

Cylindrical Photoelectric Sensor

CY-100 SERIES

Amplifier Built-in

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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

Related Information

- General terms and conditions..... F-3
- Glossary of terms P.1549~

- Selection guide P.231~
- General precautions P.1552~

Listing
(2 m cable length type only)

FEATURES

- Wide product range
Shape: Standard type
Side view type
Connector: 2 m (6.562 ft) cable length type
M12 plug-in connector type
- Diffuse reflective type sensor with sensitivity adjuster is available.
- M18 thread size for convenient mounting
- Strong resistance IP67
- Convenient universal sensor mounting stand is available.

ORDER GUIDE

2 m cable length type

Type	Appearance	Sensing range	Model No. (Note 1)		Output operation
			NPN output	PNP output	
Standard	Thru-beam	15 m 49.213 ft	CY-111A	CY-111A-P	Light-ON
			CY-111B	CY-111B-P	Dark-ON
	Retroreflective (Note 2,3)	4 m 13.123 ft	CY-192A-Y	CY-192A-P-Y	Light-ON
			CY-192B-Y	CY-192B-P-Y	Dark-ON
	Diffuse reflective With sensitivity adjuster	2 m 6.562 ft	CY-191A-Y	CY-191A-P-Y	Light-ON
			CY-191B-Y	CY-191B-P-Y	Dark-ON
Side view	Thru-beam	100 mm 3.937 in	CY-121A	CY-121A-P	Light-ON
			CY-121B	CY-121B-P	Dark-ON
		600 mm 23.622 in	CY-122A	CY-122A-P	Light-ON
			CY-122B	CY-122B-P	Dark-ON
	Retroreflective (Note 2,3)	15 m 49.213 ft	CY-111VA	CY-111VA-P	Light-ON
			CY-111VB	CY-111VB-P	Dark-ON
		4 m 13.123 ft	CY-192VA-Y	CY-192VA-P-Y	Light-ON
			CY-192VB-Y	CY-192VB-P-Y	Dark-ON
	Diffuse reflective With sensitivity adjuster	2 m 6.562 ft	CY-191VA-Y	CY-191VA-P-Y	Light-ON
			CY-191VB-Y	CY-191VB-P-Y	Dark-ON
		100 mm 3.937 in	CY-121VA	CY-121VA-P	Light-ON
			CY-121VB	CY-121VB-P	Dark-ON
	Diffuse reflective With sensitivity adjuster	600 mm 23.622 in	CY-122VA	CY-122VA-P	Light-ON
			CY-122VB	CY-122VB-P	Dark-ON

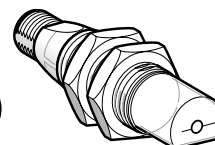
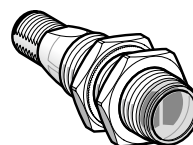
Notes: 1) The model No. with "E" shown on the label affixed to the thru-beam type sensor is the emitter, "D" shown on the label is the receiver. (e.g.)
 2) The reflector is sold separately.
 3) The sensing range of the retroreflective type sensor is specified for the RF-420 reflector (optional).

M12 plug-in connector type

M12 plug-in connector type is also available.
 When ordering this type, suffix "-Z" for the M12 plug-in connector type to the model No. (e.g.) M12 plug-in connector type of CY-111A-P is "CY-111A-P-Z".
 In case of the retroreflective type, M12 plug-in connector type of CY-19□-P-Y is "CY-19□-P-Z-Y".

• Standard type

• Side view type



ORDER GUIDE

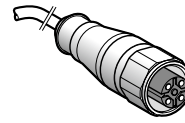
Mating cable (2 cables are required for the thru-beam type.)

