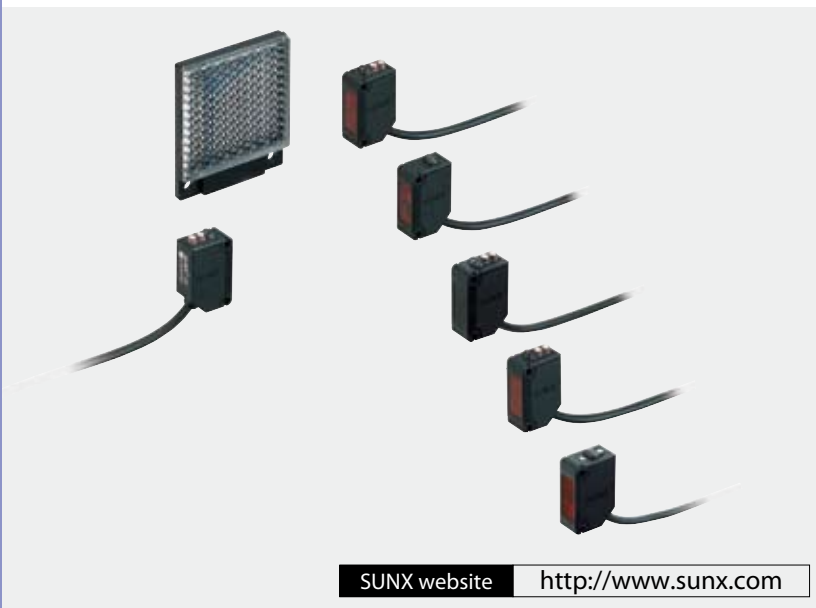


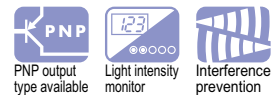
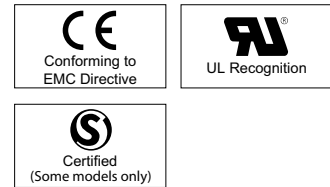
CX-400 SERIES

| | | |
|---------------------|---------------------------------------|--|
| Related Information | General terms and conditionsP.1 | Sensor selection guideP.11~ / P.229~ |
| | MS-AJ / CHX-SC2P.799 / P.800 | Glossary of terms / General precautionsP.983~ / P.986~ |
| | Korea's S-mark..... P.1034~ | |

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- LASER SENSORS
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- MICRO PHOTOELECTRIC SENSORS
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- PRESSURE SENSORS
- INDUCTIVE PROXIMITY SENSORS
- PARTICULAR USE SENSORS
- SENSOR OPTIONS
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- MEASUREMENT SENSORS
- STATIC CONTROL DEVICES
- LASER MARKERS



SUNX website <http://www.sunx.com>



World standard photoelectric sensors Full line up 116 models!

Wide variety of 116 models

You can find your desired sensors among the CX-400 series because of their high basic performance, superior cost performance, and wide variation of types.

| Type | Sensing range |
|--|---------------------------------|
| Thru-beam (long sensing range) | 15 m 49.213 ft |
| Thru-beam | 10 m 32.808 ft |
| Retroreflective (long sensing range) | 5 m 16.404 ft |
| Retroreflective (with polarizing filters) | 3 m 9.843 ft |
| Retroreflective (for transparent object sensing) | 0.1 to 2 m 0.328 in 6.562 in |
| Retroreflective (for transparent object sensing) | 50 to 500 mm 1.969 to 19.685 in |
| Diffuse reflective (800 mm 9.843 in type) | 800 mm 9.843 in |
| Diffuse reflective (300 mm 11.811 in type) | 300 mm 11.811 in |
| Diffuse reflective (100 mm 3.937 in type) | 100 mm 3.937 in |
| Diffuse reflective (narrow-view type) | 70 to 200 mm 2.756 to 7.874 in |
| Adjustable range reflective | 20 to 300 mm 0.787 to 11.811 in |
| Adjustable range reflective | 15 to 100 mm 0.591 to 3.937 in |
| Adjustable range reflective | 2 to 50 mm 0.079 to 1.969 in |
| Adjustable range reflective (small spot) | 2 to 50 mm 0.079 to 1.969 in |

| | |
|-------------------------------------|---|
| Output | NPN, PNP |
| Connecting method (Note 1) | Cable type, M8 Plug-in connector type, M12 Pigtailed type |
| Cable length of cable type (Note 2) | 0.5 m 1.640 ft, 2 m 6.562 ft, 5 m 16.404 ft |

- Notes: 1) The adjustable range reflective type includes the cable type and M8 connector type only.
 2) The adjustable range reflective type includes the 2 m 6.562 ft cable type (standard) only.

Strong against oil and coolant liquids

CX-41/42/49

The lens material for the thru-beam type, retroreflective type (excluding the CX-48) and the diffuse reflective type are made of a strong acrylic that resists the harmful effects of coolants. These sensors can be used with confidence even around metal processing machinery that disperses oil mists. The protection mechanism also conforms to IP67 (IEC).



Strong against ethanol

CX-44/48

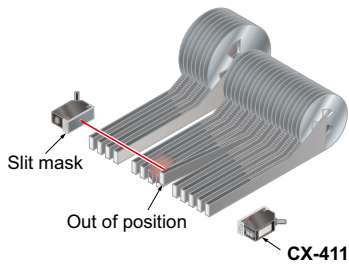
A strong, ethanol resistant polycarbonate was used for the front and display covers. Safe even for installing near food processing machinery that disperses ethanol based detergents. The protection mechanism also conforms to IP67 (IEC).



Caution: Set the CX-48 so that cleaning liquid will not get on to the attached reflector.

APPLICATIONS

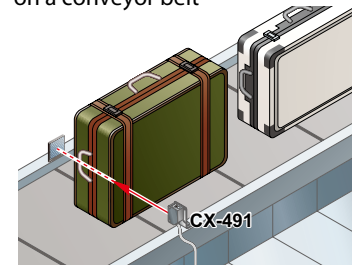
Detecting out of position tape feeder cassette



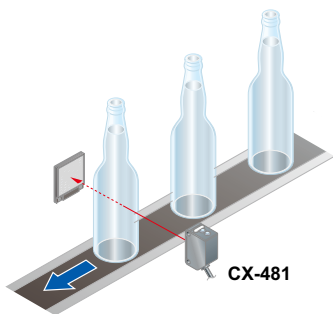
Detecting objects in places that have a lot of dust or clouds of particles



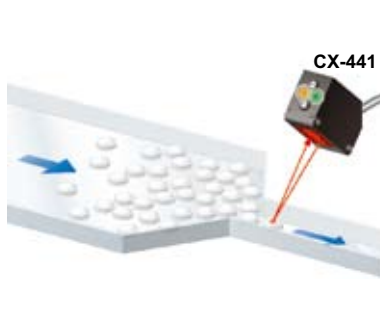
Passage confirmation of object on a conveyor belt



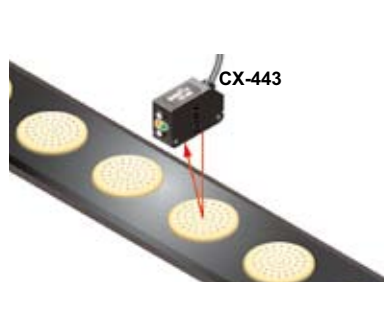
Detecting transparent glass bottles



Small tablet sensing



Biscuit sensing



BASIC PERFORMANCE

Strong infrared beam

CX-412

The longest in its class, it realizes a 15 m 49.213 ft long-distance sensing range. Remarkable penetrating power enables applications such as package content detection. (Note)



Note: When sensing utilizing penetrating power, make sure to verify using the actual sensor.

Can sense differences as small as 0.4 mm 0.016 in, with hysteresis of 2 % or less

CX-441/443

An advanced optical system provides sensing performance that is 2.5 times approx. than conventional models. Even ultra-small differences of 0.4 mm 0.016 in can be detected accurately.

2.5 times the sensing capability!

Height differences of as little as 0.4 mm 0.016 in can be detected at a setting distance of 20 mm 0.787 in



Hardly affected by color

CX-441/443

Both black and white objects can be sensed at the same distances. No adjuster control is needed, even when products of different colors are moving along the production line.

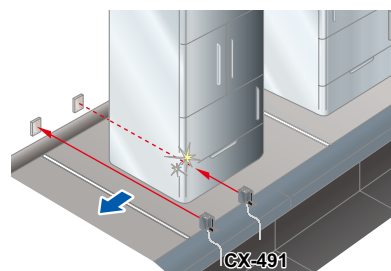
30 % higher sensing capability



Retroreflective type with polarizing filters

CX-491

Built-in polarizing filters ensure stable sensing even on a specular object.



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Amplifier Built-in

CX-400

EX-10

EX-20

EX-30

EX-40

EQ-30

EQ-500

MQ-W

RX-LS200

RX

CY

PX-2

RT-610

Power Supply Built-in

NX5

VF

Amplifier-separated

SU-7 / SH

SS-A5 / SH

Other Products

[The difference in sensing ranges is 1% or less between non-glossy white paper with a setting distance of 50 mm 1.969 in and non-glossy gray paper with a brightness level of 5.]

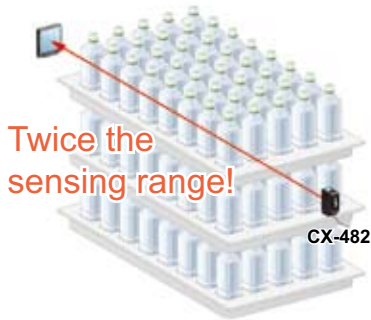
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- VF
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- SU-7 / SH
- SS-A5 / SH
- Other Products

BASIC PERFORMANCE

Introducing the transparent object sensing type sensor

CX-480

Our unique optical system and transparent object sensing circuitry provide stable sensing of even thinner transparent objects than the conventional models.



Transparent objects detectable with **CX-480** (Typical examples)

| Sensing object | Sensing object size (mm in) | |
|----------------------|-----------------------------|---------------------|
| Glass sheet | □50 □1.969 | t = 0.7 0.028 |
| Cylindrical glass | ∅50 ∅1.969 ℓ = 50 1.969 | t = 1.3 0.051 |
| Acrylic board | □50 □1.969 | t = 1.0 0.039 |
| Styrol (Floppy case) | □50 □1.969 | t = 0.9 0.035 |
| Food wrapping film | □50 □1.969 | t = 10 μm 0.394 mil |
| Cigarette case film | □50 □1.969 | t = 20 μm 0.787 mil |
| Vinyl sack | □50 □1.969 | t = 30 μm 1.181 mil |
| Pet bottle (500ml) | ∅66 ∅2.598 | |

Reflector setting range **CX-481**: 300 to 500 mm 11.811 to 19.685 in, **CX-482**: 1 to 2 m 3.281 to 6.562 ft [with the **RF-230** reflector at the optimum condition (Note)]
 Each object should pass across the beam at the center between the sensor and the reflector.
 ℓ: Length of cylindrical glasses
 t: Thickness of sensing object
 Note: The optimum condition is defined as the condition in which the sensitivity level is set such that the stability indicator just lights up when the object is absent.

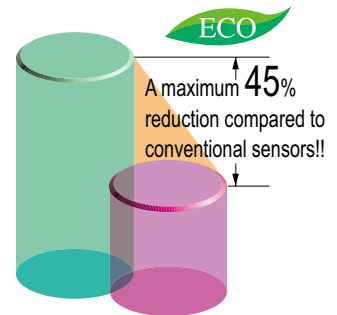
Long sensing range of 5 m 16.404 ft **CX-493**

A long 5 m 16.404 ft sensing range is possible with the red LED type that is easy to align with the beam axis. Can be used for wide automatic door shutters.



Less power consumed

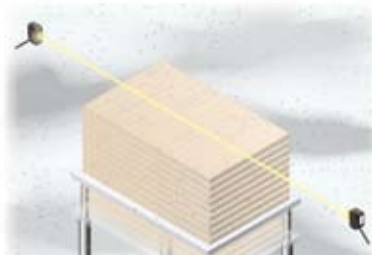
The CX-400 series sensors achieve a maximum of approx. 55 % the power consumption of conventional sensors. Contributes to preserving the environment.



ENVIRONMENTAL RESISTANCE

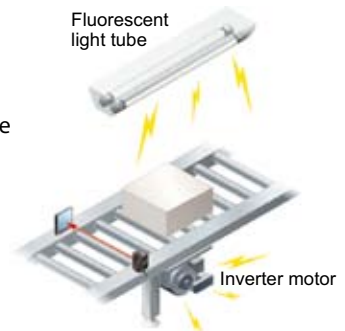
Strong on dust and dirt **CX-412**

Because the light source is an infrared light, it is strong on dust and dirt compared to the red beam type.



Strong against noise

Significantly stronger against inverter light and other extraneous light as well as high frequency and electromagnetic noise generated by high-pressure inverter motors and other devices.



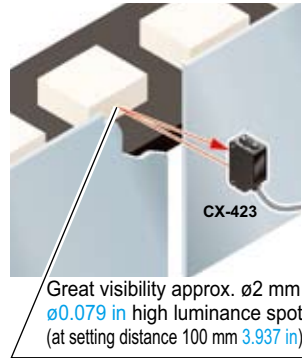
Strong even in cold environments

Stable performance can be maintained even in environments of -25 °C -13 °F.

MOUNTING

Beam axis alignment made easy with a high luminance spot beam **CX-423**

These sensors realize a high luminance red LED spot that provides bright visibility enabling the sensing position to be checked at a glance. Because it has the smallest spot in its class, $\varnothing 2$ mm $\varnothing 0.079$ in approx., even the minutest object can be accurately detected.



The bright spot makes beam axis alignment easy **CX-441**

These sensors realize a high luminance red spot that provides bright visibility. The sensing position can be checked at a glance. Because the CX-441 sensor has the smallest spot in its class $\varnothing 2$ mm $\varnothing 0.079$ in approx., even the minutest object can be accurately detected.

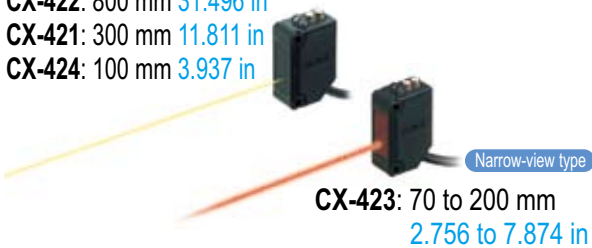


OPERABILITY

Reduction of volume adjustment labor **CX-423**

Because these sensors possess many variations depending on the sensing range, enables you to make optimal volume adjustment easily.

- CX-422:** 800 mm 31.496 in
- CX-421:** 300 mm 11.811 in
- CX-424:** 100 mm 3.937 in



Can be used for sensing minute differences **CX-441**

Equipped with a 5-turn adjuster so that even challenging range settings can be handled with ease.



VARIETIES

Less processing

M8 plug-in connector type and M12 pigtailed type are available. This contributes to less time spent in setting up. In addition, cable types are available with cable lengths of 0.5 m 1.640 ft, 2 m 6.562 ft and 5 m 16.404 ft. This results in less wastage.

No unnecessary cables or terminal blocks

ECO

Great maintainability

Cable type

- 5 m 16.404 ft
- 2 m 6.562 ft
- 0.5 m 1.640 ft

M8 plug-in connector type

- Elbow (2 m 6.562 ft / 5 m 16.404 ft)
- Straight (2 m 6.562 ft / 5 m 16.404 ft)

M12 pigtailed type

- Straight (2 m 6.562 ft / 5 m 16.404 ft)

Select from 2 spot diameters as per the application **CX-441/443**

Within the choice of 50 mm 1.969 in sensing range sensors, we offer small spot approx. $\varnothing 2$ mm $\varnothing 0.079$ in type optimal for detecting minute object and large approx. $\varnothing 6.5$ mm $\varnothing 0.256$ in spot type capable of sensing object covered with holes and grooves.

