

Information of Discontinued Models

Compact & general purpose photoelectric sensor CX-20 series

Stopping taking order date: **30, Sep, 2005**
Date of production discontinuance: **31, Dec, 2005**

Discontinued models

Compact & general purpose photoelectric sensor CX-20 series

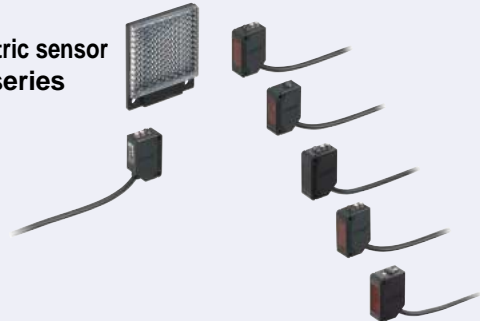


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Main points of difference between recommended replacements and discontinued models for details on model numbers for each type.

Recommended replacements

Compact photoelectric sensor CX-400 series



Refer to 'Compact photoelectric sensor **CX-400** series catalog' for details.

Advantages of switching to recommended replacements

A total of 116 models with identical shape in the lineup

The **CX-400** series of recommended replacements include a wide variety of photoelectric sensors with the same shape but using different sensing methods, such as thru-beam, retroreflective, diffuse reflective and adjustable range reflective types. The total number of varieties available is 116, providing the ultimate range of multi-purpose photoelectric sensors.

World standard size

The mounting hole pitch is the world standard 25.4 mm **1.000 in.**

Less processing

A variety of sensing methods are available from sensors with the same shape, so that it relieves much of the difficulty in setup design.

Wide number of variations

A wide variety of different in sensing ranges is also available, so that you can select the sensor that ideally suits your application.

Less space / Wire-saving

In addition to the cable type and M8 plug-in connector type, an M12 pigtailed type is also included in the lineup to make setup less processing.

Notes on using recommended replacements

Recommended replacements	Sensing performance	Specifications	Output circuit	Mounting dimensions	Dimensions	Enclosure color
CX-400 series	◎	◎	◎	○	○	○

◎: Highly interchangeable
※: Large differences

○: Almost no difference
-: No corresponding item or model

- High degree of interchangeability in specifications, mounting dimensions and operability, so that replacement of the **CX-20** series with the **CX-400** series can be carried out smoothly.
- The mounting hole pitch for the **CX-20** series is 25.0 mm **0.984 in** which is 0.4 mm **0.016 in** different from the standard, but they can be used in the workplace with almost no resulting problems.
- When using the **CX-21** to carry out sensing utilizing permeation ability (such as if measuring object overlap), it is recommended that you first carry out an actual test using the recommended replacement beforehand.

Main points of difference between recommended replacements and discontinued models

Discontinued models		Recommended replacements		Main points of difference from discontinued models
• Thru-beam · infrared LED type		• Thru-beam · red LED type		• If permeation ability is required it is recommended that you use the CX-412 infrared LED type (sensing range 15 m 49.213 ft). Notes: 1) Use the CN-24A-C (straight type) or CN-24AL-C (elbow type) cable as the connection cable. 2) The CX-21S includes self-diagnosis output. No recommended replacements have been made available because of a low degree of market need.
Model No.	Sensing range	Model No.	Sensing range	
CX-21	10 m 32.808 ft	→ CX-411	10 m 32.808 ft	
CX-21-C5	10 m 32.808 ft	→ CX-411-C5	10 m 32.808 ft	
CX-21-J	10 m 32.808 ft	→ CX-411-Z (Note1)	10 m 32.808 ft	
CX-21-PN	10 m 32.808 ft	→ CX-411-P	10 m 32.808 ft	
CX-21-PN-J	10 m 32.808 ft	→ CX-411-P-Z (Note1)	10 m 32.808 ft	
CX-21S	10 m 32.808 ft	→ - (Note2)	-	
• Diffuse reflective long sensing range · infrared LED type		• Diffuse reflective · infrared LED type		Notes: 1) Use the CN-24A-C (straight type) or CN-24AL-C (elbow type) cable as the connection cable. 2) The CX-22S includes self-diagnosis output. No recommended replacements have been made available because of a low degree of market need.
Model No.	Sensing range	Model No.	Sensing range	
CX-22	800 mm 31.496 in	→ CX-422	800 mm 31.496 in	
CX-22-C5	800 mm 31.496 in	→ CX-422-C5	800 mm 31.496 in	
CX-22-J	800 mm 31.496 in	→ CX-422-Z (Note 1)	800 mm 31.496 in	
CX-22-PN	800 mm 31.496 in	→ CX-422-P	800 mm 31.496 in	
CX-22-PN-J	800 mm 31.496 in	→ CX-422-P-Z (Note 1)	800 mm 31.496 in	
CX-22S	800 mm 31.496 in	→ - (Note 2)	800 mm 31.496 in	

