LASER SENSORS

MICRO PHOTOELECTRIC SENSORS

AREA SENSORS

SAFETY LIGHT CURTAINS / SAFETY COMPONENTS PRESSURE / FLOW

SENSORS INDUCTIVE PROXIMITY **SENSORS**

PARTICULAR USE SENSORS SENSOR OPTIONS

SIMPLE WIRE-SAVING UNITS

WIRE-SAVING SYSTEMS

MEASUREMENT SENSORS

STATIC CONTROL DEVICES

LASER MARKERS

PLC

HUMAN MACHINE INTERFACES

FNFRGY MANAGEMENT SOLUTIONS

FA COMPONENTS

MACHINE VISION SYSTEMS

UV CURING SYSTEMS

Selection Guide Amplitier Built-in Power Supply Built-in Amplifierseparated

EX-Z CX-400 CY-100 EX-10 EX-20 EX-30 EX-40

EQ-30 EQ-500 MQ-W

CX-440

RX-LS200

RT-610

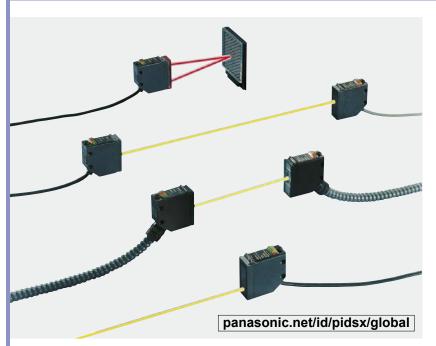
Robust Photoelectric Sensor Amplifier Built-in

Related Information

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

■ Glossary of terms......P.1549~

■ Selection guideP.231~ ■ General precautions......P.1552~











Sturdy photoelectric sensor made of die-cast zinc alloy

Robust

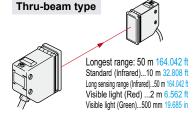
The enclosure is robust as it is made of die-cast zinc alloy.

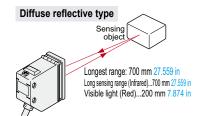
VARIETIES

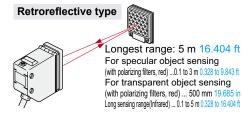
Standard type



Wide variety







DC 2-wire type

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.

MAINTENANCE

Test input (emission halt input)

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

Heavy duty type **Durable against oil**

This sensor can be used in a harsh environment.



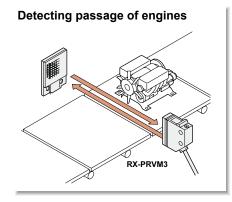
FUNCTIONS

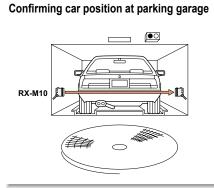
Automatic interference prevention function Retroreflective / diffuse reflective types

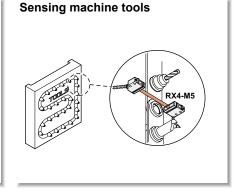
Two sensors can be mounted side by side because of the automatic interference prevention function. (Excluding RX2 types)



APPLICATIONS



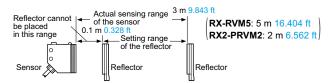




ORDER GUIDE

		Туре	Appearance	Sensing range	Model No. (Note 2)	Output
		Infrared		10 m 32.808 ft	RX-M10	
type)	Thru-beam	Long sensing range		50 m 164.042 ft	RX-M50	
	Thru-	Red Sensing Green		2 m 6.562 ft	RX-M2R	
		Green		500 mm 19.685 in	RX-500G	NPN open-collector transistor
RX (Standard type)	flective	Red (with polarizing filters)		0.1 to 3 m 0.328 to 9.843 ft (Note 1)	RX-PRVM3	
RX (8	Retroreflective	Infrared (long sensing range)		0.1 to 5 m 0.328 to 16.404 ft (Note 1)	RX-RVM5	
	Diffuse reflective	Infrared	0	700 mm 27.559 in	RX-D700	
	Diffuse r	Red		200 mm 7.874 in	RX-D200R	
(e	Thru-beam	Infrared		5 m 16.404 ft	RX2-M5	
RX2 (DC 2-wire type)	Retroreflective	Red (with polarizing filters)		0.1 to 2 m 0.328 to 6.562 ft (Note 1)	RX2-PRVM2	Non contact DC 2-wire type
RX	Diffuse reflective			300 mm 11.811 in	RX2-D300	
(type)		2 m 6.562 ft cable length			RX4-M5	NPN
RX4 (Heavy duty type)		3 m 9.843 ft cable length 5 m 16.404 ft	5 m 16.404 ft	RX4-M5-C3	open-collector transistor	
Неал		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.

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Power Supply Juilt-in Amplifiereparated

