse reflective	Infrared	300 mm 11.811 in	RX2-D300	
RX4 (Heavy duty type)	Thru-beam	Infrared	2 m 6.562 ft cable length	RX4-M5	NPN open-collector transistor
			3 m 9.843 ft cable length	RX4-M5-C3	
			5 m 16.404 ft cable length	RX4-M5-C5	

Notes: 1) The sensing range of the retroreflective type sensor is specified for the **RF-230** reflector. Further, the sensing range of **RX-PRVM3**, **RX-RVM5** and **RX2-PRVM2** 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. (e.g.) Emitter of **RX-M10**: **RX-M10P**, Receiver of **RX-M10**: **RX-M10D**

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WIRE-SAVING SYSTEMS

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EX-20

EX-30

EX-40

CX-440

EQ-30

EQ-500

MQ-W

RX-LS200

RX

RT-610

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ORDER GUIDE

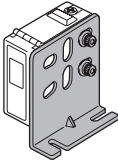
5 m 16.404 ft cable length type

5m 16.404 ft cable length type (standard: 2m 6.562 ft) is also available for **RX** and **RX2** types. (excluding **RX-500G**)
When ordering this type, suffix “-C5” to the model No.
(e.g.) 5 m 16.404 ft cable length type of **RX-M10** is “**RX-M10-C5**”.

Accessories

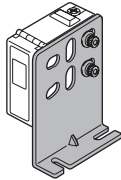
- **MS-RX-1** (Sensor mounting bracket)
- **MS-RX-2** (Sensor mounting bracket)
- **PT-RX4-1** (Oil resistant protective tube 1 m 3.281 ft long)
- **PT-RX4-2** (Oil resistant protective tube 2 m 6.562 ft long)
- **PT-RX4-4** (Oil resistant protective tube 4 m 13.123 ft long)
- **RF-230** (Reflector)

• **MS-RX-1**



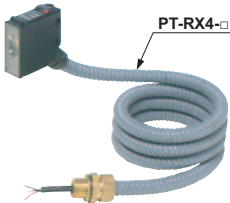
Two M4 (length 16 mm 0.630 in) hexagon-socket-head bolts are attached

• **MS-RX-2**

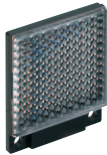


Two M4 (length 16 mm 0.630 in) hexagon-socket-head bolts are attached

• **PT-RX4-□**



• **RF-230**



OPTIONS

Designation	Model No.	Description	
Slit mask (For RX-M10 and RX2-M5 only)	OS-RX-05×5 (Slit size 0.5 × 5 mm) (0.020 × 0.197 in)	Slit on emitter	- Sensing range: 2.7 m 8.858 ft [RX-M10] 1.4 m 4.593 ft [RX2-M5] - Min. sensing object: ø8 mm ø0.315 in
		Slit on receiver	- Sensing range: 1.9 m 6.234 ft [RX-M10] 1 m 3.281 ft [RX2-M5] - Min. sensing object: ø6 mm ø0.236 in
	OS-RX-5×05 (Slit size 5 × 0.5 mm) (0.197 × 0.020 in)	Slit on both sides	- Sensing range: 0.4 m 1.312 ft [RX-M10] 0.2 m 0.656 ft [RX2-M5] - Min. sensing object: 0.5 × 5 mm 0.020 × 0.197 in
		Slit on emitter	- Sensing range: 3.8 m 12.467 ft [RX-M10] 1.9 m 6.234 ft [RX2-M5] - Min. sensing object: ø8 mm ø0.315 in
	OS-RX-1×5 (Slit size 1 × 5 mm) (0.039 × 0.197 in)	Slit on receiver	- Sensing range: 2.8 m 9.186 ft [RX-M10] 1.4 m 4.593 ft [RX2-M5] - Min. sensing object: ø6 mm ø0.236 in
		Slit on both sides	- Sensing range: 0.8 m 2.625 ft [RX-M10] 0.4 m 1.312 ft [RX2-M5] - Min. sensing object: 1 × 5 mm 0.039 × 0.197 in
	OS-RX-5×1 (Slit size 5 × 1 mm) (0.197 × 0.039 in)	Slit on both sides	- Sensing range: 7 m 22.966 ft [RX-M10] 3.5 m 11.483 ft [RX2-M5] - Min. sensing object: ø8 mm ø0.315 in
		Slit on emitter	- Sensing range: 4.9 m 16.076 ft [RX-M10] 2.5 m 8.202 ft [RX2-M5] - Min. sensing object: ø6 mm ø0.236 in
	OS-RX-3×5 (Slit size 3 × 5 mm) (0.118 × 0.197 in)	Slit on receiver	- Sensing range: 2.6 m 8.530 ft [RX-M10] 1.3 m 4.265 ft [RX2-M5] - Min. sensing object: 3 × 5 mm 0.118 × 0.197 in
		Slit on both sides	- Sensing range: 0.2 to 1.5 m 0.656 to 4.921 ft [RX-RVM5] 0.4 to 1 m 1.312 to 3.281 ft [RX-PRVM3] - Min. sensing object: ø30 mm ø1.181 in
	OS-RX-5×3 (Slit size 5 × 3 mm) (0.197 × 0.118 in)	Slit on both sides	- Sensing range: 0.1 to 3.8 m 0.328 to 12.467 ft [RX-RVM5] 0.1 to 2 m 0.328 to 6.562 ft [RX-PRVM3] 0.1 to 1.3 m 0.328 to 4.265 ft [RX2-PRVM2] - Min. sensing object: ø35 mm ø1.378 in
Reflector (For retroreflective type sensor only) (Note 1)	RF-210	- Sensing range: 0.2 to 1.5 m 0.656 to 4.921 ft [RX-RVM5] 0.4 to 1 m 1.312 to 3.281 ft [RX-PRVM3] - Min. sensing object: ø30 mm ø1.181 in	
	RF-220	- Sensing range: 0.1 to 3.8 m 0.328 to 12.467 ft [RX-RVM5] 0.1 to 2 m 0.328 to 6.562 ft [RX-PRVM3] 0.1 to 1.3 m 0.328 to 4.265 ft [RX2-PRVM2] - Min. sensing object: ø35 mm ø1.378 in	
Reflector mounting bracket (Note 1)	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 RX-RVM5) only	RF-T110	This tape can be used in place of the reflector by cutting it to a suitable size. • Size: 100 × 100 mm 3.937 × 3.937 in • Sensing range: 3 m 9.843 ft (at 50 × 50 mm 1.969 × 1.969 in) (There may be a slight variation depending on the product.)	
Protective tube	PT-RX500	Length	500 mm 19.685 in
	PT-RX1000	Length	1,000 mm 39.370 in
Sensor checker	CHX-SC2 (Note 2)	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.	

Notes: 1) Refer to **CX-400** series pages for dimensions of the reflector or the reflector mounting bracket.
2) Refer to the sensor checker **CHX-SC2** pages for details.