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Main points of difference between recommended replacements and discontinued models

Discontinued models		Recommended replacements		Main points of difference from discontinued models	
● Thru-narrow beam · infrared LED type		● Thru-beam · red beam type			
Model No.	Sensing range	Model No.	Sensing range		
CX-23	5 m 16.404 ft	→ CX-411	10 m 32.808 ft	● Sensing range 10 m 32.808 ft Note: Use the CN-24A-C (straight type) or CN-24AL-C (elbow type) cable as the connection cable.	
CX-23-C5	5 m 16.404 ft	→ CX-411-C5	10 m 32.808 ft		
CX-23-J	5 m 16.404 ft	→ CX-411-Z (Note 1)	10 m 32.808 ft		
CX-23-PN	5 m 16.404 ft	→ CX-411-P	10 m 32.808 ft		
CX-23-PN-J	5 m 16.404 ft	→ CX-411-P-Z (Note 1)	10 m 32.808 ft		
● Diffuse reflective short sensing range · infrared LED type		● Diffuse reflective · infrared LED type			
Model No.	Sensing range	Model No.	Sensing range		
CX-24	300 mm 11.811 in	→ CX-421	300 mm 11.811 in	Notes: 1) Use the CN-24A-C (straight type) or CN-24AL-C (elbow type) cable as the connection cable. 2) The CX-24S includes self-diagnosis output. No recommended replacements have been made available because of a low degree of market need.	
CX-24-C5	300 mm 11.811 in	→ CX-421-C5	300 mm 11.811 in		
CX-24-J	300 mm 11.811 in	→ CX-421-Z (Note 1)	300 mm 11.811 in		
CX-24-PN	300 mm 11.811 in	→ CX-421-P	300 mm 11.811 in		
CX-24-PN-J	300 mm 11.811 in	→ CX-421-P-Z (Note 1)	300 mm 11.811 in		
CX-24S	300 mm 11.811 in	→ — (Note 2)	—		
● Retroreflective for transparent object sensing · red LED type		● Retroreflective for transparent object sensing · infrared LED type			
Model No.	Sensing range	Model No.	Sensing range		
CX-28	0 to 500 mm 0 to 19.685 in	→ CX-481	50 to 500 mm 1.969 to 19.685 in	● The recommended replacements have 50 mm 1.969 in blind sectors. Notes: 1) Use the CN-24A-C (straight type) or CN-24AL-C (elbow type) cable as the connection cable. 2) The discontinued models are the retroreflective types without a reflector. It is recommended that you use the retroreflective types with reflector.	
CX-28-C5	0 to 500 mm 0 to 19.685 in	→ CX-481-C5	50 to 500 mm 1.969 to 19.685 in		
CX-28-J	0 to 500 mm 0 to 19.685 in	→ CX-481-Z (Note 1)	50 to 500 mm 1.969 to 19.685 in		
CX-28-PN	0 to 500 mm 0 to 19.685 in	→ CX-481-P	50 to 500 mm 1.969 to 19.685 in		
CX-28-PN-J	0 to 500 mm 0 to 19.685 in	→ CX-481-P-Z (Note 1)	50 to 500 mm 1.969 to 19.685 in		
CX-28-Y	0 to 500 mm 0 to 19.685 in	→ CX-481 (Note 2)	50 to 500 mm 1.969 to 19.685 in		
CX-28-Y-C5	0 to 500 mm 0 to 19.685 in	→ CX-481-C5 (Note 2)	50 to 500 mm 1.969 to 19.685 in		
CX-28-J-Y	0 to 500 mm 0 to 19.685 in	→ CX-481-Z (Note 1, 2)	50 to 500 mm 1.969 to 19.685 in		
CX-28-PN-Y	0 to 500 mm 0 to 19.685 in	→ CX-481-P (Note 2)	50 to 500 mm 1.969 to 19.685 in		
CX-28-PN-J-Y	0 to 500 mm 0 to 19.685 in	→ CX-481-P-Z (Note 1, 2)	50 to 500 mm 1.969 to 19.685 in		
