

Light Curtain Sensors




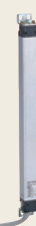




- ESN series
- SSC-T800 series
- SSP-T200 series
- SS10 series
- SS20 series
- SS40 series
- SS80 series
- SSF series
- SSR series
- SST series
- MST series
- SST300 series
- SS-CH series

Light Curtain Sensors

List of models

(*) Certain detecting conditions apply. See data for details.



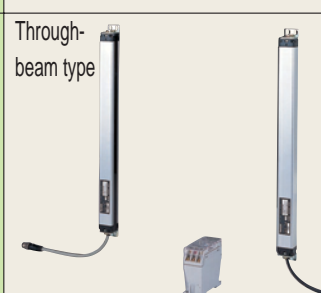
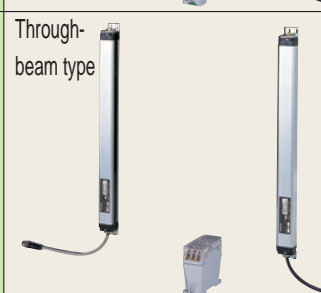
Series name Overview	Appearance/shape	Model	Detecting width	Light axis interval	Detecting distance	Detecting object (*)	See page
ESN Ultra-slim	Through-beam type  CE	ESN-T8	140mm	20mm	5m max.	φ 30mm min.	270
		ESN-T12	220mm				
		ESN-T16	300mm				
		ESN-T20	380mm				
SSC-T800 For small/thin object detection Radial cross ray type	Through-beam type  CE cULus	SSC-T801	50mm	5.55mm	100-500mm	φ 6mm min.	276
		SSC-T802			0.4-1.2m	φ 8mm min.	
		SSC-T804		12.5mm	0.5-2m	φ 15mm min.	
		SSC-T805			100-500mm	φ 12.5mm min.	
		SSC-T850	150mm	16.6mm	150- 800mm	φ 17mm min.	
		SSC-T810	100mm	11mm		φ 11mm min.	
		SSC-T815		20mm		φ 20mm min.	
		SSC-T830		11mm	0.5- 2.5m	φ 13mm min.	
		SSC-T835		20mm		φ 22mm min.	
SSP-T200 Picking	Through-beam type 	SSP-T205	100mm	25mm	2m max.	φ 35mm min.	284
		SSP-T210	225mm				
		SSP-T213	300mm				
		SSP-T216	375mm				
SS10 Slim type with 10-mm interval light axes	Through-beam type  CE	SS10-T16	150mm	10mm	2m max.	φ 17mm min.	290
		SS10-T24	230mm				
		SS10-T32	310mm				
		SS10-T48	470mm				
		SS10-T64	630mm				
		SS10-T80	790mm				
		SS10-T96	950mm				
SS20 Slim type with 20-mm interval light axes	Through-beam type  CE SP cULus	SS20-T8	140mm	20mm	7m max.	φ 32mm min.	290
		SS20-T12	220mm				
		SS20-T16	300mm				
		SS20-T20	380mm				
		SS20-T24	460mm				
		SS20-T32	620mm				
		SS20-T40	780mm				
		SS20-T48	940mm				

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Light Curtain Sensors

List of models

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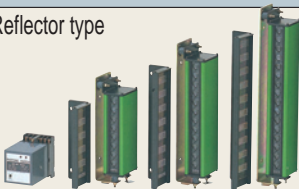
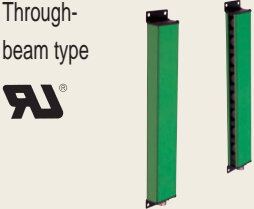



Series name Overview	Appearance/shape	Model	Detecting width	Light axis interval	Detecting distance	Detecting object (*)	See page
SS40 Slim type with 40-mm interval light axes		SS40-T4	120mm	40mm	7m max.	φ 52mm min.	290
		SS40-T6	200mm				
		SS40-T8	280mm				
		SS40-T10	360mm				
		SS40-T12	440mm				
		SS40-T16	600mm				
		SS40-T20	760mm				
		SS40-T24	920mm				
SS80 Slim type with 80-mm interval light axes	Through-beam type 	SS80-T2	80mm	80mm	3-15m	φ 92mm min.	296
		SS80-T4	240mm				
		SS80-T6	400mm				
		SS80-T8	560mm				
		SS80-T10	720mm				
		SS80-T12	880mm				
		SS80-T14	1,040mm				
		SS80-T16	1,200mm				
		SS80-T18	1,360mm				
		SS80-T20	1,520mm				
		SS80-T22	1,680mm				
		SS80-T24	1,840mm				
SSF-T200 Multifunctional fail-safe type with 20-mm interval light axes	Through-beam type 	SSF-T8C	140mm	20mm	5m max.	φ 30mm min.	302
		SSF-T16C	300mm				
		SSF-T24C	460mm				
		SSF-T32C	620mm				
		SSF-T40C	780mm				
		SSF-T48C	940mm				
		SSF-T56C	1,100mm				
		SSF-T64C	1,260mm				
SSF-T400 Multifunctional fail-safe type with 40-mm interval light axes	Through-beam type 	SSF-T404C	120mm	40mm	5m max.	φ 50mm min.	302
		SSF-T408C	280mm				
		SSF-T412C	440mm				
		SSF-T416C	600mm				
		SSF-T420C	760mm				
		SSF-T424C	920mm				
		SSF-T428C	1,080mm				
		SSF-T432C	1,240mm				

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List of models

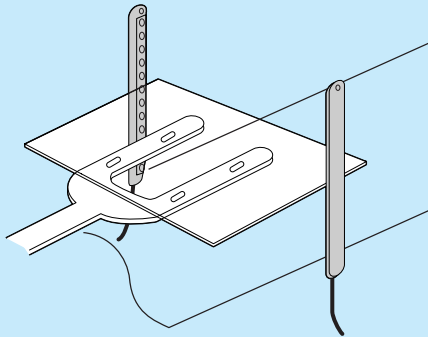
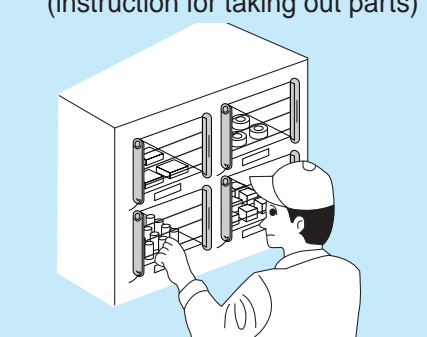
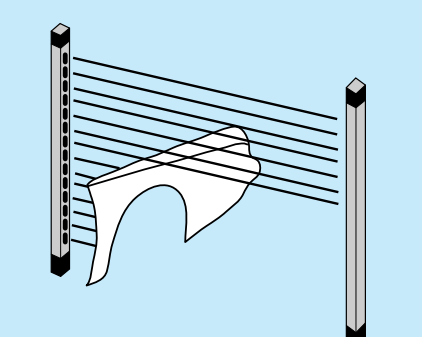
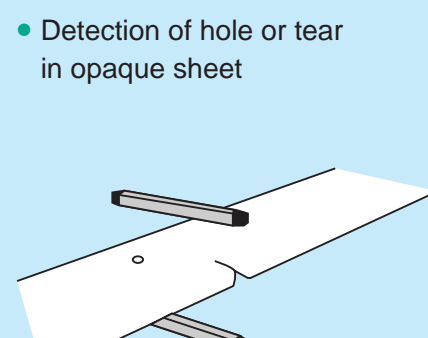
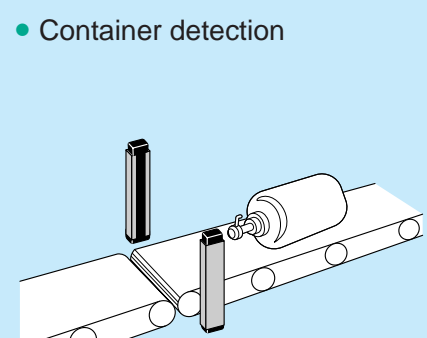
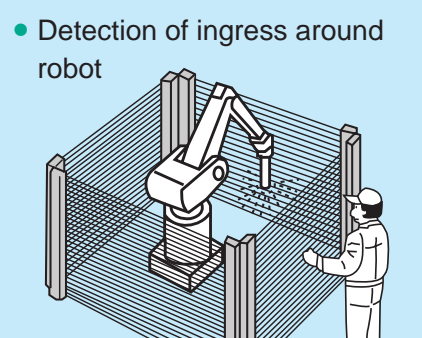
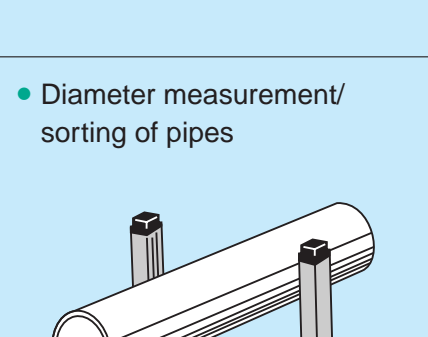
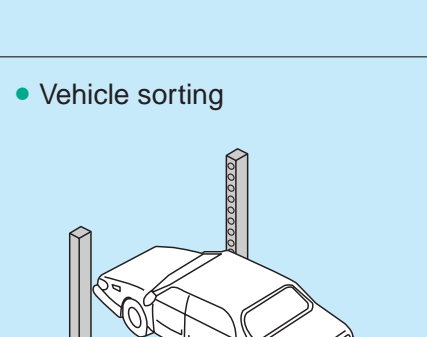
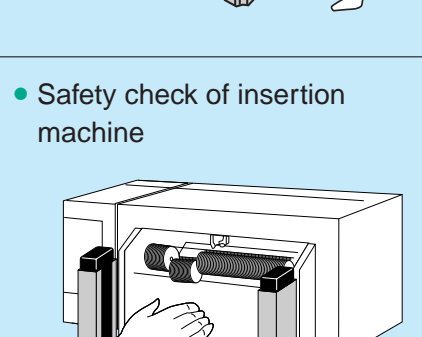
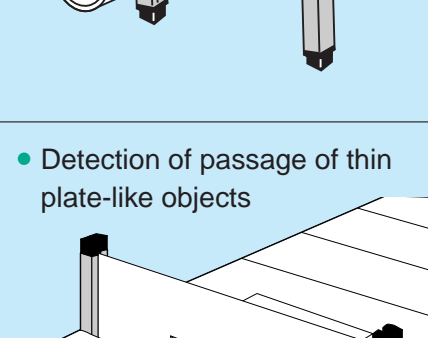
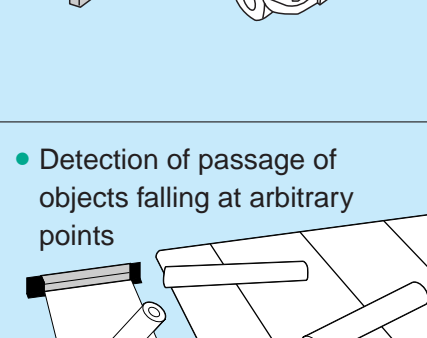
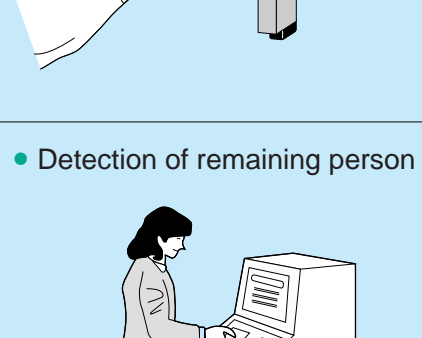
(*) Certain detecting conditions apply. See data for details.