Slit mask

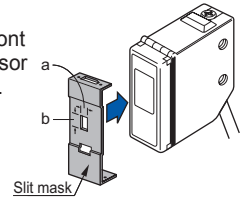
• OS-RX-□

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

*Slit size

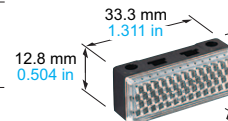
OS-RX-1×5

a b

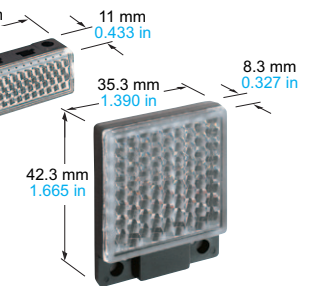


Reflector

• RF-210

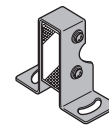


• RF-220



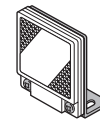
Reflector mounting bracket

• MS-RF21-1



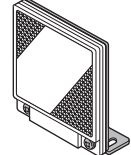
Two M3 (length 12 mm **0.472 in**) screws with washers are attached.

• MS-RF22



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

• MS-RF23

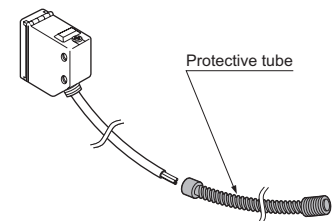


Two M4 (length 10 mm **0.394 in**) screws with washers are attached.

Protective tube

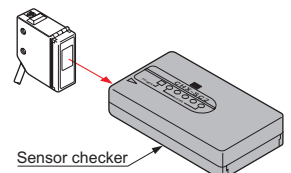
• PT-RX500

• PT-RX1000



Sensor checker

• CHX-SC2



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RX

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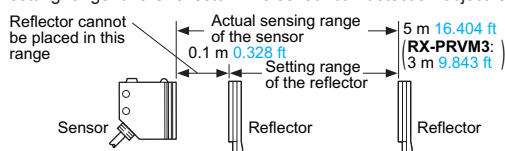
SPECIFICATIONS

Standard type

		Type		Thru-beam				Retroreflective		Diffuse reflective	
				Infrared		Red	Green	Red (with polarizing filters)	Infrared (Long sensing range)	Infrared	Red
			Long sensing range								
Item	Model No.	RX-M10	RX-M50	RX-M2R	RX-500G	RX-PRVM3	RX-RVM5	RX-D700	RX-D200R		
Sensing range		10 m 32.808 ft	50 m 164.042 ft	2 m 6.562 ft	500 mm 19.685 in	0.1 to 3 m 0.328 to 9.843 ft (Note 2)	0.1 to 5 m 0.328 to 16.404 ft (Note 2)	700 mm 27.559 in (Note 3)	200 mm 7.874 in (Note 3)		
Sensing object		ø10 mm 0.394 in or more opaque 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)			
Hysteresis		—————				—————		15 % or less of operation distance (Note 3)			
Repeatability (perpendicular to sensing axis)		0.5 mm 0.020 in or less				1 mm 0.039 in or less		0.5 mm 0.020 in or less			
Supply voltage		12 to 24 V DC ±10 %				Ripple P-P 10 % or less					
Current consumption		Emitter: 20 mA or less (RX-M50: 25 mA or less), Receiver: 25 mA or less				40 mA or less					
Sensing output		NPN open-collector transistor • Maximum sink current: 100 mA • Applied voltage: 30 V DC or less (between sensing output and 0 V) • Residual voltage: 2 V or less (at 100 mA sink current) 1 V or less (at 16 mA sink current)									
	Utilization category	DC-12 or DC-13									
	Output operation	Switchable either Light-ON or Dark-ON									
	Short-circuit protection	Incorporated									
Self-diagnosis output		NPN open-collector transistor • Maximum sink current: 50 mA • Applied voltage: 30 V DC or less (between self-diagnosis output and 0 V) • Residual voltage: 1.5 V or less (at 50 mA sink current) 1 V or less (at 16 mA sink current)									
	Output operation	ON under unstable sensing condition									
	Short-circuit protection	—————									
Response time		1 ms or less									
Test input (emission halt) function		Incorporated									
Operation indicator		Red LED (lights up when the sensing output is ON)									
Stability indicator		Green LED (lights up under stable light received condition or stable dark condition)									
Emitting indicator		Red LED (lights up during beam emission)				—————					
Sensitivity adjuster		Continuously variable adjuster									
Automatic interference prevention function		—————				Incorporated (Two units of sensors can be mounted close together.)					
Environmental resistance	Pollution degree	3 (Industrial environmrnt)									
	Protection	IP67 (IEC)									
	Ambient temperature	-25 to +60 °C -13 to +140 °F (No dew condensation or icing allowed), Storage: -30 to +70 °C -22 to +158 °F									
	Ambient humidity	35 to 85 % RH, Storage: 35 to 85 % RH									
	Ambient illuminance	Incandescent light: 3,500 lx at the light-receiving face									
	EMC	EN 60947-5-2									
	Voltage withstandability	1,000 V AC for one min. between all supply terminals connected together and enclosure									
	Insulation resistance	20 MΩ, or more, with 250 V DC megger between all supply terminals connected together and enclosure									
Vibration resistance		10 to 500 Hz frequency, 1.5 mm 0.059 in amplitude (10 G max.) in X, Y and Z directions for two hours each									
Shock resistance		500 m/s ² acceleration (50 G approx.) in X, Y and Z directions for three times each									
Emitting element (modulated)		Infrared LED		Red LED	Green LED	Red LED	Infrared LED		Red LED		
	Peak emission wavelength	880 nm 0.035 mil		680 nm 0.027 mil	570 nm 0.022 mil	680 nm 0.027 mil	880 nm 0.035 mil		680 nm 0.027 mil		
Material		Enclosure: Die-cast zinc alloy, Indicator cover: Polyethersulphone, Lens: Polycarbonate (Retroreflective type: Acrylic)									
Cable		Emitter: 0.15 mm ² 3-core oil, heat and cold resistant cabtyre cable, 2 m 6.562 ft long Receiver: 0.15 mm ² 4-core oil, heat and cold resistant cabtyre cable, 2 m 6.562 ft long				0.15 mm ² 5-core oil, heat and cold resistant cabtyre cable, 2 m 6.562 ft long					
Cable extension		Extension up to total 100 m 328.084 ft is possible with 0.3 mm ² , or more, cable (thru-beam type: both emitter and receiver).									
Net weight		Emitter: 70 g approx. (RX-M50: 75 g approx.) Receiver: 70 g approx. (RX-M50: 75 g approx.)				75 g approx.					
Accessories		MS-RX-1 (Sensor mounting bracket): 1 set for emitter and receiver Adjusting screwdriver: 1 pc.				MS-RX-1 (Sensor mounting bracket): 1 set RF-230 (Reflector): 1 pc. Adjusting screwdriver: 1 pc.		MS-RX-1 (Sensor mounting bracket): 1 set Adjusting screwdriver: 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 for the retroreflective type sensor are specified for the **RF-230** reflector. Further, the sensing range of **RX-PRVM3** and **RX-RVM5** 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 on **RX-M10**, an object of 0.5 × 5 mm 0.020 × 0.197 in can be detected.
- 5) Make sure to confirm detection with an actual sensor before use.

