

EX-10 SERIES

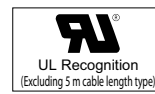
Related Information

General terms and conditionsP.1
 Glossary of terms / General precautionsP.983~ / P.986~

Sensor selection guideP.11~ / P.229~
 Korea's S-mark..... P.1034~



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



Amplifier built-in extraordinarily small and slim size

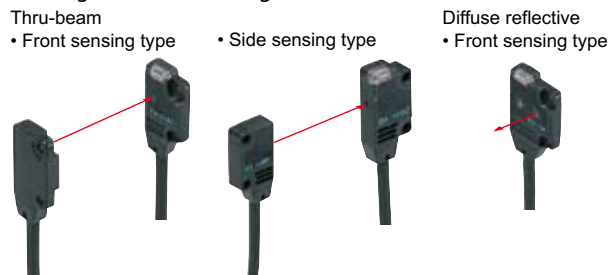
Smallest body, just 3.5 mm 0.138 in thick

It can be mounted in a very small space as its size is just $W10 \times H14.5 \times D3.5$ mm
 $W0.394 \times H0.571 \times D0.138$ in
 (thru-beam, front sensing type).



Flexible mounting

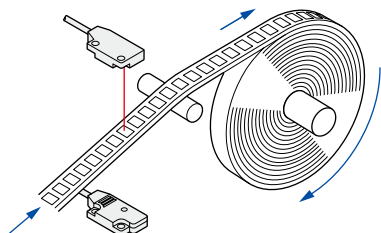
The diffuse reflective type sensor is front sensing and is so thin that it gives an impression of being just pasted on the mounting base. The thru-beam type is available as front sensing type, as well as, side sensing type, allowing flexible mounting.



BASIC PERFORMANCE

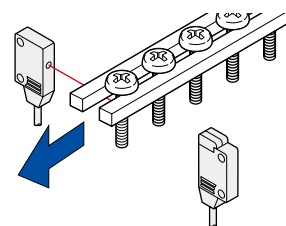
High-speed response time: 0.5 ms

The sensor is suitable for detecting small and high-speed traveling objects.

Minimum sensing object: $\phi 1$ mm $\phi 0.039$ in

EX-11(E) EX-15(E)

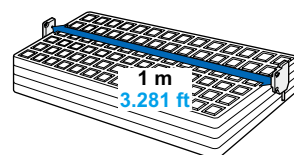
EX-11, EX-11E, EX-15 and EX-15E are incorporated with $\phi 1$ mm $\phi 0.039$ in slit masks so that $\phi 1$ mm $\phi 0.039$ in, or more, object can be detected. Hence, they are suitable for precise positioning or small parts detection.



Long sensing range: 1 m 3.281 ft

EX-19

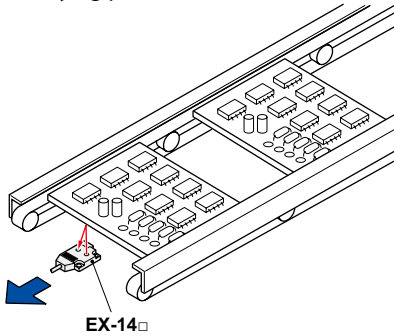
A sensing range of 1 m 3.281 ft has been realized with a slim size of just 3.5 mm 0.138 in. It can be used to detect even wide IC trays.



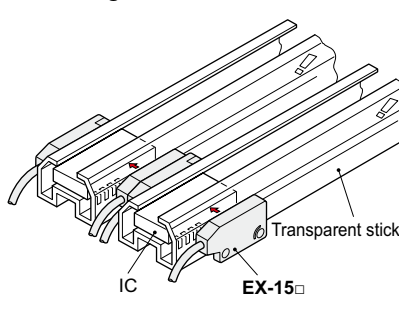
Selection Guide
Amplifier Built-in
CX-400
EX-10
EX-20
EX-30
EX-40
EQ-30
EQ-500
MQ-W
RX-LS200
RX
CY
PX-2
RT-610
Power Supply Built-in
NX5
VF
Amplifier-separated
SU-7 / SH
SS-A5 / SH
Other Products

ORDER GUIDE
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P.260I/O CIRCUIT DIAGRAMS
P.261~SENSING CHARACTERISTICS
P.262~PRECAUTIONS FOR PROPER USE
P.264DIMENSIONS
P.265~**APPLICATIONS**

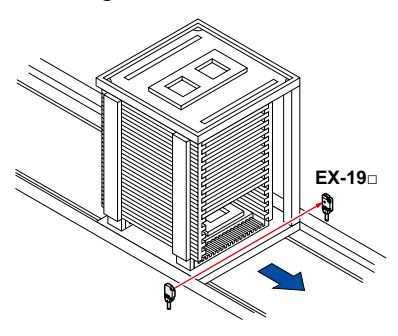
Verifying position of PCBs



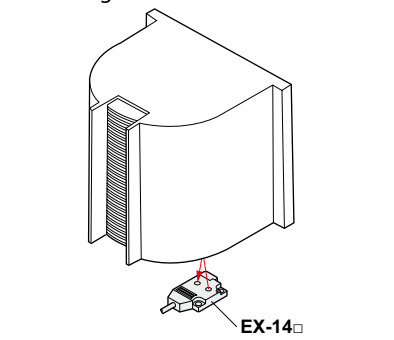
Detecting ICs



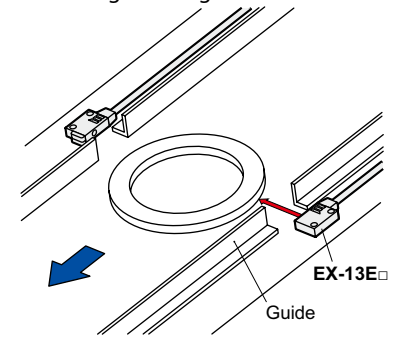
Detecting PCB rack



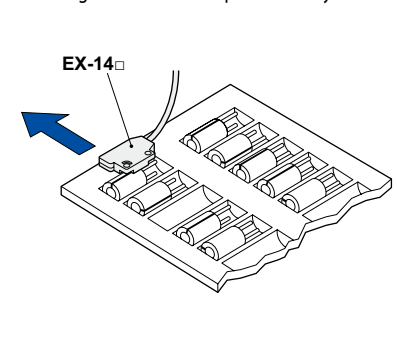
Detecting wafer cassette



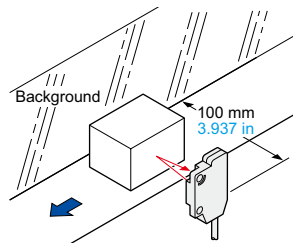
Detecting thin ring



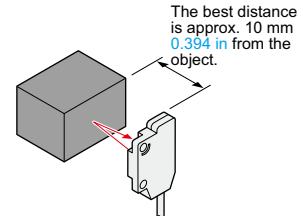
Checking for absence of capacitor in tray

**BASIC PERFORMANCE****Background suppression****EX-14****Hardly affected by background**

Even a specular background separated by 100 mm 3.937 in, or more, is not detected. (However, the background should be directly opposite. A spherical or curved background may be detected.)

**Black object reliably detected**

It can reliably detect dark color objects since it is convergent reflective type.

**ENVIRONMENTAL RESISTANCE****Waterproof**

The sensor can be hosed down because of its IP67 construction and the non-corrosive stainless steel mounting bracket.

Note: However, take care that if it is exposed to water splashes during operation, it may detect a water drop itself.

Ten times durable**EX-R**

Flexible cable on EX- R is 10 times as durable as conventional model. It is most suitable for moving parts, such as robot arm, etc.

FUNCTIONS**Bright 2-color indicator**

A convenient 2-color indicator has been incorporated in the miniature body.