CX-441
Spot diameter: $\varnothing 2$ mm $\varnothing 0.079$ in approx.

[Positioning]
Detects minute holes.

CX-443
Spot diameter: $\varnothing 6.5$ mm $\varnothing 0.256$ in approx.

[Detection of presence / absence of objects]
Ignores minute holes and accurately detects objects.

FIBER SENSORS

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Amplifier Built-in

CX-400

EX-10

EX-20

EX-30

EX-40

EQ-30

EQ-500

MQ-W

RX-LS200

RX

CY

PX-2

RT-610

Power Supply Built-in

NX5

VF

Amplifier-separated

SU-7 / SH

SS-A5 / SH

Other Products

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FUNCTIONS

BGS / FGS functions make even the most challenging settings possible!

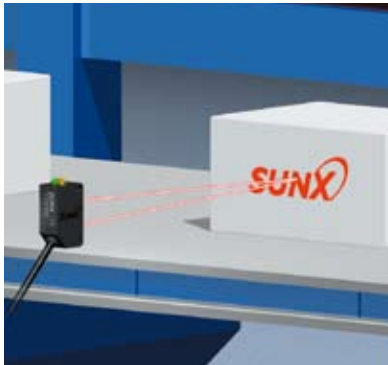
CX-440

For details on the operation of the BGS / FGS functions, refer to p.249, "BGS / FGS functions" of "PRECAUTIONS FOR PROPER USE".

The BGS function is best suited for the following case

Background not present
When object and background are separated

BGS



Not affected if the background color changes or someone passes behind the conveyor.



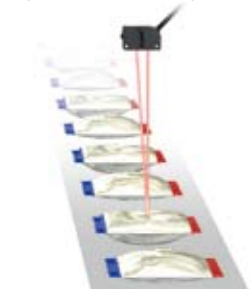
The FGS function is best suited for the following case

Background present
When object and background are close together
When the object is glossy or uneven

FGS

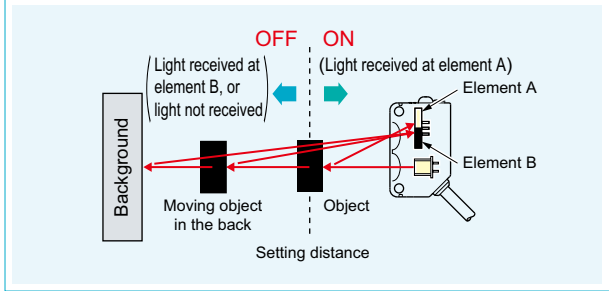


Unaffected by gloss, color or uneven surfaces when sensing objects present on a conveyor belt.



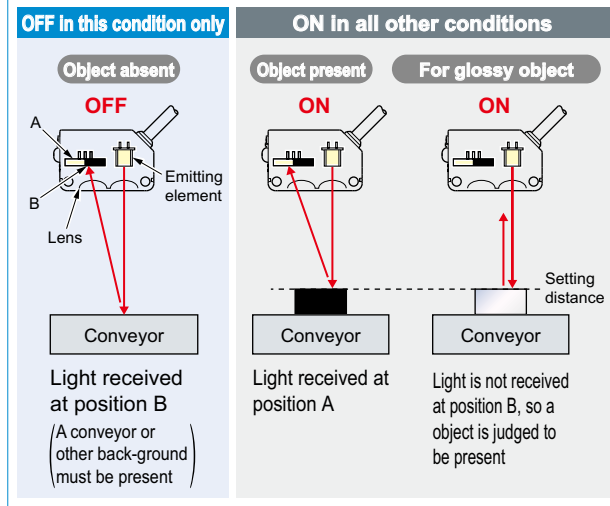
BGS (Background suppression) function

The sensor judges that an object is present when light is received at position A of the light-receiving element (2-segment element). This is useful if the object and background are far apart. The distance adjustment method is the same as the conventional adjustment method for adjustable range reflective type sensors.



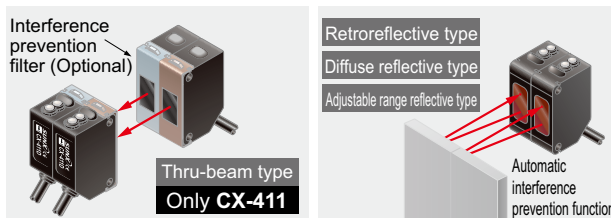
FGS (Foreground suppression) function

The sensor judges that an object is present when no light is received at position B of the light-receiving element (2-segment element). Accordingly, even objects that are glossy can be sensed. This is useful if the object and background are close together, or if the object being sensed is glossy.



Strong against interference

The interference prevention function lets two sensors to be mounted close together precisely.



OTHERS

Less resources used

Based on environmental considerations, simplified packaging is used in order to reduce waste. In addition, the bag is made from polyethylene which produces no toxic gases even when burned.

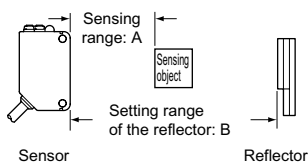


ORDER GUIDE

| Type | Appearance | Sensing range | Model No. (Note 1) | | Emitting element |
|-----------------------------|-------------|--|--------------------------------|------------|------------------|
| | | | NPN output | PNP output | |
| Thru-beam | | 10 m 32.808 ft | CX-411 | CX-411-P | Red LED |
| | | 15 m 49.213 ft | CX-412 | CX-412-P | Infrared LED |
| Retroreflective | | 3 m 9.843 ft (Note 2) | CX-491 | CX-491-P | Red LED |
| | | 5 m 16.404 ft (Note 2) | CX-493 | CX-493-P | |
| | | 50 to 500 mm 1.969 to 19.685 in (Note 2) | CX-481 | CX-481-P | Infrared LED |
| | | 0.1 to 2 m 0.328 to 6.562 ft (Note 2) | CX-482 | CX-482-P | |
| Diffuse reflective | | 100 mm 3.937 in | CX-424 | CX-424-P | Infrared LED |
| | | 300 mm 11.811 in | CX-421 | CX-421-P | |
| | | 800 mm 31.496 in | CX-422 | CX-422-P | |
| | Narrow-view | | 70 to 200 mm 2.756 to 7.874 in | CX-423 | CX-423-P |
| Adjustable range reflective | | | CX-441 | CX-441-P | Red LED |
| | | 2 to 50 mm 0.079 to 1.969 in | CX-443 | CX-443-P | |
| | | 15 to 100 mm 0.591 to 3.937 in | CX-444 | CX-444-P | |
| | | 20 to 300 mm 0.787 to 11.811 in | CX-442 | CX-442-P | |

NOTE: Mounting bracket is not supplied with the sensor. Please select from the range of optional sensor mounting brackets.

- Notes: 1) The model No. with suffix "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.) Emitter of CX-411: CX-411E, Receiver of CX-411: CX-411D
 2) The sensing range of the retroreflective type sensor is specified for the RF-230 reflector. The sensing range represents the actual sensing range of the sensor. The sensing ranges itemized in "A" of the table below may vary depending on the shape of sensing object. Be sure to check the operation with the actual sensing object.



| | CX-491 | CX-493 | CX-481 | CX-482 |
|---|---------------------------------|----------------------------------|-------------------------------------|---------------------------------|
| A | 0 to 3 m 0 to 9.843 ft | 0 to 5 m 0 to 16.404 ft | 50 to 500 mm 1.969 to 19.685 in | 0.1 to 2 m 0.328 to 6.562 ft |
| B | 0.1 to 3 m 0.328 to 9.843 ft | 0.1 to 5 m 0.328 to 16.404 ft | 100 to 500 mm 3.937 to 19.685 in | 0.8 to 2 m 2.625 to 6.562 ft |

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- SS-A5 / SH
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ORDER GUIDE

0.5 m 1.640 ft / 5 m 16.404 ft cable length types

0.5 m 1.640 ft / 5 m 16.404 ft cable length types (standard: 2 m 6.562 ft) are also available.
 When ordering this type, suffix "-C05" for the 0.5 m 1.640 ft cable length type, "-C5" for the 5 m 16.404 ft cable length type to the model No. (Please note that 0.5 m 1.640 ft cable length type and 5 m 16.404 ft cable length type are not available for CX-44 .)
 (e.g.) 0.5m 1.640 ft cable length type of CX-411-P is "CX-411-P-C05"
 5 m 16.404 ft cable length type of CX-411-P is "CX-411-P-C5"

M8 plug-in connector type, M12 pigtailed type

M8 plug-in connector type and M12 pigtailed type are also available.
 When ordering this type, suffix "-Z" for the M8 connector type, "-J" for the M12 pigtailed type to the model No. (Please note that M12 pigtailed type is not available for CX-44 .)
 (e.g.) M8 connector type of CX-411-P is "CX-411-P-Z"
 M12 pigtailed type of CX-411-P is "CX-411-P-J"

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

| Type | | Model No. | Cable length | Description |
|-------------------------------|----------|------------|---------------|-------------------------------------|
| For M8 plug-in connector type | Straight | CN-24A-C2 | 2 m 6.562 ft | Can be used with all models |
| | | CN-24A-C5 | 5 m 16.404 ft | |
| | Elbow | CN-24AL-C2 | 2 m 6.562 ft | |
| | | CN-24AL-C5 | 5 m 16.404 ft | |
| For M12 pigtailed type | 2-core | CN-22-C2 | 2 m 6.562 ft | For thru-beam type emitter (2-core) |
| | | CN-22-C5 | 5 m 16.404 ft | |
| | 4-core | CN-24-C2 | 2 m 6.562 ft | Can be used with all models |
| | | CN-24-C5 | 5 m 16.404 ft | |

Package without reflector

NPN output type: CX-491-Y
 PNP output type: CX-491-P-Y

Accessory

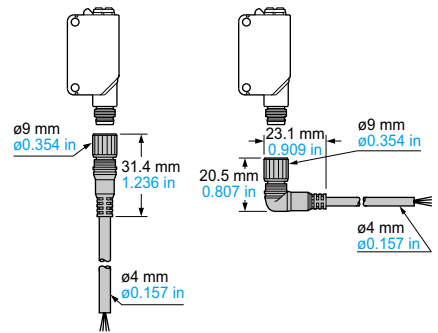
▪ RF-230 (Reflector)



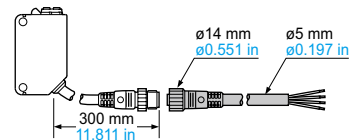
Mating cable

▪ CN-24A-C2
CN-24A-C5

▪ CN-24AL-C2
CN-24AL-C5



▪ CN-22-C2, CN-22-C5
CN-24-C2, CN-24-C5

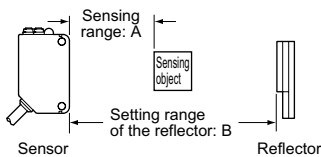


OPTIONS

| Designation | Model No. | | Slit size | Sensing range | | Min. sensing object | |
|---|------------|--------|--------------------------------|------------------|--------------------|---------------------|--------------------------------|
| | Slit | Sensor | | Slit on one side | Slit on both sides | Slit on one side | Slit on both sides |
| Round slit mask (For thru-beam type sensor only) | OS-CX-05 | CX-411 | ø0.5 mm ø0.020 in | 400 mm 15.748 in | 20 mm 0.787 in | ø12 mm ø0.472 in | ø0.5 mm ø0.020 in |
| | | CX-412 | | 600 mm 23.622 in | 30 mm 1.181 in | | |
| | OS-CX-1 | CX-411 | ø1 mm ø0.039 in | 900 mm 35.433 in | 100 mm 3.937 in | ø12 mm ø0.472 in | ø1 mm ø0.039 in |
| | | CX-412 | | 1.35 m 4.429 ft | 150 mm 5.906 in | | ø1.5 mm ø0.059 in |
| | OS-CX-2 | CX-411 | ø2 mm ø0.079 in | 2 m 6.562 ft | 400 mm 15.748 in | ø12 mm ø0.472 in | ø2 mm ø0.079 in |
| | | CX-412 | | 3 m 9.843 ft | 600 mm 23.622 in | | ø3 mm ø0.118 in |
| Rectangular slit mask (For thru-beam type sensor only) | OS-CX-05×6 | CX-411 | 0.5 × 6 mm 0.020 × 0.236 in | 2 m 6.562 ft | 400 mm 15.748 in | ø12 mm ø0.472 in | 0.5 × 6 mm 0.020 × 0.236 in |
| | | CX-412 | | 3 m 9.843 ft | 600 mm 23.622 in | | |
| | OS-CX-1×6 | CX-411 | 1 × 6 mm 0.039 × 0.236 in | 3 m 9.843 ft | 1 m 3.281 ft | ø12 mm ø0.472 in | 1 × 6 mm 0.039 × 0.236 in |
| | | CX-412 | | 4.5 m 14.764 ft | 1.5 m 4.921 ft | | |
| | OS-CX-2×6 | CX-411 | 2 × 6 mm 0.079 × 0.236 in | 5 m 16.404 ft | 2 m 6.562 ft | ø12 mm ø0.472 in | 2 × 6 mm 0.079 × 0.236 in |
| | | CX-412 | | 7.5 m 24.606 ft | 3 m 9.843 ft | | |

| Designation | Model No. | Sensing range | Min. sensing object | |
|---|---|------------------------|---|------------------|
| Interference prevention filter (For CX-441 only) | PF-CX4-V (Vertical) 2 pcs. per set | 5 m 16.404 ft (Note 1) | ø12 mm ø0.472 in (Note 1) | |
| | PF-CX4-H (Horizontal) 2 pcs. per set | 5 m 16.404 ft (Note 1) | ø12 mm ø0.472 in (Note 1) | |
| Reflector (For retroreflective type sensor only) | RF-210 | CX-491 | 1 m 3.281 ft (Note 2) | |
| | | CX-493 | 1.5 m 4.921 ft (Note 2) | |
| | | CX-481 | — | |
| | RF-220 | CX-482 | 0.1 to 0.6 m 0.328 to 1.969 ft (Note 2) | ø30 mm ø1.181 in |
| | | CX-491 | 1.5 m 4.921 ft (Note 2) | |
| | | CX-493 | 3 m 9.843 ft (Note 2) | |
| | | CX-481 | 50 to 300 mm 1.969 to 11.811 in (Note 2) | |
| | | CX-482 | 0.1 to 1.3 m 0.328 to 4.265 ft (Note 2) | |

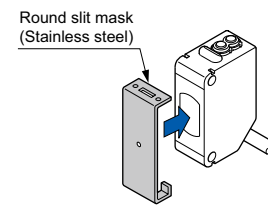
Notes: 1) Value when attached to both sides.
 2) Set the distance between the CX-491 /493 and the reflector to 0.1 m 0.328 ft or more. However, see the table below for CX-48. The sensing range "A" may vary depending on the shape of sensing object. Be sure to check the operation with the actual sensing object.



| Model No. | | A | B |
|-----------|-----------|------------------------------------|-------------------------------------|
| Sensor | Reflector | | |
| CX-481 | RF-220 | 50 to 300 mm 1.969 to 11.811 in | 100 to 300 mm 3.937 to 11.811 in |
| CX-482 | RF-220 | 0.1 to 1.3 m 0.328 to 4.265 ft | 0.5 to 1.3 m 1.640 to 4.265 ft |
| | RF-210 | 0.1 to 0.6 m 0.328 to 1.969 ft | 0.3 to 0.6 m 0.984 to 1.969 ft |

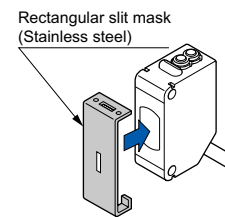
Round slit mask

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



Rectangular slit mask

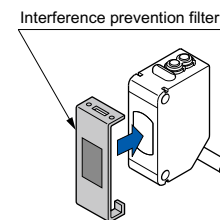
- OS-CX×6
- Fitted on the front face of the sensor with one-touch.