Type	Model No.	Description
For M12 plug-in connector type	Straight	CN-24C-C2 Length: 2 m 6.562 ft
		CN-24C-C5 Length: 5 m 16.404 ft
	Elbow	CN-24CL-C2 Length: 2 m 6.562 ft
		CN-24CL-C5 Length: 5 m 16.404 ft

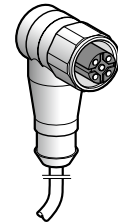
Clamping ring :
ø14mm **0.551 in**
Cable outer :
ø5.3mm **0.209 in**

Mating cable

• Straight type



• Elbow type



OPTIONS

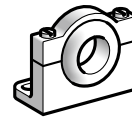
Designation	Model No.	Description
Sensor mounting bracket	MS-CY1-1	Material: Stainless steel
	MS-CY1-2	Material: Plastic, For beam axis alignment
Universal sensor mounting stand	MS-AJ3	It can adjust the height of the sensor and reflector RF-420 . (The thru-beam type sensor needs two brackets.)
Reflector	RF-420	50 × 50 mm 1.969 × 1.969 in
	RF-410	24 × 21 mm 0.945 × 0.827 in
Reflective tape	RF-40RL5	22 mm × 5 m 0.866 × 196.850 in , Thickness: 0.4 mm 0.016 in

Sensor mounting bracket

• MS-CY1-1

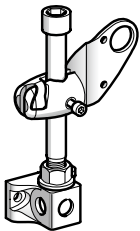


• MS-CY1-2



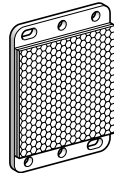
Universal sensor mounting stand

• MS-AJ3

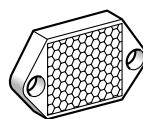


Reflector

• RF-420

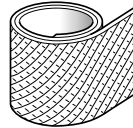


• RF-410



Reflective tape

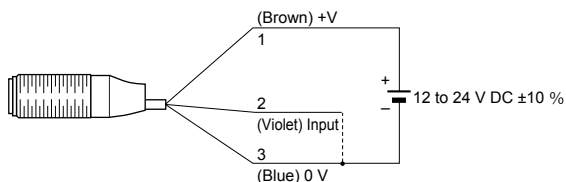
• RF-40RL5



WIRING DIAGRAMS

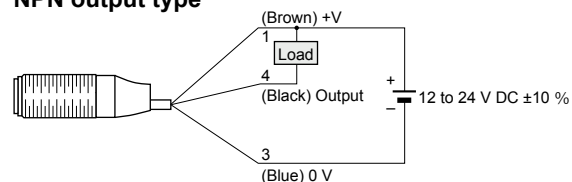
Wiring diagram

Emitter of thru-beam type



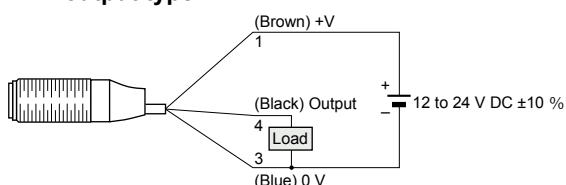
Receiver of thru-beam / Reflective type

NPN output type



Receiver of thru-beam / Reflective type

PNP output type



Connector pin position

M12 connector



- 1 : +V
- 2 : Input (Only emitter of thru-beam type)
- 3 : 0 V
- 4 : Output (Only receiver of thru-beam type and reflective type)

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separated**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**