2-color indicator
(Red: Operation indicator)
(Green: Stability indicator)

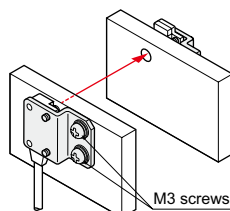
FIBER
SENSORSLASER
SENSORSPHOTOELECTRIC
SENSORSMICRO
PHOTOELECTRIC
SENSORSAREA
SENSORSSAFETY
COMPONENTSPRESSURE
SENSORSINDUCTIVE
PROXIMITY
SENSORSPARTICULAR
USE SENSORSSENSOR
OPTIONSWIRE-SAVING
SYSTEMSMEASUREMENT
SENSORSSTATIC CONTROL
DEVICESLASER
MARKERSSelection
GuideAmplifier
Built-in**CX-400****EX-10****EX-20****EX-30****EX-40****EQ-30****EQ-500****MQ-W****RX-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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SENSORSPHOTOELECTRIC
SENSORSMICRO
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Built-in**NX5****VF**Amplifier-
separated**SU-7 / SH****SS-A5 / SH**Other
Products**MOUNTING / SIZE****Mountable with M3 screws**

Non-corrosive stainless steel type mounting bracket is also available.

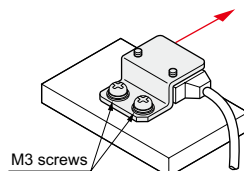
- MS-EX10-1
[Cold rolled carbon steel (SPCC)]

MS-EX10-11
[Stainless steel (SUS304)]
(mounting bracket for the front
sensing type)



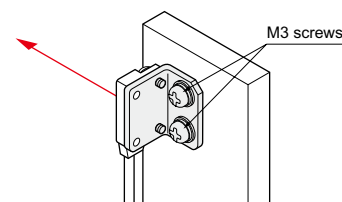
- MS-EX10-2
[Cold rolled carbon steel (SPCC)]

MS-EX10-12
[Stainless steel (SUS304)]
(mounting bracket for the side
sensing type)



- MS-EX10-3
[Cold rolled carbon steel (SPCC)]

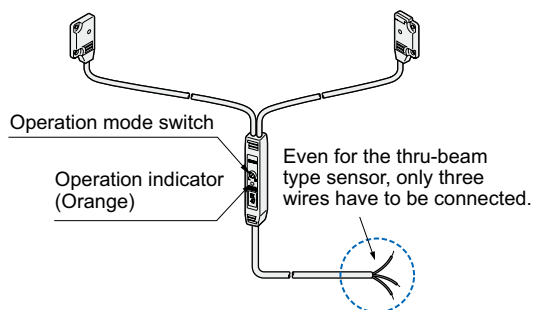
MS-EX10-13
[Stainless steel (SUS304)]
(L-shaped mounting bracket)

**Red beam makes beam alignment easy**

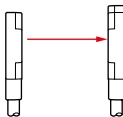
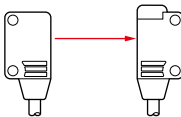
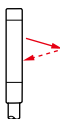
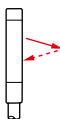
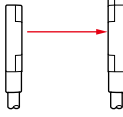
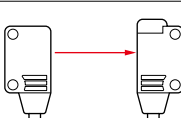

The red LED beam projected from the emitter helps you to align the sensor heads.

VARIETIES**Operation mode switch****EX-15□/17□**

Thru-beam type sensor incorporated with an operation mode switch on the bifurcation is also available. It helps you to test the operability before start-up.



ORDER GUIDE

Type	Appearance	Sensing range	Model No. (Note 2)	Output operation	Output
NPN output	Thru-beam	Front sensing 	150 mm 5.906 in	EX-11A	Light-ON
				EX-11B	Dark-ON
			500 mm 19.685 in	EX-13A	Light-ON
				EX-13B	Dark-ON
			1 m 3.281 ft	EX-19A	Light-ON
				EX-19B	Dark-ON
	Side sensing 	150 mm 5.906 in	EX-15	Switchable either Light-ON or Dark-ON	NPN open-collector transistor
			500 mm 19.685 in	EX-17	
			500 mm 19.685 in	EX-17W	
			150 mm 5.906 in	EX-11EA	
				EX-11EB	
			500 mm 19.685 in	EX-13EA	
	Convergent reflective (Diffused beam type)	Front sensing 	150 mm 5.906 in	EX-13EB	
			150 mm 5.906 in	EX-15E	
			500 mm 19.685 in	EX-17E	
	Convergent reflective (Diffused beam type)	Front sensing 	2 to 25 mm 0.079 to 0.984 in (Note 1) (Convergent point: 10 mm 0.394 in)	EX-14A	Light-ON
				EX-14B	Dark-ON
PNP output	Thru-beam	Front sensing 	150 mm 5.906 in	EX-11A-PN	Light-ON
				EX-11B-PN	Dark-ON
			500 mm 19.685 in	EX-13A-PN	Light-ON
				EX-13B-PN	Dark-ON
			1 m 3.281 ft	EX-19A-PN	Light-ON
				EX-19B-PN	Dark-ON
	Side sensing 	150 mm 5.906 in	EX-11EA-PN	Light-ON	PNP open-collector transistor
				EX-11EB-PN	
			500 mm 19.685 in	EX-13EA-PN	
				EX-13EB-PN	
	Convergent reflective (Diffused beam type)	Front sensing 	2 to 25 mm 0.079 to 0.984 in (Note 1) (Convergent point: 10 mm 0.394 in)	EX-14A-PN	Light-ON
				EX-14B-PN	Dark-ON

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

- Notes: 1) The sensor does not detect even a specular background if it is separated by 100 mm 3.937 in or more. (However, the background should be directly opposite. A spherical or curved background may be detected.)
 2) The model No. with suffix "P" shown on the label affixed to the thru-beam type sensor is the emitter, "D" shown on the label is the receiver.
 (e.g.) Emitter of EX-11A: EX-11P, Receiver of EX-11A: EX-11AD

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SENSORSPHOTO-
ELECTRIC
SENSORSMICRO
PHOTO-
ELECTRIC
SENSORSAREA
SENSORSSAFETY
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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

ORDER GUIDE

Flexible cable type

Flexible cable type is also available for NPN output type. (excluding sensor with operation mode switch on the bifurcation EX-15 /17 and series connection type EX-17W.)

When ordering this type, suffix "R" to the model No.

(e.g.) Flexible cable type of EX-11A is "EX-11A-R".

5 m 16.404 ft cable length type

5 m 16.404 ft cable length type (standard: 2 m 6.562 ft) is also available for NPN output type. (excluding series connection type EX-17W and flexible cable type.)

When ordering this type, suffix "C5" to the model No.

(e.g.) 5 m 16.404 ft cable length type of EX-11A is "EX-11A-C5".