EX-Z CX-400

CY-100 EX-10 EX-20

EX-30

EX-40 CX-440

EQ-30 EQ-500

MQ-W RX-LS200

RX RT-610

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EX-30 EX-40

CX-440 EQ-30

EQ-500 MQ-W

RX-LS200

RT-610

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				
	OS-RX-05×5 (Slit size 0.5 × 5 mm 0.020 × 0.197 in) OS-RX-5×05 (Slit size 5 × 0.5 mm 0.197 × 0.020 in)	• Sensing range: 2.7 m 8.858 ft [RX-M10] Slit on emitter • Sensing range: 2.7 m 8.858 ft [RX2-M10] 1.4 m 4.593 ft [RX2-M5] • Min. sensing object: ø8 mm ø0.315 in				
		• Sensing range: 1.9 m 6.234 ft [RX-M10] Slit on receiver 1 m 3.281 ft [RX2-M5] • Min. sensing object: ø6 mm ø0.236 in				
		• 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 mask	OS-RX-1×5 (Slit size 1 × 5 mm (0.039 × 0.197 in)) OS-RX-5×1 (Slit size 5 × 1 mm (0.197 × 0.039 in))	• Sensing range: 3.8 m 12.467 ft [RX-M10] Slit on emitter 1.9 m 6.234 ft [RX2-M5] • Min. sensing object: ø8 mm ø0.315 in				
For RX-M10 and RX2-M5 only		• Sensing range: 2.8 m 9.186 ft [RX-M10] Slit on receiver 1.4 m 4.593 ft [RX2-M5] • Min. sensing object: ø6 mm ø0.236 in				
		• 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-3×5 (Slit size 3 × 5 mm 0.118 × 0.197 in) OS-RX-5×3	• Sensing range: 7 m 22.966 ft [RX-M10] Slit on emitter 3.5 m 11.483 ft [RX2-M5] • Min. sensing object: ø8 mm ø0.315 in				
		• 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				
	Slit size 5 × 3 mm 0.197 × 0.118 in	• 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				
Reflector	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				
retroreflective type sensor only / (Note 1)	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	MS-RF21-1	Protective mounting bracket for RF-210 It protects the reflector from damage and maintains alignment.				
bracket	MS-RF22	For RF-220				
(Note 1)	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	500 mm 19.685 in It does not rust as it is made of stainless steel.				
1 Totective tube	PT-RX1000	1,000 mm 39.370 in stainless steel.				
Sensor checker (Note 2)	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.				

Notes: 1) Refer to **CX-400** series pages (p.269 and p.272) for dimensions of the reflector or the reflector mounting bracket.

2) Refer to p.959~ for the sensor checker.

Slit mask

• OS-RX-□
Fitted on the front face of the sensor with one-touch.

*Slit size
OS-RX-1×5
a b Slit mask

Reflector



Reflector mounting bracket

• MS-RF21-1



• MS-RF22



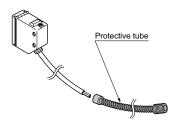
Two M3 (length 8 mm 0.315 in) screws with washers are attached.