Interference prevention filter

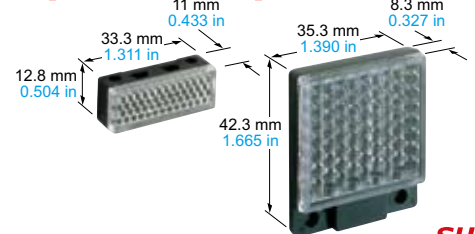
- PF-CX4-V
- PF-CX4-H

Two sets of CX-441 can be mounted close together.



Reflector

- RF-210
- RF-220



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Amplifier Built-in

CX-400

EX-10

EX-20

EX-30

EX-40

EQ-30

EQ-500

MQ-W

RX-LS200

RX

CY

PX-2

RT-610

Power Supply Built-in

NX5

VF

Amplifier-separated

SU-7 / SH

SS-A5 / SH

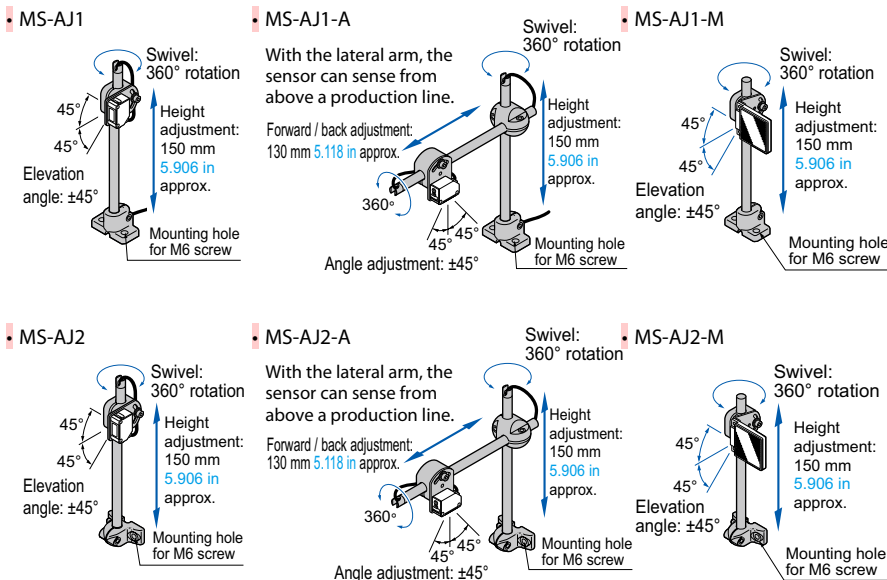
Other Products

OPTIONS

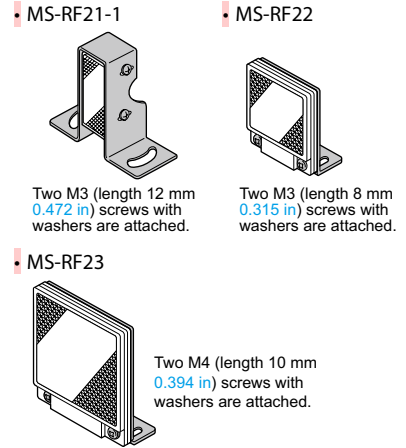
| Designation | Model No. | Description | |
|--|-----------|--|--|
| Reflector mounting bracket | MS-RF21-1 | Protective mounting bracket for RF-210 It protects the reflector from damage and maintains alignment. | |
| | MS-RF22 | For RF-220 | |
| | MS-RF23 | For RF-230 | |
| Reflective tape | RF-11 | <ul style="list-style-type: none"> Sensing range (Note 4): 0.5 m 1.640 ft [CX-491] 0.8 m 2.625 ft [CX-493] | <ul style="list-style-type: none"> Ambient temperature: -25 to +50 °C -13 to +122 °F Ambient humidity: 35 to 85 % RH |
| | RF-12 | <ul style="list-style-type: none"> Sensing range (Note 4): 0.7 m 2.297 ft [CX-491] 1.2 m 3.937 ft [CX-493] 0.1 to 0.6 m 0.328 to 1.969 ft [CX-482] | Notes <ul style="list-style-type: none"> Keep the tape free from stress. If it is pressed too much, its capability may deteriorate. Do not cut the tape. It will deteriorate the sensing performance. |
| | RF-13 | <ul style="list-style-type: none"> Sensing range (Note 4): 0.5 m 1.640 ft [CX-491] 0.8 m 2.625 ft [CX-493] | <ul style="list-style-type: none"> Ambient temperature: -25 to +55 °C -13 to +131 °F Ambient humidity: 35 to 85 % RH |
| Sensor mounting bracket (Note 1) | MS-CX2-1 | Foot angled mounting bracket It can also be used for mounting RF-210. | The thru-beam type sensor needs two brackets. |
| | MS-CX2-2 | Foot biangled mounting bracket It can also be used for mounting RF-210. | |
| | MS-CX2-4 | Protective mounting bracket | |
| | MS-CX2-5 | Back biangled mounting bracket | |
| | MS-CX-3 | Back angled mounting bracket | |
| Universal sensor mounting stand (Note 2) | MS-AJ1 | Horizontal mounting type | Basic assembly |
| | MS-AJ2 | Vertical mounting type | Lateral arm assembly |
| | MS-AJ1-A | Horizontal mounting type | |
| | MS-AJ2-A | Vertical mounting type | |
| | MS-AJ1-M | Horizontal mounting type | Assembly for reflector |
| | MS-AJ2-M | Vertical mounting type | |
| Sensor checker (Note 3) | 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) The plug-in connector type sensor does not allow use of some sensor mounting brackets because of the protrusion of the connector.
 2) Refer to p.799 for details of the universal sensor mounting stand.
 3) Refer to p.800 for details of the sensor checker CHX-SC2.
 4) Set the distance between the sensor and the reflective tape to 0.1 m 0.328 ft (CX-482 : 0.4 m 1.312 ft) or more.

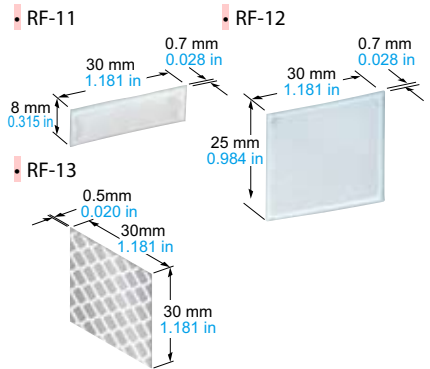
Universal sensor mounting stand



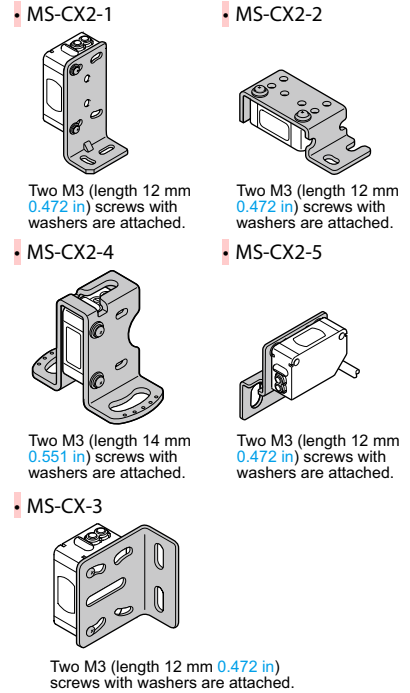
Reflector mounting bracket



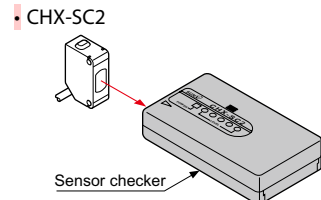
Reflective tape



Sensor mounting bracket



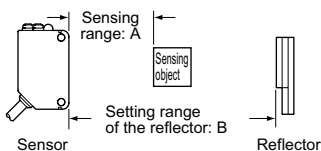
Sensor checker



SPECIFICATIONS

| Item | Model No. | Type | Thru-beam | | Retroreflective | | | | Diffuse reflective | | | | | |
|---|--------------------------|--|--|--|---|---|---|--|--|------------------------------|---|--|-------------------------|--|
| | | | Long sensing range | With polarizing filters | Long sensing range | For transparent object sensing | Narrow-view | | | | | | | |
| | | NPN output | CX-411 | CX-412 | CX-491 | CX-493 | CX-481 | CX-482 | CX-424 | CX-421 | CX-422 | CX-423 | | |
| | | PNP output | CX-411-P | CX-412-P | CX-491-P | CX-493-P | CX-481-P | CX-482-P | CX-424-P | CX-421-P | CX-422-P | CX-423-P | | |
| Sensing range | | | 10 m 32.808 ft | 15 m 49.213 ft | 3 m 9.843 ft (Note 2) | 5 m 16.404 ft (Note 2) | 50 to 500 mm 1.969 to 19.685 in (Note 2) | 0.1 to 2 m 0.328 to 6.562 ft (Note 2) | 100 mm 3.937 in (Note 3) | 300 mm 11.811 in (Note 3) | 800 mm 31.496 in (Note 3) | 70 to 200 mm 2.756 to 7.874 in (Note 3) | | |
| Sensing object | | | ø12 mm ø0.472 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) | ø50 mm ø1.969 in or more transparent, translucent or opaque object (Note 2, 5) | | Opaque, translucent or transparent object (Note 5) | | | Opaque, translucent or transparent object (Note 5) (Min. sensing object: ø0.5 mm ø0.020 in copper wire) | | |
| 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 Receiver: 20 mA or less | Emitter: 25 mA or less Receiver: 20 mA or less | 20 mA or less | | | 25 mA or less | 25 mA or less | | | 20 mA or less | | |
| Output | | | <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: 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 | | | | | | | | | | | |
| Short-circuit protection | | | Incorporated | | | | | | | | | | | |
| Response time | | | 1 ms or less | | | | | | | | | | | |
| Operation indicator | | | Orange LED (lights up when the output is ON) (incorporated on the receiver for thru-beam type) | | | | | | | | | | | |
| Stability indicator | | | Green LED (lights up under stable light received condition or stable dark condition) (incorporated on the receiver for thru-beam type) | | | | | | | | | | | |
| Power indicator | | | Green LED (lights up when the power is ON) (incorporated on the emitter) | ————— | | | | | | | | | | |
| Sensitivity adjuster | | | Continuously variable adjuster (incorporated on the receiver for thru-beam type) | | | | | | | | | | | |
| Automatic interference prevention function | | | Two units of sensors can be mounted close together with interference prevention filters. (Sensing range: 5 m 16.404 ft) | Incorporated (Two units of sensors can be mounted close together.) | | | | | | | | | | |
| Environmental resistance | Protection | | IP67 (IEC) (Refer to p.984 for details of standards.) | | | | | | | | | | | |
| | 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 | | | | | | | | | | | |
| | Ambient humidity | | 35 to 85 % RH, Storage: 35 to 85 % RH | | | | | | | | | | | |
| | Ambient illuminance | | Incandescent light: 3,000 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) | | | Red LED | Infrared LED | Red LED | | Infrared LED | | Infrared LED | | | Red LED | | |
| | Peak emission wavelength | | 680 nm 0.027 mil | 870 nm 0.034 mil | 680 nm 0.027 mil | 650 nm 0.026 mil | 870 nm 0.034 mil | | 860 nm 0.034 mil | | | 645 nm 0.025 mil | | |
| Material | | | Enclosure: PBT (polybutylene terephthalate), Lens: acrylic (CX-48 : polycarbonate), Indicator cover: acrylic (CX-48 : polycarbonate) | | | | | | | | | | | |
| Cable | | | 0.2 mm ² 3-core (thru-beam type emitter: 2-core) 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). | | | | | | | | | | | |
| Weight | Net weight | | Emitter: 45 g approx., Receiver: 50 g approx. | | | | 50 g approx. | | | | | | | |
| | Gross weight | | 100 g approx. | | | | 80 g approx. | | | | 60 g approx. | | | |
| Accessory | | | RF-230 (Reflector): 1 pc. | | | | | | | | | | | |

- Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +23 °C +73.4 °F.
 2) The sensing range and the sensing object of the retroreflective type sensor are specified for the RF-230 reflector. The sensing range represents the actual sensing range of the sensor. The sensing ranges itemized in "A" of the table below may vary depending on the shape of sensing object. Be sure to check the operation with the actual sensing object.



| | CX-491 | CX-493 | CX-481 | CX-482 |
|---|---------------------------------|----------------------------------|-------------------------------------|---------------------------------|
| A | 0 to 3 m 0 to 9.843 ft | 0 to 5 m 0 to 16.404 ft | 50 to 500 mm 1.969 to 19.685 in | 0.1 to 2 m 0.328 to 6.562 ft |
| B | 0.1 to 3 m 0.328 to 9.843 ft | 0.1 to 5 m 0.328 to 16.404 ft | 100 to 500 mm 3.937 to 19.685 in | 0.8 to 2 m 2.625 to 6.562 ft |

- 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, an object of ø0.5 mm ø0.020 in (using round slit mask) can be detected.
 5) Make sure to confirm detection with an actual sensor before use.

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Amplifier Built-in

CX-400

EX-10

EX-20

EX-30

EX-40

EQ-30

EQ-500

MQ-W

RX-LS200

RX

CY

PX-2

RT-610

Power Supply Built-in

NX5

VF

Amplifier-separated

SU-7 / SH

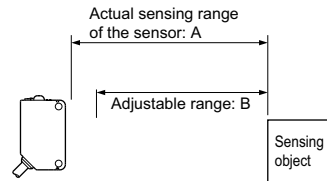
SS-A5 / SH

Other Products

SPECIFICATIONS

| Item | Model No. | Type | Adjustable range reflective | | | |
|---|--------------------------|--|--|---|---|--|
| | | | Small spot | | | |
| | | NPN output | CX-441 | CX-443 | CX-444 | CX-442 |
| | | PNP output | CX-441-P | CX-443-P | CX-444-P | CX-442-P |
| Adjustable range (Note 2) | | | 20 to 50 mm 0.787 to 1.969 in | | 20 to 100 mm 0.787 to 3.937 in | 40 to 300 mm 1.575 to 11.811 in |
| Sensing range (with white non-glossy paper) | | | 2 to 50 mm 0.079 to 1.969 in | | 15 to 100 mm 0.591 to 3.937 in | 20 to 300 mm 0.787 to 11.811 in |
| Hysteresis | | | 2 % or less of operation distance (with white non-glossy paper) | | | 5 % or less of operation distance (with white non-glossy paper) |
| Repeatability | | | Along sensing axis: 1 mm 0.039 in or less, Perpendicular to sensing axis: 0.2 mm 0.008 in or less (with white non-glossy paper) | | | |
| Supply voltage | | | 12 to 24 V DC ± 10 % Ripple P-P 10 % or less | | | |
| Current consumption | | | 25 mA or less | | | |
| Output | | | <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: 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 Detection-ON or Detection-OFF | | | |
| Short-circuit protection | | | Incorporated | | | |
| Response time | | | 1 ms or less | | | |
| Operation indicator | | | Orange LED (lights up when the output is ON) | | | |
| Stability indicator | | | Green LED (lights up under stable operating condition) | | | |
| Distance adjuster | | | 5-turn mechanical adjuster | | | |
| Sensing mode | | | BGS / FGS functions Switchable with wiring of sensing mode selection input | | | |
| Automatic interference prevention function (Note 3) | | | Incorporated | | | |
| Environmental resistance | Protection | | IP67 (IEC) (Refer to p.984 for details of standards.) | | | |
| | 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 | | | |
| | Ambient humidity | | 35 to 85 % RH, Storage: 35 to 85 % RH | | | |
| | Ambient illuminance | | Incandescent light: 3,000 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, 3 mm 0.118 in amplitude 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 | | | Red LED (Peak emission wavelength: 680 nm 0.027 mil , modulated) | | | |
| Spot diameter | | | ø2 mm ø0.079 in approx. (at 50 mm 1.969 in distance) | ø6.5 mm ø0.256 in approx. (at 50 mm 1.969 in distance) | ø9 mm ø0.354 in approx. (at 100 mm 3.937 in distance) | 15 mm 0.591 in approx. (at 300 mm 11.811 in distance) |
| Material | | | Enclosure: PBT (Polybutylene terephthalate), Front cover: Polycarbonate, Indicator cover: Polycarbonate | | | |
| Cable | | | 0.2 mm ² 4-core 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. | | | |
| Weight | | | Net weight: 55 g approx., Gross weight: 80 g approx. | | | |

- 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 adjustable range stands for the maximum sensing range which can be set with the distance adjuster. The sensor can detect an object 2 mm **0.079 in** [CX-444(-P)]: 15 mm **0.591 in**, CX-442(-P): 20 mm **0.787 in**], or more, away.
 3) Note that detection may be unstable depending on the mounting conditions or the sensing object. In the state that this product is mounted, be sure to check the operation with the actual sensing object.