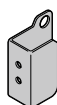
OPTIONS

Designation	Model No.	Description
Sensor mounting bracket	MS-EX10-1	Mounting bracket for the front sensing type sensor [Cold rolled carbon steel (SPCC)] (The thru-beam type sensor needs two brackets.)
	MS-EX10-2	Mounting bracket for the side sensing type sensor [Cold rolled carbon steel (SPCC)] (The thru-beam type sensor needs two brackets.)
	MS-EX10-3	L-shaped mounting bracket sensor [Cold rolled carbon steel (SPCC)] (The thru-beam type sensor needs two brackets.)
	MS-EX10-11	Mounting bracket for the front sensing type sensor [Stainless steel (SUS304)] (The thru-beam type sensor needs two brackets.)
	MS-EX10-12	Mounting bracket for the side sensing type sensor [Stainless steel (SUS304)] (The thru-beam type sensor needs two brackets.)
	MS-EX10-13	L-shaped mounting bracket [Stainless steel (SUS304)] (The thru-beam type sensor needs two brackets.)
Slit mask	OS-EX10-12 (Slit size $\phi 1.2$ mm $\phi 0.047$ in)	Slit on one side <ul style="list-style-type: none"> Sensing range: 600 mm 23.622 in [EX-19] 250 mm 9.843 in [EX-13 , EX-17] Min. sensing object: $\phi 2$ mm $\phi 0.079$ in
		Slit on both sides <ul style="list-style-type: none"> Sensing range: 400 mm 15.748 in [EX-19] 200 mm 7.874 in [EX-13 , EX-17] Min. sensing object: $\phi 1.2$ mm $\phi 0.047$ in
	OS-EX10-15 (Slit size $\phi 1.5$ mm $\phi 0.059$ in)	Slit on one side <ul style="list-style-type: none"> Sensing range: 800 mm 31.496 in [EX-19] 350 mm 13.780 in [EX-13] Min. sensing object: $\phi 2$ mm $\phi 0.079$ in
		Slit on both sides <ul style="list-style-type: none"> Sensing range: 500 mm 19.685 in [EX-19] 300 mm 11.811 in [EX-13] Min. sensing object: $\phi 1.5$ mm $\phi 0.059$ in
	OS-EX10E-12 (Slit size $\phi 1.2$ mm $\phi 0.047$ in)	Slit on one side <ul style="list-style-type: none"> Sensing range: 250 mm 9.843 in [EX-13E , EX-17E] Min. sensing object: $\phi 2$ mm $\phi 0.079$ in
		Slit on both sides <ul style="list-style-type: none"> Sensing range: 200 mm 7.874 in [EX-13E , EX-17E] Min. sensing object: $\phi 1.2$ mm $\phi 0.047$ in
Sensor checker (Note)	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.
Mounting screw	MS-M2	Mounting screws with washers (50 pcs. lot). It can mount securely as it is spring washer attached.

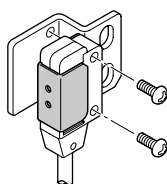
Note: Refer to p.800 for details of the sensor checker CHX-SC2.

Slit mask

- OS-EX10-12
- OS-EX10-15
- OS-EX10E-12



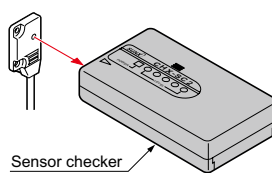
Example of mounting
(OS-EX10E-12)



Tighten along with the sensor mounting bracket.

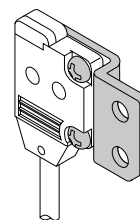
Sensor checker

- CHX-SC2



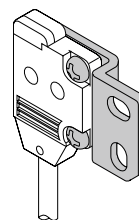
Sensor mounting bracket

- MS-EX10-1



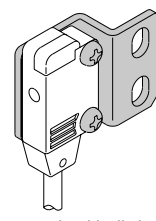
Material: Cold rolled carbon steel (SPCC) (Uni-chrome plated)
Two M2 (length 4 mm 0.157 in) pan head screws are attached.

- MS-EX10-11



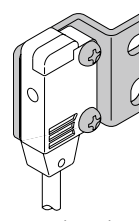
Material: Stainless steel (SUS304)
Two M2 (length 4 mm 0.157 in) pan head screws [stainless steel (SUS304)] are attached.

- MS-EX10-2



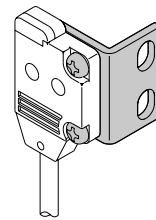
Material: Cold rolled carbon steel (SPCC) (Uni-chrome plated)
Two M2 (length 8 mm 0.315 in) pan head screws are attached.

- MS-EX10-12



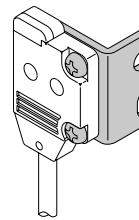
Material: Stainless steel (SUS304)
Two M2 (length 8 mm 0.315 in) pan head screws [stainless steel (SUS304)] are attached.

- MS-EX10-3



Material: Cold rolled carbon steel (SPCC) (Uni-chrome plated)
Two M2 (length 4 mm 0.157 in) pan head screws, and two M2 (length 8 mm 0.315 in) pan head screws are attached.

- MS-EX10-13

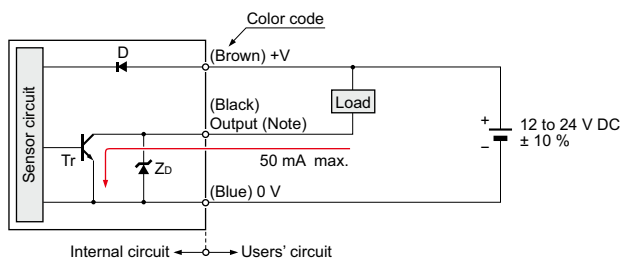


Material: Stainless steel (SUS304)
Two M2 (length 4 mm 0.157 in) pan head screws [stainless steel (SUS304)] and two M2 (length 8 mm 0.315 in) pan head screws [stainless steel (SUS304)] are attached.

SPECIFICATIONS

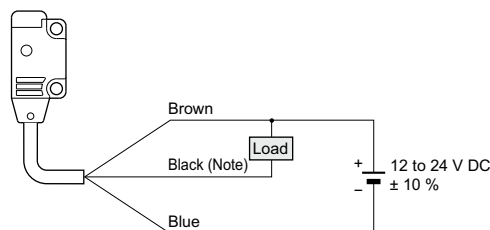
Type			Thru-beam					Convergent reflective (Diffused beam type)	Thru-beam · with operation mode switch on bifurcation					
			Front sensing	Side sensing	Front sensing	Side sensing	Front sensing	Front sensing	Front sensing	Side sensing	Front sensing	Side sensing		
Item	Model No. (Note 2)	Light-ON	EX-11A(-PN)	EX-11EA(-PN)	EX-13A(-PN)	EX-13EA(-PN)	EX-19A(-PN)	EX-14A(-PN)	EX-15 (Note 3)	EX-15E (Note 3)	EX-17(W) (Note 3, 4)	EX-17E (Note 3)		
	Dark-ON	EX-11B(-PN)	EX-11EB(-PN)	EX-13B(-PN)	EX-13EB(-PN)	EX-19B(-PN)	EX-14B(-PN)							
Sensing range			150 mm 5.906 in		500 mm 19.685 in		1 m 3.281 ft	2 to 25 mm 0.079 to 0.984 in (Note 5) (Conv. point: 10 mm 0.394 in)	150 mm 5.906 in		500 mm 19.685 in			
Min. sensing object			ø1 mm ø0.039 in opaque object (Completely beam interrupted object) Setting distance between emitter and receiver: 150 mm 5.906 in		ø2 mm ø0.079 in opaque object (Completely beam interrupted object) Setting distance between emitter and receiver: 500 mm 19.685 in		ø2 mm ø0.079 in opaque object (Completely beam interrupted object) Setting distance between emitter and receiver: 1 m 3.281 ft	ø0.1 mm ø0.004 in copper wire (Completely beam interrupted object) (Setting distance: 10 mm 0.394 in)	ø1 mm ø0.039 in opaque object (Completely beam interrupted object) Setting distance between emitter and receiver: 150 mm 5.906 in		ø2 mm ø0.079 in opaque object (Completely beam interrupted object) Setting distance between emitter and receiver: 500 mm 19.685 in			
Hysteresis			—————					15 % or less of operation distance (Note 5)	—————					
Repeatability (perpendicular to sensing axis)			0.05 mm 0.002 in or less					0.1 mm 0.004 in or less	0.05 mm 0.002 in or less					
Supply voltage			12 to 24 V DC ± 10 %					Ripple P-P 10 % or less						
Current consumption			Emitter: 10 mA or less, Receiver: 15 mA or less					20 mA or less	30 mA or less					
Output			<NPN output type> NPN open-collector transistor <ul style="list-style-type: none">Maximum sink current: 50 mAApplied voltage: 30 V DC or less (between output and 0 V)Residual voltage: 1 V or less (at 50 mA sink current) 0.4 V or less (at 16 mA sink current)		<PNP output type> PNP open-collector transistor <ul style="list-style-type: none">Maximum source current: 50 mAApplied voltage: 30 V DC or less (between output and +V)Residual voltage: 1 V or less (at 50 mA source current) 0.4 V or less (at 16 mA source current)			NPN open-collector transistor <ul style="list-style-type: none">Maximum sink current: 100 mAApplied voltage: 30 V DC or less (between output and 0 V)Residual voltage (Note 6): 1.5 V or less (at 100 mA sink current) 0.4 V or less (at 16 mA sink current)						
			Utilization category		DC-12 or DC-13					—————				
			Short-circuit protection		Incorporated									
Response time			0.5 ms or less (Note 7)											
Operation indicator			Red LED (lights up when the output is ON)						Orange LED (lights up when the output is ON), located on the bifurcation					
Incident beam indicator			—————						Red LED (lights up under light received condition), located on the receiver					
Stability indicator			Green LED (lights up under stable light received condition or stable dark condition)						Green LED (lights up under stable light received condition or stable dark condition), located on the receiver					
Environmental resistance	Pollution degree		3 (Industrial environment)						—————					
	Protection		IP67 (IEC) (Refer to p.984 for details of standards.)											
	Ambient temperature		-25 to +55 °C -13 to +131 °F (EX-17W: -25 to +50 °C -13 to +122 °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)											
Material			Enclosure: Polyethylene terephthalate Lens: Polyallylate						Enclosure: Polyethylene terephthalate Lens: Polyallylate, Bifurcation: Polyallylate					
Cable (Note 8)			0.1 mm ² 3-core (thru-beam type emitter: 2-core) cabtyre cable, 2 m 6.562 ft long						0.2 mm ² 3-core cabtyre cable, 2 m 6.562 ft long (beyond bifurcation; from emitter / receiver to bifurcation: 0.5 m 1.640 ft long)					
Cable extension			Extension up to total 50 m 164.042 ft is possible with 0.3 mm ² , or more, cable (thru-beam type: emitter and receiver).						Extension up to total 100 m 328.084 ft is possible with 0.3 mm ² , or more, cable.					
Weight			Net weight (each emitter and receiver): 20 g approx., Gross weight: 60 g approx.						Net weight: 20 g approx. Gross weight: 40 g approx.	Net weight: 55 g approx., Gross weight: 80 g approx.				
Accessories			Mounting screws: 1 set						Mounting screws: 1 set	Mounting screws: 1 set, Adjusting screwdriver: 1 pc.				

Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +23 °C +73.4 °F.
2) Model Nos. having the suffix “-PN” are PNP output type.
3) Either Light-ON or Dark-ON can be selected by the operation mode switch (located on the bifurcation).
4) Model No. having the suffix “W” is series connection type.
5) The sensing range and the hysteresis of convergent reflective type sensor are specified for white non-glossy paper (50 × 50 mm 1.969 × 1.969 in) as the object.
6) Consider the output residual voltage due to the series connection when supplying power to the EX-17W.
7) The maximum response time of the EX-17W is 50 ms with two units in series connection.
8) The flexible cable type (model Nos. having suffix “-R”) has a 0.1 mm² 3-core (thru-beam type emitter: 2-core) flexible cabtyre cable, 2 m 6.562 ft long.

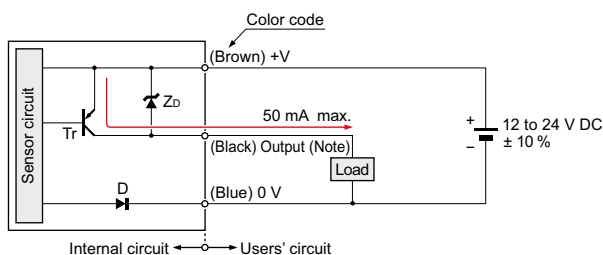
I/O CIRCUIT AND WIRING DIAGRAMS**EX-11** **EX-13** **EX-19** **EX-14****NPN output type****I/O circuit diagram**

Note: The emitter of the thru-beam type sensor does not incorporate the output.

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

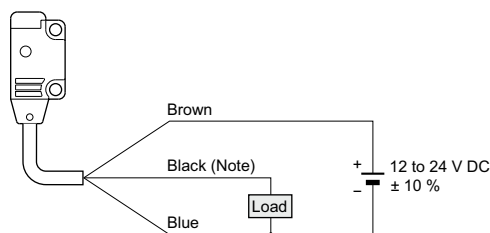
Wiring diagram

Note: The emitter of the thru-beam type sensor does not incorporate the black wire.

EX-11-PN **EX-13-PN** **EX-19-PN** **EX-14-PN****PNP output type****I/O circuit diagram**

Note: The emitter of the thru-beam type sensor does not incorporate the output.

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

Wiring diagram

Note: The emitter of the thru-beam type sensor does not incorporate the black wire.

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

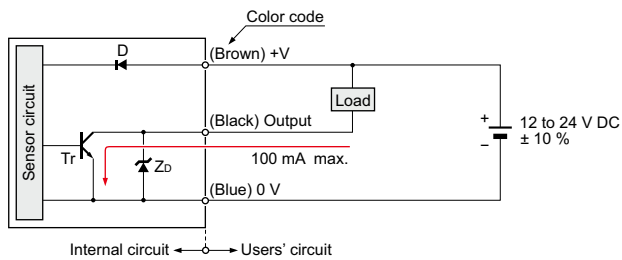
SU-7 / SH**SS-A5 / SH**

Other Products

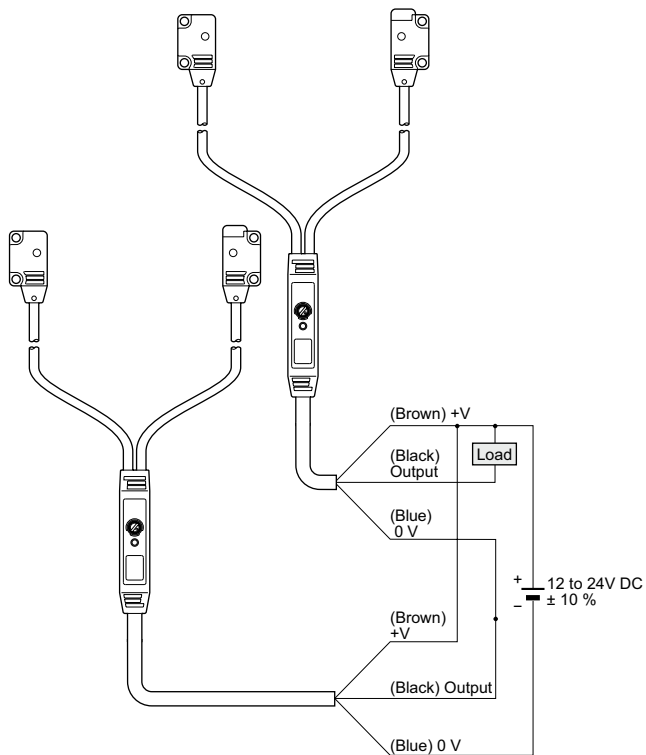
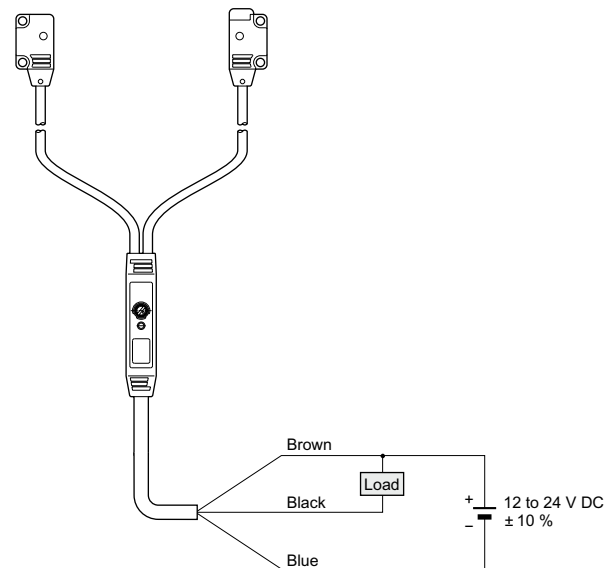
I/O CIRCUIT AND WIRING DIAGRAMS