• MS-RF23

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

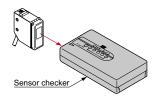
Protective tube

• PT-RX500 • PT-RX1000



Sensor checker

• CHX-SC2



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CX-400 CY-100 EX-10

EX-20 EX-30

EX-40 CX-440

EQ-30 EQ-500

MQ-W RX-LS200

RT-610

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Power Supply Built-in

EX-Z CX-400 CY-100 EX-10 FX-20 EX-30 EX-40 CX-440 EQ-30

MQ-W RX-LS200 RT-610

EQ-500

SPECIFICATIONS

Standard type

1,		Thru-beam				Retroreflective		Diffuse reflective	
`	Туре	Infra		Red	Green	Red / with polar-\	Infrared (Long sensing range)	Infrared	Red
			Long sensing range			\izing filters/			
Iten	n Model No.	RX-M10	RX-M50	RX-M2R	RX-500G	RX-PRVM3	RX-RVM5	RX-D700	RX-D200F
CE marking directive compliance Sensing range				I	EMC Directive,	RoHS Directive	1		
		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
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, transtranstransparent o		
Hyst	teresis							15 % or less of opera	tion distance (Note
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				
Sup	ply voltage			12 to 2	4 V DC ±10 %	Ripple P-P 10 % or less			
Curr	rent consumption	Emitter: 20 mA or	less (RX-M50 : 25	mA or less), Rece	iver: 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			Sv	vitchable either L		-ON		
	Short-circuit protection				Incorp	orated			
Self-diagnosis output		NPN open-collector transistor							
	Output operation	ON under unstable sensing condition							
	Short-circuit protection								
	ponse time	1 ms or less							
	input (emission halt) function	Incorporated							
	eration indicator Dility indicator	Red LED (lights up when the sensing output is ON) Groon LED (lights up under stable light received condition or stable dark condition)							
	tting indicator	Green LED (lights up under stable light received condition or stable dark condition) Red LED (lights up during beam emission)							
	,	1100		uring beam emi	ssion)	1			
Sensitivity adjuster Automatic interference prevention function		Incorporated (Two units of sensors can be mounted close togethe							
	natic interference prevention function		LED (lights up u	uring beam emi	,	ariable adjuster	wo units of sensor		close together
Auton	natic interference prevention function Pollution degree			uring beam emi	Continuously v		wo units of sensor		close together
Auton	· · · · · · · · · · · · · · · · · · ·			uring beam emi	Continuously v	Incorporated (T	wo units of sensor		close together
istance	Pollution degree	–25 to			Continuously v	Incorporated (Trenvironment) (IEC)		s can be mounted	
istance	Pollution degree Protection	-25 to		-140 °F (No dev	Continuously v 3 (Industrial	Incorporated (Tenvironment) (IEC) r icing allowed),	Storage: –30 to	s can be mounted	
istance	Pollution degree Protection Ambient temperature	-25 to	+60 °C -13 to +	-140 °F (No dev 35 Incandescent	Continuously v 3 (Industrial IP67 v condensation o to 85 % RH, Sto light: 3,500 & or	Incorporated (Tenvironment) (IEC) r icing allowed), rage: 35 to 85 %	Storage: –30 to RH -receiving face	s can be mounted +70 °C -22 to +	
istance	Pollution degree Protection Ambient temperature Ambient humidity Ambient illuminance Voltage withstandability		+60 °C -13 to 4	-140 °F (No dev 35 Incandescent for one min. be	Continuously v 3 (Industrial IP67 v condensation o to 85 % RH, Sto light: 3,500 & or tween all supply	Incorporated (Tenvironment) (IEC) r icing allowed), rage: 35 to 85 % less at the light terminals conne	Storage: –30 to RH -receiving face cted together an	s can be mounted +70 °C -22 to +	158 °F
istance	Pollution degree Protection Ambient temperature Ambient humidity Ambient illuminance Voltage withstandability Insulation resistance	20	+60 °C -13 to 4 1,000 V AC MΩ, or more, wi	-140 °F (No dev 35 Incandescent for one min. be th 250 V DC me	Continuously v 3 (Industrial IP67 v condensation o to 85 % RH, Sto light: 3,500 & or etween all supply	Incorporated (Tenvironment) (IEC) r icing allowed), rage: 35 to 85 % less at the light terminals conne	Storage: –30 to RH -receiving face cted together an s connected tog	s can be mounted +70 °C -22 to +	158 °F
Auton	Pollution degree Protection Ambient temperature Ambient humidity Ambient illuminance Voltage withstandability Insulation resistance Vibration resistance	20	+60 °C −13 to + 1,000 V AC MΩ, or more, wi the distribution of the control of	-140 °F (No dev 35 Incandescent for one min. be th 250 V DC me 1.5 mm 0.059 in	Continuously v 3 (Industrial IP67 v condensation o to 85 % RH, Sto light: 3,500 & or etween all supply egger between all n double amplitude	Incorporated (Tenvironment) (IEC) r icing allowed), rage: 35 to 85 % less at the light terminals conne supply terminal de (10 G max.) ir	Storage: -30 to RH -receiving face cted together an s connected tog n X, Y and Z dire	s can be mounted +70 °C -22 to + and enclosure ether and enclose ctions for two ho	158 °F
Environmental resistance	Pollution degree Protection Ambient temperature Ambient humidity Ambient illuminance Voltage withstandability Insulation resistance Vibration resistance Shock resistance	20 10 to 500	+60 °C -13 to + 1,000 V AC MΩ, or more, wi D Hz frequency, 500 m.	140 °F (No dev 35 Incandescent for one min. be th 250 V DC me 1.5 mm 0.059 ir s'acceleration	Continuously v 3 (Industrial IP67 v condensation o to 85 % RH, Sto light: 3,500 & or tween all supply gger between al double amplitud (50 G approx.) ir	Incorporated (Tenvironment) (IEC) r icing allowed), rage: 35 to 85 % less at the light terminals conne I supply terminal de (10 G max.) ir	Storage: –30 to RH -receiving face cted together an s connected tog n X, Y and Z dire ctions three time	s can be mounted +70 °C -22 to + id enclosure ether and enclos ctions for two hose each	ure urs each
Environmental resistance	Pollution degree Protection Ambient temperature Ambient humidity Ambient illuminance Voltage withstandability Insulation resistance Vibration resistance Shock resistance tting element (modulated)	20 10 to 500	+60 °C -13 to -1,000 V AC MΩ, or more, wi D Hz frequency, 500 m.	-140 °F (No dev 35 Incandescent for one min. be th 250 V DC me 1.5 mm 0.059 in se's acceleration Red LED	Continuously v 3 (Industrial IP67 v condensation o to 85 % RH, Stor light: 3,500 & or tween all supply gger between all double amplitud (50 G approx.) ir Green LED	Incorporated (Tenvironment) (IEC) r icing allowed), rage: 35 to 85 % less at the light terminals conne I supply terminal de (10 G max.) ir X, Y and Z dire	Storage: –30 to RH -receiving face cted together an s connected tog n X, Y and Z dire ctions three time	s can be mounted +70 °C –22 to + and enclosure either and enclos ctions for two ho as each	ure urs each
Environmental resistance	Pollution degree Protection Ambient temperature Ambient humidity Ambient illuminance Voltage withstandability Insulation resistance Vibration resistance Shock resistance tting element (modulated) Peak emission wavelength	20 10 to 500 Infrare 880 nm (+60 °C -13 to -1 1,000 V AC MΩ, or more, wi D Hz frequency, 500 m. d LED 0.035 mil	Incandescent for one min. be th 250 V DC me 1.5 mm 0.059 in s² acceleration Red LED 660 nm 0.026 mil	Continuously v 3 (Industrial IP67 v condensation o to 85 % RH, Stor light: 3,500 & or tween all supply gger between all double amplitud (50 G approx.) ir Green LED 570 nm 0.022 mil	Incorporated (Tenvironment) (IEC) r icing allowed), rage: 35 to 85 % less at the light terminals conne I supply terminal de (10 G max.) ir X, Y and Z dire Red LED 680 nm 0.027 mil	Storage: –30 to RH -receiving face cted together an s connected tog n X, Y and Z dire ctions three time	+70 °C -22 to + Ind enclosure Either and enclos ctions for two ho as each and LED 0.035 mil	ure urs each Red LED 680 nm 0.027 n
Environmental resistance	Pollution degree Protection Ambient temperature Ambient humidity Ambient illuminance Voltage withstandability Insulation resistance Vibration resistance Shock resistance tting element (modulated) Peak emission wavelength	20 10 to 500 Infrare 880 nm (Enclost Emitter: 0.15 mm² 3-4	+60 °C -13 to • 1,000 V AC MΩ, or more, wi 0 Hz frequency, 500 m. d LED 0.035 mil ure: Die-cast zinc core oil, heat and colo	140 °F (No dev 35 Incandescent for one min. be th 250 V DC me 1.5 mm 0.059 in rs² acceleration Red LED 660 nm 0.026 mil alloy, Indicator of resistant cabtyre cal	Continuously v 3 (Industrial IP67 v condensation o to 85 % RH, Sto light: 3,500 & o tween all supply gger between al n double amplitud (50 G approx.) ir Green LED 570 nm 0.022 mil	Incorporated (Tenvironment) (IEC) r icing allowed), rage: 35 to 85 % less at the light terminals conne supply terminal de (10 G max.) ir X, Y and Z dire Red LED 680 nm 0.027 mil	Storage: –30 to RH -receiving face cted together an s connected tog n X, Y and Z dire ctions three time Infrare 880 nm	s can be mounted +70 °C -22 to + Id enclosure either and enclos ctions for two ho es each ed LED 0.035 mil correflective type:	ure urs each Red LED 680 nm 0.027 n Acrylic)
da Diametral resistance	Pollution degree Protection Ambient temperature Ambient humidity Ambient illuminance Voltage withstandability Insulation resistance Vibration resistance Shock resistance tting element (modulated) Peak emission wavelength	20 10 to 500 Infrare 880 nm (Enclosu Emitter: 0.15 mm² 3-4 Receiver: 0.15 mm² 4	+60 °C -13 to -10 MΩ, or more, with the control of	Incandescent for one min. be th 250 V DC me 1.5 mm 0.059 ir s² acceleration Red LED 660 nm 0.026 mil alloy, Indicator of resistant cabtyre call ld resistant cabtyre cal	Continuously v 3 (Industrial IP67 v condensation to 85 % RH, Sto light: 3,500 & or tween all supply gger between al double amplitud (50 G approx.) ir Green LED 570 nm 0.022 mil cover: Polyethersu ble, 2 m 6.562 ft long	Incorporated (Tenvironment) (IEC) rage: 35 to 85 % less at the light terminals connel supply terminal le (10 G max.) ir at X, Y and Z dire Red LED 680 nm 0.027 mil alphone, Lens: Pc 0.15 mm² 5-4 2 m 6.562 ft	Storage: –30 to RH -receiving face cted together an s connected tog 1 X, Y and Z dire ctions three time Infrare 880 nm Dlycarbonate (Ref	s can be mounted +70 °C –22 to + Id enclosure ether and enclos ctions for two ho es each ed LED 0.035 mil croreflective type: d cold resistant c	ure urs each Red LED 680 nm 0.027 m Acrylic) abtyre cable,
Environmental resistance	Pollution degree Protection Ambient temperature Ambient humidity Ambient illuminance Voltage withstandability Insulation resistance Vibration resistance Shock resistance tting element (modulated) Peak emission wavelength erial	20 10 to 500 Infrare 880 nm (Enclose Emitter: 0.15 mm² 3- Receiver: 0.15 mm² 4 Extension up	+60 °C -13 to -10 MΩ, or more, with the control of	Incandescent for one min. be th 250 V DC me 1.5 mm 0.059 in s² acceleration Red LED 660 nm 0.026 mil alloy, Indicator or resistant cabtyre calld resistant cabtyre call resistant	Continuously v 3 (Industrial IP67 v condensation o to 85 % RH, Sto light: 3,500 & or etween all supply gger between all n double amplitud (50 G approx.) ir Green LED 570 nm 0.022 mil cover: Polyethersu ble, 2 m 6.562 ft long able, 2 m 6.562 ft long	Incorporated (Tenvironment) (IEC) rage: 35 to 85 % less at the light terminals connel supply terminal le (10 G max.) ir at X, Y and Z dire Red LED 680 nm 0.027 mil alphone, Lens: Pc 0.15 mm² 5-4 2 m 6.562 ft	Storage: –30 to RH -receiving face cted together an s connected tog n X, Y and Z dire ctions three time Infrare 880 nm blycarbonate (Ret core oil, heat and long e (thru-beam typ	s can be mounted +70 °C –22 to + Id enclosure ether and enclos ctions for two ho es each ed LED 0.035 mil croreflective type: d cold resistant c	ure urs each Red LED 680 nm 0.027 m Acrylic) abtyre cable,