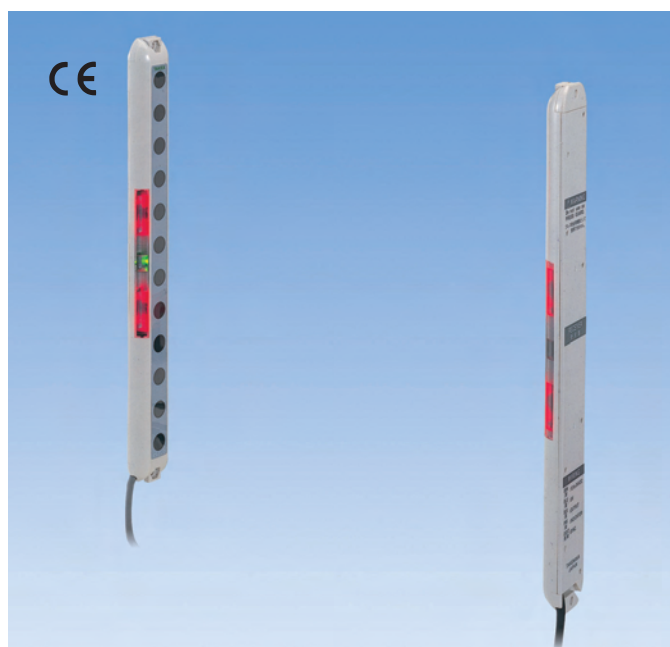
Series name Overview	Appearance/shape	Model	Detecting width	Light axis interval	Detecting distance	Detecting object (*)	See page
SSR Reflector type	Reflector type 	SSR304	140mm	40mm	0.4-3m	φ 60mm min.	314
		SSR306	220mm				
		SSR308	300mm				
		SSR310	380mm				
		SSR312	460mm				
SST100 Generic type	Through-beam type 	SST104	120mm	40mm	10m max. (15m max. for H type)	φ 60mm min.	318
		SST108	280mm				
		SST112	440mm				
		SST116	600mm				
		SST120	760mm				
		SST124	920mm				
MST Separate output for each light axis	Through-beam type 	MST104	120mm	40mm	10m max.	φ 60mm min.	320
		MST108	280mm				
		MST112	440mm				
		MST116	600mm				
		MST120	760mm				
		MST124	920mm				
SST300 For pipe and bar steel detection	Through-beam type 	SST316	150mm	10mm	2m max.	φ 15mm min.	322
		SST332	310mm				
		SST348	470mm				
		SST364	630mm				
		SST396	950mm				
SS-CH Output according to combination of light axes		See the pages shown on the right for details.					324

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Light Curtain Sensors

Application Examples

<ul style="list-style-type: none"> Robot hand detection 	<ul style="list-style-type: none"> Operation instruction sensor (instruction for taking out parts) 	<ul style="list-style-type: none"> Checking the shape of work 
<ul style="list-style-type: none"> Detection of hole or tear in opaque sheet 	<ul style="list-style-type: none"> Container detection 	<ul style="list-style-type: none"> Detection of ingress around robot 
<ul style="list-style-type: none"> Diameter measurement/ sorting of pipes 	<ul style="list-style-type: none"> Vehicle sorting 	<ul style="list-style-type: none"> Safety check of insertion machine 
<ul style="list-style-type: none"> Detection of passage of thin plate-like objects 	<ul style="list-style-type: none"> Detection of passage of objects falling at arbitrary points 	<ul style="list-style-type: none"> Detection of remaining person 



● Ultra-thin

Slim type of only 13 mm thick and 30 mm wide never affecting work efficiency

● High-intensity red LED employed

Large operation indicator of high-intensity LEDs in series offering superb visibility, may double as work instruction indicator

● Objects as small as $\phi 30$ detected

● Automatic sensitivity compensation feature

● Anti Interference feature

Allowing adjacent mounting of 2 units for wider range of applications

Type

Detection method	Detecting distance	Light axis interval	No. of light axes	Detecting width	Set model No.	Operation mode	Detecting object
 Through-beam type	5m	20mm	8	140mm	ESN-T8	Activated when light beams of all axes are received	Opaque object of $\phi 30$ mm min.
			12	220mm	ESN-T12		
			16	300mm	ESN-T16		
			20	380mm	ESN-T20		

*For prices of the transmitter and receiver for separate purchase, see the Price List at the end of this book. Mounting brackets are separately available. See "With Mounting Bracket (Optional) Attached" for details.

Transmitter-receiver linked operation indicator

High-intensity LEDs in series

Wide display offers excellent visibility

Light axis interval: 20mm

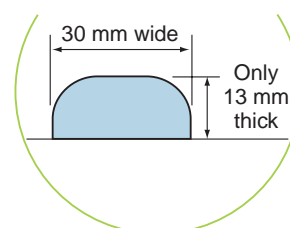
Smallest detectable object diameter: $\phi 30$ mm

Detecting distance: 5m

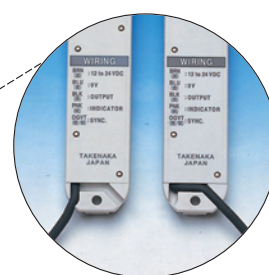
Optimum sensitivity maintained by automatic sensitivity compensation feature

Wide display may be used as work instruction indicator

Thin and slim size requiring minimum mounting space



Flexible cord orientation (left/right/rear) for routing convenience



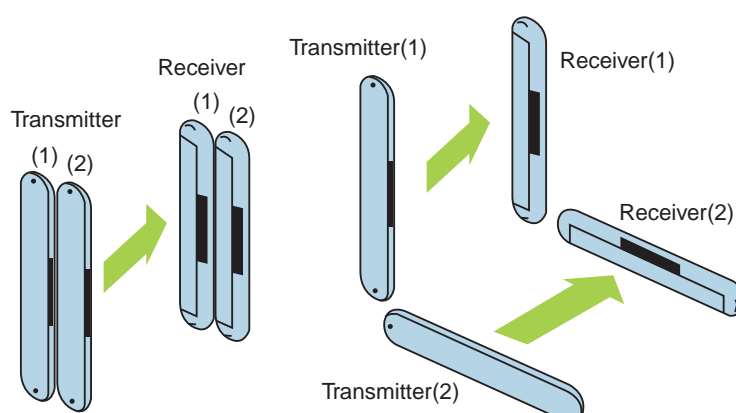
Rating/Performance/Specification

	Model	Set model No.	ESN-T8 (PN)	ESN-T12 (PN)	ESN-T16 (PN)	ESN-T20 (PN)
		Transmitter model No.	ESN-TL8	ESN-TL12	ESN-TL16	ESN-TL20
		Receiver model No.	ESN-TR8 (PN)	ESN-TR12 (PN)	ESN-TR16 (PN)	ESN-TR20 (PN)
Rating/performance	Detection method	Through-beam type				
	Detecting distance	5m max.				
	Detection object	Opaque object of ϕ 30mm min.				
	Light axis interval	20mm				
	No. of light axes	8	12	16	20	
	Detecting width	140mm	220mm	300mm	380mm	
	Power supply	12-24V DC \pm 10% / Ripple 10% max.				
	Current consumption	100mA max.	110mA max.	120mA max.	130mA max.	
	Output mode	NPN open collector Rating: sink current 100 mA (30 VDC) max. Models with model Nos. ending with "-PN" have PNP open collector output; source current: 100 mA max.				
	Operation mode	Activated when light beams of all axes are received (deactivated when light beam of any axis is blocked)				
Specification	Response time	7ms max.				
	Light source	Infrared LED (wavelength: 850 nm)				
	Light-sensitive element	Photo IC				
	Indicator	Transmitter: Power indicator (green LED) / Operation indicator (red LED) Receiver: Stable light reception indicator (green LED) / Operation indicator (red LED)				
	Material	Case: ABS / Indicator window: acrylic				
	Connection	Permanently attached cord (Outer dimension: dia.4.3) Cord length: 3 m Cord: with five 0.2 mm ² cores, gray (transmitter) or black (receiver) covering				
	Mass	160g max.	180g max.	200g max.	220g max.	
	Auxiliary functions	Automatic sensitivity compensation, Anti Mutual Sensitivity feature for adjacent installation, output short circuit protection				
	Accessory	Operation manual Note: Mounting brackets are separately available.				

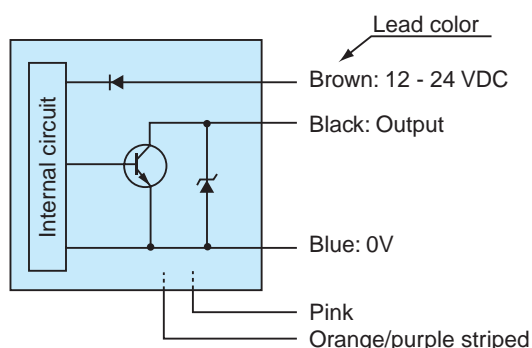
Environmental Specification

Environment	Ambient light	10000lx max.
	Ambient temperature	-10 - +55°C (non-freezing)
	Ambient humidity	35-85%RH (non-condensing)
	Vibration	10-55 Hz / 1.5 mm amplitude / 2 hours each in 3 directions
	Protective structure	IP40
	Dielectric withstanding	1000VAC for 1 minute / between entire live part and case
	Insulation resistance	500 VDC, 20 M Ω .

Adjacent or face-to-face installation of two pairs of sensors will not cause interference.

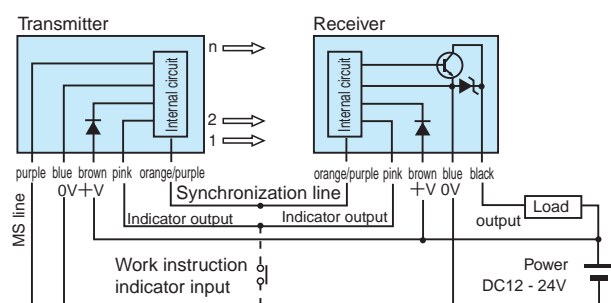


Input/Output Circuit and Connection

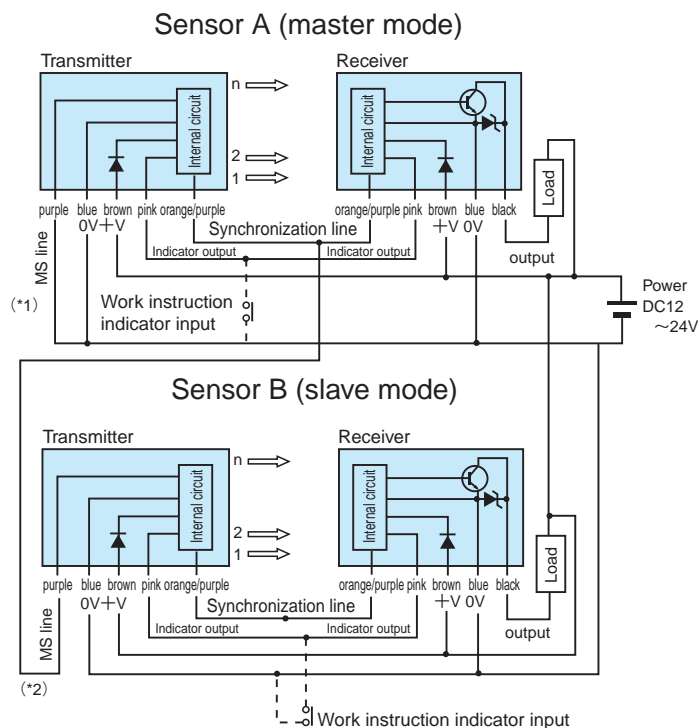


The output is provided with short circuit protection, and turns off when the protection feature is activated. Identify and eliminate the cause of the short circuit and turn the power back on.