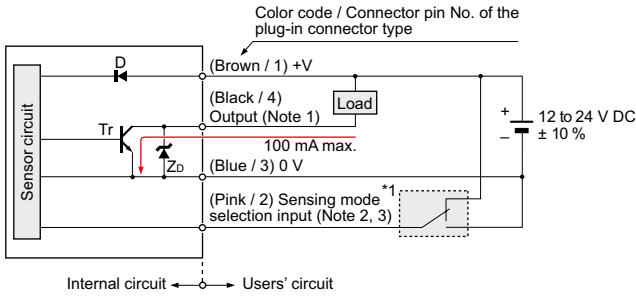


| | CX-441/443 | CX-444 | CX-442 |
|---|---|--|---|
| A | 2 to 50 mm 0.079 to 1.969 in | 15 to 100 mm 0.591 to 3.937 in | 20 to 300 mm 0.787 to 11.811 in |
| B | 20 to 50 mm 0.787 to 1.969 in | 20 to 100 mm 0.787 to 3.937 in | 40 to 300 mm 1.575 to 11.811 in |

I/O CIRCUIT AND WIRING DIAGRAMS

NPN output type

I/O circuit diagram



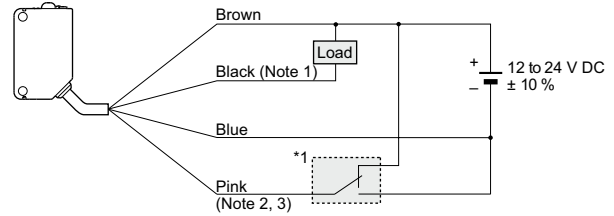
- Notes:
- 1) The emitter of the thru-beam type sensor does not incorporate the output.
 - 2) Sensing mode selection input is incorporated only for the CX-44 adjustable range reflective type. When using the CX-44, be sure to wire the sensing mode selection input (pink / 2).
 - 3) When the mating cable is connected to the plug-in connector type of CX-44, its color is white.

* 1

- Sensing mode selection input
BGS function: Connect to 0 V
FGS function: Connect to +V

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

Wiring diagram



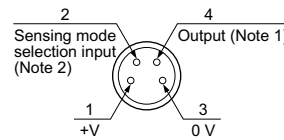
- Notes:
- 1) The emitter of the thru-beam type sensor does not incorporate the black wire.
 - 2) The pink wire is incorporated only for the CX-44 adjustable range reflective type. When using the CX-44, be sure to wire the pink wire.
 - 3) When the mating cable is connected to the plug-in connector type of CX-44, its color is white.

* 1

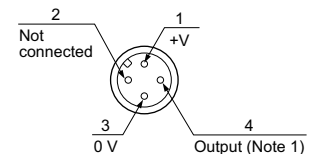
- Sensing mode selection input
BGS function: Connect to 0 V
FGS function: Connect to +V

Connector pin position

M8 plug-in connector type



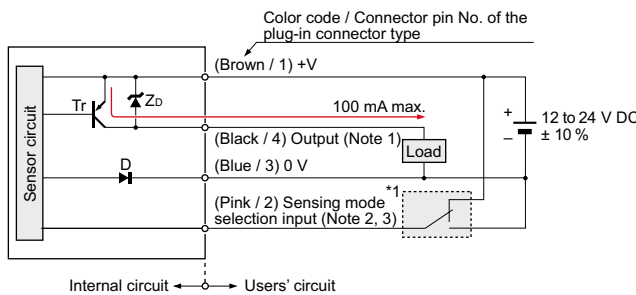
M12 pigtailed type



- Notes:
- 1) The emitter of the thru-beam type sensor does not incorporate the output.
 - 2) Sensing mode selection input is incorporated only for the CX-44 adjustable range reflective type. When using the CX-44, be sure to wire the sensing mode selection input (pink / 2).

PNP output type

I/O circuit diagram



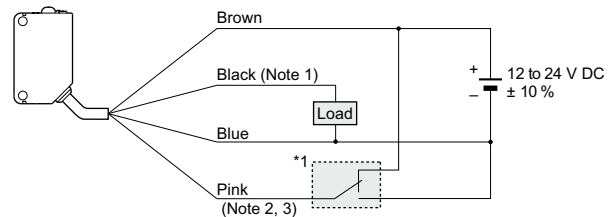
- Notes:
- 1) The emitter of the thru-beam type sensor does not incorporate the output.
 - 2) Sensing mode selection input is incorporated only for the CX-44 -P adjustable range reflective type. When using the CX-44 -P, be sure to wire the sensing mode selection input (pink / 2).
 - 3) When the mating cable is connected to the plug-in connector type of CX-44-P, its color is white.

* 1

- Sensing mode selection input
BGS function: Connect to 0 V
FGS function: Connect to +V

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

Wiring diagram



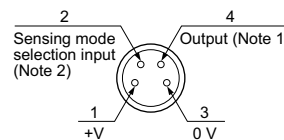
- Notes:
- 1) The emitter of the thru-beam type sensor does not incorporate the black wire.
 - 2) The pink wire is incorporated only for the CX-44 -P adjustable range reflective type. When using the CX-44 -P, be sure to wire the pink wire.
 - 3) When the mating cable is connected to the plug-in connector type of CX-44-P, its color is white.

* 1

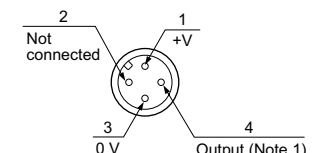
- Sensing mode selection input
BGS function: Connect to 0 V
FGS function: Connect to +V

Connector pin position

M8 plug-in connector type



M12 pigtailed type



- Notes:
- 1) The emitter of the thru-beam type sensor does not incorporate the output.
 - 2) Sensing mode selection input is incorporated only for the CX-44 -P adjustable range reflective type. When using the CX-44 -P, be sure to wire the sensing mode selection input (pink / 2).

FIBER SENSORS

LASER SENSORS

PHOTO-ELECTRIC SENSORS

MICRO PHOTO-ELECTRIC SENSORS

AREA SENSORS

SAFETY COMPONENTS

PRESSURE SENSORS

INDUCTIVE PROXIMITY SENSORS

PARTICULAR USE SENSORS

SENSOR OPTIONS

WIRE-SAVING SYSTEMS

MEASUREMENT SENSORS

STATIC CONTROL DEVICES

LASER MARKERS

Selection Guide

Amplifier Built-in

CX-400

EX-10

EX-20

EX-30

EX-40

EQ-30

EQ-500

MQ-W

RX-LS200

RX

CY

PX-2

RT-610

Power Supply Built-in

NX5

VF

Amplifier-separated

SU-7 / SH

SS-A5 / SH

Other Products

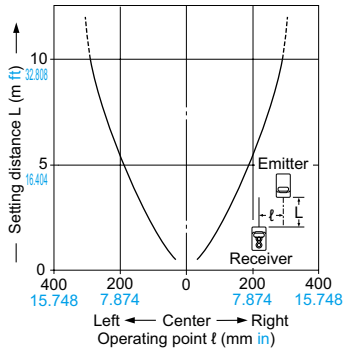
SENSING CHARACTERISTICS (TYPICAL)

FIBER SENSORS
LASER SENSORS
PHOTO-ELECTRIC SENSORS
MICRO PHOTO-ELECTRIC SENSORS
AREA SENSORS
SAFETY COMPONENTS
PRESSURE SENSORS
INDUCTIVE PROXIMITY SENSORS
PARTICULAR USE SENSORS

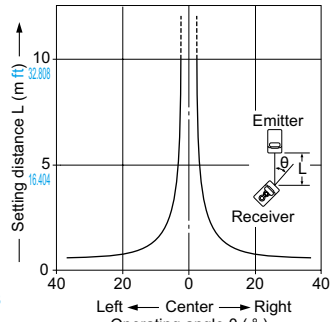
CX-411

Thru-beam type

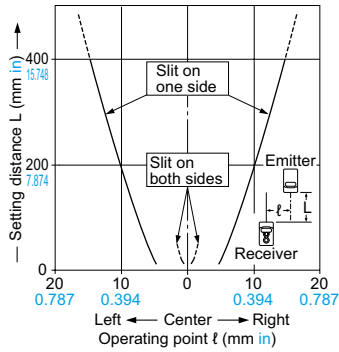
Parallel deviation



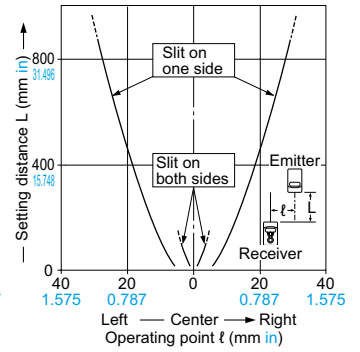
Angular deviation



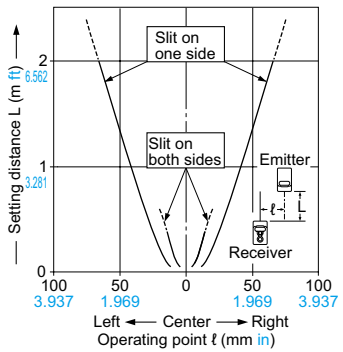
Parallel deviation with round slit masks (ø0.5 mm ø0.020 in)



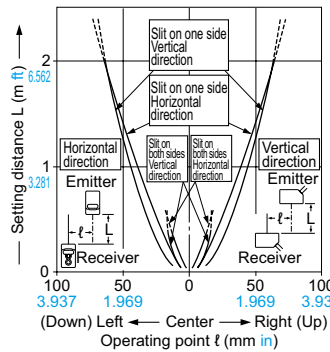
Parallel deviation with round slit masks (ø1 mm ø0.039 in)



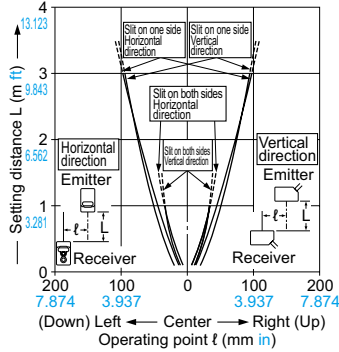
Parallel deviation with round slit masks (ø2 mm ø0.079 in)



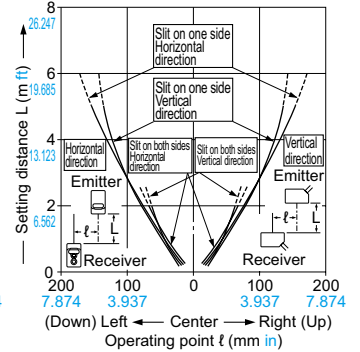
Parallel deviation with rectangular slit masks (0.5 x 6 mm 0.020 x 0.236 in)



Parallel deviation with rectangular slit masks (1 x 6 mm 0.039 x 0.236 in)



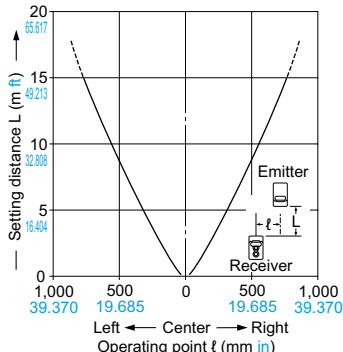
Parallel deviation with rectangular slit masks (2 x 6 mm 0.079 x 0.236 in)



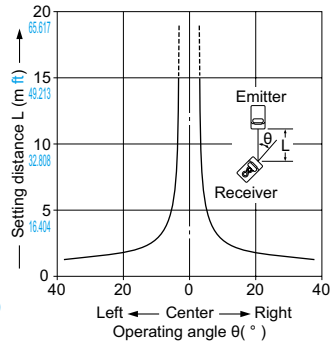
CX-412

Thru-beam type

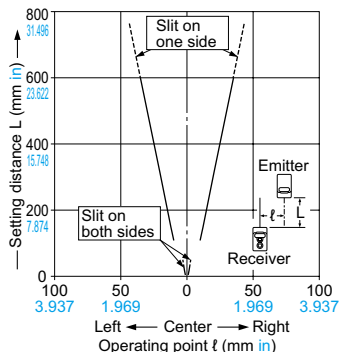
Parallel deviation



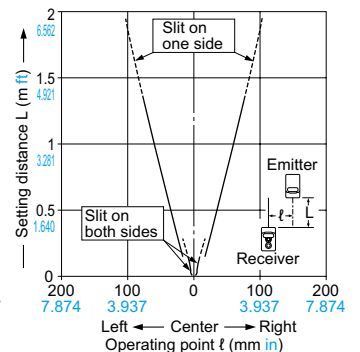
Angular deviation



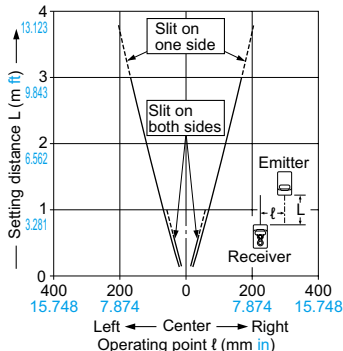
Parallel deviation with round slit masks (ø0.5 mm ø0.020 in)



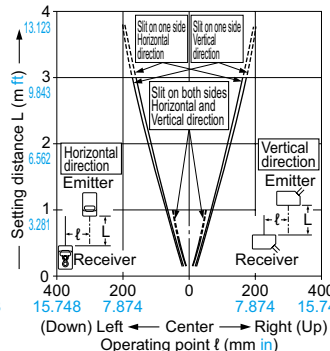
Parallel deviation with round slit masks (ø1 mm ø0.039 in)



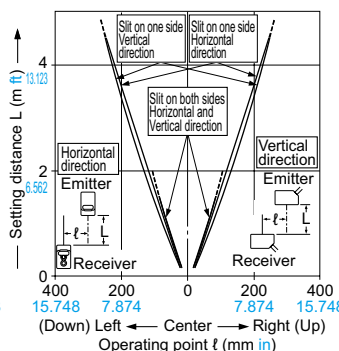
Parallel deviation with round slit masks (ø2 mm ø0.079 in)



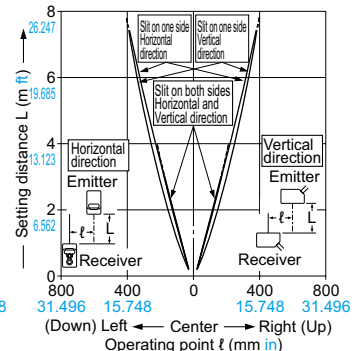
Parallel deviation with rectangular slit masks (0.5 x 6 mm 0.020 x 0.236 in)