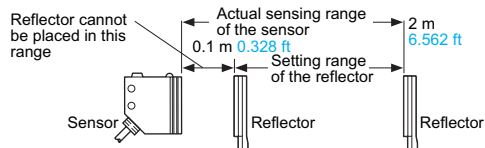
SPECIFICATIONS

DC 2-wire type

Type		Thru-beam	Retroreflective (with polarizing filters)	Diffuse reflective
Item	Model No.	RX2-M5	RX2-PRVM2	RX2-D300
Sensing range		5 m 16.404 ft	0.1 to 2 m 0.328 to 6.562 ft (Note 2)	300 mm 11.811 in (Note 3)
Sensing object		ø10 mm ø0.394 in or more opaque object (Note 4)	ø50 mm ø1.969 in or more opaque, translucent or specular object (Note 2, 5)	Opaque, translucent or transparent object (Note 5)
Hysteresis		————	————	15 % or less of operation distance (Note 3)
Repeatability (perpendicular to sensing axis)		0.5 mm 0.020 in or less	1 mm 0.039 in or less	0.5 mm 0.020 in or less
Supply voltage		12 to 24 V DC ±10 % Ripple P-P 10 % or less		
Current consumption		Emitter: 8 mA or less, Receiver: 0.8 mA or less (Note 6)	1 mA or less (Note 6)	
Sensing output		Non contact DC 2-wire type		
		• Load current: 5 to 100 mA		
		• Residual voltage: 4 V or less (Note 7)		
Output operation	Switchable either Light-ON or Dark-ON			
Short-circuit protection	Incorporated			
Response time		3 ms or less		
Operation indicator		Red LED (lights up when the output is ON)		
Stability indicator		Green LED $\left(\begin{array}{l} \text{Light-ON mode: lights up under stable light received condition} \\ \text{Dark-ON mode: lights up under stable dark condition} \end{array} \right)$		
Emitting indicator		Red LED (lights up during beam emission)	————	
Sensitivity adjuster		Continuously variable adjuster		
Environmental resistance	Protection	IP67 (IEC)		
	Ambient temperature	−20 to +60 °C −4 to +140 °F (No dew condensation or icing allowed), Storage: −30 to +70 °C −22 to +158 °F		
	Ambient humidity	35 to 85 % RH, Storage: 35 to 85 % RH		
	Ambient illuminance	Incandescent light: 3,500 lx at the light-receiving face		
	Voltage withstandability	1,000 V AC for one min. between all supply terminals connected together and enclosure		
	Insulation resistance	20 MΩ, or more, with 250 V DC megger between all supply terminals connected together and enclosure		
	Vibration resistance	10 to 500 Hz frequency, 1.5 mm 0.059 in amplitude (10 G max.) in X, Y and Z directions for two hours each		
	Shock resistance	500 m/s² acceleration (50 G approx.) in X, Y and Z directions for three times each		
Emitting element		Infrared LED (modulated)	Red LED (modulated)	Infrared LED (modulated)
Peak emission wavelength	880 nm 0.035 mil	680 nm 0.027 mil	890 nm 0.035 mil	
Material		Enclosure: Die-cast zinc alloy, Indicator cover: Polyethersulphone, Lens: Polycarbonate (RX2-PRVM2: Acrylic)		
Cable		0.15 mm² 2-core oil, heat and cold resistant cabtyre cable, 2 m 6.562 ft long		
Cable extension		———— (Note 7)		
Net weight		Emitter: 70 g approx., Receiver: 70 g approx.	75 g approx.	70 g approx.
Accessories		MS-RX-1 (Sensor mounting bracket): 1 set for emitter and receiver Adjusting screwdriver: 1 pc.	MS-RX-1 (Sensor mounting bracket): 1 set RF-230 (Reflector): 1 pc. Adjusting screwdriver: 1 pc.	MS-RX-1 (Sensor mounting bracket): 1 set Adjusting screwdriver: 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 for **RX2-PRVM2** are 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 **RX2-D300** 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 of 0.5 × 5 mm **0.020 × 0.197 in** can be detected.

5) Make sure to confirm detection with an actual sensor before use.

6) It is the leakage current when the output is in the OFF state.

7) When extending the cable, the residual voltage will be increased depending on the type of cable used. Verify the residual voltage when extending the cable.

FIBER
SENSORSLASER
SENSORSPHOTO-
ELECTRIC
SENSORSMICRO
PHOTO-
ELECTRIC
SENSORSAREA
SENSORSLIGHT
CURTAINSPRESSURE /
FLOW
SENSORSINDUCTIVE
PROXIMITY
SENSORSPARTICULAR
USE
SENSORSSENSOR
OPTIONSSIMPLE
WIRE-SAVING
UNITSWIRE-SAVING
SYSTEMSMEASURE-
MENT
SENSORSSTATIC
CONTROL
DEVICES

ENDOSCOPE

LASER
MARKERSPLC /
TERMINALSHUMAN
MACHINE
INTERFACESENERGY
CONSUMPTION
VISUALIZATION
COMPONENTSFA
COMPONENTSMACHINE
VISION
SYSTEMSUV
CURING
SYSTEMSSelection
GuideAmplifier
Built-inPower Supply
Built-inAmplifier-
separated

CX-400

EX-10

EX-20

EX-30

EX-40

CX-440

EQ-30

EQ-500

MQ-W

RX-LS200

RX

RT-610

SPECIFICATIONS

Heavy duty type

		Type	Thru-beam		
			Cable length 2 m 6.562 ft	Cable length 3 m 9.843 ft	Cable length 5 m 16.404 ft
Item	Model No.	RX4-M5	RX4-M5-C3	RX4-M5-C5	
Sensing range		5 m 16.404 ft			
Sensing object		ø10 mm ø0.394 in or more opaque object			
Repeatability (perpendicular to sensing axis)		0.5 mm 0.020 in or less			
Supply voltage		12 to 24 V DC ±10 % Ripple P-P 10 % or less			
Current consumption		Emitter: 20 mA or less, Receiver: 25 mA or less			
Sensing output		NPN open-collector transistor • Maximum sink current: 100 mA • Applied voltage: 30 V DC or less (between sensing output and 0 V) • Residual voltage: 2 V or less (at 100 mA sink current) 1 V or less (at 16 mA sink current)			
	Output operation	Switchable either Light-ON or Dark-ON			
	Short-circuit protection	Incorporated			
Self-diagnosis output		NPN open-collector transistor • Maximum sink current: 50 mA • Applied voltage: 30 V DC or less (between self-diagnosis output and 0 V) • Residual voltage: 1.5 V or less (at 50 mA sink current) 1 V or less (at 16 mA sink current)			
	Output operation	ON under unstable sensing condition			
	Short-circuit protection	—————			
Response time		1 ms or less			
Test input (emission halt) function		Incorporated			
Operation indicator		Red LED (lights up when the sensing output is ON)			
Stability indicator		Green LED (lights up under stable light received condition or stable dark condition)			
Emitting indicator		Red LED (lights up during beam emission)			
Sensitivity adjuster		Continuously variable adjuster			
Environmental resistance	Protection	IP67 (IEC), IP67g (JEM)			
	Ambient temperature	–25 to +60 °C –13 to +140 °F (No dew condensation or icing allowed), Storage: –30 to +70 °C –22 to +158 °F			
	Ambient humidity	35 to 85 % RH, Storage: 35 to 85 % RH			
	Ambient illuminance	Incandescent light: 3,500 lx at the light-receiving face			
	Voltage withstandability	1,000 V AC for one min. between all supply terminals connected together and enclosure			
	Insulation resistance	20 MΩ, or more, with 250 V DC megger between all supply terminals connected together and enclosure			
	Vibration resistance	10 to 500 Hz frequency, 1.5 mm 0.059 in amplitude (10 G max.) in X, Y and Z directions for two hours each			
	Shock resistance	500 m/s ² acceleration (50 G approx.) in X, Y and Z directions for three times each			
Emitting element		Infrared LED (Peak emission wavelength: 880 nm 0.035 mil , modulated)			
Material		Enclosure: Die-cast zinc alloy (Fluorine resin coating), Indicator cover: Polyethersulphone, Lens: Polyallylate, Protective tube sheath: Oil resistant PVC			
Cable		0.15 mm ² 4-core (emitter: 3-core) oil, heat and cold resistant cabtyre cable			
Protective tube length		1 m 3.281 ft	2 m 6.562 ft	4 m 13.123 ft	
Cable extension		Extension up to total 100 m 328.084 ft is possible for both emitter and receiver with 0.3 mm ² , or more, cable.			
Net weight		Emitter: 175 g approx., Receiver: 175 g approx.	Emitter: 265 g approx., Receiver: 265 g approx.	Emitter: 495 g approx., Receiver: 495 g approx.	
Accessories		MS-RX-2 (Sensor mounting bracket): 1 set for emitter and receiver, Adjusting screwdriver: 1 pc.			