EX-15□ EX-15E□ EX-17□ EX-17E□ EX-17W

NPN output type

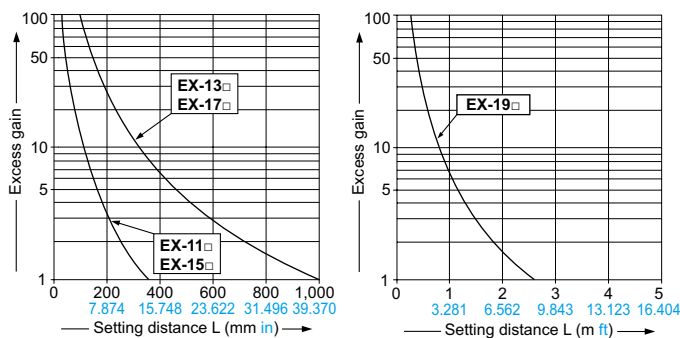
I/O circuit diagram

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

EX-17W series connection wiring diagram**EX-15 , EX-15E , EX-17 , EX-17E wiring diagram****SENSING CHARACTERISTICS (TYPICAL)**

All models

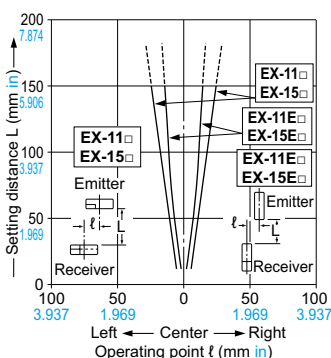
Thru-beam type

Correlation between setting distance and excess gainFIBER
SENSORSLASER
SENSORSPHOTO-
ELECTRIC
SENSORSMICRO
PHOTO-
ELECTRIC
SENSORSAREA
SENSORSSAFETY
COMPONENTSPRESSURE
SENSORSINDUCTIVE
PROXIMITY
SENSORSPARTICULAR
USE
SENSORSSENSOR
OPTIONSWIRE-
SAVING
SYSTEMSMEASURE-
MENT
SENSORSSTATIC
CONTROL
DEVICESLASER
MARKERSSelection
GuideAmplifier
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

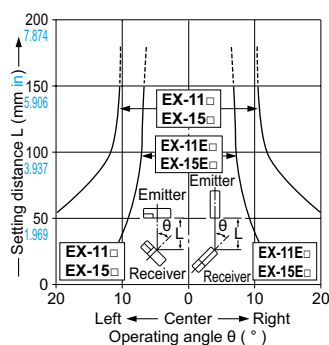
SENSING CHARACTERISTICS (TYPICAL)**EX-11** **EX-11E** **EX-15** **EX-15E**

Thru-beam type

Parallel deviation

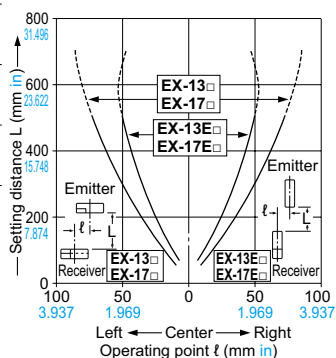


Angular deviation

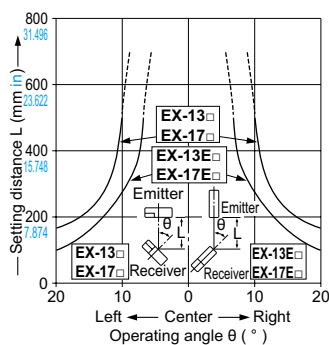
**EX-13** **EX-13E** **EX-17** **EX-17E**

Thru-beam type

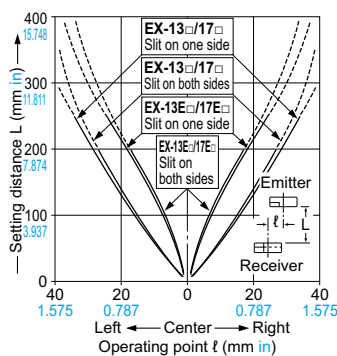
Parallel deviation



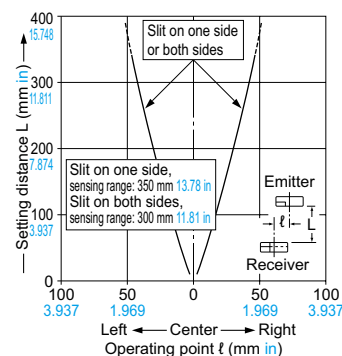
Angular deviation



Parallel deviation with slit masks (ø1.2 mm ø0.047 in)

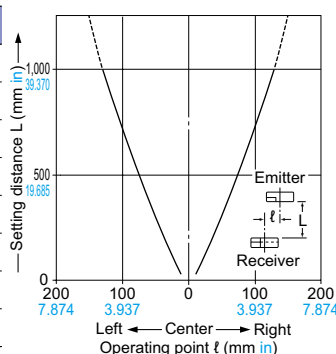


Parallel deviation with slit masks (ø1.5 mm ø0.059 in)

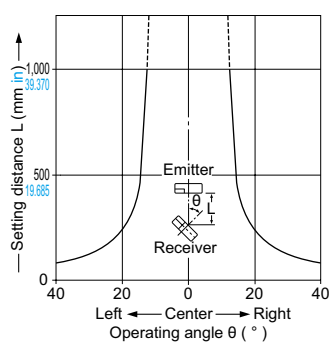
**EX-19**

Thru-beam type

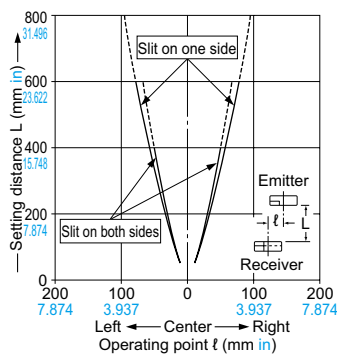
Parallel deviation



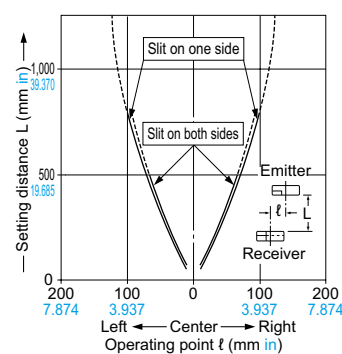
Angular deviation



Parallel deviation with slit masks (ø1.2 mm ø0.047 in)



Parallel deviation with slit masks (ø1.5 mm ø0.059 in)

FIBER
SENSORSLASER
SENSORSPHOTO-
ELECTRIC
SENSORSMICRO
PHOTO-
ELECTRIC
SENSORSAREA
SENSORSSAFETY
COMPONENTSPRESSURE
SENSORSINDUCTIVE
PROXIMITY
SENSORSPARTICULAR
USE
SENSORSSELECTION
GUIDEWIRE-
SAVING
SYSTEMSMEASURE-
MENT
SENSORSSTATIC
CONTROL
DEVICESLASER
MARKERSSELECTION
GUIDEAMPLIFIER
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

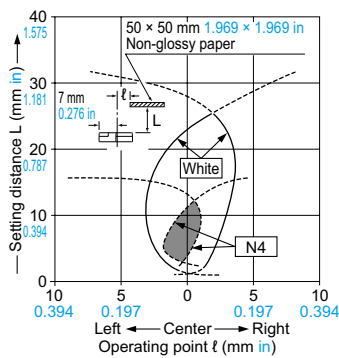
SENSING CHARACTERISTICS (TYPICAL)