Connection for single-set use



Connection for Anti Interference



(*1) Connect the MS line (purple) of the transmitter of either (A) of the two sensors to the ground line (blue), which sets the operation mode of this sensor (Sensor A) to master (M mode).

(*2) Connect the MS line (purple) of the transmitter of the other sensor (B) to the synchronization line (orange/purple) of Sensor A, which sets the operation mode of Sensor B to slave (S mode).

(Note 1) When using two sets as a pair, wire so that the operation mode of either of the two will be master and of the other will be slave.

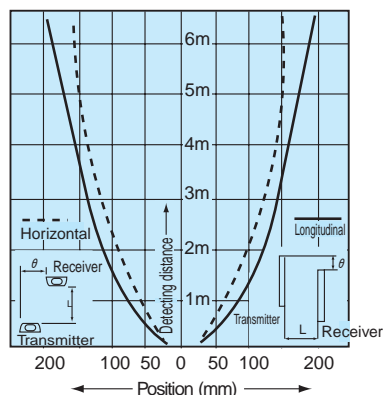
(Note 2) Do not connect the synchronization lines (orange/purple) of Sensors A and B to each other.

Cord Extension

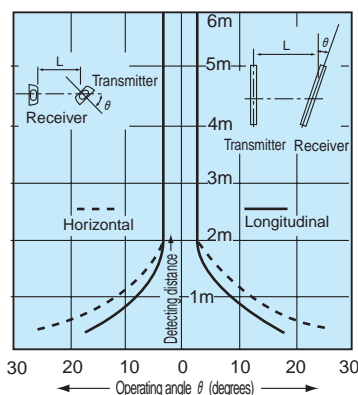
To extend the cord, use wires of at least 0.5 mm² and limit the length to within 25 m for transmitter and receiver.

Characteristics (Typical Example)

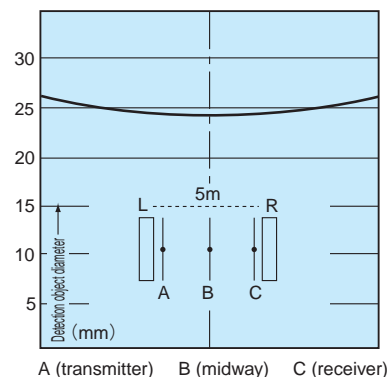
Parallel displacement characteristics



Operating angle characteristics



Smallest detectable object diameter characteristics



For Correct Use

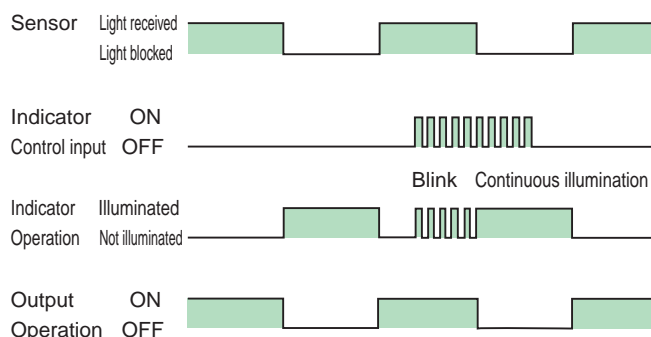


- Be sure to follow the instructions in the operation manual provided for correct use of the product.
- This sensor cannot be used as a press safety device or other safety device for protection of human body that requires conformity to domestic or overseas standards or certification concerning protection of human body. Use for such purposes may lead to death or serious injury in the unlikely event of failure.
- This sensor is intended for detection of ingress of human body or object passing through an arbitrary point not involving protection of human body or safety.
- When using this sensor for safety purposes, ensure safe operation of the system as a whole including detection and control.

Using Operation Indicator as Work Instruction Indicator

Input a flicker signal as a no-voltage contact or NPN transistor open collector input shown as the dotted line in the connection diagram.

The indicator blinks in step with the cycle (both transmitter and receiver flicker). When light beam of any axis is blocked, the operation switches to the illuminated state as the operation indicator.

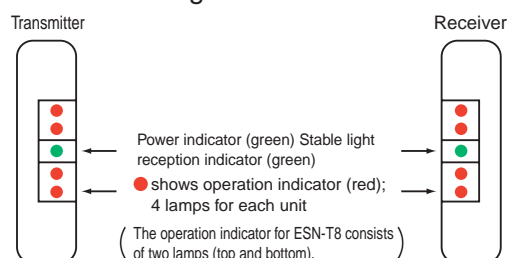


Indicators

Indicator operation

	Name	Color	Description
Transmitter	Power indicator	Green	Illuminated when power is supplied
	Operation indicator	Red	Illuminated when the sensor is activated (light beam of any axis is blocked), to red off when light beams of all axes are received
Receiver	Stable light reception indicator	Green	Illuminated when the received light intensity level is 120% or more of the operation level
	Operation indicator	Red	Illuminated when the sensor is activated (light beam of any axis is blocked), to red off when light beams of all axes are received

Indicator arrangement



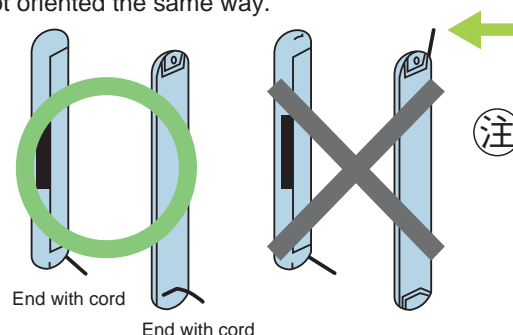
Automatic sensitivity compensation feature

After the light axis alignment is completed, turn the power off once and back on. The automatic sensitivity compensation feature is enabled and the sensitivity is set at the optimum for the sensor.

If the lens is soiled with dirt or dust, the sensitivity is automatically compensated to achieve the optimum sensitivity after the soil is removed.

Sensor Installation Orientation

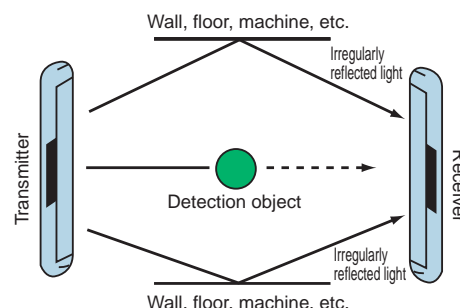
When installing the sensor, make sure that the ends of the transmitter and receiver with the cord are oriented either upward or downward. The sensor does not function if the transmitter and receiver are not oriented the same way.



- The tightening torque for installing the sensor (with M4 screws) should not exceed 0.8 N · m.

Installation Location

Any reflecting object (wall, floor, machine, etc.) within the effective range between the transmitter and receiver may allow the light of the sensor to go around the detection object, which is supposed to block the light, and reach the receiver. Choose the installation location carefully (any glossy object such as stainless steel in the surrounding area must be at least 300 mm away from the center of the light transmission and reception area both vertically (up and down) and horizontally (left and right)).

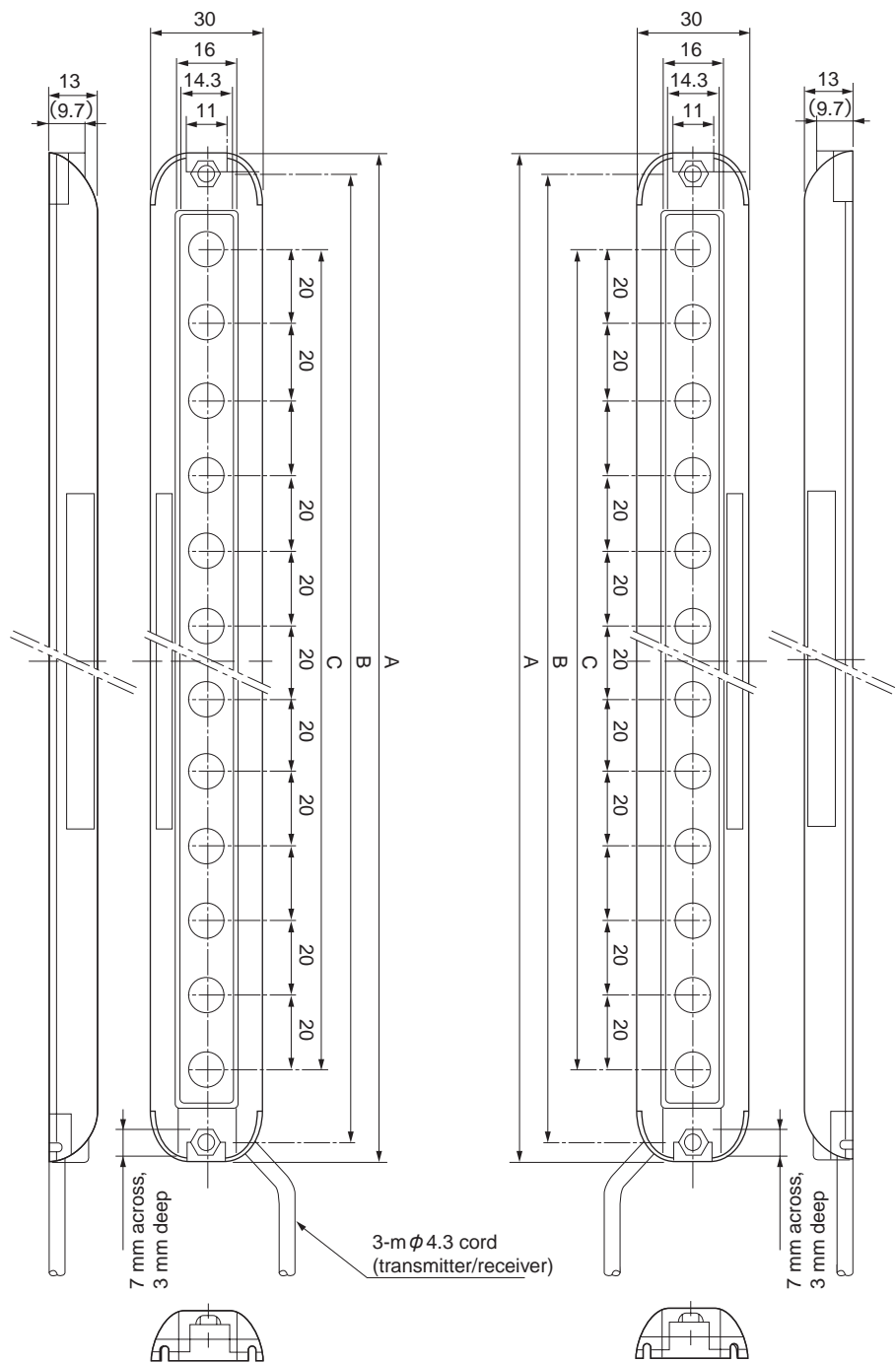


Dimensions (in mm)

CAD

Transmitter

Receiver



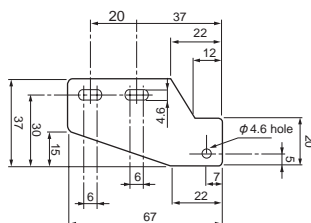
• Dimensions of portions

Model	A	B	C	No. of light axes
ESN-T8	190	180	140	8
ESN-T12	270	260	220	12
ESN-T16	350	340	300	16
ESN-T20	430	420	380	20