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

FIBER SENSORS

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

Selection Guide

Amplifier Built-in

Power Supply Built-in

Amplifier-separated

CX-400

EX-10

EX-20

EX-30

EX-40

CX-440

EQ-30

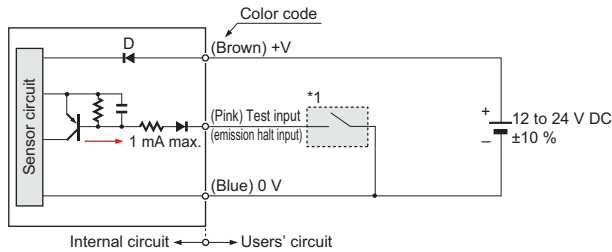
EQ-500

MQ-W

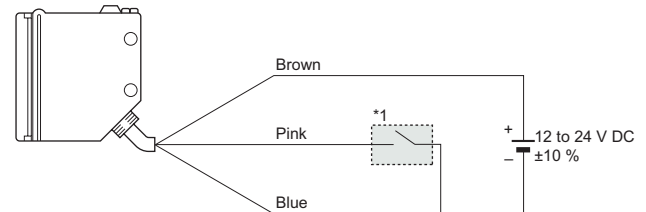
RX-LS200

RX

RT-610

I/O CIRCUIT AND WIRING DIAGRAMS**RX-□ RX4-□****I/O circuit diagrams****Emitter of thru-beam type sensor**

Symbol ... D: Reverse supply polarity protection diode

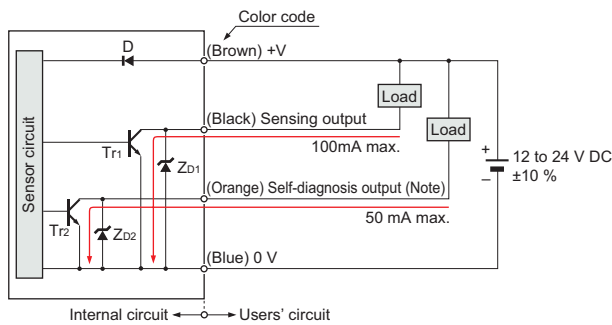
Wiring diagram**Emitter of thru-beam type sensor**

* 1

Non-voltage contact or NPN open-collector transistor

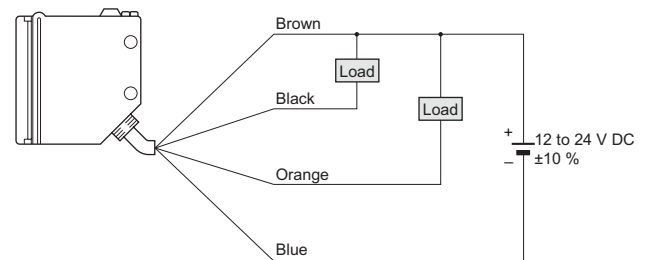
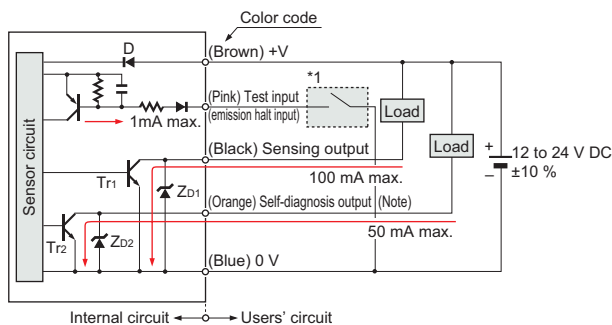


- Test input (emission halt input)
[Supply voltage – 2.5 V] or more: Emission
[Supply voltage – 3.3 V] or less: Emission halt

Receiver of thru-beam type sensor

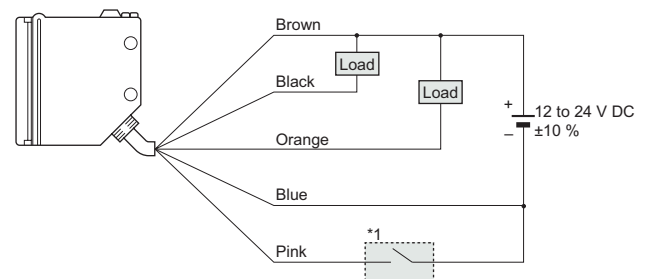
Note: The self-diagnosis output does not incorporate a short-circuit protection circuit. Do not connect it directly to a power supply or a capacitive load.

Symbols ... D: Reverse supply polarity protection diode
ZD1, ZD2: Surge absorption zener diode
Tr1, Tr2 : NPN output transistor

Receiver of thru-beam type sensor**Retroreflective and diffuse reflective type sensors**

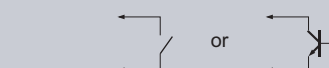
Note: The self-diagnosis output does not incorporate a short-circuit protection circuit. Do not connect it directly to a power supply or a capacitive load.

Symbols ... D: Reverse supply polarity protection diode
ZD1, ZD2: Surge absorption zener diode
Tr1, Tr2 : NPN output transistor

Retroreflective and diffuse reflective type sensors

* 1

Non-voltage contact or NPN open-collector transistor

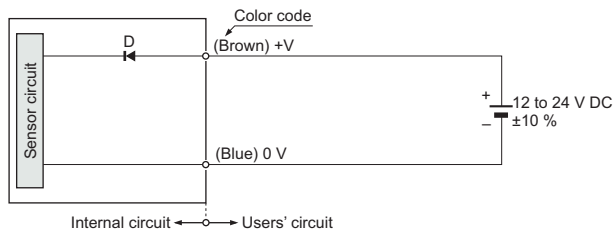


- Test input (emission halt input)
[Supply voltage – 2.5 V] or more: Emission
[Supply voltage – 3.3 V] or less: Emission halt

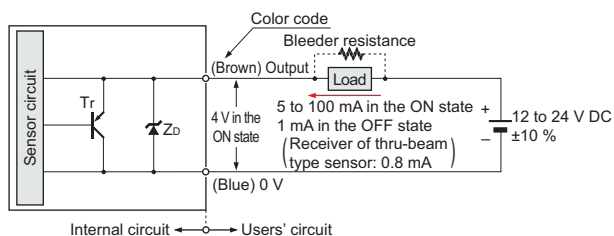
FIBER
SENSORSLASER
SENSORSPHOTO-
ELECTRIC
SENSORSMICRO
PHOTO-
ELECTRIC
SENSORSAREA
SENSORSLIGHT
CURTAINSPRESSURE /
FLOW
SENSORSINDUCTIVE
PROXIMITY
SENSORSPARTICULAR
USE
SENSORSSENSOR
OPTIONSSIMPLE
WIRE-SAVING
UNITSWIRE-SAVING
SYSTEMSMEASURE-
MENT
SENSORSSTATIC
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DEVICES