SPECIFICATIONS

Type		Thru-beam		Retroreflective				Diffuse reflective				
		Standard	Side view	Standard	Side view	With polarizing filters		Standard	Side view	With sensitivity adjuster		
						Standard	Side view			Standard	Side view	
Item	Model No.	Light-ON	CY-111A□	CY-111VA□	CY-192A□	CY-192VA□	CY-191A□	CY-191VA□	CY-121A□	CY-121VA□	CY-122A□	CY-122VA□
	Dark-ON	CY-111B□	CY-111VB□	CY-192B□	CY-192VB□	CY-191B□	CY-191VB□	CY-121B□	CY-121VB□	CY-122B□	CY-122VB□	
CE marking directive compliance		EMC Directive, RoHS Directive										
Sensing range		15 m 49.213 ft		4 m 13.123 ft (Note 2)		2 m 6.562 ft (Note 2)		100 mm 3.937 in (Note 3)		600 mm 23.622 in (Note 3)		
Sensing object		ø18 mm ø0.709 in or more opaque object (Setting distance between emitter and receiver: 15 m 49.213ft)		ø50 mm ø1.969 in or more opaque, translucent or transparent object (Note 2, 4)		ø50 mm ø1.969 in or more opaque, translucent, transparent or specular object (Note 2, 4)		Opaque, translucent or transparent object (Note 4)				
Hysteresis		—————							3 to 15 % of operation distance (Note 3)			
Supply voltage		12 to 24 V DC ±10 % Ripple P-P 10 % or less										
Current consumption		Emitter: 35 mA or less Receiver: 35 mA or less		35 mA or less								
Output		<NPN output type> NPN open-collector transistor • Maximum sink current: 100 mA • Applied voltage: 24 V DC or less (between output and 0 V) • Residual voltage: 1.5 V or less					<PNP output type> PNP open-collector transistor • Maximum source current: 100 mA • Applied voltage: 24 V DC or less (between output and +V) • Residual voltage: 1.5 V or less					
		Utilization category		DC-12 or DC-13								
		Short-circuit protection		Incorporated								
Response time		1 ms or less										
Test input (emission halt) function		Incorporated		—————								
Operation indicator		Yellow LED (lights up when the output is ON) (incorporated on the receiver for thru-beam type)										
Power indicator		Green LED (lights up when the power is ON) (incorporated on the emitter)		—————								
Environmental resistance	Pollution degree		3 (Industrial environment)									
	Protection		IP67 (IEC)									
	Ambient temperature		-25 to +55 °C -13 to +131 °F (No dew condensation or icing allowed), Storage: -40 to +70 °C -22 to +158 °F									
	Ambient humidity		50 % RH (at +70 °C +158 °F)									
	Ambient illuminance		Incandescent light: 5,000 lx or less at the light-receiving face									
	Voltage withstandability		500 V AC for one min. between all supply terminals connected together and enclosure									
	Vibration resistance		10 to 55 Hz frequency, 0.5 mm 0.020 in double amplitude in X, Y and Z directions for 1.5 hours each									
	Shock resistance		294 m/s ² acceleration (30 G approx.) in X, Y and Z directions three times each									
Emitting element		Infrared LED (modulated)				Red LED (modulated)		Infrared LED (modulated)				
Peak emission wavelength		890 nm 0.035 mil		875 nm 0.034 mil		665 nm 0.026 mil		875 nm 0.034 mil				
Material		Enclosure: PBT, Lens: PMMA										
Cable (except for M12 plug-in connection type)		0.44 mm ² 3-core cabtyre cable, 2 m 6.562 ft long										
Cable extension		Extension up to total 10 m 32.808 ft is possible with 0.34 mm ² , or more, cable (thru-beam type: both emitter and receiver).										
Net weight (Note 5)	2 m cable length type	Emitter/ Receiver: 65 g approx.	Emitter/ Receiver: 70 g approx.	65 g approx.	70 g approx.	65 g approx.	70 g approx.	65 g approx.	70 g approx.	75 g approx.		
	M12 plug-in connector type	Emitter/ Receiver: 15 g approx.	Emitter/ Receiver: 20 g approx.	15 g approx.	20 g approx.	15 g approx.	20 g approx.	15 g approx.	20 g approx.	25 g approx.		
Accessories		Nut: 4 pcs.			Nut: 2 pcs.							

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

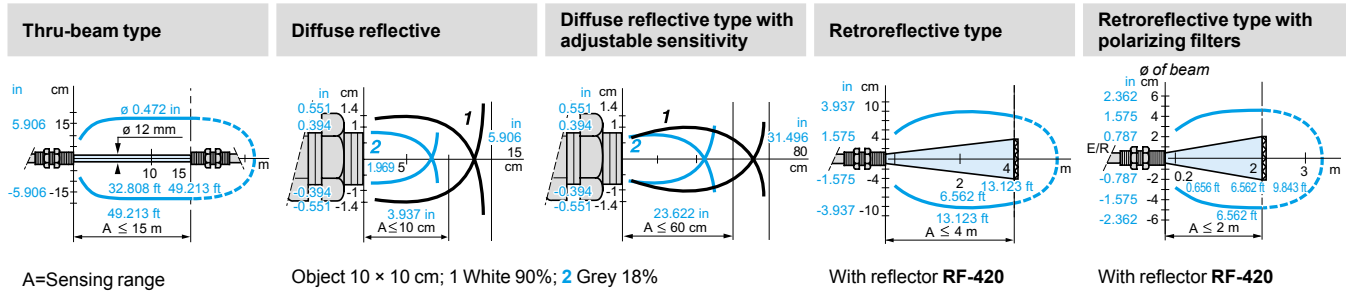
2) The sensing range and the sensing object of the retroreflective type sensor are specified for the **RF-420** reflector (optional).