CAD



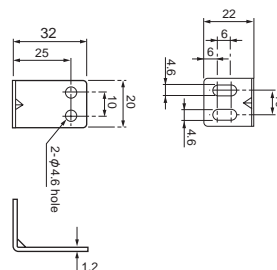
Model	A	B	C	D	No. of light axes
ESN-T8	190	180	140	130	8
ESN-T12	270	260	220	210	12
ESN-T16	350	340	300	290	16
ESN-T20	430	420	380	370	20



CAD



Model	A	B	C	D	No. of light axes
ESN-T8	190	180	140	160	8
ESN-T12	270	260	220	240	12
ESN-T16	350	340	300	320	16
ESN-T20	430	420	380	400	20










Model	Description
ES-BF	4 brackets for 1 set (with screws, nuts, washers)
ES-BL	4 brackets for 1 set (with screws, nuts, washers)



• New type with radial cross ray method

- Small objects and flat tape-like objects detected
- Convenient simplified wiring requiring no clock (synchronization) line
- Compact and flat (14.5 mm)
- Water resistance to IP 67

Type

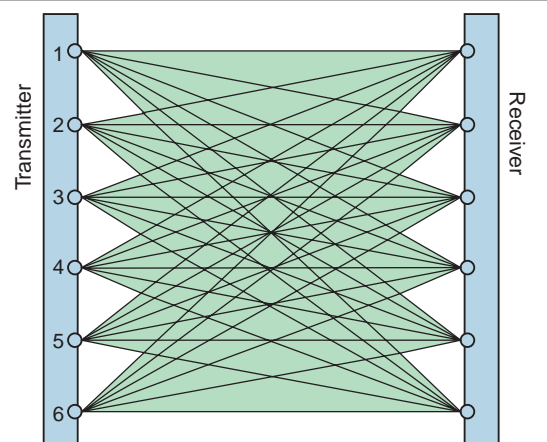
Detection method	Detecting distance	Light axis interval	No. of light axes	Detecting width	Set model No.	Detecting object
<div></div> <div>Through-beam type</div>	<div></div> 100-500mm	5.55mm	10	50mm	SSC-T801	Opaque object of ϕ 6mm min.
	<div></div> 0.4-1.2m				SSC-T802	Opaque object of ϕ 8mm min.
	<div></div> 0.5-2m	12.5mm	5		SSC-T804	Opaque object of ϕ 15mm min.
	<div></div> 100-500mm				SSC-T805	Opaque object of ϕ 12.5mm min.
	<div></div> 150-800mm	16.6mm	10	150mm	SSC-T850	Opaque object of ϕ 17mm min.
		11mm	10	100mm	SSC-T810	Opaque object of ϕ 11mm min.
		20mm	6		SSC-T815	Opaque object of ϕ 20mm min.
	<div></div> 0.5-2.5m	11mm	10		SSC-T830	Opaque object of ϕ 13mm min.
		20mm	6		SSC-T835	Opaque object of ϕ 22mm min.

Radial Cross Ray Method

The transmitter emits light beams in a scanning manner and receiver accepts light beams of all axes at all times.

When Beam 1 is emitted, all of the receiving elements of the receiver receive the light. The sensor is activated when light beam of any of the light axes is blocked.

The figure on the right shows a model with six light axes. The number of light axes depends on the model.



SSC-T800

Rating/Performance/Specification

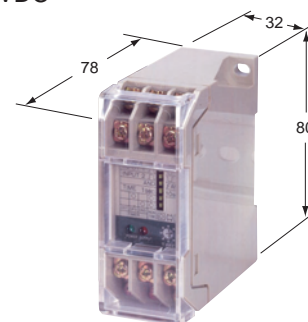
Rating/performance	Model	Set model No.	SSC-T801 (PN)	SSC-T802 (PN)	SSC-T804 (PN)	SSC-T805 (PN)	SSC-T850 (PN)	SSC-T810 (PN)	SSC-T815 (PN)	SSC-T830 (PN)	SSC-T835 (PN)	
		Transmitter model No.	SSC-TL801	SSC-TL802	SSC-TL804	SSC-TL805	SSC-TL850	SSC-TL810	SSC-TL815	SSC-TL830	SSC-TL835	
		Receiver model No.	SSC-TR801 (PN)	SSC-TR802 (PN)	SSC-TR804 (PN)	SSC-TR805 (PN)	SSC-TR850 (PN)	SSC-TR810 (PN)	SSC-TR815 (PN)	SSC-TR830 (PN)	SSC-TR835 (PN)	
		Detection method	透過形									
		Detecting distance	100-500mm	0.4-1.2m	0.5-2m	100-500mm	150-800mm			0.5-2.5m		
		Detection object	Opaque object of ϕ 6mm min.	Opaque object of ϕ 8 mm min.	Opaque object of ϕ 15 mm min.	Opaque object of ϕ 12.5 mm min.	Opaque object of ϕ 17 mm min.	Opaque object of ϕ 11 mm min.	Opaque object of ϕ 20 mm min.	Opaque object of ϕ 13 mm min.	Opaque object of ϕ 22 mm min.	
		No. of light axes	10		5		10		6	10	6	
		Detecting width	50mm				150mm	100mm				
		Light axis interval	5.55mm		12.5mm		16.6mm	11mm	20mm	11mm	20mm	
		Power supply	12-24V DC \pm 10% / Ripple 10% max.									
		Current consumption	Transmitter	50mA max.		70mA max.		80mA max.		80mA max	80mA max	80mA max
			Receiver	100mA max. *		65mA max. *		110mA max. *		70mA max. *	110mA max. *	70mA max. *
			Output mode	NPN open collector Rating: sink current 100 mA (30 VDC max.) Models with model Nos. ending with X-PN \bar{E} have PNP open collector output; source current: 100 mA max.								
			Operation mode	Activated when light beams of all axes are received (deactivated when light beam of any axis is blocked)								
		Response time	Light blocking :5ms max. Light reception 8ms max.		Light blocking :3ms max. Light reception 4ms max.		Light blocking :5ms max. Light reception 8ms max.					
Specification		Light source (wavelength)	Infrared LED (860nm)									
		Indicator	Transmitter: Power indicator (green LED) Receiver: Power indicator (green LED) / Operation indicator (OrangeLED)									
		Short circuit protection	Provided									
		Material	Case body: Aluminum / Caps at ends: glass fiber filled PBT									
		Connection	Permanently attached cord (Outer dimension: dia.4) Cord length: 3 m Cord: with two 0.3 mm ² cores, gray (transmitter) or with three 0.3 mm ² cores black (receiver) covering									
		Mass	About 130 g (transmitter/receiver)				About 190 g (transmitter/receiver)	About 130 g (transmitter/receiver)				
		Accessory	Operation manual (Note) Mounting brackets are not provided									
		Notes	*The receiver current consumption shown is for 12 VDC. When the voltage is 24 VDC, the consumption is reduced to about 60%. *1 "-D" types, or models deactivated when light beams of all axes are received, are also available.									

Environmental Specification

Environment	Ambient light	5,000lx max.
	Ambient temperature	-10 - +55°C (non-freezing)
	Ambient humidity	35-85%RH (non-condensing)
	Protective structure	IP67
	Vibration	10-55 Hz / 1.5 mm amplitude / 2 hours each in 3 directions
	Shock	500 m/s ² / Twice each in 3 directions
	Dielectric withstanding	500 VAC for 1 minute
	Insulation resistance	500 VDC, 20 M Ω or higher.

Applicable power supply unit

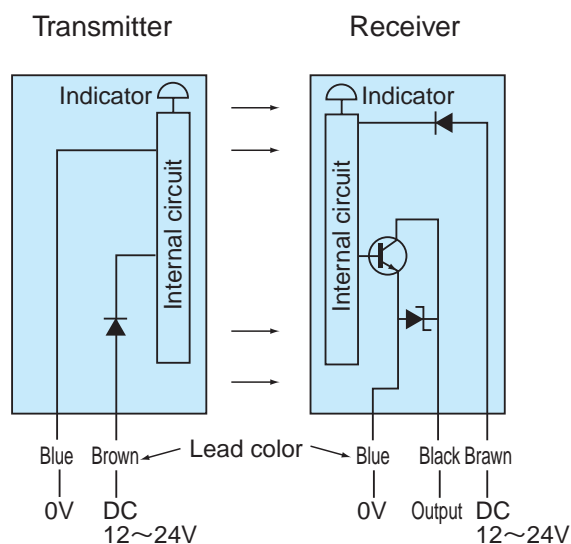
PS Series
High capacity of 200 mA at 12 VDC



(General-purpose type) PS3N
PS3N-SR
(Multifunctional type) PS3F
PS3F-SR

SSC-T800

Input/Output Circuit and Connection



The output transistor turns off when load short circuits or overload occurs. Check the load and turn the power back on

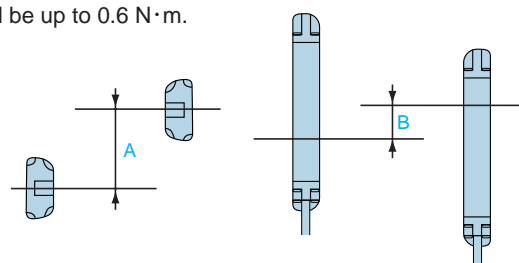
Setting

Install the transmitter and receiver face-to-face.

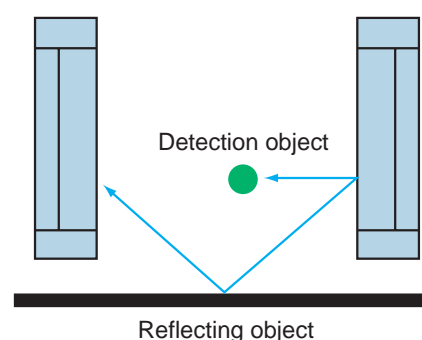
Swivel the transmitter and receiver vertically and horizontally to install them at the center of the area in which the operation indicator (orange LED) is illuminated for the individual direction.

The tightening torque for installing the sensor (with M4 screws) should be up to 0.6 N·m.

- Displacement in the A direction may be up to $\pm 30\text{mm}$. Displacement in the B direction should be within $\pm 10\text{mm}$.
- If the transmitter and receiver are too closely installed to each other or light axes are misaligned, the output may be unstable. When the light axes are aligned, the operation returns to normal.



- Any reflecting object (wall, floor, machine, etc.) within the effective range between the transmitter and receiver may allow the light of the sensor to go around the detection object, which is supposed to block the light, and reach the receiver. Choose the installation location carefully. Any glossy object such as a coated surface in the surrounding area must be at least 100mm away for the distance setting of within 1m and 150mm away for the distance setting of over 1m.
- Use caution with interference when installing sensor adjacently.