● Retroreflective for transparent object sensing · infrared LED type		● Retroreflective for transparent object sensing · infrared LED type			
Model No.	Sensing range	Model No.	Sensing range		
CX-28IR	0 to 1,000 mm 0 to 39.370 in	→ CX-482	0.1 to 2 m 0.328 to 6.562 ft		● The recommended replacements have 0.1 m 0.328 ft blind sectors. Notes: 1) Use the CN-24A-C (straight type) or CN-24AL-C (elbow type) cable as the connection cable. 2) The discontinued models are the retroreflective types without a reflector. It is recommended that you use the retroreflective types with reflector.
CX-28IR-C5	0 to 1,000 mm 0 to 39.370 in	→ CX-482-C5	0.1 to 2 m 0.328 to 6.562 ft		
CX-28IR-J	0 to 1,000 mm 0 to 39.370 in	→ CX-482-Z (Note 1)	0.1 to 2 m 0.328 to 6.562 ft		
CX-28IR-PN	0 to 1,000 mm 0 to 39.370 in	→ CX-482-P	0.1 to 2 m 0.328 to 6.562 ft		
CX-28IR-PN-J	0 to 1,000 mm 0 to 39.370 in	→ CX-482-P-Z (Note 1)	0.1 to 2 m 0.328 to 6.562 ft		
CX-28IR-Y	0 to 1,000 mm 0 to 39.370 in	→ CX-482 (Note 2)	0.1 to 2 m 0.328 to 6.562 ft		
CX-28IR-Y-C5	0 to 1,000 mm 0 to 39.370 in	→ CX-482-C5 (Note 2)	0.1 to 2 m 0.328 to 6.562 ft		
CX-28IR-J-Y	0 to 1,000 mm 0 to 39.370 in	→ CX-482-Z (Note 1, 2)	0.1 to 2 m 0.328 to 6.562 ft		
CX-28IR-PN-Y	0 to 1,000 mm 0 to 39.370 in	→ CX-482-P (Note 2)	0.1 to 2 m 0.328 to 6.562 ft		
CX-28IR-PN-J-Y	0 to 1,000 mm 0 to 39.370 in	→ CX-482-P-Z (Note 1, 2)	0.1 to 2 m 0.328 to 6.562 ft		
● Retroreflective with polarizing filters · red LED type		● Retroreflective with polarizing filters · red LED type			
Model No.	Sensing range	Model No.	Sensing range		
CX-29	0 to 3 m 0 to 9.843 ft	→ CX-491	0 to 3 m 0 to 9.843 ft	Notes: 1) Use the CN-24A-C (straight type) or CN-24AL-C (elbow type) cable as the connection cable. 2) The discontinued models are the retroreflective types without a reflector. It is recommended that you use the retroreflective types with reflector. 3) The CX-29S , CX-29S-Y includes self-diagnosis output. No recommended replacements have been made available because of a low degree of market need.	
CX-29-C5	0 to 3 m 0 to 9.843 ft	→ CX-491-C5	0 to 3 m 0 to 9.843 ft		
CX-29-J	0 to 3 m 0 to 9.843 ft	→ CX-491-Z (Note 1)	0 to 3 m 0 to 9.843 ft		
CX-29-PN	0 to 3 m 0 to 9.843 ft	→ CX-491-P	0 to 3 m 0 to 9.843 ft		
CX-29-PN-J	0 to 3 m 0 to 9.843 ft	→ CX-491-P-Z (Note 1)	0 to 3 m 0 to 9.843 ft		
CX-29S	0 to 3 m 0 to 9.843 ft	→ — (Note 3)	0 to 3 m 0 to 9.843 ft		
CX-29-Y	0 to 3 m 0 to 9.843 ft	→ CX-491-Y	0 to 3 m 0 to 9.843 ft		
CX-29-Y-C5	0 to 3 m 0 to 9.843 ft	→ CX-491-C5 (Note 2)	0 to 3 m 0 to 9.843 ft		
CX-29-J-Y	0 to 3 m 0 to 9.843 ft	→ CX-491-Z (Note 1, 2)	—		
CX-29-PN-Y	0 to 3 m 0 to 9.843 ft	→ CX-491-P-Y	—		
CX-29-PN-J-Y	0 to 3 m 0 to 9.843 ft	→ CX-491-P-Z (Note 1, 2)	0 to 3 m 0 to 9.843 ft		
CX-29S-Y	0 to 3 m 0 to 9.843 ft	→ — (Note 3)	0 to 3 m 0 to 9.843 ft		