Parallel deviation with rectangular slit masks (1 x 6 mm 0.039 x 0.236 in)



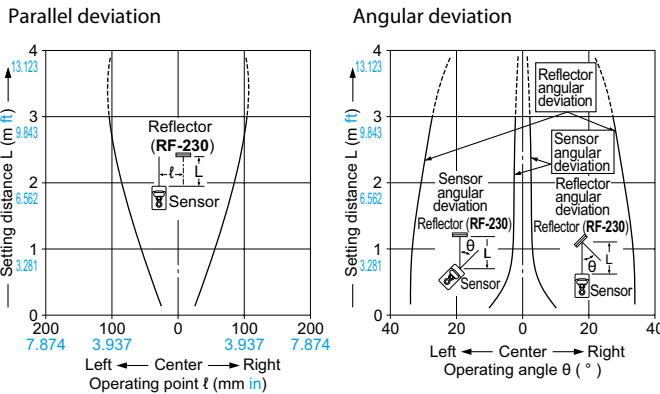
Parallel deviation with rectangular slit masks (2 x 6 mm 0.079 x 0.236 in)



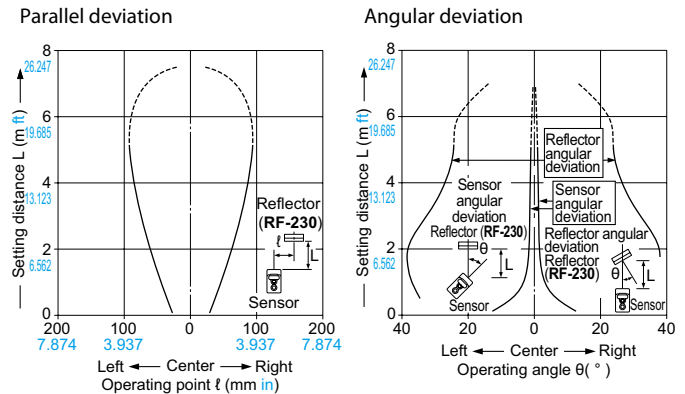
Selection Guide
Amplifier Built-in
CX-400
EX-10
EX-20
EX-30
EX-40
EQ-30
EQ-500
MQ-W
RX-LS200
RX
CY
PX-2
RT-610
Power Supply Built-in
NX5
VF
Amplifier-separated
SU-7 / SH
SS-A5 / SH
Other Products

SENSING CHARACTERISTICS (TYPICAL)

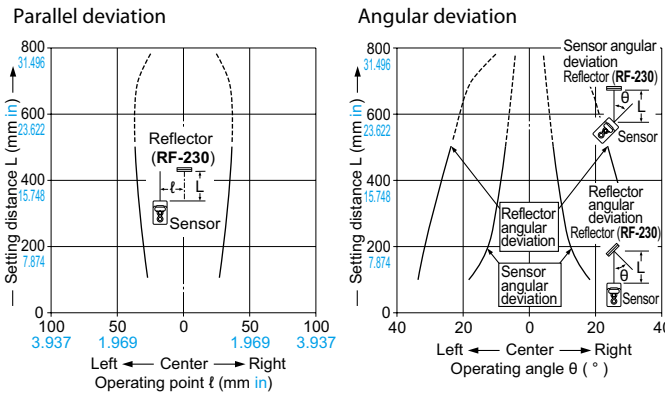
CX-491 Retroreflective type



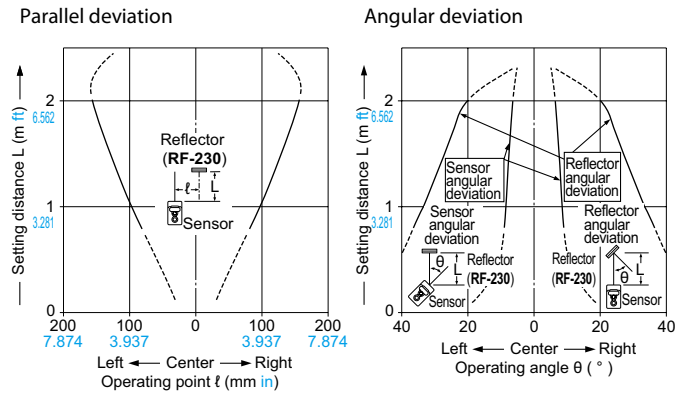
CX-493 Retroreflective type



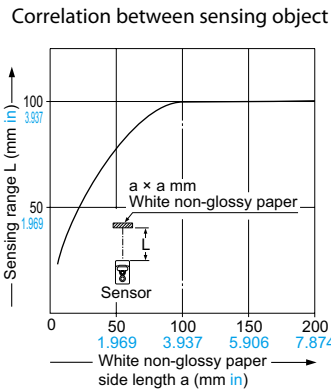
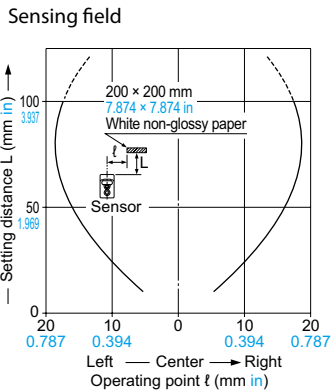
CX-481 Retroreflective type



CX-482 Retroreflective type



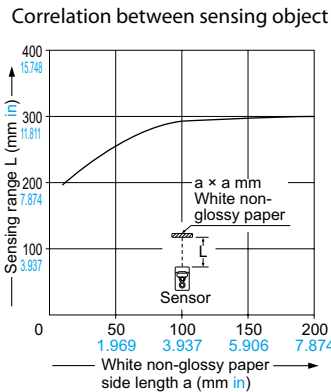
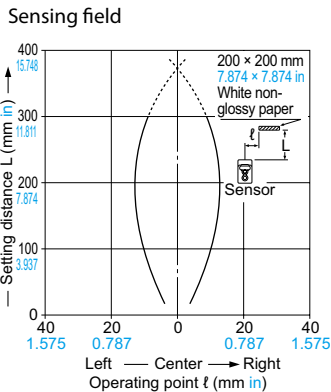
CX-424 Diffuse reflective type



As the sensing object size becomes smaller than the standard size (white non-glossy paper 200 x 200 mm 7.874 x 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 x 200 mm 7.874 x 7.874 in white non-glossy paper is just detectable at a distance of 100 mm 3.937 in.)

CX-421 Diffuse reflective type



As the sensing object size becomes smaller than the standard size (white non-glossy paper 200 x 200 mm 7.874 x 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 x 200 mm 7.874 x 7.874 in white non-glossy paper is just detectable at a distance of 300 mm 11.811 in.)

- FIBER SENSORS
- LASER SENSORS
- PHOTO-ELECTRIC SENSORS
- MICRO PHOTO-ELECTRIC SENSORS
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- PRESSURE SENSORS
- INDUCTIVE PROXIMITY SENSORS
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- MEASUREMENT SENSORS
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- EX-20
- EX-30
- EX-40
- EQ-30
- EQ-500
- MQ-W
- RX-L5200
- RX
- CY
- PX-2
- RT-610
- Power Supply Built-in
- NX5
- VF
- Amplifier-separated
- SU-7 / SH
- SS-A5 / SH
- Other Products

SENSING CHARACTERISTICS (TYPICAL)

FIBER SENSORS

LASER SENSORS

PHOTO-ELECTRIC SENSORS
MICRO PHOTO-ELECTRIC SENSORS

AREA SENSORS

SAFETY COMPONENTS

PRESSURE SENSORS

INDUCTIVE PROXIMITY SENSORS

PARTICULAR USE SENSORS

SENSOR OPTIONS

WIRE- SAVING SYSTEMS

MEASURE- MENT SENSORS

STATIC CONTROL DEVICES

LASER MARKERS

Selection Guide

Amplifier Built-in

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EX-20

EX-30

EX-40

EQ-30

EQ-500

MQ-W

RX-LS200

RX

CY

PX-2

RT-610

Power Supply Built-in

NX5

VF

Amplifier-separated

SU-7 / SH

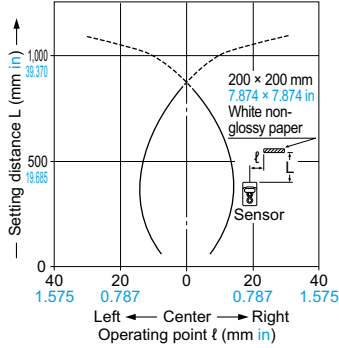
SS-A5 / SH

Other Products

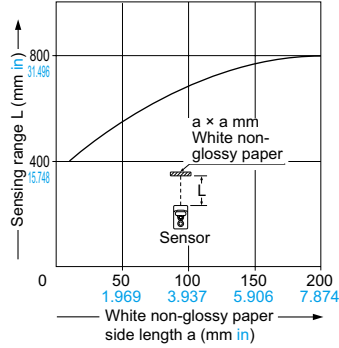
Diffuse reflective type

CX-422

Sensing field



Correlation between sensing object size and sensing range



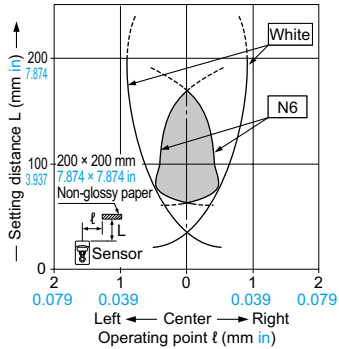
As the sensing object size becomes smaller than the standard size (white non-glossy paper 200 × 200 mm 7.874 × 7.874 in), the sensing range shortens, as shown in the left graph.

(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 800 mm 31.496 in.)

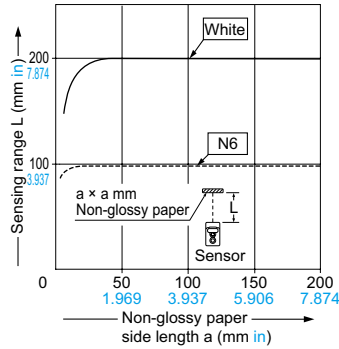
CX-423

Diffuse reflective type

Sensing field



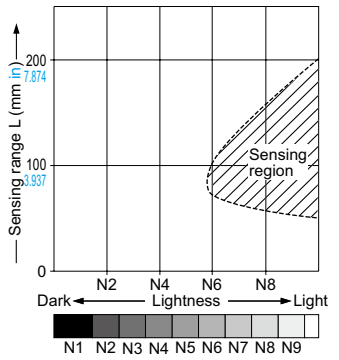
Correlation between sensing object size and sensing range



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.)

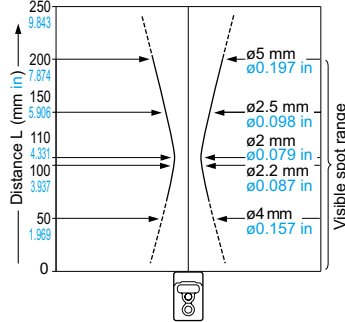
Correlation between lightness and sensing range



The sensing region is represented by oblique lines in the left figure. However, the sensitivity should be set with an enough margin because of slight variation in products.

(Lightness shown on the left may differ slightly from the actual object condition.)

Emitted beam



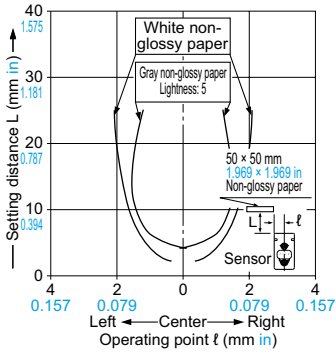
SENSING CHARACTERISTICS (TYPICAL)

CX-441

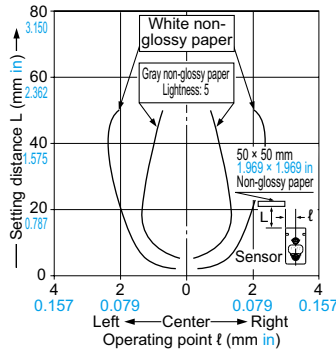
Adjustable range reflective type

Sensing fields

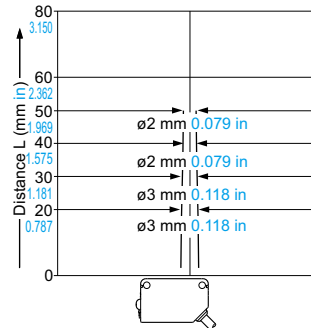
Setting distance: 25 mm 0.984 in



Setting distance: 50 mm 1.969 in

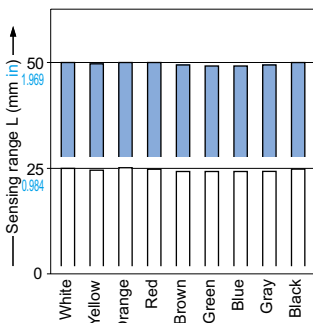


Emitted beam



Correlation between color

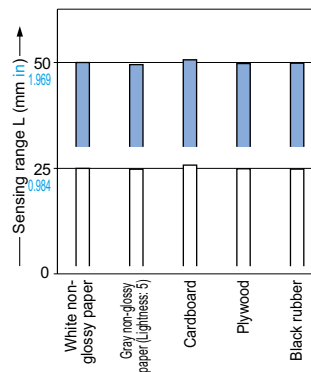
(50 × 50 mm 1.969 × 1.969 in construction paper) and sensing range



These bars indicate the sensing range with the respective colors when the distance adjuster is set to a sensing range of 50 mm 1.969 in and 25 mm 0.984 in long, respectively, with white color. The sensing range also varies depending on material.

Correlation between material

(50 × 50 mm 1.969 × 1.969 in) and sensing range



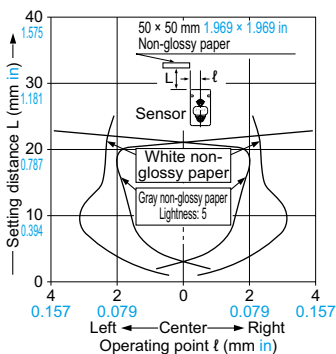
These bars indicate the sensing range with the respective objects when the distance adjuster is set to a sensing range of 50 mm 1.969 in and 25 mm 0.984 in long, respectively, with white non-glossy paper.

CX-443

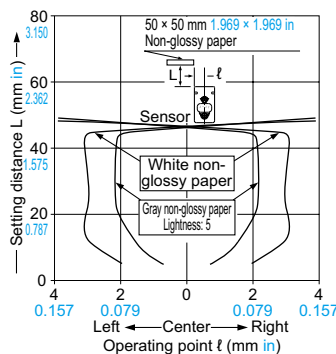
Adjustable range reflective type

Sensing fields

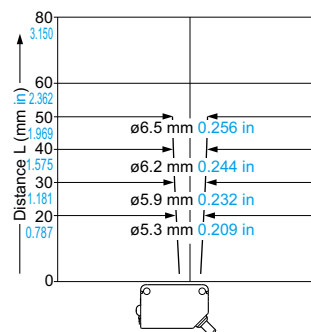
Setting distance: 25 mm 0.984 in



Setting distance: 50 mm 1.969 in

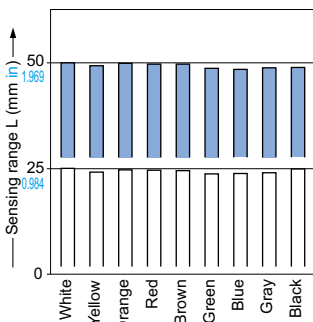


Emitted beam



Correlation between color

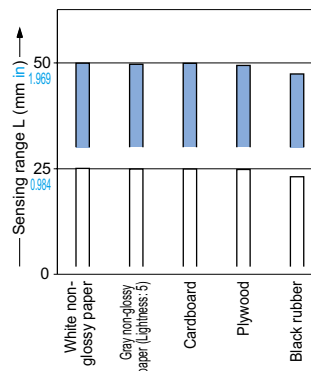
(50 × 50 mm 1.969 × 1.969 in construction paper) and sensing range



These bars indicate the sensing range with the respective colors when the distance adjuster is set to a sensing range of 50 mm 1.969 in and 25 mm 0.984 in long, respectively, with white color. The sensing range also varies depending on material.