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) Make sure to confirm detection with an actual sensor before use for detection of the transparent object and the translucent object.

5) The weight includes the weight of nuts.

DETECTION CURVES



PRECAUTIONS FOR PROPER USE

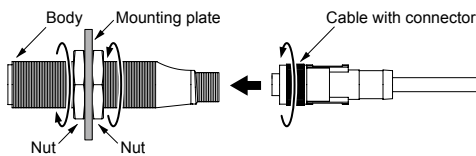
Refer to p.1552~ for general precautions.



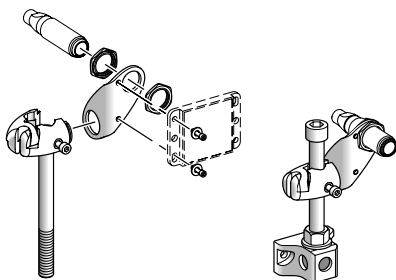
- Never use this product as a sensing device for personnel protection.
- In case of using sensing devices for personnel protection, use products which meet laws and standards, such as OSHA, ANSI or IEC etc., for personnel protection applicable in each region or country.

Mounting

- The tightening torque should be 3 N·m or less.
- Use a cable with connector **CN-24C(L)-C□** (optional) for M12 connector type.
Tightening torque for connector part is 2 N·m or less.



Mounting drawing with sensor or reflector RF-420



Wiring

- Make sure that the power supply is off while wiring.
- Verify that the supply voltage variation is within the rating.
- If power is supplied from a commercial switching regulator, ensure that the frame ground (F.G.) terminal of the power supply is connected to an actual ground.
- Ensure that an isolation transformer is utilized for the DC power supply. If an autotransformer is utilized, the main body or power supply may be damaged.
- If the used power supply generates a surge, connect a surge absorber to the power supply to absorb the surge.
- Do not use during the initial transient time (0.5 sec) after the power supply is switched on.
- In case noise generating equipment (switching regulator, inverter motor, etc.) is used in the vicinity of this product, connect the frame ground (F.G.) terminal of the equipment to an actual ground.
- Do not run the wires together with high-voltage lines or power lines or put them in the same raceway. This can cause malfunction due to induction.
- Damage or burnout may result in case of short circuit of load or miswiring.
- Make a cable length as short as possible to lessen noise pickup.

Others

- This device has been developed / produced for industrial use only.
- Take care that the sensor is not directly exposed to fluorescent lamp from a rapid-starter lamp or a high frequency lighting device, as it may affect the sensing performance.
- Avoid using a product where there is excessive vapor, dust or corrosive gas, or in a place where it could be exposed directly to water or chemicals.
- Take care that the sensor does not come in direct contact with water, oil, grease or organic solvents, such as, thinner, etc.
- Do not use in an environment containing inflammable or explosive gases.
- Never disassemble or modify the product.

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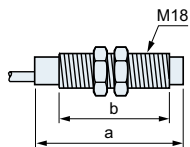
RX-LS200

RX

RT-610

DIMENSIONS (Unit: mm in)**CY-1□**

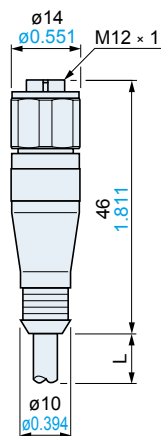
Sensor



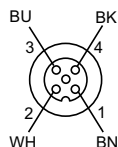
	2 m cable length type (mm in)		M12 plug-in connector type (mm in)	
	a	b	a	b
Standard type CY-111□/121□/192□	46 1.811	28 1.102	60 2.362	28 1.102
Standard type CY-191□	48 1.890	28 1.102	62 2.441	28 1.102
Side view type CY-111V□/121V□/191V□/192V□	62 2.441	28 1.102	76 2.992	28 1.102
Standard type CY-122□	62 2.441	44 1.732	76 2.992	44 1.732
Side view type CY-122V□	78 3.071	44 1.732	92 3.622	44 1.732