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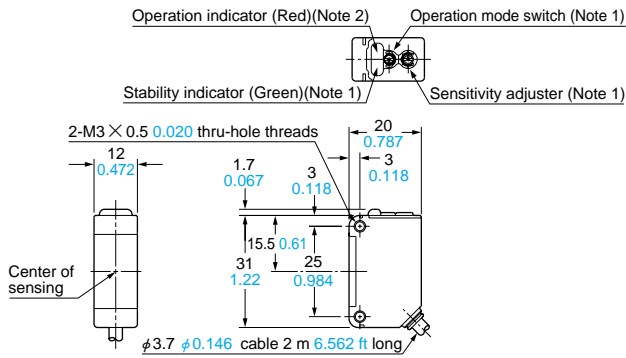
Compact & general purpose photoelectric sensor CX-20 series

Dimensions (Unit: mm in)

Discontinued models

CX-20 series

CX-20 Cable type

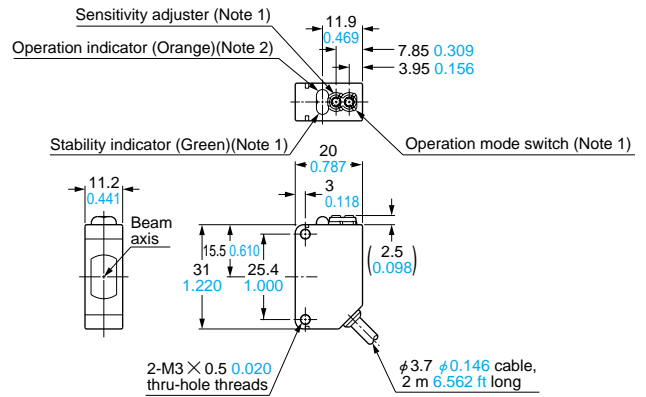


- Notes: 1) Not incorporated on the emitter of the thru-beam type sensor.
2) It is the power indicator (red) on the emitter of the thru-beam type sensor.

Recommended replacements

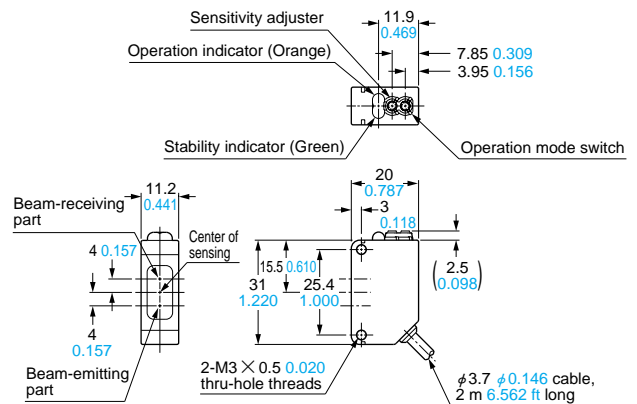
CX-400 series

CX-41 Cable type



- Notes: 1) Not incorporated on the emitter of the thru-beam type sensor.
2) It is the power indicator (green) on the emitter of the thru-beam type sensor.

CX-42, CX-48, CX-49 Cable type



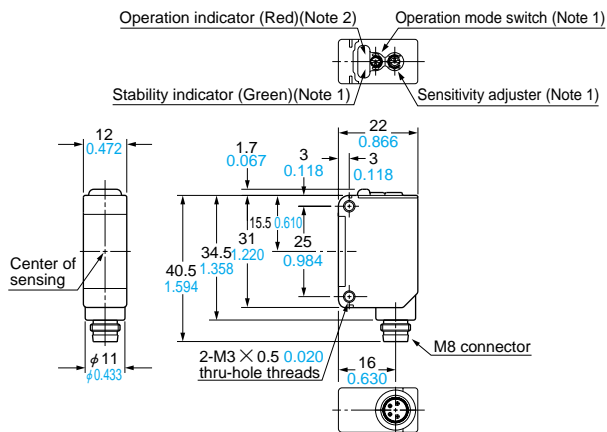
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Discontinued models

CX-20 series

CX-2□-J Plug-in connector type

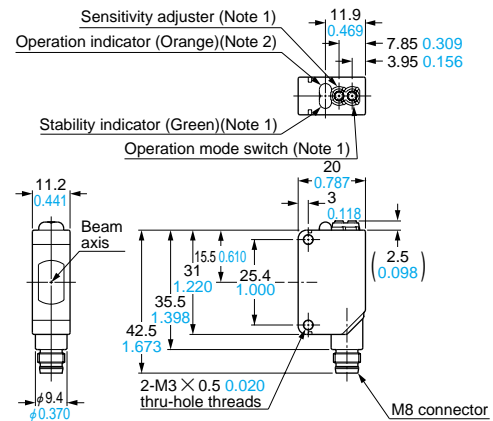


- Notes: 1) Not incorporated on the emitter of the thru-beam type sensor.
 2) It is the power indicator (red) on the emitter of the thru-beam type sensor.