Correlation between material

(50 × 50 mm 1.969 × 1.969 in) and sensing range



These bars indicate the sensing range with the respective objects when the distance adjuster is set to a sensing range of 50 mm 1.969 in and 25 mm 0.984 in long, respectively, with white non-glossy paper.

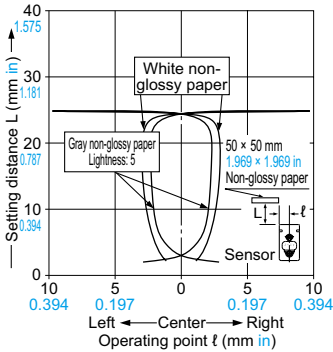
- FIBER SENSORS
- LASER SENSORS
- PHOTO-ELECTRIC SENSORS
- MICRO PHOTO-ELECTRIC SENSORS
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- NX5
- VF
- Amplifier-separated
- SU-7 / SH
- SS-A5 / SH
- Other Products

SENSING CHARACTERISTICS (TYPICAL)

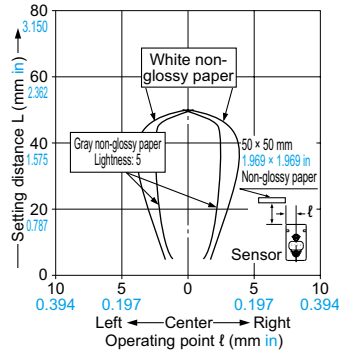
CX-444 Adjustable range reflective type

Sensing fields

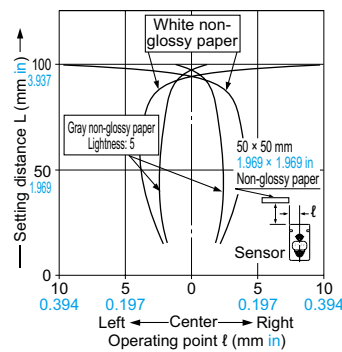
Setting distance: 25 mm 0.984 in



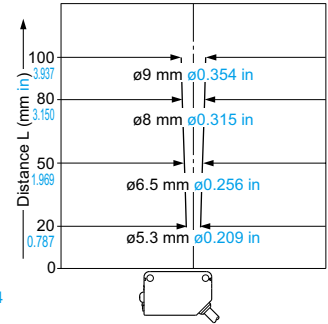
Setting distance: 50 mm 1.969 in



Setting distance: 100 mm 3.937 in

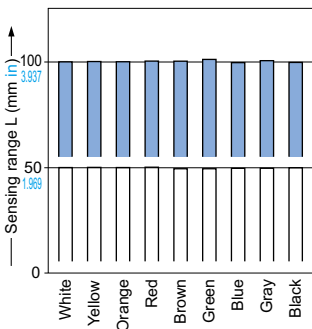


Emitted beam



Correlation between color

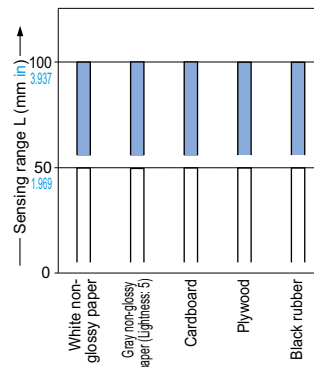
(50 × 50 mm 1.969 × 1.969 in construction paper) and sensing range



These bars indicate the sensing range with the respective colors when the distance adjuster is set to a sensing range of 100 mm 3.937 in and 50 mm 1.969 in long, respectively, with white color. The sensing range also varies depending on material.

Correlation between material

(50 × 50 mm 1.969 × 1.969 in) and sensing range

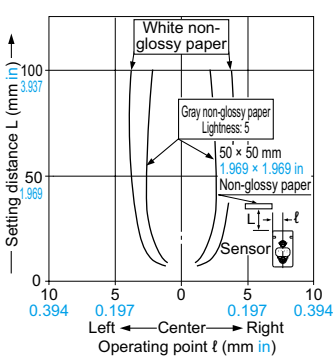


These bars indicate the sensing range with the respective objects when the distance adjuster is set to a sensing range of 100 mm 3.937 in and 50 mm 1.969 in long, respectively, with white non-glossy paper.

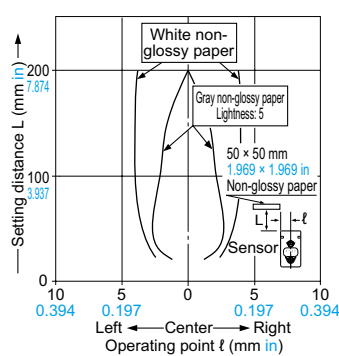
CX-442 Adjustable range reflective type

Sensing fields

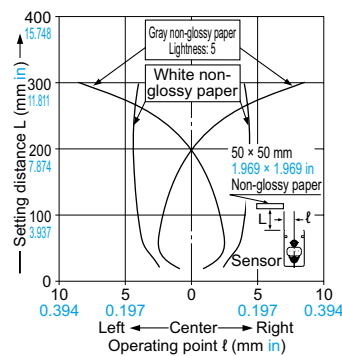
Setting distance: 100 mm 3.937 in



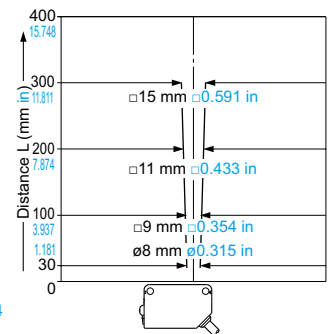
Setting distance: 200 mm 7.874 in



Setting distance: 300 mm 11.811 in

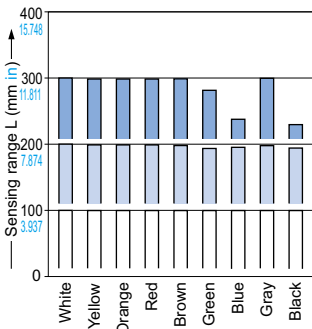


Emitted beam



Correlation between color

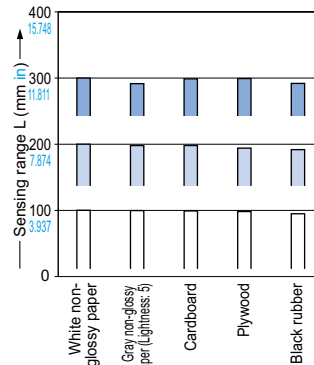
(50 × 50 mm 1.969 × 1.969 in construction paper) and sensing range



These bars indicate the sensing range with the respective colors when the distance adjuster is set to a sensing range of 300 mm 11.811 in, 200 mm 7.874 in and 100 mm 3.937 in long, respectively, with white color. The sensing range also varies depending on material.

Correlation between material

(50 × 50 mm 1.969 × 1.969 in) and sensing range




These bars indicate the sensing range with the respective objects when the distance adjuster is set to a sensing range of 300 mm 11.811 in, 200 mm 7.874 in and 100 mm 3.937 in long, respectively, with white non-glossy paper.

PRECAUTIONS FOR PROPER USE

Refer to p.986~ for general precautions.

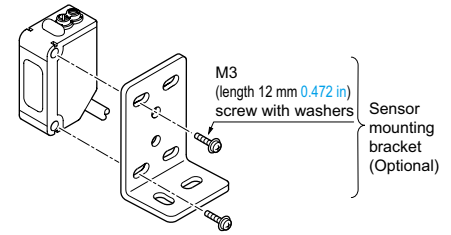
All models



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

Mounting

- The tightening torque should be 0.5 N·m or less.



Others

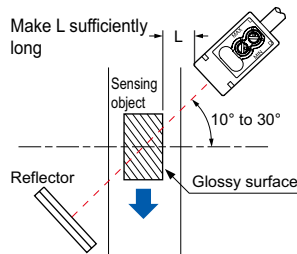
- Do not use during the initial transient time (50 ms) after the power supply is switched on.

CX-49□ CX-48□

Retroreflective type sensor (excluding CX-491)

- 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.



Retroreflective type sensor with polarizing filters (CX-491)

- 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

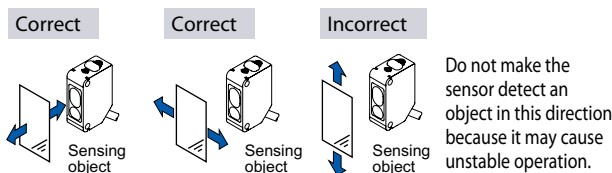
Steps

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

CX-44□

Mounting

- Care must be taken regarding the sensor mounting direction with respect to the object's direction of movement.

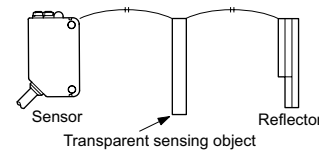


- When detecting a specular object (aluminum or copper foil, etc.) or an object having a glossy surface or coating, please take care that there are cases when the object may not be detected due to a change in angle, wrinkles on the object surface, etc.

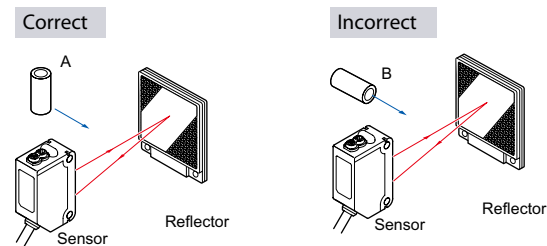
CX-48□

Retroreflective type sensor for transparent object sensing (CX-48)

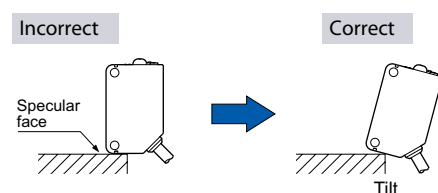
- Optimum sensing is possible when the position of the transparent sensing object is set at the center of the sensor and the reflector. If the sensing position is set near the sensor or the reflector, the sensing may be unstable. In this case, set the sensing position at the center of the sensor and the reflector.



- When the sensor detects an uneven plastic receptacle or glass bottle, the received-light amount may differ with the sensing position or direction. Adjust the sensitivity after confirming the stable sensing condition by turning the sensing object, etc.
- When sensing pipe-shaped transparent sensing object, set it in a standing, not lying, position as shown in Figure A. The sensor may fail to detect a lying object as shown in Figure B.



- When a specular body is present below the sensor, use the sensor by tilting it slightly upwards to avoid wrong operation.



- If a specular body is present in the background, wrong operation may be caused due to a small change in the angle of the background body. In that case, install the sensor at an inclination and confirm the operation with the actual sensing object.

- FIBER SENSORS
- LASER SENSORS
- PHOTO-ELECTRIC SENSORS
- MICRO PHOTO-ELECTRIC SENSORS
- AREA SENSORS
- SAFETY COMPONENTS
- PRESSURE SENSORS
- INDUCTIVE PROXIMITY SENSORS
- PARTICULAR USE SENSORS
- SENSOR OPTIONS
- WIRE-SAVING SYSTEMS
- MEASUREMENT SENSORS
- STATIC CONTROL DEVICES
- LASER MARKERS
- Selection Guide
- Amplifier Built-in
- CX-400
- EX-10
- EX-20
- EX-30
- EX-40
- EQ-30
- EQ-500
- MQ-W
- RX-L5200
- RX
- CY
- PX-2
- RT-610
- Power Supply Built-in
- NX5
- VF
- Amplifier-separated
- SU-7 / SH
- SS-A5 / SH
- Other Products

PRECAUTIONS FOR PROPER USE

Refer to p.986~ for general precautions.

FIBER SENSORS

LASER SENSORS

PHOTO-ELECTRIC SENSORS

MICRO PHOTO-ELECTRIC SENSORS

AREA SENSORS

SAFETY COMPONENTS

PRESSURE SENSORS

INDUCTIVE PROXIMITY SENSORS

PARTICULAR USE SENSORS

SENSOR OPTIONS

WIRE-SAVING SYSTEMS

MEASUREMENT SENSORS

STATIC CONTROL DEVICES

LASER MARKERS

Selection Guide

Amplifier Built-in

CX-400

EX-10

EX-20

EX-30

EX-40

EQ-30

EQ-500

MQ-W

RX-LS200

RX

CY

PX-2

RT-610

Power Supply Built-in

NX5

VF

Amplifier-separated

SU-7 / SH

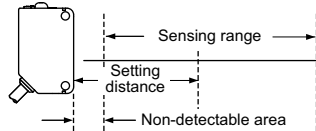
SS-A5 / SH

Other Products

CX-440

Mounting

- Take care that there is a non-detectable area right in front of the sensor.
- Depending on whether you select the BGS or FGS function, the output operation changes as follows.



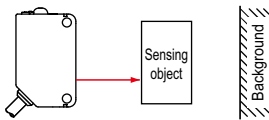
| | | | |
|-----|------|-----------------|-----|
| BGS | L-ON | [Sensing range] | ON |
| | D-ON | [Sensing range] | OFF |
| FGS | L-ON | [Sensing range] | ON |
| | D-ON | [Sensing range] | OFF |

BGS / FGS functions

- This sensor incorporates BGS / FGS functions. Select either BGS or FGS function depending on the positions of the background and sensing object.

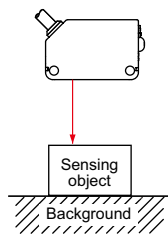
BGS function

- This function is used when the sensing object is apart from the background.



FGS function

- This function is used when the sensing object contacts the background or the sensing object is glossy, etc.



Distance adjustment

- When this product is used, be sure to carry out the distance adjustment.
- Since the distance adjuster of this sensor is a 5-turn adjuster, when the point A and B adjusted as explained in the table right, there may be more than 1 turn between the point A and B. Therefore, make sure to remember the turns of both points to find the optimum position.
- Be sure to wire the sensing mode selection input (Pink / 2) before distance adjustment. If the wiring is done after the distance adjustment, the sensing area is changed.

- Turn the distance adjuster gradually and lightly with a "minus" screwdriver (please arrange separately). In order to protect itself, the distance adjuster idles if turned fully. If the adjuster is idled when distance adjustment is done, carry out the adjustment again.

When using the BGS function

<When a sensing object is moving right or left to the sensor>

| Step | Description | Distance adjuster |
|------|---|-------------------|
| ① | Turn the distance adjuster fully counterclockwise to the minimum sensing range position. (CX-441 /443 /444 : 20 mm 0.787 in approx., CX-442 : 40 mm 1.575 in approx.) | Turn fully |
| ② | Place an object at the required distance from the sensor, turn the distance adjuster gradually clockwise, and find out point A where the sensor changes to the detecting condition. | |
| ③ | Remove the object, turn the adjuster clockwise further until the sensor goes into the detecting state again. Once it has entered, turn the distance adjuster backward until the sensor returns to the non-detecting condition. This position is designated as point B. When the sensor does not go into the detecting condition even if the adjuster is turned fully clockwise, the position where the adjuster was fully turned is regarded as the point B. (There may be more than 1 turn between point A and B since this sensor incorporates a 5-turn adjuster.) | |
| ④ | The optimum position to stably detect objects is the center point between A and B. | |

<When a sensing object is approaching / moving away from the sensor>

- Follow only steps ① and ② since the sensing point may change depending on the sensing object, be sure to check the operation with the actual sensing object.