CN-24C-C2 CN-24C-C5

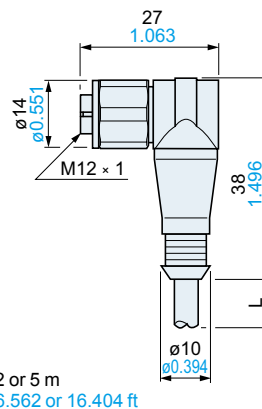
Mating cable



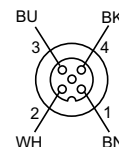
Connector pin position

L = 2 or 5 m
6.562 or 16.404 ft**CN-24CL-C2 CN-24CL-C5**

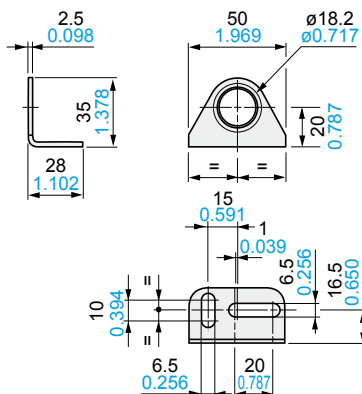
Mating cable



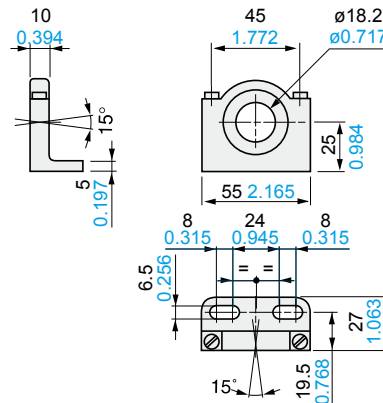
Connector pin position

L = 2 or 5 m
6.562 or 16.404 ft**MS-CY1-1**

Sensing mounting bracket

**MS-CY1-2**

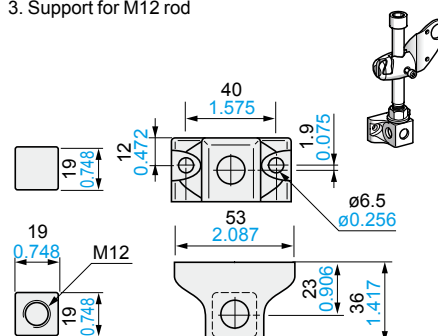
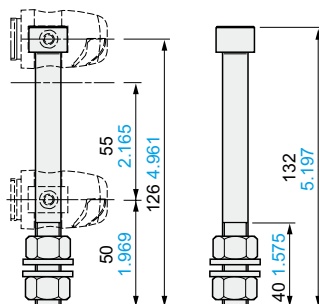
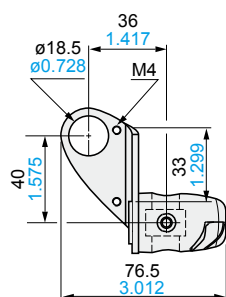
Sensing mounting bracket

**MS-AJ3**

Universal sensor mounting stand

1. Ball-joint mounted fixing bracket **CY-100** series or **RF-420** 2. M12 rod

3. Support for M12 rod

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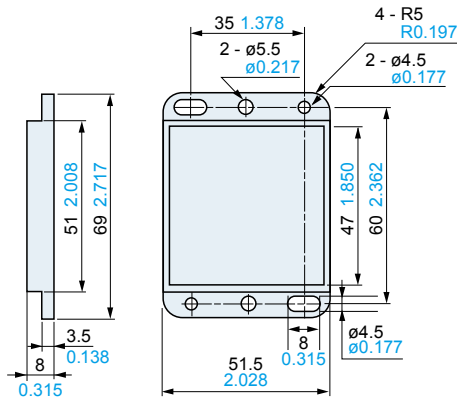
RX

RT-610

DIMENSIONS (Unit: mm in)

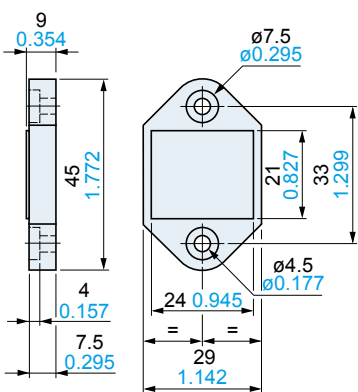
RF-420

Reflector



RF-410

Reflector



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