- 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.
 - Reflector cannot be placed in this range Actual sensing range of the sensor 5 m 16.404 ft (RX-PRVM3: 3 m 9.843 ft 0.1 m 0.328 ft
 Setting range of the reflector Reflector Reflector

- 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

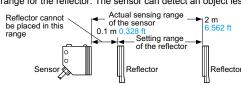
DC 2-wire type

		Туре	Thru-beam	Retroreflective (with polarizing filters)	Diffuse reflective		
Item	1	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)		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 le	ss (Note 6)		
Sens	Sensing output		Non contact DC 2-wire type • Load current: 5 to 100 mA • Residual voltage: 4 V or less (Note 7)				
	Output ope	ration	Switchable either Light-ON or Dark-ON				
	Short-circu	it protection		Incorporated			
Resp	oonse time			3 ms or less			
Ope	ration indica	tor	Red LED (lights up when the output is ON)				
Stab	Stability indicator		Green LED (Light-ON mode: lights up under stable light received condition) Dark-ON mode: lights up under stable dark condition				
Emit	Emitting indicator		Red LED (lights up during beam emission) ————				
Sens	Sensitivity adjuster		Continuously variable adjuster				
	Protection			IP67 (IEC)			
nce	Ambient te	mperature	-20 to +60 °C -4 to +140 °F (No dew condensation or icing allowed), Storage: -30 to +70 °C -22 to +158 °F				
sista	Ambient hu	ımidity	35 to 85 % RH, Storage: 35 to 85 % RH				
talre	Ambient illu	uminance	Incandescent light: 3,500 & or less at the light-receiving face				
men	Voltage wit	hstandability	1,000 V AC for one min. between all supply terminals connected together and enclosure				
Ambient temperature —20 to +60 °C —4 to +140 °F (No dew condensation or icing allowed), Storage Ambient humidity 35 to 85 % RH, Storage: 35 to 85 % RH Ambient illuminance				nnected together and enclosure			
E	Vibration re	esistance	10 to 500 Hz frequency, 1.5 mm 0.0	59 in double amplitude (10 G max.) in X, Y and Z directions for two hours each			
	Shock resis	stance	500 m/s ² accelera	ation (50 G approx.) in X, Y and Z directions three times each			
Emit	tting element		Infrared LED (modulated)	Red LED (modulated)	Infrared LED (modulated)		
	Peak emiss	ion 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)				
Cabl	Cable		0.15 mm² 2-core oil, heat and cold resistant cabtyre cable, 2 m 6.562 ft long				
Cabl	e 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