When using the FGS function

| Step | Description | Distance adjuster |
|------|---|-------------------|
| ① | Turn the distance adjuster fully clockwise to the maximum sensing range position. (CX-441 /443 : 50 mm 1.969 in approx., CX-444 : 100 mm 3.937 in approx., CX-442 : 300 mm 11.811 in approx.) | Turn fully |
| ② | In the state where the sensor detects the background, turn the distance adjuster gradually counterclockwise, and find out point A where the sensor changes to the non-detecting condition. | |
| ③ | Place an object at the required distance from the sensor, turn the adjuster counterclockwise further until the sensor goes into the non-detecting condition again. Once entered, turn the distance adjuster backward until the sensor returns to the detecting condition. This position is designated as point B. When the sensor does not go into the non-detecting condition even if the adjuster is turned fully counterclockwise, the position where the adjuster was fully turned is regarded as the point B. (There may be more than 1 turn between point A and B since this sensor incorporates a 5-turn adjuster.) | |
| ④ | The optimum position to stably detect objects is the center point between A and B. | |

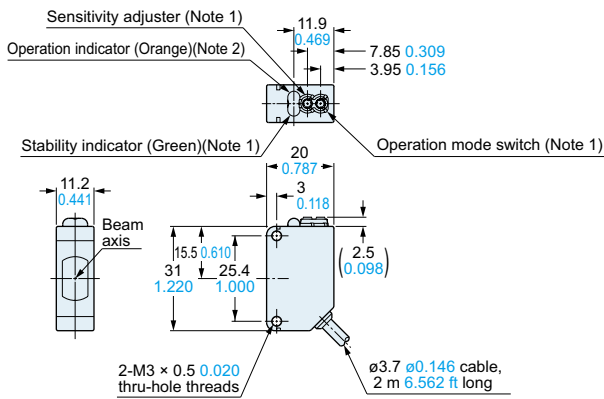
Others

- Its distance adjuster is mechanically operated. Do not drop; avoid other shocks.

DIMENSIONS (Unit: mm in)

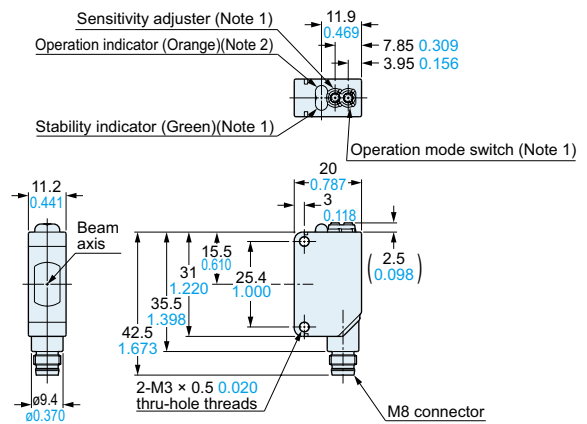
The CAD data in the dimensions can be downloaded from the SUNX website: <http://www.sunx.com>

CX-41 Sensor



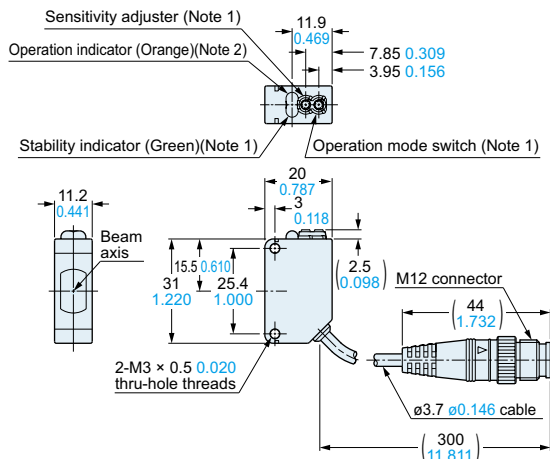
Notes: 1) Not incorporated on the emitter.
2) It is the power indicator (green) on the emitter.

CX-41-Z Sensor



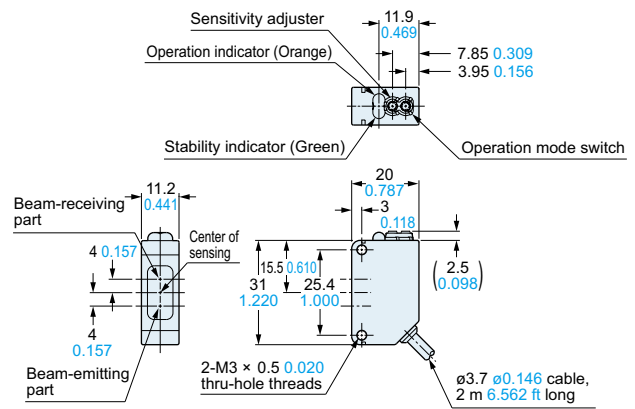
Notes: 1) Not incorporated on the emitter.
2) It is the power indicator (green) on the emitter.

CX-41-J Sensor



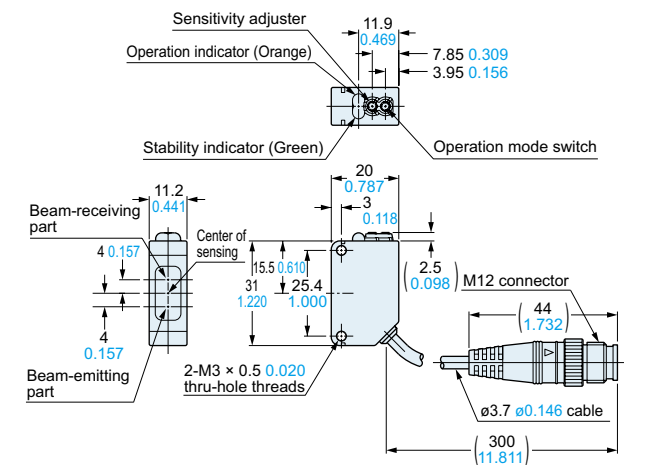
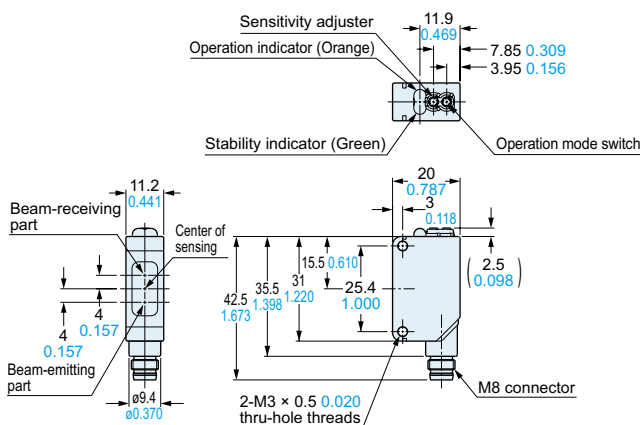
Notes: 1) Not incorporated on the emitter.
2) It is the power indicator (green) on the emitter.

CX-49 **CX-48** **CX-42** Sensor



CX-49-Z **CX-48-Z** **CX-42-Z** Sensor

CX-49-J **CX-48-J** **CX-42-J** Sensor



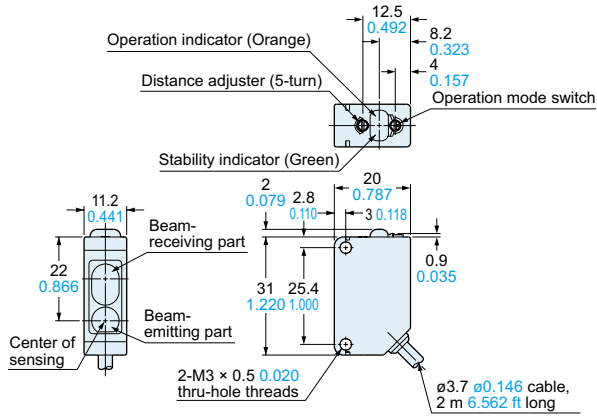
| |
|------------------------------|
| FIBER SENSORS |
| LASER SENSORS |
| PHOTO-ELECTRIC SENSORS |
| MICRO PHOTO-ELECTRIC SENSORS |
| AREA SENSORS |
| SAFETY COMPONENTS |
| PRESSURE SENSORS |
| INDUCTIVE PROXIMITY SENSORS |
| PARTICULAR USE SENSORS |
| SENSOR OPTIONS |
| WIRE-SAVING SYSTEMS |
| MEASUREMENT SENSORS |
| STATIC CONTROL DEVICES |
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| EX-30 |
| EX-40 |
| EQ-30 |
| EQ-500 |
| MQ-W |
| RX-LS200 |
| RX |
| CY |
| PX-2 |
| RT-610 |
| Power Supply Built-in |
| NX5 |
| VF |
| Amplifier-separated |
| SU-7 / SH |
| SS-A5 / SH |
| Other Products |

DIMENSIONS (Unit: mm in)

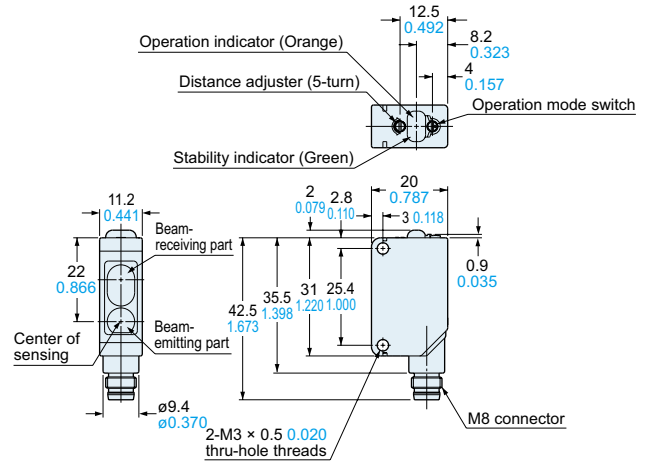
The CAD data in the dimensions can be downloaded from the SUNX website: <http://www.sunx.com>

- FIBER SENSORS
- LASER SENSORS
- PHOTO-ELECTRIC SENSORS
- MICRO PHOTO-ELECTRIC SENSORS
- AREA SENSORS
- SAFETY COMPONENTS
- PRESSURE SENSORS
- INDUCTIVE PROXIMITY SENSORS
- PARTICULAR USE SENSORS
- SENSOR OPTIONS
- WIRE- SAVING SYSTEMS
- MEASURE- MENT SENSORS
- STATIC CONTROL DEVICES
- LASER MARKERS
- Selection Guide
- Amplifier Built-in
- CX-400**
- EX-10**
- EX-20**
- EX-30**
- EX-40**
- EQ-30**
- EQ-500**
- MQ-W**
- RX-LS200**
- RX**
- CY**
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- Power Supply Built-in
- NX5**
- VF**
- Amplifier-separated
- SU-7 / SH**
- SS-A5 / SH**
- Other Products

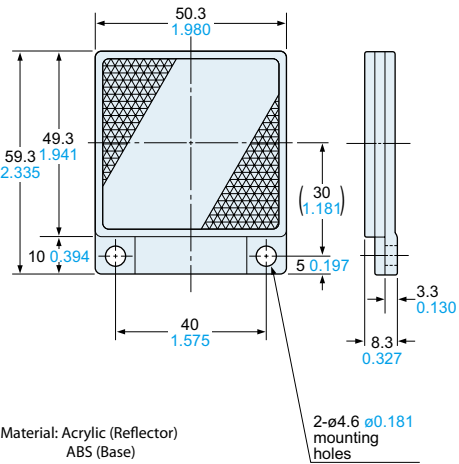
CX-44 Sensor



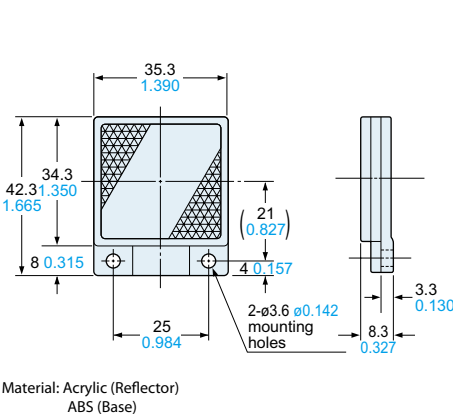
CX-44-Z Sensor



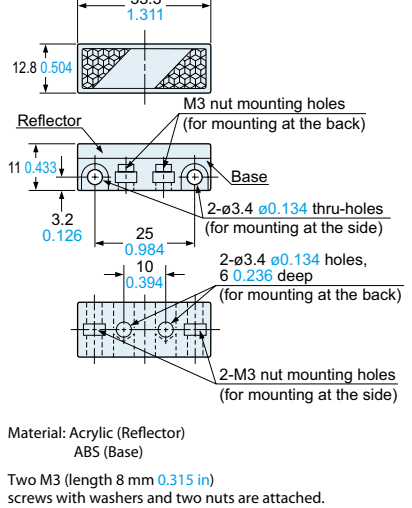
RF-230 Reflector (Accessory for the retroreflective type sensor)



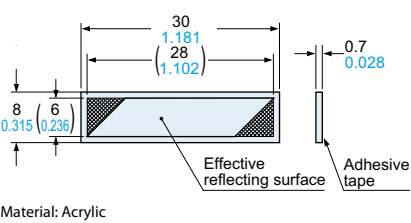
RF-220 Reflector (Optional)



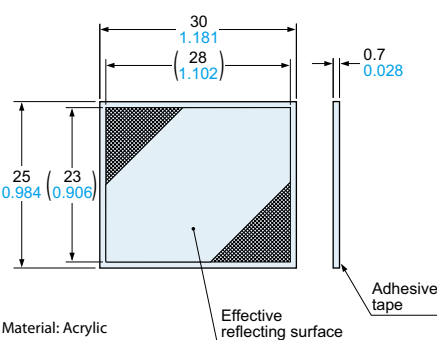
RF-210 Reflector (Optional)



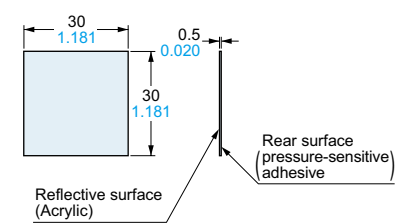
RF-11 Reflective tape (Optional)



RF-12 Reflective tape (Optional)



RF-13 Reflective tape (Optional)

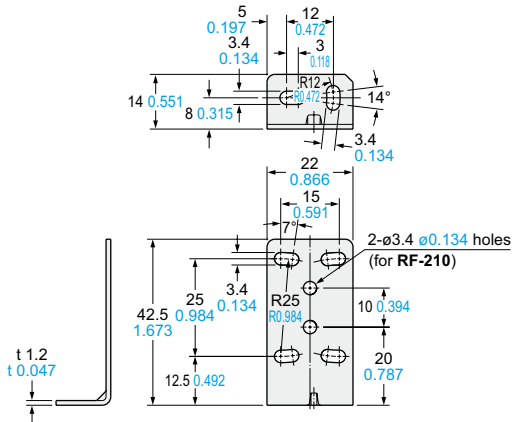


DIMENSIONS (Unit: mm in)

The CAD data in the dimensions can be downloaded from the SUNX website: <http://www.sunx.com>

MS-CX2-1

Sensor mounting bracket (Optional)

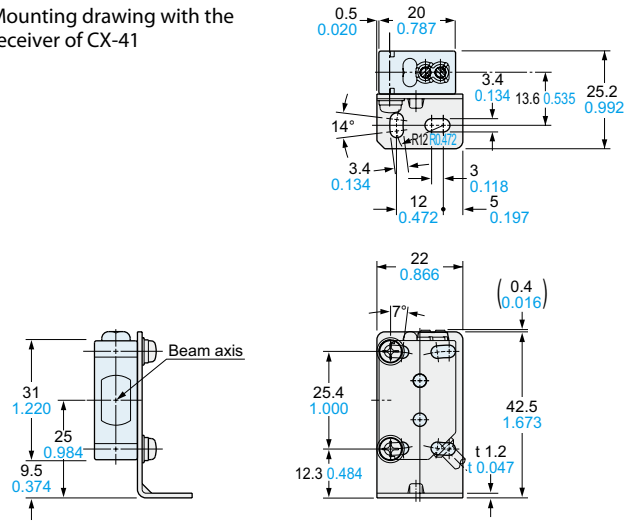


Material: Stainless steel (SUS304)