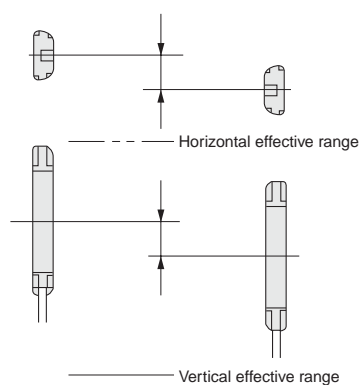
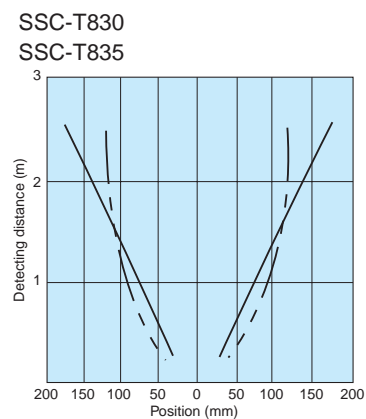
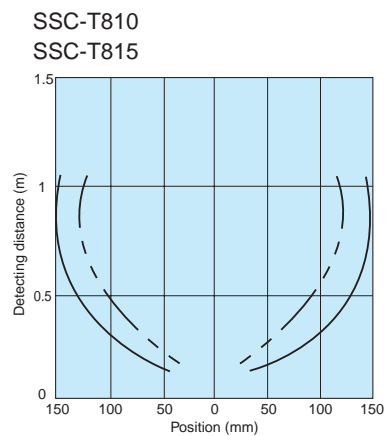
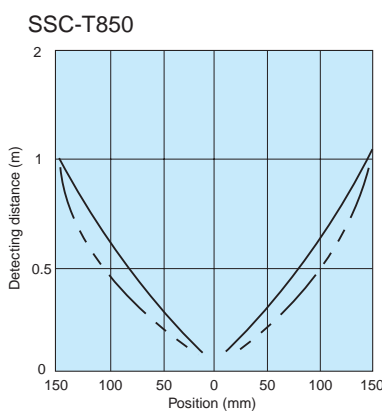
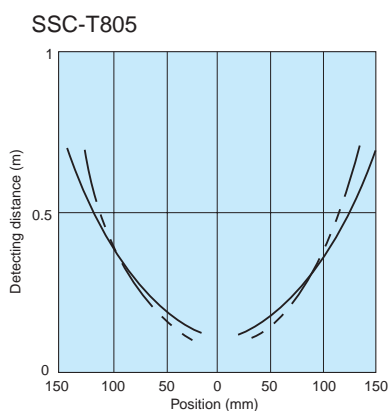
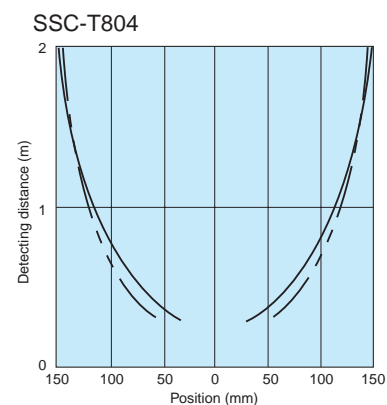
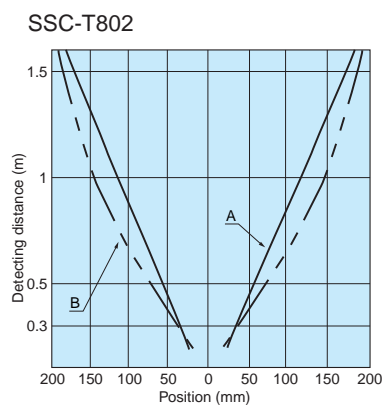
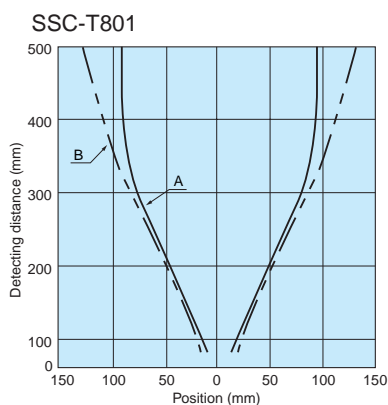
For Correct Use



- Be sure to follow the instructions in the operation manual provided for correct use of the product.
- This sensor cannot be used as a press safety device or other safety device for protection of human body that requires conformity to domestic or overseas standards or certification concerning protection of human body. Use for such purposes may lead to death or serious injury in the unlikely event of failure.
- This sensor is intended for detection of ingress of human body or object passing through an arbitrary point not involving protection of human body or safety.
- When using this sensor for safety purposes, ensure safe operation of the system as a whole including detection and control.

Characteristics (Typical Example)

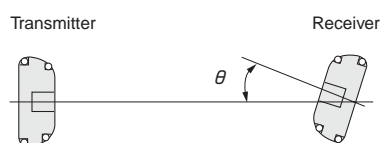
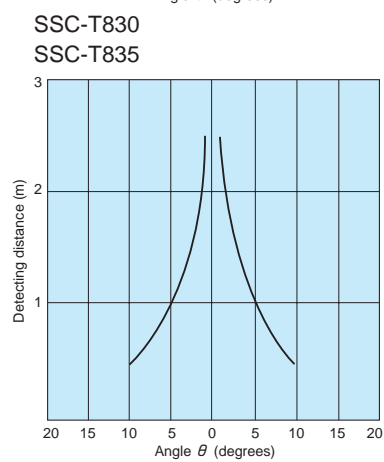
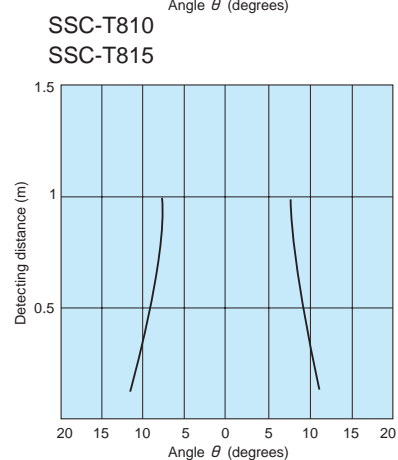
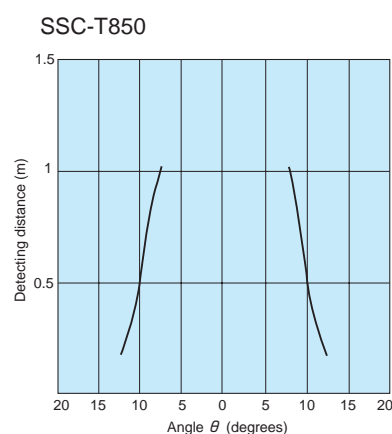
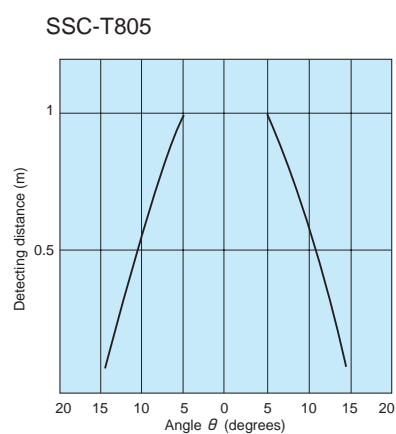
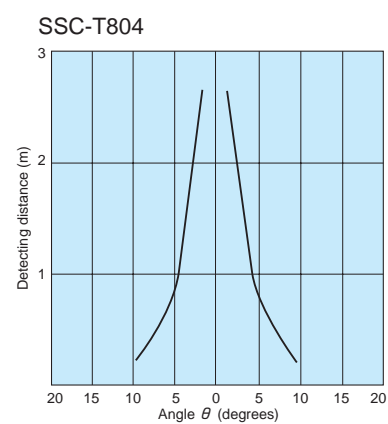
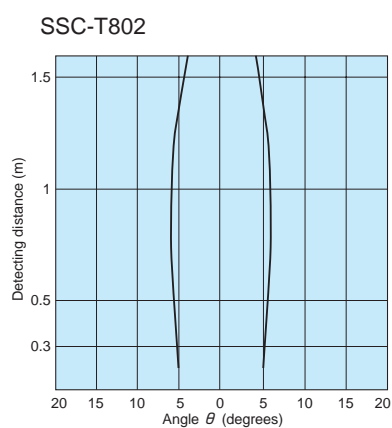
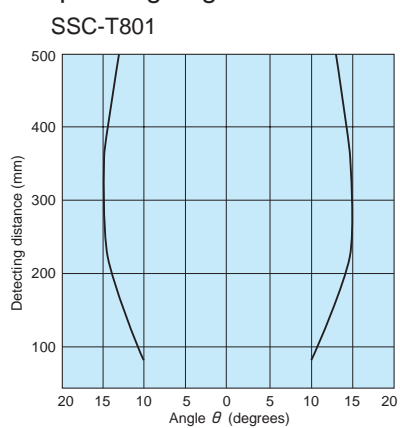
Parallel displacement characteristics



SSC-T800

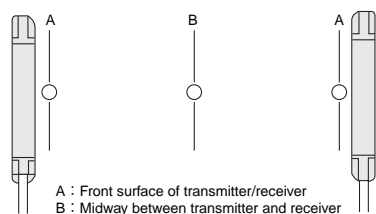
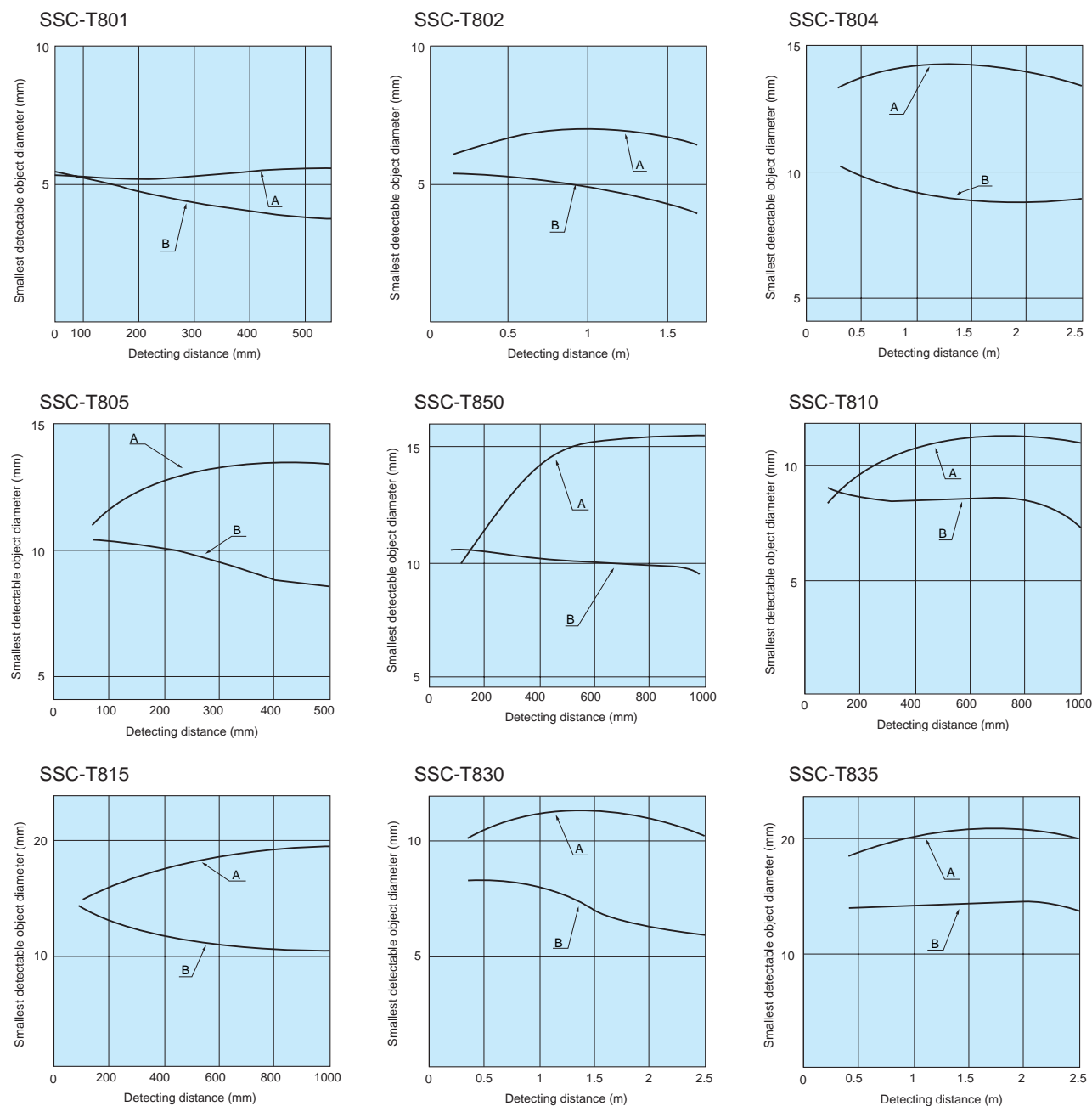
Characteristics (Typical Example)