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 ($200 \times 200 \text{ mm } 7.874 \times 7.874 \text{ in}$) 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.

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LASER SENSORS

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> FA COMPONENTS

MACHINE VISION SYSTEMS

IV CURING CYSTEMS

Selection Guide Amplifier Built-in Power Supply Built-in

Built-in
Power Supply
Built-in
Amplifierseparated

CX-400 CY-100

EX-10 EX-20 EX-30

EX-40 CX-440

> EQ-30 EQ-500

MQ-W RX-LS200

RT-610

SPECIFICATIONS

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UV CURING SYSTEMS

Power Supply Built-in

EX-Z CX-400 CY-100 EX-10 EX-20 EX-30 EX-40 CX-440

EQ-30 EQ-500 MQ-W RX-LS200

RT-610

Heavy duty type

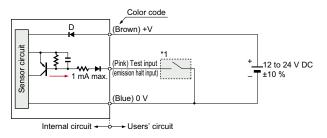
Type		Thru-beam					
	Туре	Cable length 2 m 6.562 ft	Cable length 3 m 9.843 ft	Cable length 5 m 16.404 ft			
ten	n Model No.	RX4-M5	RX4-M5-C3	RX4-M5-C5			
Sensing range		5 m 16.404 ft					
Sensing object		ø10 mm ø0.394 in or more opaque object					
Repeatability (perpendicular to sensing axis)		0.5 mm 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					
	Output operation	ON under unstable sensing condition					
	Short-circuit protection						
Res	ponse time	1 ms or less					
Test	input (emission halt) function	Incorporated					
Оре	eration indicator	Red LED (lights up when the sensing output is ON)					
Stal	pility indicator	Green LED (lights up under stable light received condition or stable dark condition)					
Ξmi	tting indicator	Red LED (lights up during beam emission)					
Sen	sitivity adjuster	Continuously variable adjuster					
	Protection	IP67 (IEC), IP67G					
nce	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					
sista	Ambient humidity	35 to 85 % RH, Storage: 35 to 85 % RH					
al re	Ambient illuminance	Incandescent light: 3,500 tx or less at the light-receiving face					
nent	Voltage withstandability	1,000 V AC for one min. between all supply terminals connected together and enclosure					
Environmental resistance	Insulation resistance	$20~\text{M}\Omega$, or more, with 250 V DC megger between all supply terminals connected together and enclosure					
Ē	Vibration resistance	10 to 500 Hz frequency, 1.5 mm 0.059 in double 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 three times each					
Emi	tting 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: Polyalylate, Protective tube sheath: Oil resistant PVC					
Cab	le	0.15 mm ² 4-cor	re (emitter: 3-core) oil, heat and cold resistar	nt cabtyre cable			
Prof	ective tube length	1 m 3.281 ft	2 m 6.562 ft	4 m 13.123 ft			
Cab	le extension	Extension up to total 100 m 328.	.084 ft is possible for both emitter and receiv	ver with 0.3 mm ² , or more, cable.			
Vet	weight	Emitter: 175 g approx., Receiver: 175 g approx.	Emitter: 265 g approx., Receiver: 265 g approx.	Emitter: 495 g approx., Receiver: 495 g appro			
Δ _C C	essories	MS-RX-2 (Sensor mounting	ng bracket): 1 set for emitter and receiver, A	djusting screwdriver: 1 pc.			

I/O CIRCUIT AND WIRING DIAGRAMS

RX-- RX4--

I/O circuit diagrams

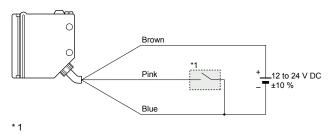
Emitter of thru-beam type sensor



Symbol ... D: Reverse supply polarity protection diode

Wiring diagram

Emitter of thru-beam type sensor

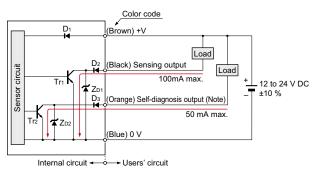


Non-voltage contact or NPN open-collector transistor

or

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

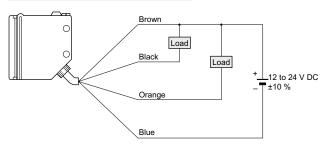
Receiver of thru-beam type sensor



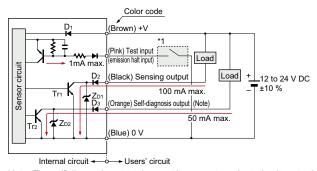
Note: The self-diagnosis output does not incorporate a short-circuit protection circuit. Do not connect it directly to a power supply or a capacitive load.