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VISUALIZATION
COMPONENTSFA
COMPONENTSMACHINE
VISION
SYSTEMSUV
CURING
SYSTEMSSelection
GuideAmplifier
Built-inPower Supply
Built-inAmplifier-
separated**CX-400****EX-10****EX-20****EX-30****EX-40****CX-440****EQ-30****EQ-500****MQ-W****RX-LS200****RX****RT-610**

I/O CIRCUIT AND WIRING DIAGRAMS**RX2-□****I/O circuit diagrams****Emitter of thru-beam type sensor**

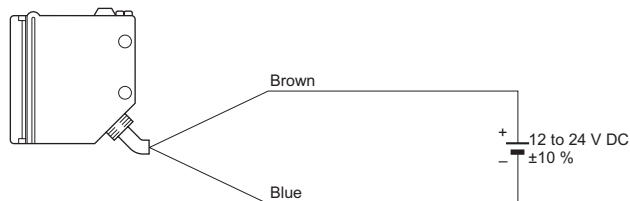
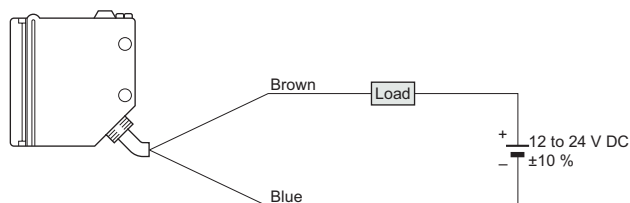
Symbol ... D: Reverse supply polarity protection diode

Receiver of thru-beam type sensor, retroreflective and diffuse reflective type sensors

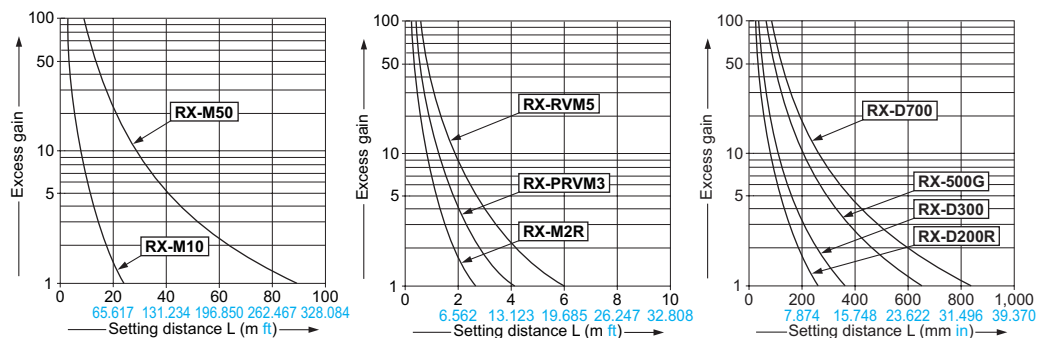
Symbols ... D : Reverse supply polarity protection diode
Zd: Surge absorption zener diode
Tr : PNP output transistor

Conditions for the load

- 1) The load should not be actuated by the leakage current (1 mA; 0.8 mA for receiver of thru-beam type sensor) in the OFF state.
 - 2) The load should be actuated by (supply voltage – 4 V) in the ON state.
 - 3) The current in the ON state should be between 5 to 100 mA DC.
- [In case the current is less than 5 mA, connect a bleeder resistance in parallel to the load (shown in dotted line above) so that a current of 5 mA, or more, flows.]

Wiring diagrams**Emitter of thru-beam type sensor****Receiver of thru-beam type sensor, retroreflective and diffuse reflective type sensors****SENSING CHARACTERISTICS (TYPICAL)****RX-□**

All models

Correlation between setting distance and excess gainFIBER
SENSORSLASER
SENSORSPHOTO-
ELECTRIC
SENSORSMICRO
PHOTO-
ELECTRIC
SENSORSAREA
SENSORSLIGHT
CURTAINSPRESSURE /
FLOW
SENSORSINDUCTIVE
PROXIMITY
SENSORSPARTICULAR
USE
SENSORSSENSOR
OPTIONSSIMPLE
WIRE-SAVING
UNITSWIRE-SAVING
SYSTEMSMEASURE-
MENT
SENSORSSTATIC
CONTROL
DEVICES

ENDOSCOPE

LASER
MARKERSPLC /
TERMINALSHUMAN
MACHINE
INTERFACESENERGY
CONSUMPTION
VISUALIZATION
COMPONENTSFA
COMPONENTSMACHINE
VISION
SYSTEMSUV
CURING
SYSTEMSSelection
GuideAmplifier
Built-inPower Supply
Built-inAmplifier-
separated

CX-400

EX-10

EX-20

EX-30

EX-40

CX-440

EQ-30

EQ-500

MQ-W

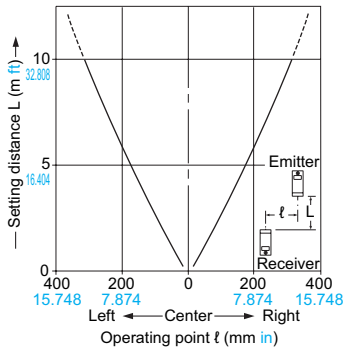
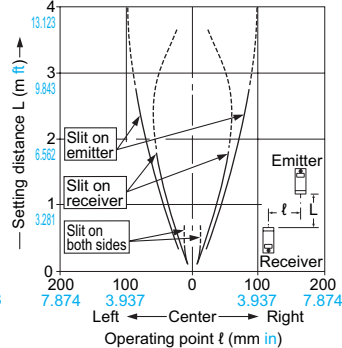
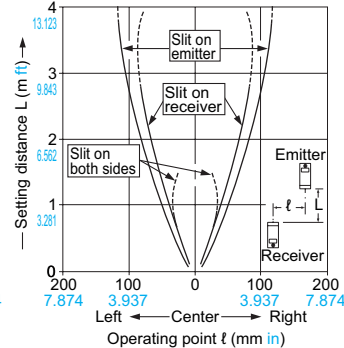
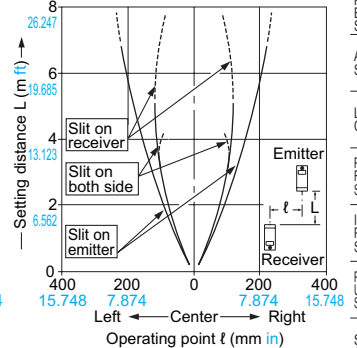
RX-LS200

RX

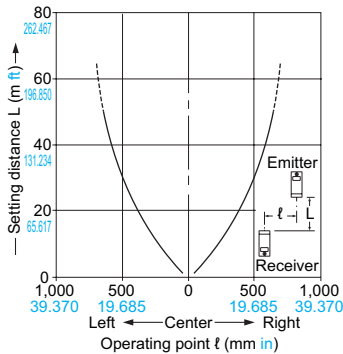
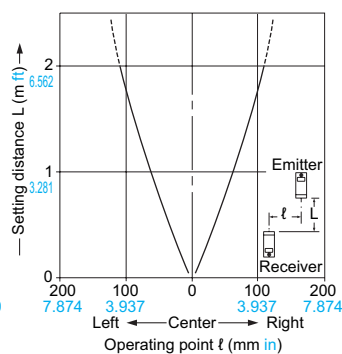
RT-610