Recommended replacements

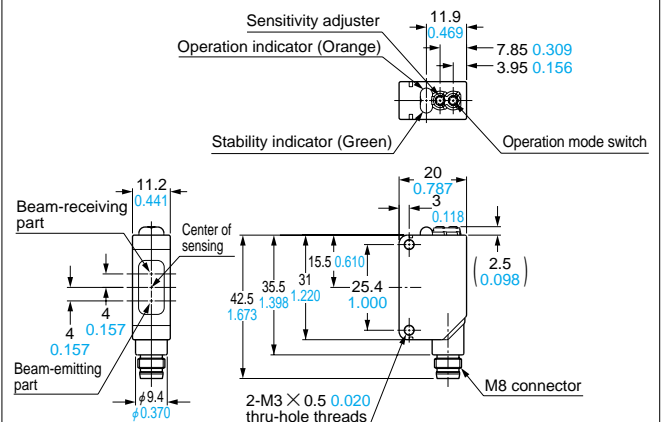
CX-400 series

CX-41□-Z Plug-in connector type



- Notes: 1) Not incorporated on the emitter of the thru-beam type sensor.
 2) It is the power indicator (green) on the emitter of the thru-beam type sensor.

CX-42□-Z, CX-48□-Z, CX-49□-Z Plug-in connector type



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Main rated specifications

Item	Basic model No.	Type	Discontinued models				Recommended replacements			
			Thru-beam		Diffuse reflective		Thru-beam	Diffuse reflective		
			Narrow beam	Short sensing range	Long sensing range	Short sensing range		Long sensing range		
		NPN output	CX-21	CX-23	CX-24	CX-22	CX-411	CX-421	CX-422	
		PNP output	CX-21-P	CX-23-P	CX-24-P	CX-22-P	CX-411-P	CX-421-P	CX-422-P	
Sensing range			10 m 32.808 ft	5 m 16.404 ft	300 mm 11.811 in	800 mm 31.496 in	10 m 32.808 ft	300 mm 11.811 in	800 mm 31.496 in	
Sensing object			φ 12 mm φ 0.472 in or more opaque object (Note 2)		Opaque, translucent or transparent object		φ 12 mm φ 0.472 in or more opaque object (Note 2)		Opaque, translucent or transparent object	
Hysteresis			—		15 % or less of operation distance		—		15 % or less of operation distance	
Repeatability (perpendicular to sensing axis)			0.5 mm 0.020 in or less	0.05 mm 0.0019 in or less	1 mm 0.039 in or less		0.5 mm 0.020 in or less		1 mm 0.039 in or less	
Supply voltage			12 to 24 V DC ± 10 % Ripple P-P 10 % or less							
Current consumption			Emitter: 35 mA or less Receiver: 25 mA or less (Note 1)		35 mA or less (Note 2)		Emitter: 20 mA or less Receiver: 20 mA or less		25 mA or less	
Sensing output			<NPN output type> NPN open-collector transistor • Maximum sink current: 100 mA • Applied voltage: 30 V DC or less (between sensing output and 0V) • Residual voltage: 1.5 V or less (at 100 mA sink current) 0.4 V or less (at 16 mA sink current)				<NPN output type> NPN open-collector transistor • Maximum sink current: 100 mA • Applied voltage: 30 V DC or less (between output and 0 V) • Residual voltage: 1 V or less (at 100 mA sink current) 0.4 V or less (at 16 mA sink current)			
			<PNP output type> PNP open-collector transistor • Maximum source current: 100mA • Applied voltage: 30 V DC or less (between sensing output and + V) • Residual voltage: 1.5 V or less (at 100 mA source current) 0.4 V or less (at 16 mA source current)				<PNP output type> PNP open-collector transistor • Maximum source current: 100 mA • Applied voltage: 30 V DC or less (between output and + V) • Residual voltage: 1 V or less (at 100 mA source current) 0.4 V or less (at 16 mA source current)			
		Output operation	Switchable either Light-ON or Dark-ON							
Response time			1 ms or less							
Protection			IP67 (IEC)							
Ambient temperature			- 25 to + 55 °C - 13 to + 131 °F (No dew condensation or icing allowed), Storage: - 30 to + 70 °C - 22 to + 158 °F							
Emitting element			Infrared LED (modulated)			Red LED (modulated)		Infrared LED (modulated)		
Material			Enclosure: Polycarbonate, Lens: Polycarbonate Indicator cover: Polycarbonate, Front cover: Polycarbonate				Enclosure: PBT (polybutylene terephthalate), Lens: acrylic Indicator cover: acrylic			
Cable			0.2 mm ² 3-core (thru-beam type emitter: 2-core) oil resistant cabtyre cable, 2 m 6.562 ft long				0.2 mm ² 3-core (thru-beam type emitter: 2-core) cabtyre cable, 2 m 6.562 ft long			
Weight			Emitter: 45 g approx., Receiver: 50 g approx.		50 g approx.		Emitter: 45 g approx., Receiver: 50 g approx.		50 g approx.	