Symbols ... D1: Reverse supply polarity protection diode D2, D3: Reverse output polarity protection diode ZD1, ZD2: Surge absorption zener diode Tr1, Tr2: NPN output transistor

Receiver of thru-beam type sensor



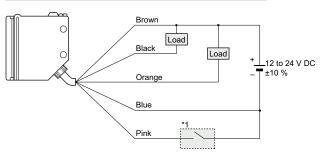
Retroreflective and diffuse reflective type sensors

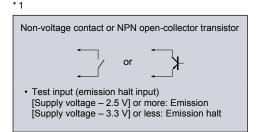


Note: The self-diagnosis output does not incorporate a short-circuit protection circuit. Do not connect it directly to a power supply or a capacitive load.

Symbols ... D1: Reverse supply polarity protection diode D2, D3: Reverse output polarity protection diode ZD1, ZD2: Surge absorption zener diode Tr1, Tr2: NPN output transistor

Retroreflective and diffuse reflective type sensors





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MEASURE-MENT SENSORS

CONTROL

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Power Supply Built-in Amplifierseparated

CX-400 CY-100

EX-10

EX-20 EX-30

EX-40

CX-440 EQ-30

EQ-500

MQ-W RX-LS200

RX RT-610

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MACHINE INTERFACES

HUMAN

FA COMPONENTS MACHINE VISION SYSTEMS

CURING SYSTEMS

Amplifier Built-in

Power Supply Built-in

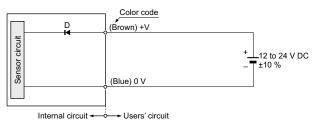
EX-Z

CX-400

RX2-□

I/O circuit diagrams

Emitter of thru-beam type sensor

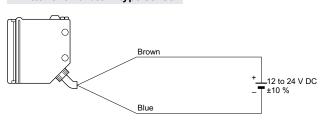


■ I/O CIRCUIT AND WIRING DIAGRAMS

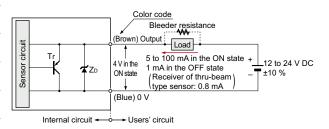
Symbol ... D: Reverse supply polarity protection diode

Wiring diagrams

Emitter of thru-beam type sensor

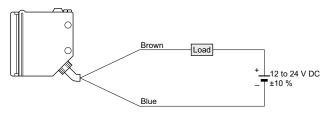


Receiver of thru-beam type sensor, retroreflective and diffuse reflective type sensors



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

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



Conditions for the load

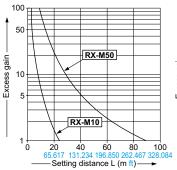
- 1) The load should not be actuated by the leakage current (1 mA; 0.8 mA for receiver of thru-beam type sensor) in the OFF state.
- 2) The load should be actuated by (supply voltage 4 V) in the ON state.
- 3) The current in the ON state should be between 5 to 100 mA DC. In case the current is less than 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.

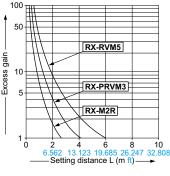
SENSING CHARACTERISTICS (TYPICAL)

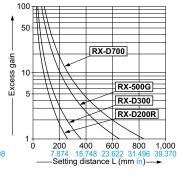
RX-□

All models

Correlation between setting distance and excess gain







CY-100 EX-10 **EX-20** EX-30 EX-40 CX-440 EQ-30 EQ-500 MQ-W

RT-610

RX-LS200

SENSING CHARACTERISTICS (TYPICAL)

Thru-beam type RX-M10 Parallel deviation Parallel deviation with slit masks Parallel deviation with slit masks Parallel deviation with slit masks (1 × 5 mm 0.039 × 0.197 in) $(0.5 \times 5 \text{ mm } 0.020 \times 0.197 \text{ in})$ $(3 \times 5 \text{ mm } 0.118 \times 0.197 \text{ in})$ Slit on emitter Setting distance L (m ft) → Setting distance L (m ft) → Setting distance L (m ft) → Setting distance L (m ft)→ Slit on Slit on receiver Slit on Emitter Emitte emitter Emitte Emitte Slit on both side both sides Slit on receiver Slit on Receiver 0+ 400 200 7.87 0 200 7.874 0 400 15.74 400 15.74 200 100 100 3.937 ➤ Right 3.937 ➤ Right 7.874 → Right 7.874 Left ◄ 3.93 Left ◄ 3.937 Left ◄ Right Left Center Center Center Center Operating point & (mm in) Operating point ℓ (mm in) Operating point & (mm in) Operating point & (mm in) RX-M50 Thru-beam type RX-M2R Thru-beam type **RX-500G** Thru-beam type RX4-M5_□ Thru-beam type Parallel deviation Parallel deviation Parallel deviation Parallel deviation Setting distance L (m ft) → Setting distance L (m ft)→ Setting distance L (m ft) → 60 (H H) 600 distance L 400 Emitter Emitte Emitter Emitte 20 Receiver Receiver 0 200 0 40 1,000 0 400 500 500 1,000 100 Ò 100 200 20 Ó 20 200 200 400 0.787 ➤ Right U./8 Left ◄ 7.074 → Right -Center Left < Left -Center ► Right Left --Center → Right - Center Operating point ℓ (mm in) Operating point ℓ (mm in) Operating point & (mm in) Operating point ℓ (mm in) RX2-M5 Thru-beam type Parallel deviation Parallel deviation with slit masks Parallel deviation with slit masks Parallel deviation with slit masks $(0.5 \times 5 \text{ mm } 0.020 \times 0.197 \text{ in})$ $(1 \times 5 \text{ mm } 0.039 \times 0.197 \text{ in})$ $(3 \times 5 \text{ mm } 0.118 \times 0.197 \text{ in})$ Slit on Slit on emitter Setting distance L (m ft) → Setting distance L (m ft) + 4.92 3.28 1.64 (m ft) - 1.55 (m ft) - 1.64 (Setting distance L (m ft)→ Setting distance L (m ft) 1.5 Slit on receive Slit on Emitte Emitte Emitte Emitte Slit on receive Ď Slit on 0.5 0.5 Slit on |--- l -- i L Slit on Slit on 0 400 74 0+ 100 100 3.937 0 ↓ 200 200 200 400 50 50 100 50 50 100 100 100 Left -Right Center Right ► Right -Center Operating point (mm in) Operating point ℓ (mm in) Operating point ℓ (mm in) **RX-PRVM3** Retroreflective type **RX-RVM5** Retroreflective type **RX2-PRVM2** Retroreflective type Parallel deviation Parallel deviation Parallel deviation Setting distance L (m ft) → Setting distance L (m Setting distance L (m Reflector (**RF-230**) Reflector (RF-230) (RF-230 |---| |-- l--| 0 ↓ 100 0 100 50 Ó ò 50 100 50 100 50 100 50 50 100 1.969 → Right