SENSING CHARACTERISTICS (TYPICAL)**RX-M10**

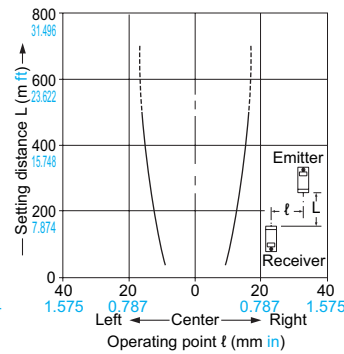
Thru-beam type

Parallel deviation**Parallel deviation with slit masks (0.5 × 5 mm 0.020 × 0.197 in)****Parallel deviation with slit masks (1 × 5 mm 0.039 × 0.197 in)****Parallel deviation with slit masks (3 × 5 mm 0.118 × 0.197 in)****RX-M50**

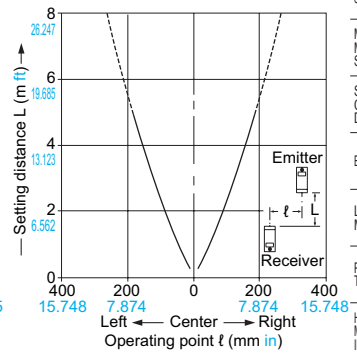
Thru-beam type

Parallel deviation**Parallel deviation****RX-M2R**

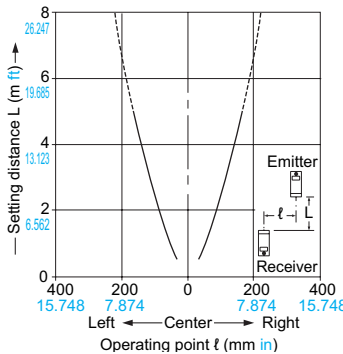
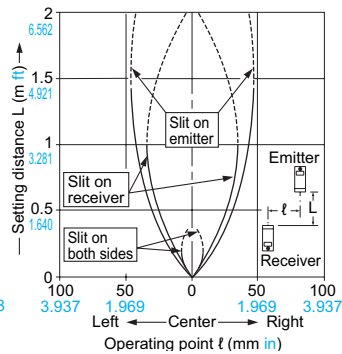
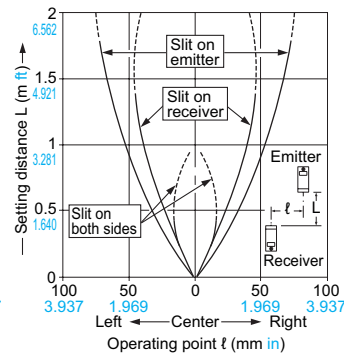
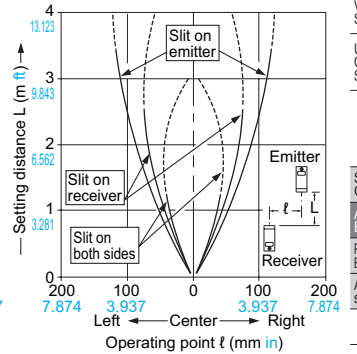
Thru-beam type

Parallel deviation**RX-500G**

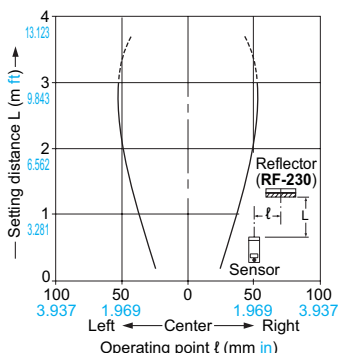
Thru-beam type

Parallel deviation**RX2-M5**

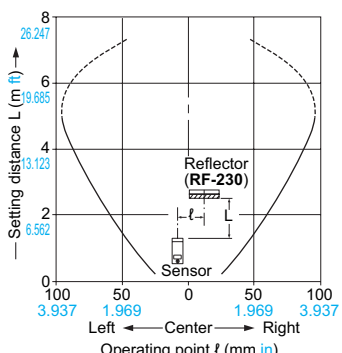
Thru-beam type

Parallel deviation**Parallel deviation with slit masks (0.5 × 5 mm 0.020 × 0.197 in)****Parallel deviation with slit masks (1 × 5 mm 0.039 × 0.197 in)****Parallel deviation with slit masks (3 × 5 mm 0.118 × 0.197 in)****RX-PRVM3**

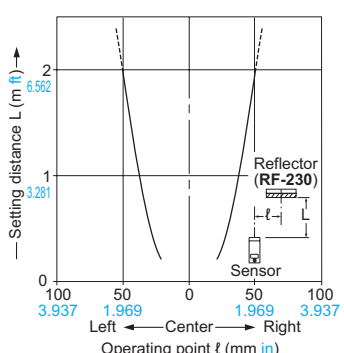
Retroreflective type

Parallel deviation**RX-RVM5**

Retroreflective type

Parallel deviation**RX2-PRVM2**

Retroreflective type

Parallel deviationFIBER
SENSORSLASER
SENSORSPHOTO-
ELECTRIC
SENSORSMICRO
PHOTO-
ELECTRIC
SENSORSAREA
SENSORSLIGHT
CURTAINSPRESSURE /
FLOW
SENSORSINDUCTIVE
PROXIMITY
SENSORSPARTICULAR
USE
SENSORSSENSOR
OPTIONSSIMPLE
WIRE-
SAVING
UNITSWIRE-
SAVING
SYSTEMSMEASURE-
MENT
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INTERFACESENERGY
CONSUMPTION
VISUALIZATION
COMPONENTSFA
COMPONENTSMACHINE
VISION
SYSTEMSUV
CURING
SYSTEMSSelection
GuideAmplifier
Built-inPower Supply
Built-inAmplifier-
separated

CX-400

EX-10

EX-20

EX-30

EX-40

CX-440

EQ-30

EQ-500

MQ-W

RX-LS200

RX

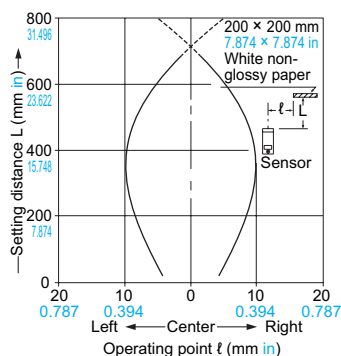
RT-610

SENSING CHARACTERISTICS (TYPICAL)

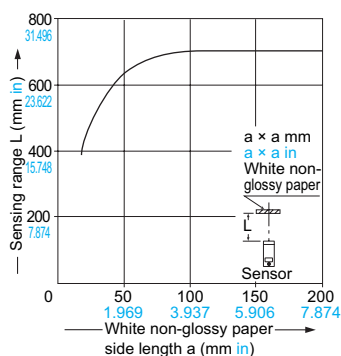
RX-D700

Diffuse reflective type

Sensing field



Correlation between sensing object size and sensing range



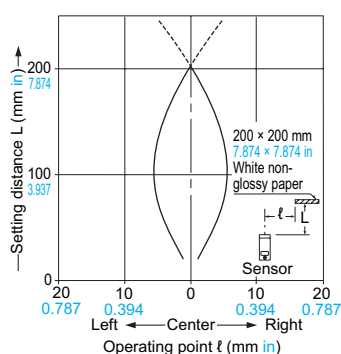
As the sensing object size becomes smaller than the standard size (white non-glossy paper 200×200 mm 7.874×7.874 in), the sensing range shortens, as shown in the left graph.