EX-14

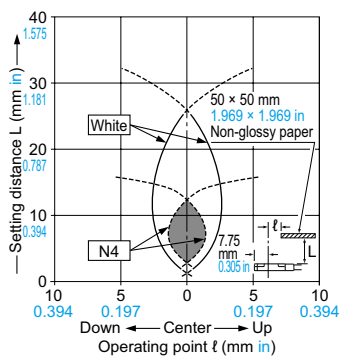
Convergent reflective type

Sensing fields

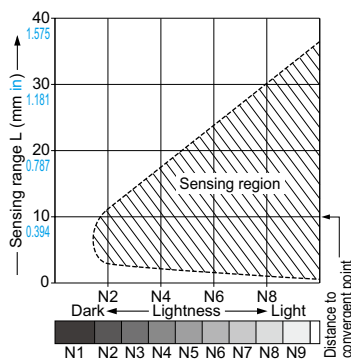
Horizontal (left and right) direction



Vertical (up and down) direction



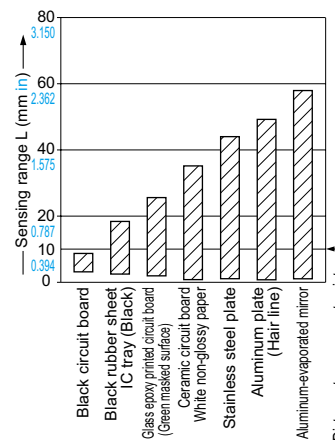
Correlation between lightness and sensing range



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

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

Correlation between material (50 × 50 mm 1.969 × 1.969 in) and sensing range



The bars in the graph indicate the sensing range (typical) for the respective material. However, there is a slight variation in the sensing range depending on the product. Further, if there is a reflective object (conveyor, etc.) in the background of the sensing object, since it affects the sensing, separate it by more than twice the sensing range shown in the left graph.

PRECAUTIONS FOR PROPER USE

Refer to p.986~ for general precautions.

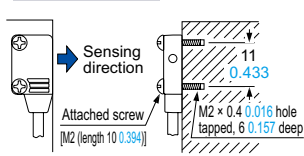


- Never use this product as a sensing device for personnel protection.
- In case of using sensing devices for personnel protection, use products which meet laws and standards, such as OSHA, ANSI or IEC etc., for personnel protection applicable in each region or country.

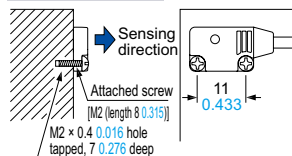
Mounting

In case of mounting on tapped holes (Unit: mm/in)

Side sensing



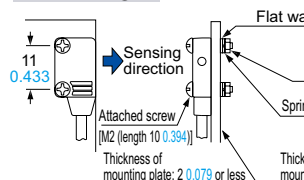
Front sensing



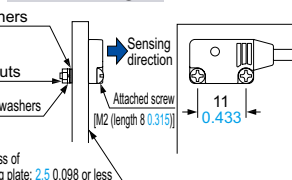
The tightening torque should be 0.2 N·m or less.

In case of using attached screws and nuts (Unit: mm/in)

Side sensing



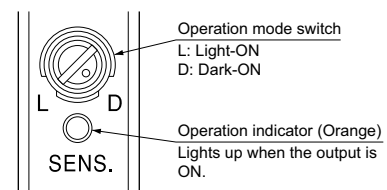
Front sensing



The tightening torque should be 0.2 N·m or less.

Operation mode switch

(EX-15, EX-15E, EX-17 and EX-17E only)



Switch position	Description
	Light-ON mode is set when the switch is turned fully clockwise (L side).
	Dark-ON mode is set when the switch is turned fully counterclockwise (D side).

Others

- Do not use during the initial transient time (50 ms) (EX-15, EX-15E, EX-17, EX-17E : 100 ms) after the power supply is switched on.
- Excess bending of the cable or stress applied to the cable may disconnect the internal lead wire.

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

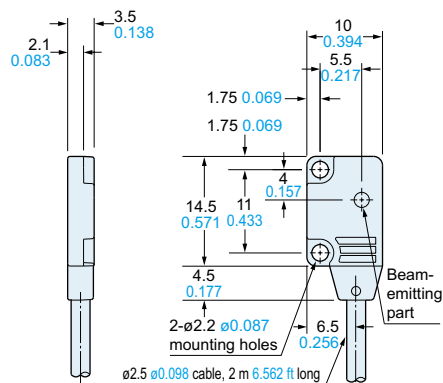
Other Products

DIMENSIONS (Unit: mm in)

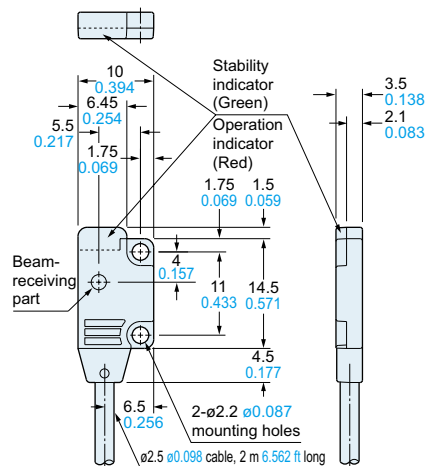
The CAD data in the dimensions can be downloaded from the SUNX website: <http://www.sunx.com>