FIBER SENSORS

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VISION SYSTEMS

EX-Z CX-400

CY-100 EX-10

EX-20 EX-30

EX-40 CX-440

EQ-30 EQ-500

MQ-W RX-LS200

RT-610

Downloaded from **Arrow.com**.

Left ◄

-Center

Operating point (mm in)

Left ◄

-Center

Operating point & (mm in)

Right

Left ◄

-Center

Operating point & (mm in)

Right

PHOTO-ELECTRIC SENSORS

MICRO
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SENSORS

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SENSORS

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Selection Guide Amplifier Built-in

Power Supply Built-in
Amplifier-separated

EX-Z

CX-400

CY-100

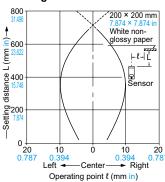
EX-Z
CX-400
CY-100
EX-10
EX-20
EX-30
EX-40
CX-440
EQ-30
EQ-500
MQ-W
RX-LS200

RT-610

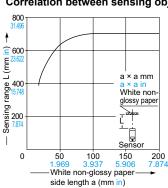
SENSING CHARACTERISTICS (TYPICAL)

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

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

RX-D200R Sensing field

₹ 200 = 7,874

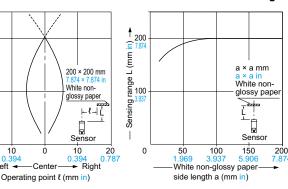
distance I

-Setting

100

0 ↓ 20

Correlation between sensing object size and sensing range



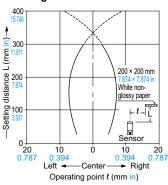
As the sensing object size becomes smaller than the standard size (white non-glossy paper $200 \times 200 \text{ mm } 7.874 \times 7.874 \text{ in}$), the sensing range shortens, as shown in the left graph.

Diffuse reflective type

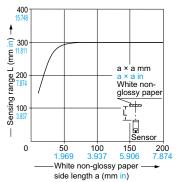
For plotting the left graph, the sensitivity has been set such that a 200 × 200 mm 7.874 × 7.874 in white non-glossy paper is just detectable at a distance of 200 mm 7.874 in.

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

For plotting the left graph, the sensitivity has been set such that a 200 × 200 mm 7.874 × 7.874 in white non-glossy paper is just detectable at a distance of 300 mm 11.811 in.

PRECAUTIONS FOR PROPER USE

Refer to p.1552~ for general precautions.



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

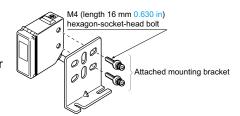
 In case of using sensing devices for personnel protection, use products which meet laws and standards, such as OSHA, ANSI or IEC etc., for personnel protection applicable in each region or country.

Wiring

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

Mounting

 The tightening torque should be 1.17 N·m or less.



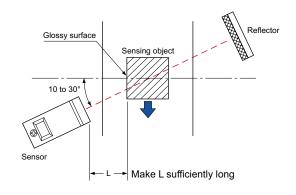
Others

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

RX-RVM5

Glossy object sensing

- Please take care of the following points when detecting materials having a gloss.
- ①Make 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

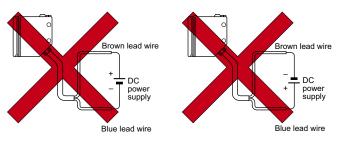
- Tilt the sensor with respect to the sensing object while fitting.
- · Reduce the sensitivity.
- Increase the distance between the sensor and the sensing object.

RX2-□

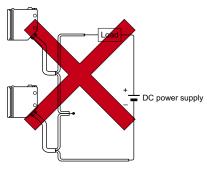
Wiring

 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.

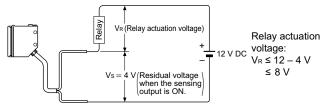
Further, note that the sensor will be damaged if the power supply is connected in reverse without a load.



· 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.)