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

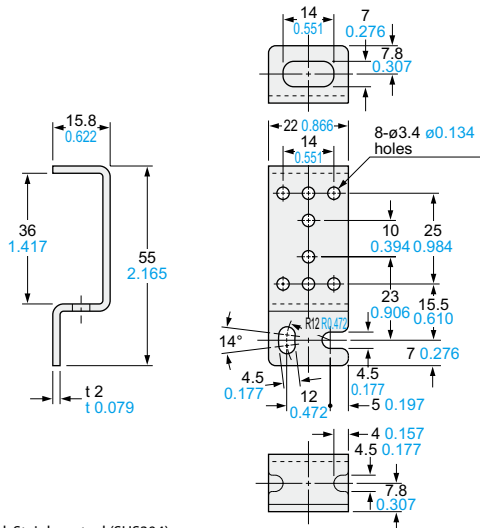
Assembly dimensions

Mounting drawing with the receiver of CX-41



MS-CX2-2

Sensor mounting bracket (Optional)

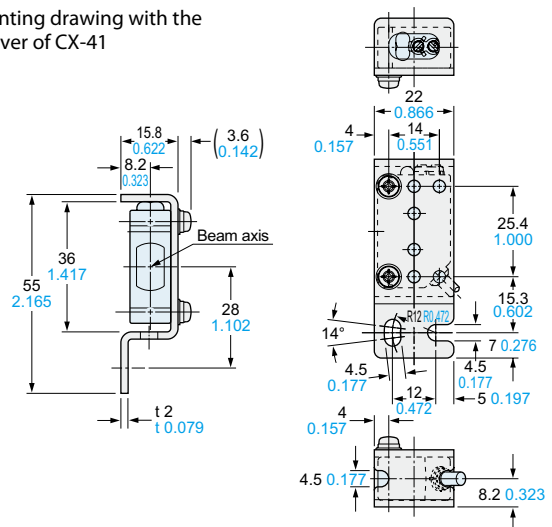


Material: Stainless steel (SUS304)

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

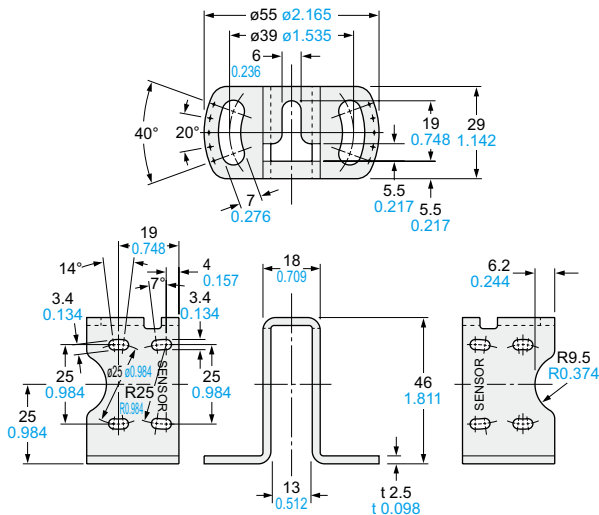
Assembly dimensions

Mounting drawing with the receiver of CX-41



MS-CX2-4

Sensor mounting bracket (Optional)

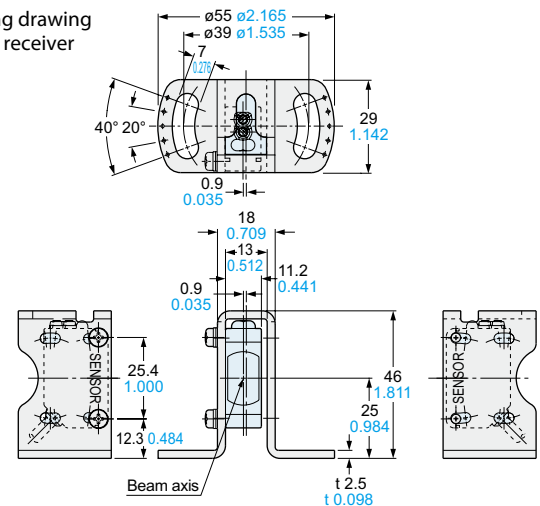


Material: Stainless steel (SUS304)

Two M3 (length 14 mm 0.551 in) screws with washers are attached.

Assembly dimensions

Mounting drawing with the receiver of CX-41



| |
|------------------------------|
| FIBER SENSORS |
| LASER SENSORS |
| PHOTO-ELECTRIC SENSORS |
| MICRO PHOTO-ELECTRIC SENSORS |
| AREA SENSORS |
| SAFETY COMPONENTS |
| PRESSURE SENSORS |
| INDUCTIVE PROXIMITY SENSORS |
| PARTICULAR USE SENSORS |
| SENSOR OPTIONS |
| WIRE-SAVING SYSTEMS |
| MEASUREMENT SENSORS |
| STATIC CONTROL DEVICES |
| LASER MARKERS |
| Selection Guide |
| Amplifier Built-in |
| CX-400 |
| EX-10 |
| EX-20 |
| EX-30 |
| EX-40 |
| EQ-30 |
| EQ-500 |
| MQ-W |
| RX-LS200 |
| RX |
| CY |
| PX-2 |
| RT-610 |
| Power Supply Built-in |
| NX5 |
| VF |
| Amplifier-separated |
| SU-7 / SH |
| SS-A5 / SH |
| Other Products |

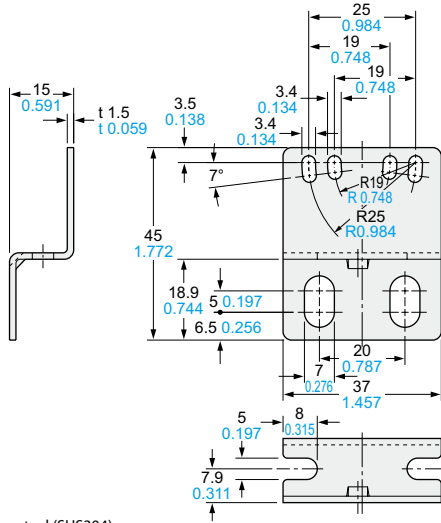
DIMENSIONS (Unit: mm in)

The CAD data in the dimensions can be downloaded from the SUNX website: <http://www.sunx.com>

| |
|------------------------------|
| FIBER SENSORS |
| LASER SENSORS |
| PHOTO-ELECTRIC SENSORS |
| MICRO PHOTO-ELECTRIC SENSORS |
| AREA SENSORS |
| SAFETY COMPONENTS |
| PRESSURE SENSORS |
| INDUCTIVE PROXIMITY SENSORS |
| PARTICULAR USE SENSORS |
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| EX-30 |
| EX-40 |
| EQ-30 |
| EQ-500 |
| MQ-W |
| RX-LS200 |
| RX |
| CY |
| PX-2 |
| RT-610 |
| Power Supply Built-in |
| NX5 |
| VF |
| Amplifier-separated |
| SU-7 / SH |
| SS-A5 / SH |
| Other Products |

MS-CX2-5

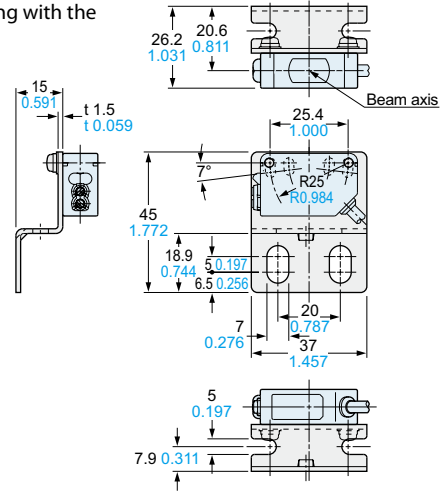
Sensor mounting bracket (Optional)



Material: Stainless steel (SUS304)
Two M3 (length 12 mm 0.472 in) screws with washers are attached.

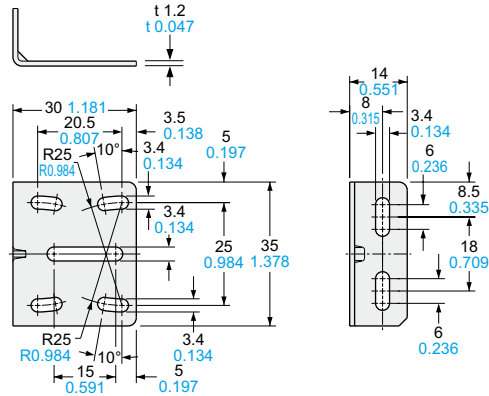
Assembly dimensions

Mounting drawing with the receiver of CX-41



MS-CX-3

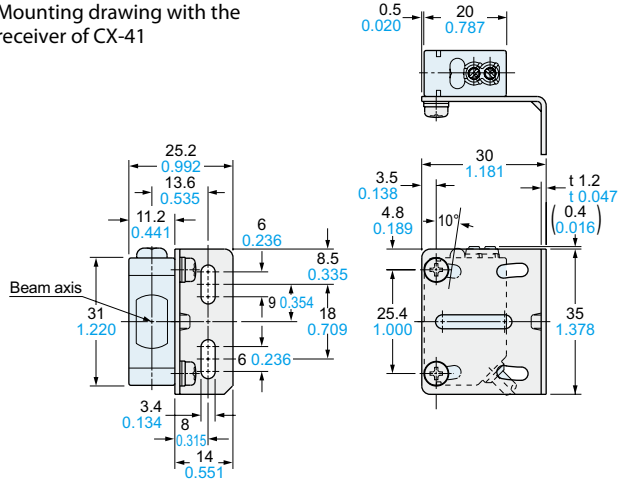
Sensor mounting bracket (Optional)



Material: Stainless steel (SUS304)
Two M3 (length 12 mm 0.472 in) screws with washers are attached.

Assembly dimensions

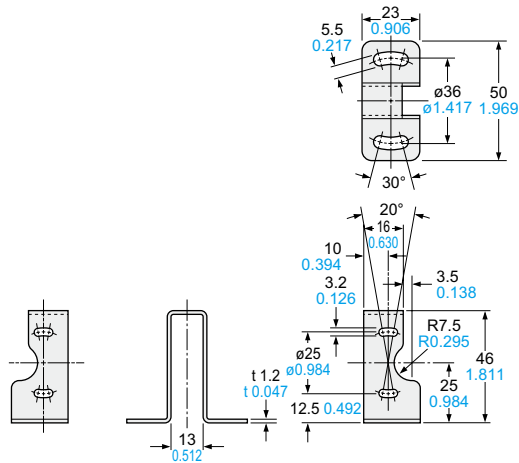
Mounting drawing with the receiver of CX-41



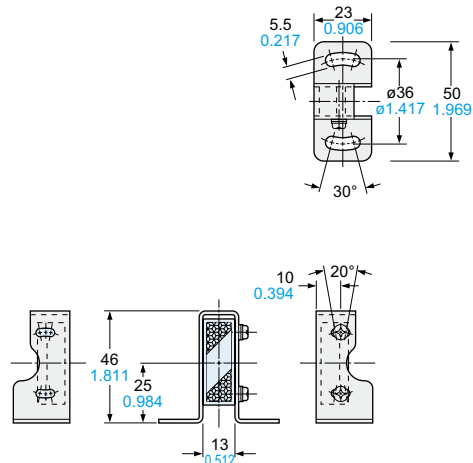
MS-RF21-1

Reflector mounting bracket for RF-210 (Optional)

Assembly dimensions



Material: Stainless steel (SUS304)
Two M3 (length 12 mm 0.472 in) screws with washers are attached.



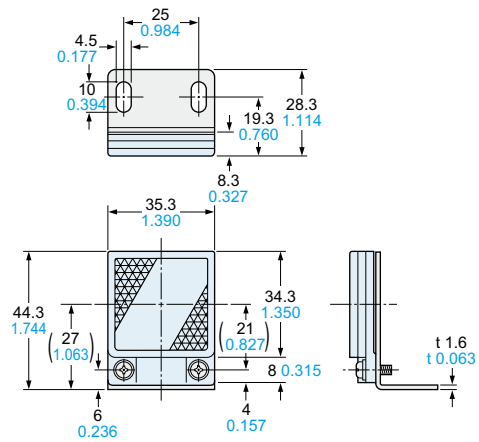
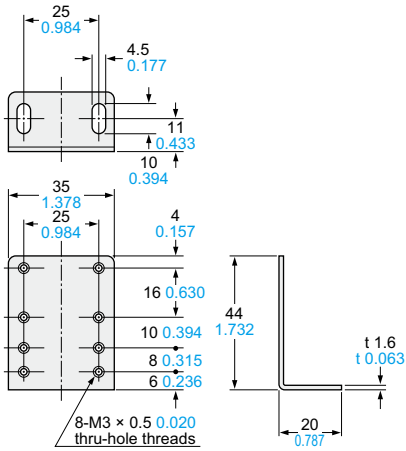
DIMENSIONS (Unit: mm in)

The CAD data in the dimensions can be downloaded from the SUNX website: <http://www.sunx.com>

MS-RF22

Reflector mounting bracket for RF-220 (Optional)

Assembly dimensions



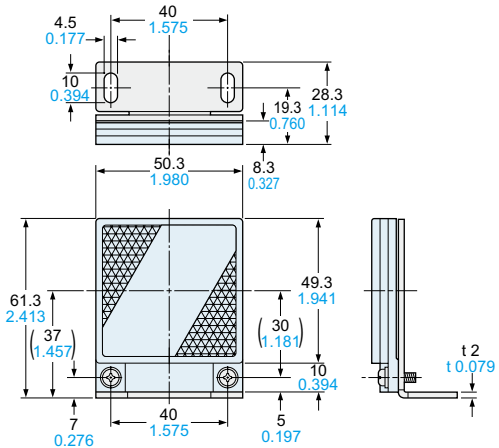
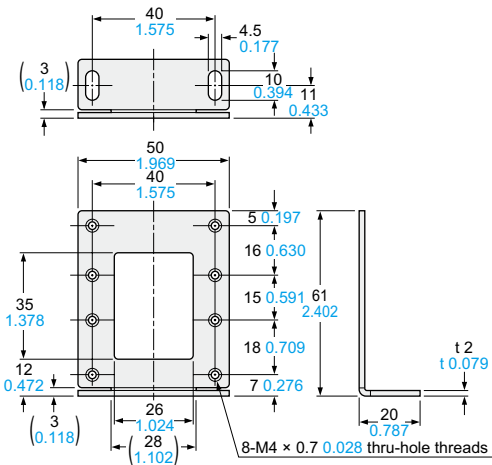
Material: Cold rolled carbon steel (SPCC)
(Uni-chrome plated)

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

MS-RF23

Reflector mounting bracket for RF-230 (Optional)

Assembly dimensions



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

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

FIBER SENSORS

LASER SENSORS

PHOTO-ELECTRIC SENSORS

MICRO PHOTO-ELECTRIC SENSORS

AREA SENSORS

SAFETY COMPONENTS

PRESSURE SENSORS

INDUCTIVE PROXIMITY SENSORS

PARTICULAR USE SENSORS

SENSOR OPTIONS

WIRE- SAVING SYSTEMS

MEASURE- MENT SENSORS

STATIC CONTROL DEVICES

LASER MARKERS

Selection Guide

Amplifier Built-in

CX-400

EX-10

EX-20

EX-30

EX-40

EQ-30

EQ-500

MQ-W

RX-LS200

RX

CY

PX-2

RT-610

Power Supply Built-in

NX5

VF

Amplifier-separated

SU-7 / SH

SS-A5 / SH

Other Products