EX-11A EX-11B EX-13A EX-13B EX-19A EX-19B

Sensor



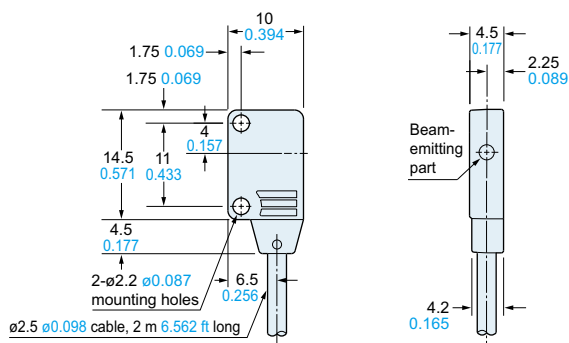
Emitter



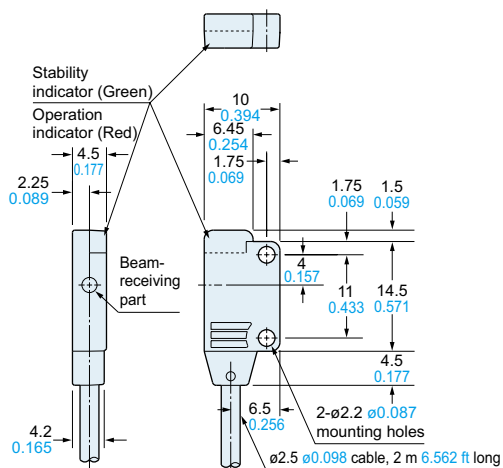
Receiver

EX-11EA EX-11EB EX-13EA EX-13EB

Sensor



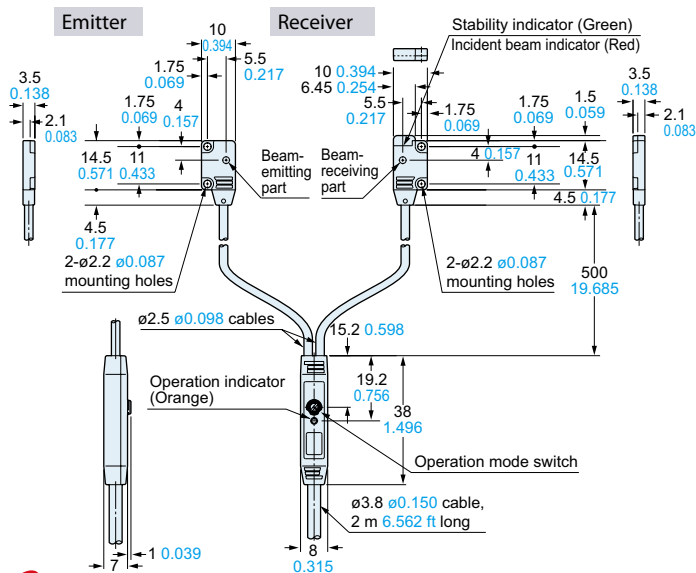
Emitter



Receiver

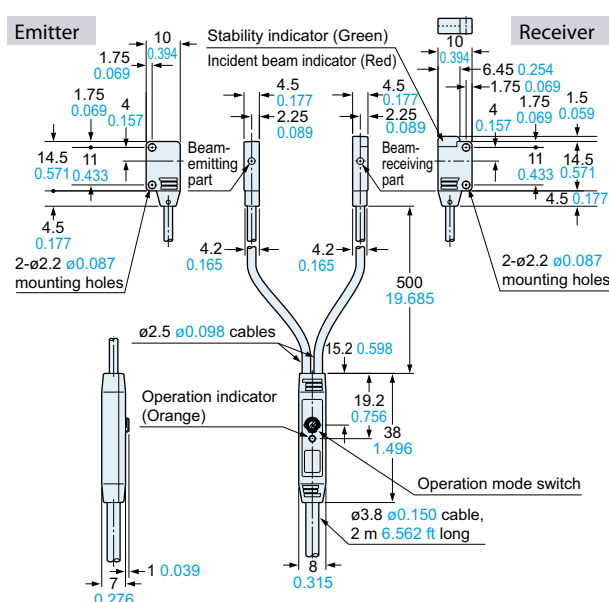
EX-15 EX-17(W)

Sensor



EX-15E EX-17E

Sensor

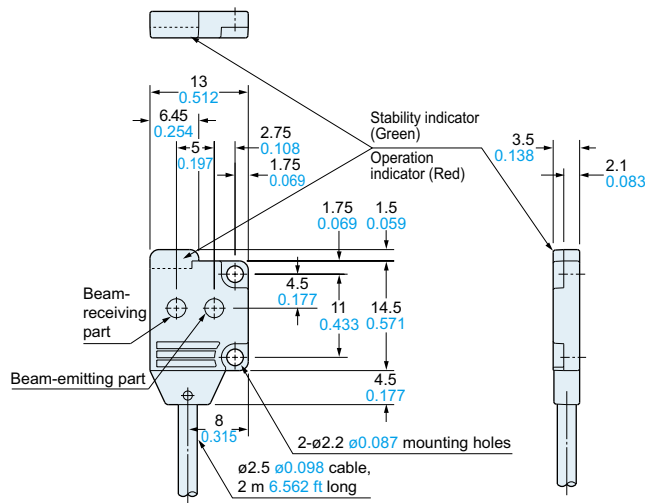


DIMENSIONS (Unit: mm in)

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

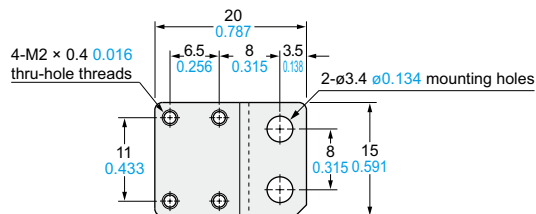
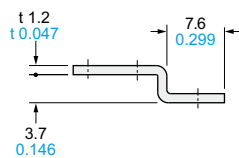
EX-14A EX-14B

Sensor



MS-EX10-1

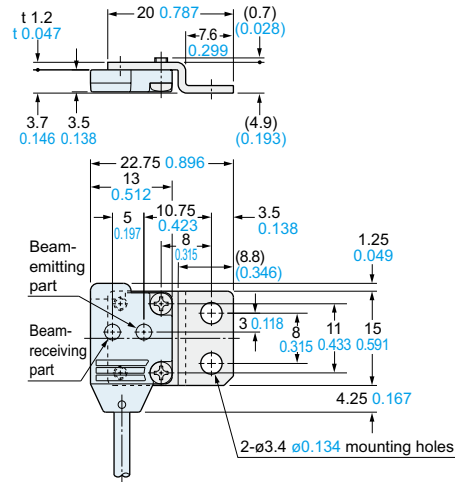
Sensor mounting bracket (Optional)

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

Two M2 (length 4 mm 0.157 in) pan head screws are attached.

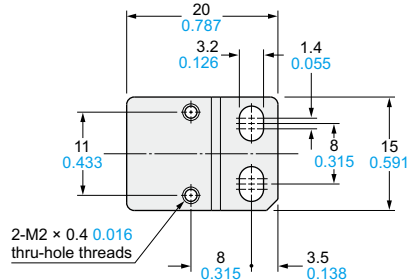
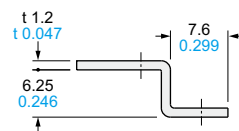
Assembly dimensions

Mounting drawing with EX-14



MS-EX10-2

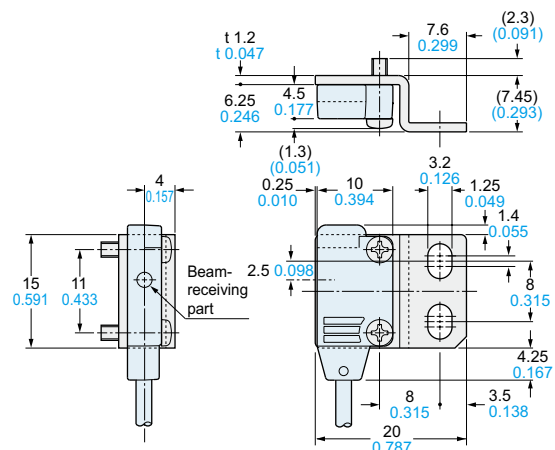
Sensor mounting bracket (Optional)

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

Two M2 (length 8 mm 0.315 in) pan head screws are attached.

Assembly dimensions

Mounting drawing with EX-11E and EX-13E

FIBER
SENSORSLASER
SENSORSPHOTO-
ELECTRIC
SENSORSMICRO
PHOTO-
ELECTRIC
SENSORSAREA
SENSORSSAFETY
COMPONENTSPRESSURE
SENSORSINDUCTIVE
PROXIMITY
SENSORSPARTICULAR
USE
SENSORSSENSOR
OPTIONSWIRE-
SAVING
SYSTEMSMEASURE-
MENT
SENSORSSTATIC
CONTROL
DEVICESLASER
MARKERSSelection
GuideAmplifier
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

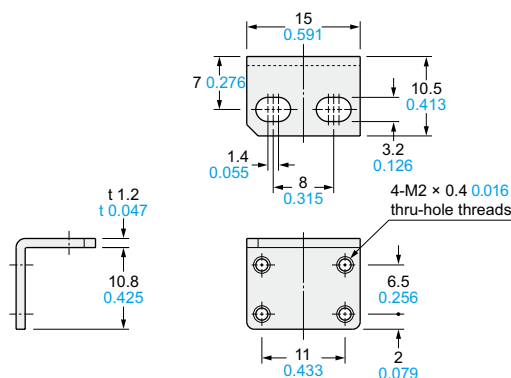
SU-7 / SH

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
SENSORSLASER
SENSORSPHOTO-
ELECTRIC
SENSORSMICRO
PHOTO-
ELECTRIC
SENSORSAREA
SENSORSSAFETY
COMPONENTSPRESSURE
SENSORSINDUCTIVE
PROXIMITY
SENSORSPARTICULAR
USE
SENSORSSENSOR
OPTIONSWIRE-
SAVING
SYSTEMSMEASURE-
MENT
SENSORSSTATIC
CONTROL
DEVICESLASER
MARKERSSelection
GuideAmplifier
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**MS-EX10-3**