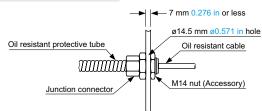


RX4-

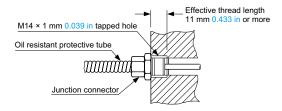
Connection of protective tube connector

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

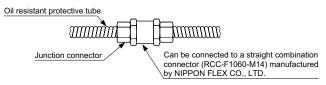
When mounted on a plate



When mounted with a female screw



When connected to another protective tube



FIBER SENSORS

LASER SENSORS

PHOTO-ELECTRIC SENSORS
MICRO
PHOTO-ELECTRIC
SENSORS

AREA SENSORS

CURTAINS / SAFETY COMPONENTS PRESSURE / FLOW SENSORS

INDUCTIVE PROXIMITY SENSORS

PARTICULAR USE SENSORS

SENSOR OPTIONS SIMPLE WIRE-SAVING

WIRE-SAVING SYSTEMS

MEASURE-MENT SENSORS

STATIC CONTROL DEVICES

LASER MARKERS

PLC

ENERGY MANAGEMENT SOLUTIONS

FA COMPONENTS

MACHINE VISION SYSTEMS

CURING SYSTEMS

Selection Guide Amplifier Built-in

Power Supply Built-in Amplifierseparated

EX-Z CX-400

CY-100 EX-10

EX-20

EX-40 CX-440

EQ-30

EQ-500 MQ-W

RX-LS200

RT-610

LASER

AREA SENSORS

COMPONENTS

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WIRE-SAVING SYSTEMS

MEASURE-MENT SENSORS

STATIC CONTROL DEVICES

LASER MARKERS

PLC

HUMAN

MACHINE INTERFACES

SOLUTIONS

FA COMPONENTS

MACHINE

VISION SYSTEMS

CURING SYSTEMS

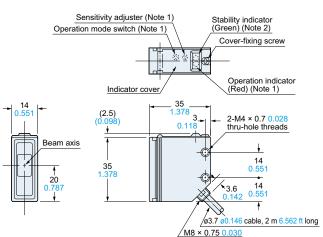
SENSORS

DIMENSIONS (Unit: mm in)

The CAD data can be downloaded from our website.

Refer to CX-400 series pages (p.269 and p.272) for dimensions of the reflector or the reflector mounting bracket.

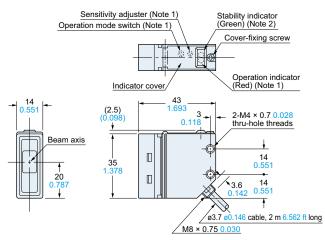
RX-M10 RX-M2R RX-500G RX2-M5



Notes: 1) Not incorporated on the emitter.

2) It is the emitting indicator (red) on the emitter.

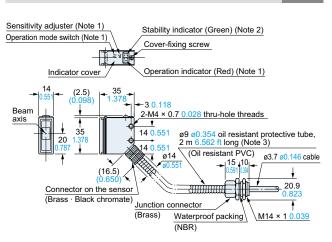
RX-M50



Notes: 1) Not incorporated on the emitter.

2) It is the emitting indicator (red) on the emitter.

RX4-M5□

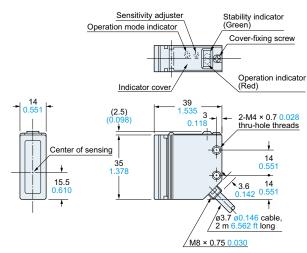


Notes: 1) Not incorporated on the emitter.

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)

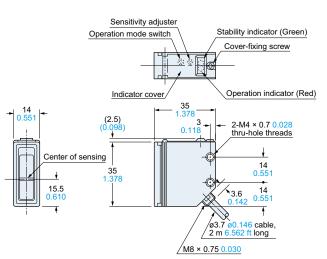
RX-PRVM3 RX-RVM5 RX2-PRVM2



RX-D700 RX-D200R RX2-D300

Sensor

Sensor



Amplifiei Built-ir Power Supply Built-in

FX-Z CX-400 CY-100 EX-10

EX-20

EX-30

EX-40 CX-440 EQ-30 EQ-500 MQ-W RX-LS200

RT-610

Downloaded from **Arrow.com**.

DIMENSIONS (Unit: mm in)

The CAD data can be downloaded from our website.

Refer to CX-400 series pages (p.269 and p.272) for dimensions of the reflector or the reflector mounting bracket.

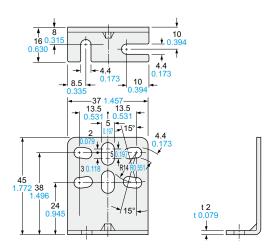
-30 1.181-

- 30

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MS-RX-1

Sensor mounting bracket (Accessory for **RX-**□, **RX2-**□)



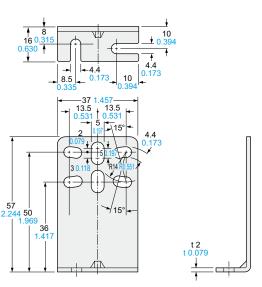
Material: Cold rolled carbon steel (SPCC)

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

Assembly dimensions Mounting drawing with RX-D700 0.315 0.335 0.

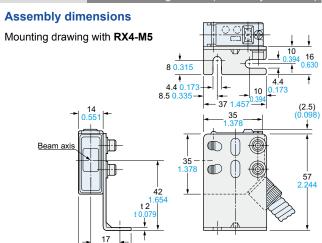
MS-RX-2

Sensor mounting bracket (Accessory for **RX4-**□)

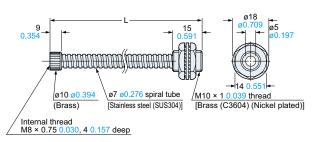


Material: Cold rolled carbon steel (SPCC)

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



PT-RX500 PT-RX1000



• Length L

Model No.	Length L		
PT-RX500	500 ^{+ 10}	19.685 + 0.394	
PT-RX1000	1,000 ^{+ 10}	39.370 ⁺ 0.394	

Protective tube (Optional)

FIBER SENSORS

PHOTO-ELECTRIC SENSORS

PHOTO-ELECTRIC SENSORS

AREA

SAFETY LIGHT CURTAINS / SAFETY COMPONENTS PRESSURE / FLOW SENSORS

INDUCTIVE PROXIMITY SENSORS PARTICULAR USE SENSORS

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FA
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Power Supply Built-in Amplifierseparated

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EX-Z

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MQ-W RX-LS200

RT-610