(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.)

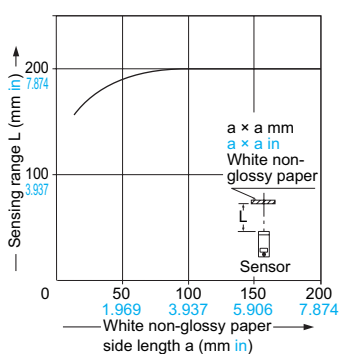
RX-D200R

Diffuse reflective type

Sensing field



Correlation between sensing object size and sensing range



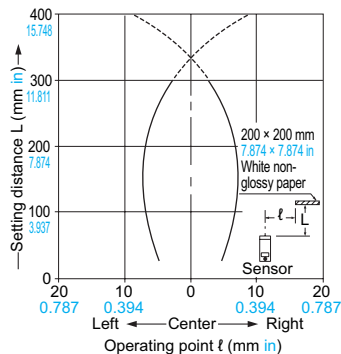
As the sensing object size becomes smaller than the standard size (white non-glossy paper 200×200 mm 7.874×7.874 in), the sensing range shortens, as shown in the left graph.

(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 200 mm 7.874 in.)

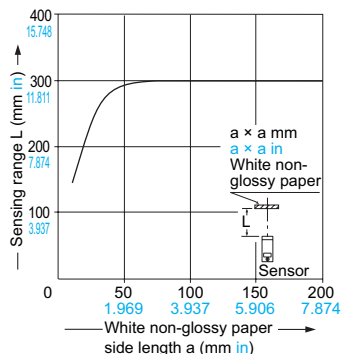
RX2-D300

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 200×200 mm 7.874×7.874 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 300 mm 11.811 in.)

PRECAUTIONS FOR PROPER USE

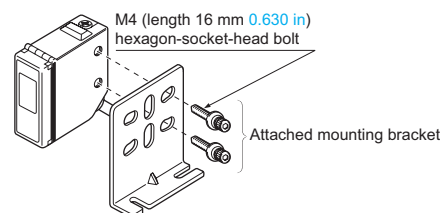
Refer to General precautions.



- 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 1.17 N·m or less.



Others

Wiring

- The self-diagnosis output does not incorporate a short-circuit protection circuit. Do not connect it directly to a power supply or a capacitive load.

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

CX-400

EX-10

EX-20

EX-30

EX-40

CX-440

EQ-30

EQ-500

MQ-W

RX-LS200

RX

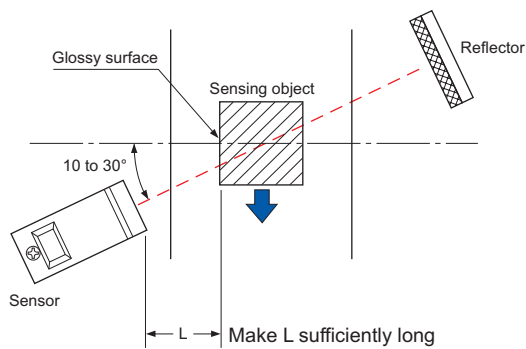
RT-610

PRECAUTIONS FOR PROPER USE

Refer to General precautions.

RX-RVM5**Glossy object sensing**

- 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.

**RX-PRVM3 RX2-PRVM2****Retroreflective type sensor with polarizing filters**

- 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

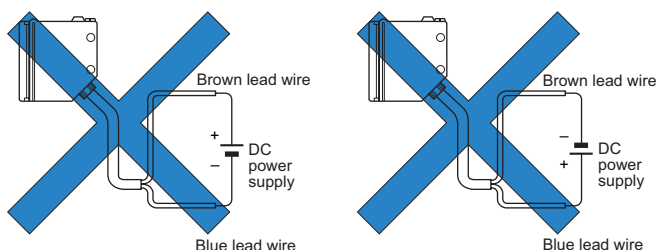
- Can wrapped by clear film
- Aluminum sheet covered by plastic film
- Gold or silver color (specular) label or wrapping paper

Steps

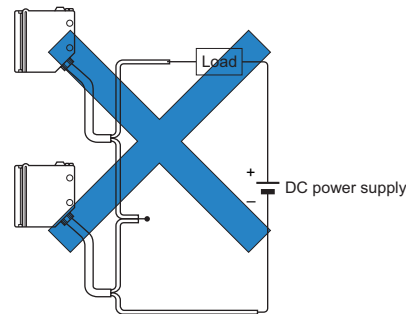
- Tilt the sensor with respect to the sensing object while fitting.
- Reduce the sensitivity.
- Increase the distance between the sensor and the sensing object.

RX2-□**Wiring**

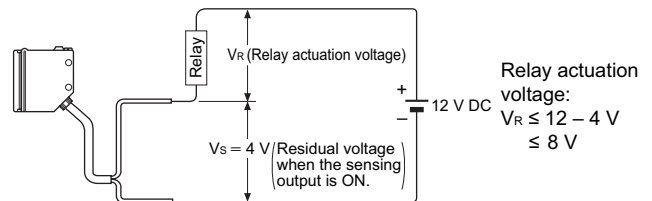
- Always connect the sensor to the power supply through a load. If the sensor is connected to the power supply directly, the short-circuit protection makes the sensor inoperable. (The output stays in the OFF state and no indicator lights up.) If this happens, connect the sensor to the power supply through a load. Further, note that the sensor will be damaged if the power supply is connected in reverse without a load.



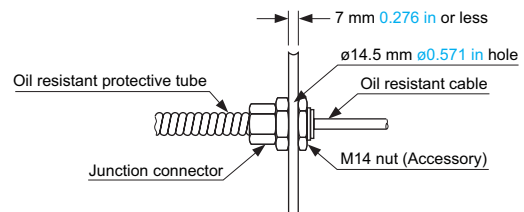
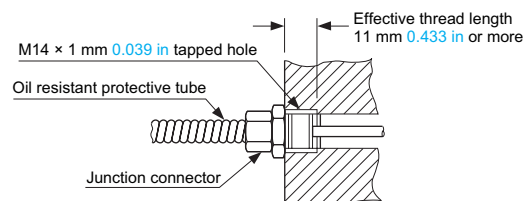
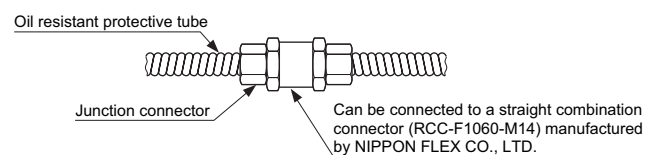
- Do not connect sensors in series (AND circuit).



- The residual voltage of the sensor is 4 V. Before connecting to a relay, be aware of the actuation voltage of the relay. (Not all 12 V relays may be connected as the load.)

**RX4-□****Connection of protective tube connector**

- Connect the junction connector securely as shown below. The tightening torque should be 0.98 N·m or less.