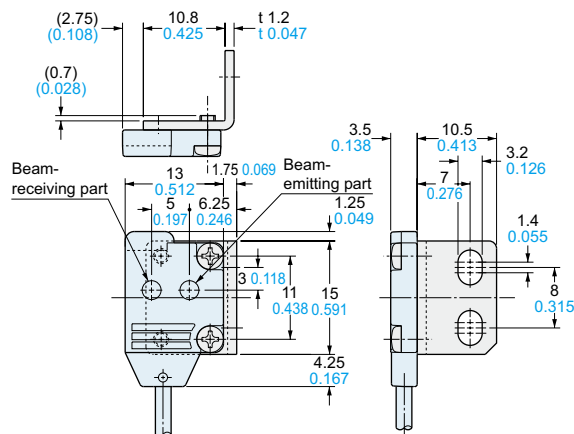
Sensor mounting bracket (Optional)

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

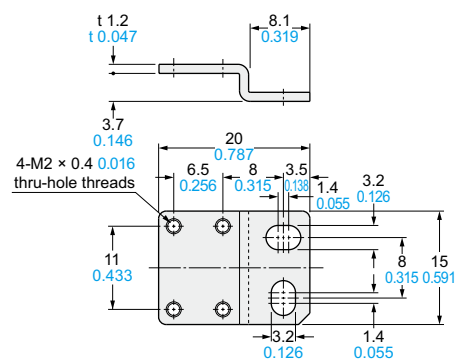
Two M2 (length 4 mm 0.157 in) pan head screws and two M2 (length 8 mm 0.315 in) pan head screws are attached.

Assembly dimensions

Mounting drawing with EX-14

**MS-EX10-11**

Sensor mounting bracket (Optional)

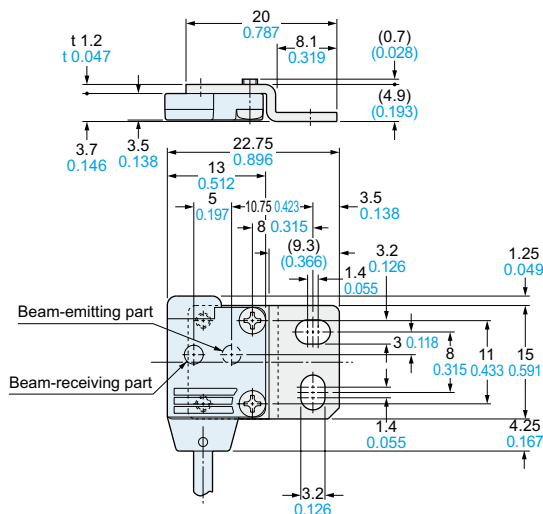


Material: Stainless steel (SUS304)

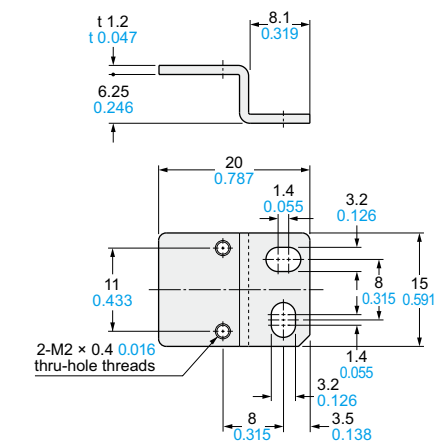
Two M2 (length 4 mm 0.157 in) pan head screws [stainless steel (SUS304)] are attached.

Assembly dimensions

Mounting drawing with EX-14

**MS-EX10-12**

Sensor mounting bracket (Optional)

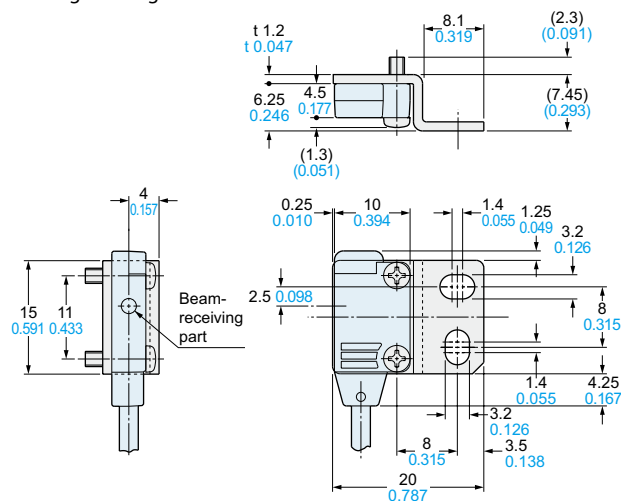


Material: Stainless steel (SUS304)

Two M2 (length 8 mm 0.315 in) pan head screws [stainless steel (SUS304)] are attached.

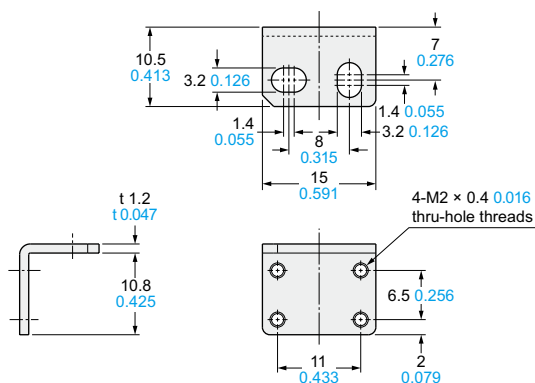
Assembly dimensions

Mounting drawing with EX-11E and EX-13E



DIMENSIONS (Unit: mm in)The CAD data in the dimensions can be downloaded from the SUNX website: <http://www.sunx.com>**MS-EX10-13**

Sensor mounting bracket (Optional)

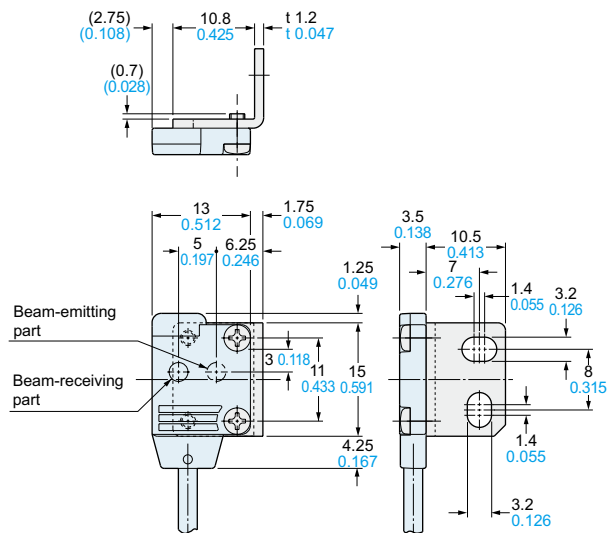


Material: Stainless steel (SUS304)

Two M2 (length 4 mm 0.157 in) pan head screws [stainless steel (SUS304)] and two M2 (length 8 mm 0.315 in) pan head screws [stainless steel (SUS304)] are attached.

Assembly dimensions

Mounting drawing with EX-14

FIBER
SENSORSLASER
SENSORSPHOTO-
ELECTRIC
SENSORSMICRO
PHOTO-
ELECTRIC
SENSORSAREA
SENSORSSAFETY
COMPONENTSPRESSURE
SENSORSINDUCTIVE
PROXIMITY
SENSORSPARTICULAR
USE
SENSORSSENSOR
OPTIONSWIRE-
SAVING
SYSTEMSMEASURE-
MENT
SENSORSSTATIC
CONTROL
DEVICESLASER
MARKERSSelection
GuideAmplifier
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