- Operating angle characteristics



Characteristics (Typical Example)

- Smallest detectable object diameter characteristics

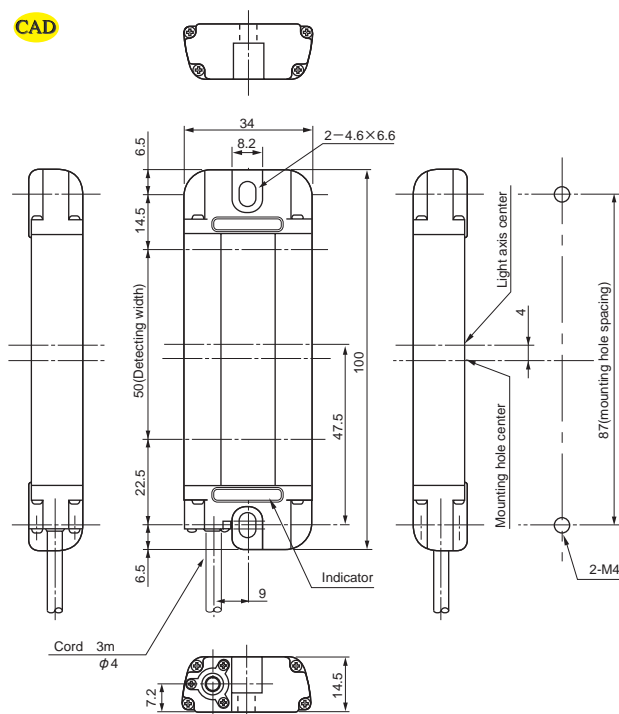


SSC-T800

Dimensions (in mm)

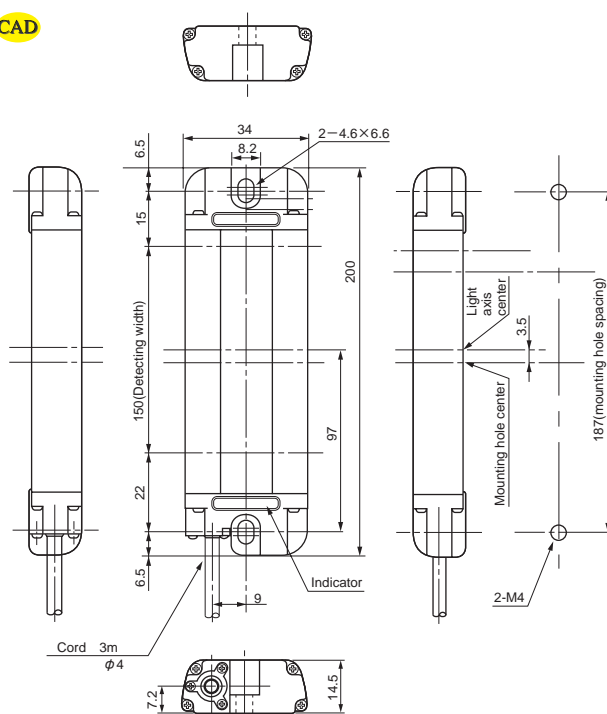
SSC-T801 SSC-T804
SSC-T802 SSC-T805

CAD



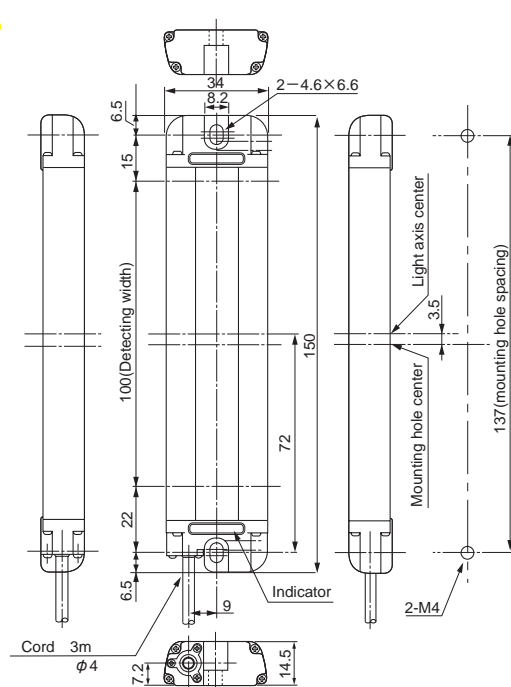
SSC-T850

CAD



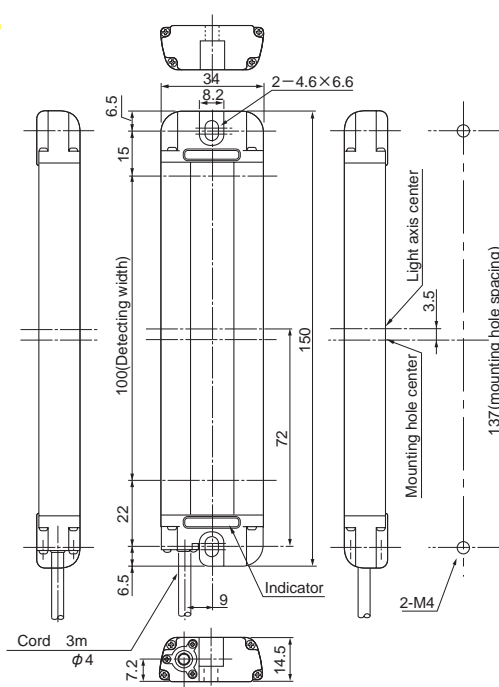
SSC-T810
SSC-T830

CAD



SSC-T815
SSC-T835

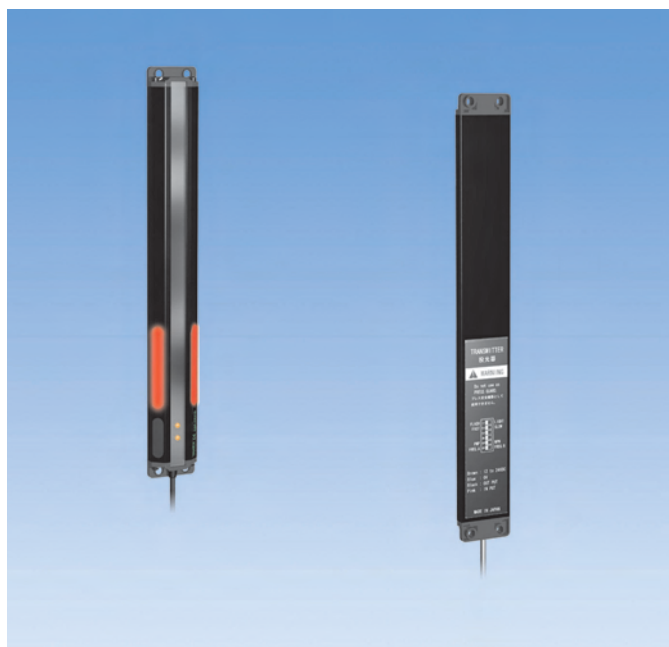
CAD



[illegible]

SSP-T200series

Light curtain sensors for picking



- Picking sensor for checking and instruction of removing parts from bin
- Thinness of 13 mm achieved with rigid metal case
- Large work operation indicator (job light)
- Faulty work operation indicator (fault light) is provided
- 4 types are available for different sizes of parts bins
- Requiring no synchronization line

Asynchronous method employed, eliminating need for synchronization line

Type

Detection method	Detecting distance	Detecting width	Set model No.	No. of light axes	Light axis interval	Detecting object	Connection
 Through-beam type	2m max.	100mm	SSP-T205	5	25mm	Opaque object of ϕ 35mm min.	Permanently attached cord
		225mm	SSP-T210	10			Permanently attached cord with connector
		300mm	SSP-T213	13			
		375mm	SSP-T216	16			
		100mm	SSP-T205-J	5			
		225mm	SSP-T210-J	10			
		300mm	SSP-T213-J	13			
		375mm	SSP-T216-J	16			

Mounting brackets are separately available.

Special mounting brackets (optional)

Model	Model	Remarks
SSP-B1	Flat plate type	Two brackets in one set (with M4 x 12 sems screws with washers and nuts)
SSP-B2	L-shaped plate type	

- Two sets are required for transmitter and receiver.

Cord with connector (optional)

Model	Shape, etc.
FAC-D4R2	M12 straight 4-core cord / 2 m (common to transmitter and receiver)
FAC-D4R5	M12 straight 4-core cord / 5 m (common to transmitter and receiver)

Rating/Performance/Specification

	Model	Permanently attached cord type	SSP-T205	SSP-T210	SSP-T213	SSP-T216
		In-line connector type	SSP-T205-J	SSP-T210-J	SSP-T213-J	SSP-T216-J
Rating/performance	Detection method		Through-beam type			
	Detecting distance		2m			
	Detection object		Opaque object of ϕ 35mm min.			
	No. of light axes		5	10	13	16
	Detecting width		100mm	225mm	300mm	375mm
	Light axis interval		25mm			
	Power supply		12-24V DC \pm 10% / Ripple 10% max.			
	Current consumption		130mA max.	140mA max.	150mA max.	155mA max.
	Output mode	Control output	Selectable between NPN and PNP with switch			
		Rating	Sink current 50mA (30VDC) max. / Residual voltage: 2V max.			
		PNP output	Source current: 50mA (30VDC) max. / Residual voltage: 2V max.			
	Operation mode		Light-ON/Dark-On selectable (with switch)			
	Frequency switching feature		Provided (for up to 2 units)			
	Response time	Normal	Light reception: 35 ms max.	Light reception: 68 ms max.	Light reception: 70 ms max.	Light reception: 94 ms max.
			Light blocking: 25 ms max.	Light blocking: 42 ms max.	Light blocking: 42 ms max.	Light blocking: 58 ms max.
		With frequency switching feature enabled	Light reception: 45 ms max.	Light reception: 74 ms max.	Light reception: 88 ms max.	Light reception: 116 ms max.
Specification			Light blocking: 28 ms max.	Light blocking: 52 ms max.	Light blocking: 54 ms max.	Light blocking: 72 ms max.
	Job light input		Contact or non-contact input			
	Light source (wavelength)		Infrared LED (wavelength: 880nm)			
	Indicator		Transmitter: Power indicator (green LED) / Job light (green LED)			
			Receiver: Light reception indicator (green / orange LED) / Light blocking indicator (orange LED) Job light (green LED) / Fault light (red LED)			
	Job light Fault light		Continuous/flashing illumination selectable with switch Flashing speed: FAST/SLOW selectable with switch			
	Short circuit protection		Provided			
	Automatic sensitivity compensation		Provided			
	Material		Case body: Aluminum / Caps at ends (mounting legs): glass fiber filled PBT Lens: polycarbonate / Switch cover: polyester elastomer			
	Connection	Permanently attached cord	(Outer dimension: dia. 4.1) Cord length: 2m Transmitter: with three 0.2mm ² cores, gray (transmitter) / with four 0.2mm ² cores, black (receiver) covering			
		Permanently attached cord with connector	With M12 connector, 2m long Cord color: transmitter: Gray / Receiver: Black			
	Mass	Permanently attached cord	Transmitter: about 105g Receiver: about 110g	Transmitter: about 160g Receiver: about 170g	Transmitter: about 195g Receiver: about 205g	Transmitter: about 225g Receiver: about 240g
		Permanently attached cord with connector	Transmitter: about 115g Receiver: about 120g	Transmitter: about 170g Receiver: about 180g	Transmitter: about 205g Receiver: about 215g	Transmitter: about 235g Receiver: about 250g
	Accessory		Screwdriver for switch operation (Note) Mounting brackets are separately available.			