When mounted on a plate**When mounted with a female screw****When connected to another protective tube**FIBER
SENSORSLASER
SENSORSPHOTO-
ELECTRIC
SENSORSMICRO
PHOTO-
ELECTRIC
SENSORSAREA
SENSORSLIGHT
CURTAINSPRESSURE /
FLOW
SENSORSINDUCTIVE
PROXIMITY
SENSORSPARTICULAR
USE
SENSORSSENSOR
OPTIONSSIMPLE
WIRE-SAVING
UNITSWIRE-SAVING
SYSTEMSMEASURE-
MENT
SENSORSSTATIC
CONTROL
DEVICES

ENDOSCOPE

LASER
MARKERSPLC /
TERMINALSHUMAN
MACHINE
INTERFACESENERGY
CONSUMPTION
VISUALIZATION
COMPONENTSFA
COMPONENTSMACHINE
VISION
SYSTEMSUV
CURING
SYSTEMSSelection
GuideAmplifier
Built-inPower Supply
Built-inAmplifier-
separated

CX-400

EX-10

EX-20

EX-30

EX-40

CX-440

EQ-30

EQ-500

MQ-W

RX-LS200

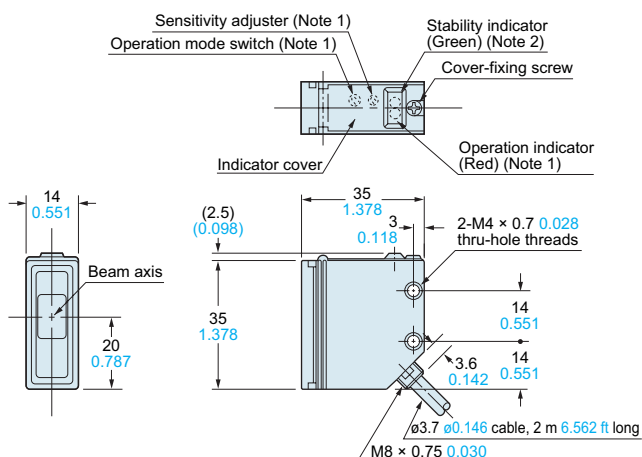
RX

RT-610

The CAD data in the dimensions can be downloaded from our website.
Refer to **CX-400** series pages for dimensions of the reflector or the reflector mounting bracket.

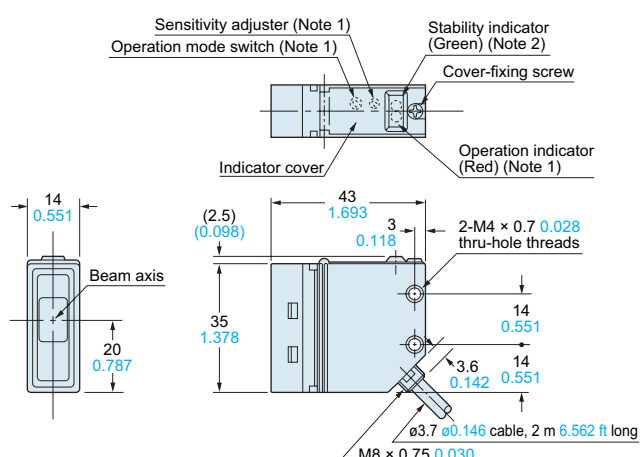
DIMENSIONS (Unit: mm in)

RX-M10 RX-M2R RX-500G RX2-M5 Sensor



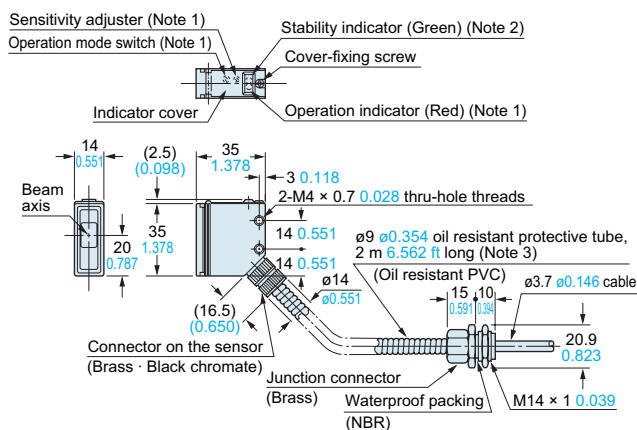
Notes: 1) Not incorporated on the emitter.
2) It is the emitting indicator (red) on the emitter.

RX-M50 Sensor



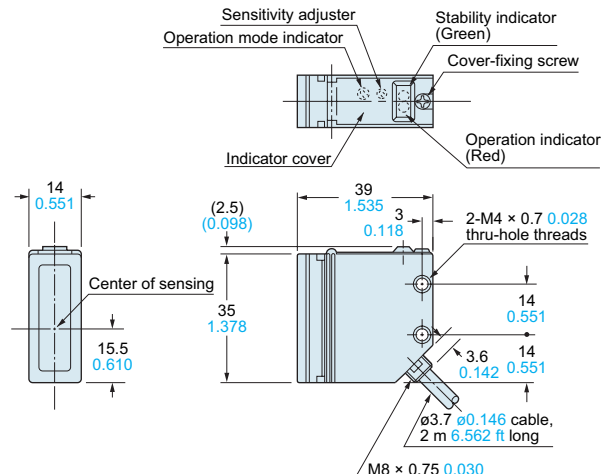
Notes: 1) Not incorporated on the emitter.
2) It is the emitting indicator (red) on the emitter.

RX4-M5□ Sensor

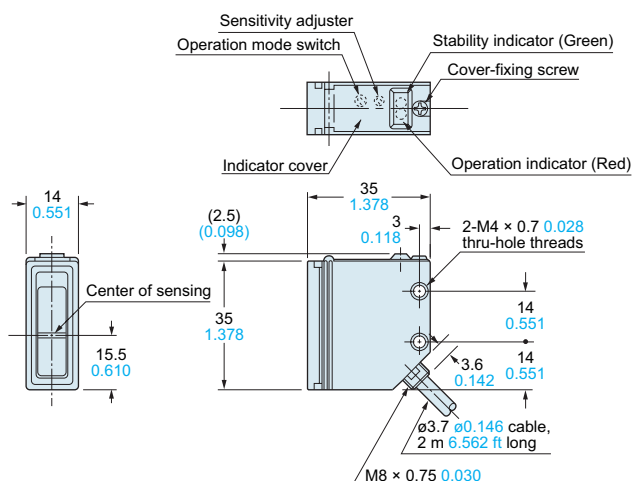


Notes: 1) Not incorporated on the emitter.
2) It is the emitting indicator (red) on the emitter.
3) The given length of the protective tube is for **RX4-M5-C3**.
(RX4-M5: 1 m 3.281 ft, RX4-M5-C5: 4 m 13.123 ft)

RX-PRVM3 RX-RVM5 RX2-PRVM2 Sensor



RX-D700 RX-D200R RX2-D300 Sensor



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

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
MEASUREMENT SENSORS
STATISTICAL CONTROL DEVICES
ENDOSCOPES
LASER MARKERS
PLC / TERMINALS
HUMAN MACHINE INTERFACES
ENERGY CONSUMPTION / VISUALIZATION COMPONENTS
PLC COMPONENTS
MACHINE VISION SYSTEMS
UV CURING SYSTEMS
Selection Guide
Amplifier Built-in
Power Supply Built-in
Amplifier-separated
CX-400
EX-10
EX-20
EX-30
EX-40
CX-440
EQ-30
EQ-500
MQ-W
RX-L5200
RX
RT-610