Notes:1) The PNP output type is 30 mA or less.

2) The PNP output type is 40 mA or less.

Refer to 'Compact photoelectric sensor CX-400 series catalog' for details.

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Compact & general purpose photoelectric sensor CX-20 series

Item	Basic model No.	Type NPN output PNP output	Discontinued models			Recommended replacements		
			Retroreflective			Retroreflective		
			For transparent object sensing		With polarizing filters	For transparent object sensing		With polarizing filters
			CX-28	CX-28IR	CX-29	CX-481	CX-482	CX-491
		CX-28-P	CX-28IR-P	CX-29-P	CX-481-P	CX-482-P	CX-491-P	
Sensing range			0 to 500 mm 0 to 19.685 in	0 to 1,000 mm 0 to 39.370 in	0 to 3 m 0 to 9.843 ft	50 to 500 mm 1.969 to 19.685 in	0.1 to 2 m 0.328 to 6.562 ft	3 m 9.843 ft
Sensing object			φ50 mm φ1.969 in or more transparent, translucent or opaque object	φ50 mm φ1.969 in or more opaque, translucent or specular object		φ50 mm φ1.969 in or more transparent, translucent or opaque object		φ50 mm φ1.969 in or more opaque, translucent or specular 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			30 mA or less (Note)			20 mA or less	25 mA or less	20 mA or less
Sensing output			<NPN output type> NPN open-collector transistor • Maximum sink current: 100 mA • Applied voltage: 30 V DC or less (between sensing output and 0 V) • Residual voltage: 1.5 V or less (at 100 mA sink current) 0.4 V or less (at 16 mA sink current)			<NPN output type> NPN open-collector transistor • Maximum sink current: 100 mA • Applied voltage: 30 V DC or less (between output and 0 V) • Residual voltage: 1 V or less (at 100 mA sink current) 0.4 V or less (at 16 mA sink current)		
			<PNP output type> PNP open-collector transistor • Maximum source current: 100 mA • Applied voltage: 30V DC or less (between sensing output and + V) • Residual voltage: 1.5V or less (at 100 mA source current) 0.4V or less (at 16 mA source current)			<PNP output type> PNP open-collector transistor • Maximum source current: 100 mA • Applied voltage: 30 V DC or less (between output and + V) • Residual voltage: 1 V or less (at 100 mA source current) 0.4 V or less (at 16 mA source current)		
		Output operation	Switchable either Light-ON or Dark-ON					
Response time			1 ms or less					
Protection			IP67 (IEC)					
Ambient temperature			- 25 to + 55 °C - 13 to + 131 °F (No dew condensation or icing allowed), Storage: - 30 to + 70 °C - 22 to + 158 °F					
Emitting element			Red LED (modulated)	Infrared LED (modulated)	Red LED (modulated)	Infrared LED (modulated)		Red LED (modulated)
Material			Enclosure: Polycarbonate Lens: Polycarbonate, Indicator cover: Polycarbonate Front cover: Polycarbonate			Enclosure: PBT (polybutylene terephthalate) Lens: acrylic (CX-48□: polycarbonate) Front cover: acrylic (CX-48□: polycarbonate)		
Cable			0.2 mm ² 3-core oil resistant cabtyre cable, 2 m 6.562 ft long			0.2 mm ² 3-core cabtyre cable, 2 m 6.562 ft long		
Weight			50 g approx.			50 g approx.		

Note: The PNP output type is 35 mA or less.

Refer to 'Compact photoelectric sensor CX-400 series catalog' for details.