Environmental Specification

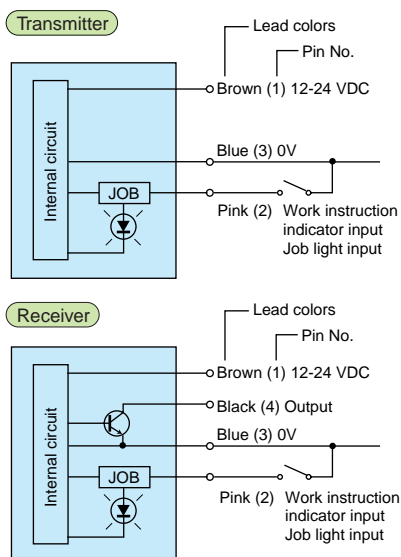
Environmental specification	Ambient light	10,000lx max.
	Ambient temperature	-10 - +55°C (non-freezing)
	Ambient humidity	35-85%RH (non-condensing)
	Vibration	10 - 55Hz / 1.5mm amplitude / 2 hours each in 3 directions
	Shock	500m/s ² / 2 times each in 3 directions
	Protective structure	IP62
	Dielectric withstanding	1,000VAC 50/60Hz for 1 minute
	Insulation resistance	500VDC, 20M Ω or higher.

SSP-T200

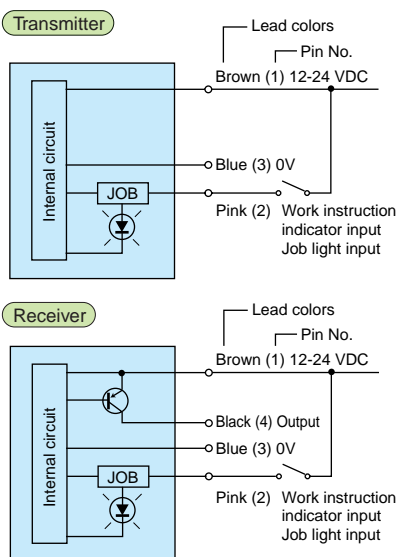
Input/Output Circuit and Connection

Use the mode switch for job light and NPN/PNP receiver output.

For NPN output



For PNP output

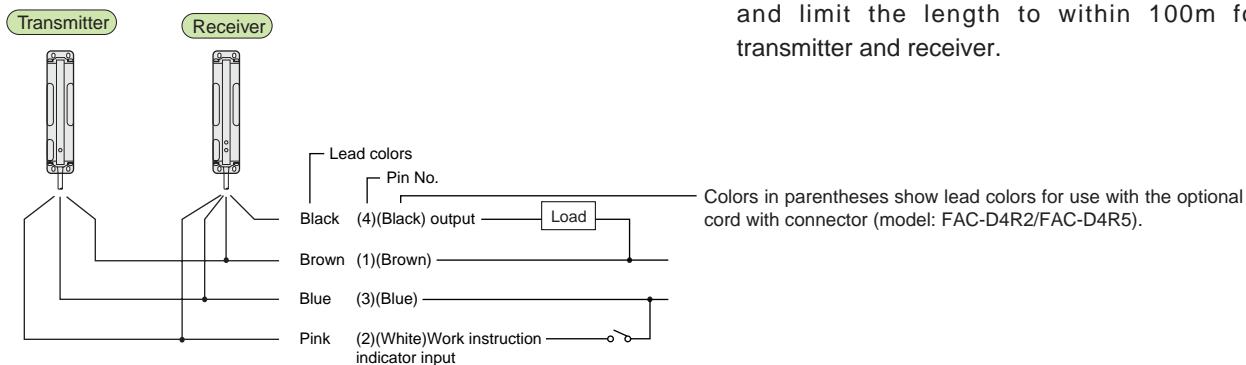


Connector pin arrangement for permanently attached cord with connector (-J type)



Connection

For NPN

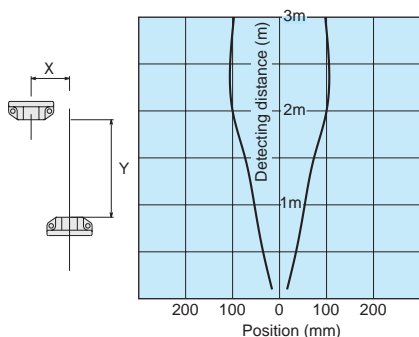


Cord extension

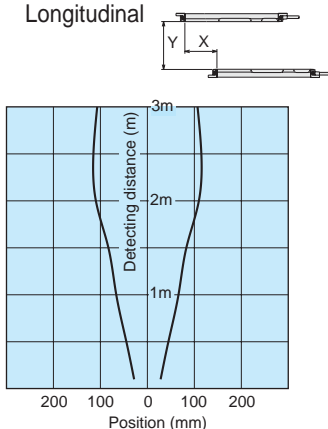
To extend the cord, use wires of at least 0.5mm² and limit the length to within 100m for transmitter and receiver.

Characteristics (Typical Example)

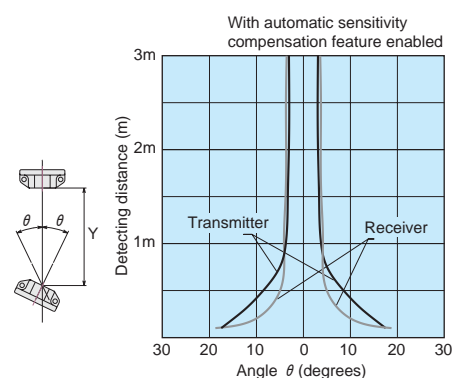
Parallel displacement characteristics



Parallel displacement characteristics Longitudinal



Operating angle characteristics



Mode Switching

Transmitter

1. Job light illumination pattern
2. Job light flashing speed switch
3. NC
4. NC
5. NPN/PNP switch
6. Frequency switching feature

Flash	1		Light
Fast	2		Slow
	3		
	4		
PNP	5		NPN
A	6		B

Receiver

1. Job light illumination pattern
2. Job light flashing speed switch
3. Operation mode switch
4. Fault light setting
5. NPN/PNP switch
6. Frequency switching feature

Flash	1		Light
Fast	2		Slow
Dark on	3		Light on
Fault on	4		Fault off
PNP	5		NPN
A	6		B

Explanation of modes

- Job light illumination pattern
Selects between continuous and flashing illumination for the job light and receiver fault light.
Light: continuous illumination / Flash: flashing illumination
- Job light flashing speed switch
Specifies the flashing speed for the job light and receiver fault light.
- Operation mode switch
Selects between receiver output modes.
- Fault light setting
Specifies the operation of the fault light.
- NPN/PNP switch
Specifies the job light input and receiver output mode.
- Frequency switching feature
Allows setting of different frequencies for A and B with the frequency switch.
Be sure to select the same frequency (A or B) for the transmitter and receiver facing each other.

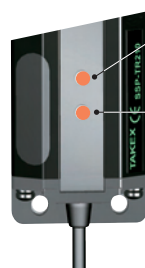
Indicators

Transmitter



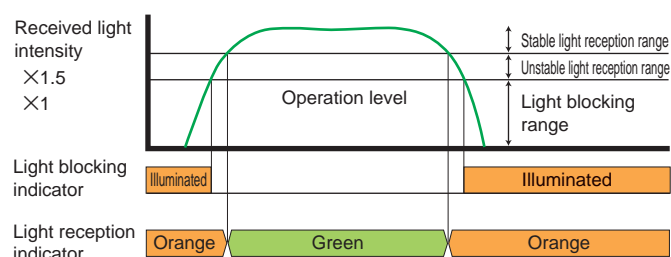
Power indicator: green LED

Receiver



Light blocking indicator: orange LED
Illuminated when light beam is blocked with object.

Light reception indicator: green/orange LED
Green: illuminated to indicate stable light reception.
Orange: illuminated to indicate unstable light reception or light blocking.



Job light and fault light

Sensor operation	Light received	Light blocked	Light received	Light blocked
Job light input		ON		
Job light (green)		Illuminated		
Fault light (red)				Illuminated

Automatic Sensitivity Compensation Feature

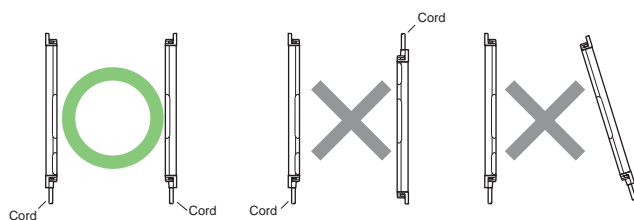
After the light axis alignment is completed, turn the power off once and back on. The automatic sensitivity compensation feature is enabled and the sensitivity is set at the optimum for the sensor.

If the lens is soiled with dirt or dust, the sensitivity is automatically compensated to achieve the optimum sensitivity after the soil is removed.

SSP-T200

Notes on Installation

- Install the transmitter and receiver directly face-to-face and firmly secure them to prevent light axis misalignment due to vibration, etc.
- When installing the sensor, make sure that the ends of the transmitter and receiver with the cord are oriented either upward or downward. The sensor does not function if the transmitter and receiver are not oriented the same way.
- Use M4 screws for mounting and limit the tightening torque to within $0.8\text{N} \cdot \text{m}$. (Prepare screws, etc. separately.)
- Any reflecting object (wall, floor, machine, etc.) within the effective range between the transmitter and receiver may allow the light of the sensor to go around the detection object, which is supposed to block the light, and reach the receiver. Choose the installation location carefully.



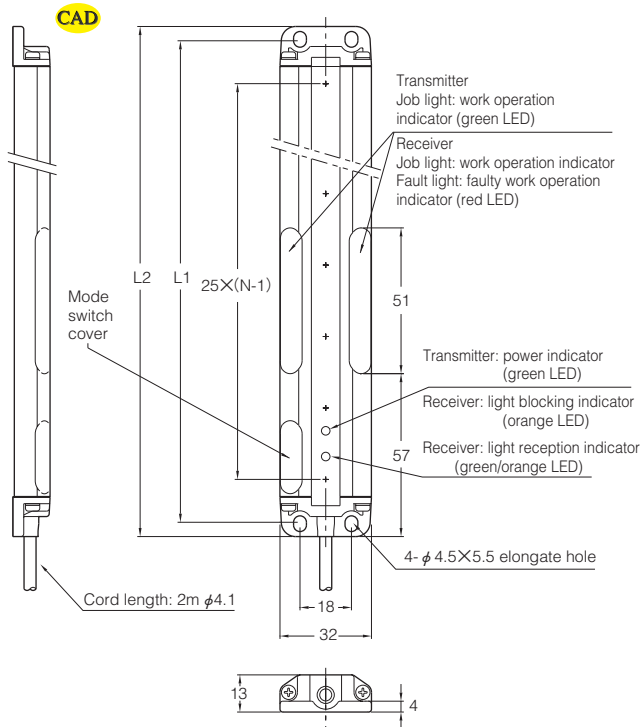
For Correct Use



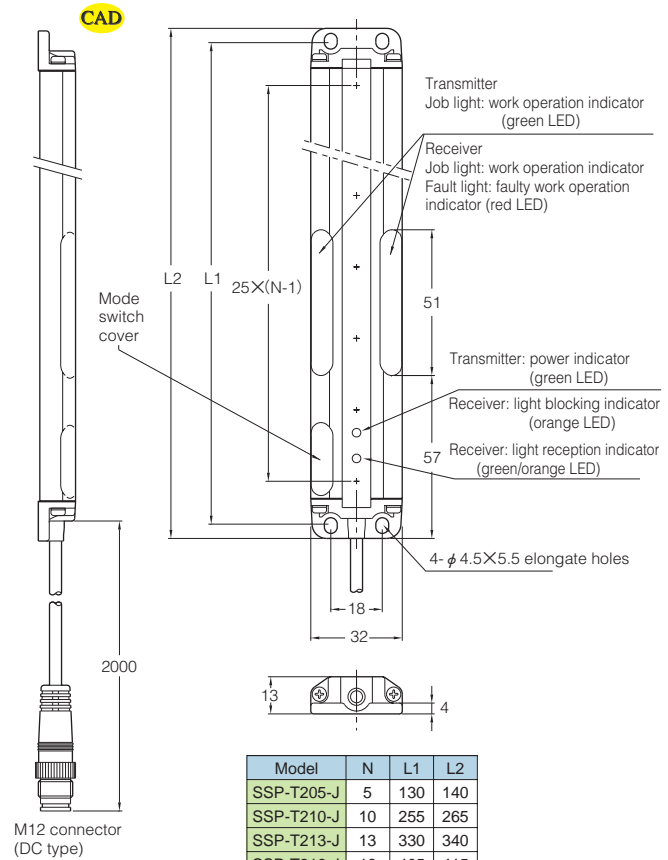
- Be sure to follow the instructions in the operation manual provided for correct use of the product.
- This sensor cannot be used as a press safety device or other safety device for protection of human body that requires conformity to domestic or overseas standards or certification concerning protection of human body. Use for such purposes may lead to death or serious injury in the unlikely event of failure.
- This sensor is intended for detection of ingress of human body or object passing through an arbitrary point not involving protection of human body or safety.
- When using this sensor for safety purposes, ensure safe operation of the system as a whole including detection and control.

Light Curtain Sensors

SSP-T200-J series



Model	N	L1	L2
SSP-T205	5	130	140
SSP-T210	10	255	265
SSP-T213	13	330	340
SSP-T216	16	405	415



Model	N	L1	L2
SSP-T205-J	5	130	140
SSP-T210-J	10	255	265
SSP-T213-J	13	330	340
SSP-T216-J	16	405	415

- Optional parts

Mounting brackets

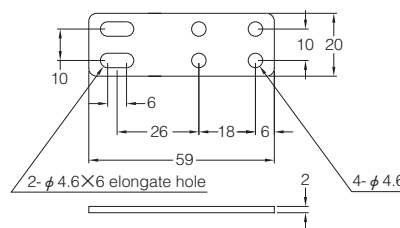
- Two types of mounting brackets are available.
 - Two brackets are required to mount either of the transmitter and receiver.
- Mounting brackets are available in sets of two.
- Four sems screws with M4 x 12 washers and nuts are provided.

Cord with connector

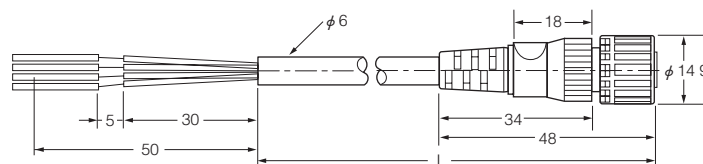
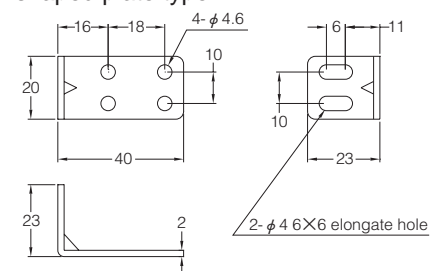
Model:FAC-D4R2 (L:2m)
FAC-D4R5 (L:5m)

CAD

Model:SSP-B1
Flat plate type



Model:SSP-B2
L-shaped plate type











SS10·SS20·SS40 series Light Curtain Sensors



- Light axis interval: 10/20/40mm
- Anti Interference feature for parallel installation (M/S switching)
- Longest -in-class detecting distance of 7m (SS20/SS40 Series)

Type

Series	Detection method	Detecting distance	Light axis interval	No. of light axes	Detecting width	Set model No.	Operation mode	Detecting object	
 SS10	 Through-beam type	 2m	10mm	16	150mm	SS10-T16	 A/O switching A: output transistor activated when light beams of all axes are received (all axes ON) O: output transistor activated when light beam of any axis is received (any axis ON)  M/S switching M: master S: slave (For prevention of interference between adjacently installed units)	Opaque object of ϕ 17mm min	
				24	230mm	SS10-T24			
				32	310mm	SS10-T32			
				48	470mm	SS10-T48			
				64	630mm	SS10-T64			
				80	790mm	SS10-T80			
 SS20		20mm	 7m	8	140mm	SS20-T8		Opaque object of ϕ 32mm min	
				12	220mm	SS20-T12			
				16	300mm	SS20-T16			
				20	380mm	SS20-T20			
				24	460mm	SS20-T24			
				32	620mm	SS20-T32			
 SS40		40mm		40	780mm	SS20-T40			Opaque object of ϕ 52mm min
				48	940mm	SS20-T48			
				4	120mm	SS40-T4			
				6	200mm	SS40-T6			
				8	280mm	SS40-T8			
				10	360mm	SS40-T10			
			12	440mm	SS40-T12				
			16	600mm	SS40-T16				
20		760mm	SS40-T20						
24		920mm	SS40-T24						

Number of axes

Models with numbers of axes other than mentioned in the "Type" table are available. See "Dimensions of portions" in "Dimensions." Contact Takex for details.

Types with unnecessary light axis disabled

Sensors with the light axes for non-detecting area disabled are available on request.

Types allowing installation in contact with glossy surface

Products with countermeasures provided for possible faulty operation due to light from the transmitter reflected on the surrounding floor or wall going around the detection object to reach the receiver are available for all models.

Type and model

- Products with countermeasure are provided for lateral reflection: "-BH" added at the end of the standard model No. (with countermeasure for horizontal light)

SS10・SS20・SS40

Rating/Performance/Specification

Rating/performance	Series	SS10 series	SS20 series	SS40 series
	Detection method	Through-beam		
	Detecting distance	2m max.	7m max.	
	Detecting object	Opaque object of ϕ 17mm min.	Opaque object of ϕ 32mm min	Opaque object of ϕ 52mm min
	No. of light axes	(See "Type.")		
	Detecting width	(See "Type.")		
	Light axis interval	10mm	20mm	40mm
	Power supply	12-24V DC \pm 10% / Ripple 10% max.		
	Output mode	NPN open collector (*) Rating: sink current 100mA (30VDC) max.		
	Operation mode	A/O and M/S switching (with switch)		
	Response time	30ms max.	15ms max.	
Specification	Light source (wavelength)	Infrared LED (860mm)	Infrared LED (950mm)	
	Light-sensitive element	Photo transistor		
	Indicator	Transmitter: M/S indicator (red LED) / Power indicator (green LED) Receiver: Stable light reception indicator (green LED) / Operation indicator (red LED)		
	Auxiliary functions	Output short circuit protection, Anti Interference feature provided for adjacent installation		
	Switch	Transmitter: M/S mode switch (M: master / S: slave); integrated under screw on the back Receiver: Operation mode switch (A: illuminated when beams of all axes are received / O: activated when beam of any axis is received); integrated under screw on the back		
	Material	Case: aluminum / Front cover/lens: Acrylic		
	Connection	Permanently attached cord with connector (cord length: 0.2m) / Cord with connector Cord: with four 0.5mm ² cores (Outer dimension: dia.6.8)		
	Mass	About 250-800g max. (transmitter/receiver)		
Accessory	Cord with connector (cord length: 5m), mounting brackets, operation manual			
Notes	(*) PNP open collector output type (source current: 100mA max.) is also available.			

Environmental Specification

Ambient light	9,000lx max.
Ambient temperature	-10 - +55°C (non-freezing)
Ambient humidity	35 - 85%RH (non-condensing)
Protective structure	IP66
Vibration	10-55Hz / 1.5mm amplitude / 2 hours each in 3 directions

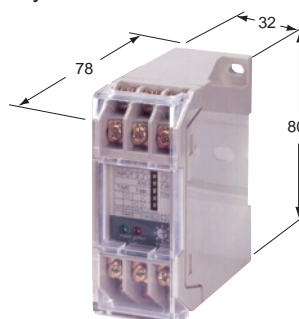
Optional Parts

- Cord with connector (10m)
- For transmitter: SS-H10L (gray covering)
- For receiver: SS-H10R (black covering)

• Applicable power supply unit

PS Series

High capacity of 200mA at 12VDC



(General-purpose type)

PS3N

PS3N-SR

(Multifunctional type)

PS3F

PS3F-SR

• Current consumption by model

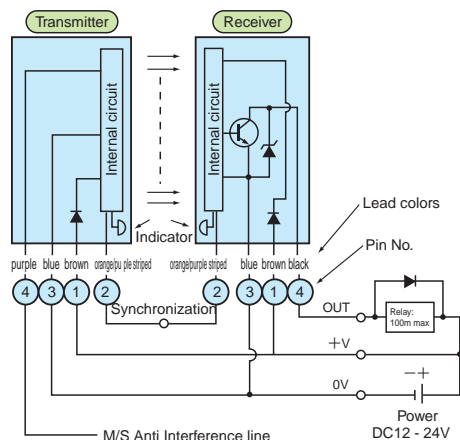
Model	Current consumption
SS10-T16	90mA max.
SS10-T24	103mA max.
SS10-T32	116mA max.
SS10-T48	142mA max.
SS10-T64	168mA max.
SS10-T80	194mA max.
SS10-T96	220mA max.
SS20-T8	70mA max.
SS20-T12	80mA max.
SS20-T16	90mA max.
SS20-T20	100mA max.
SS20-T24	110mA max.
SS20-T32	130mA max.
SS20-T40	150mA max.
SS20-T48	170mA max.
SS40-T4	50mA max.
SS40-T6	55mA max.
SS40-T8	60mA max.
SS40-T10	65mA max.
SS40-T12	70mA max.
SS40-T16	80mA max.
SS40-T20	90mA max.
SS40-T24	100mA max.

Indicator Operation

	Name	Color	Description
Transmitter	Power indicator	Green	Illuminated when power is supplied
	M/S indicator	Red	Illuminated to indicate M mode Dis-illuminated to indicate S mode
Receiver	Stable light reception indicator	Green	Illuminated when the receive light intensity level is 120% or more of the operation level
	Operation indicator	Red	Illuminated when output transistor is activated A: illuminated when light beams of all axes are received O: illuminated when light beam of any axis is received

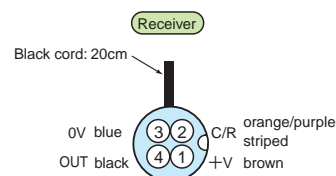
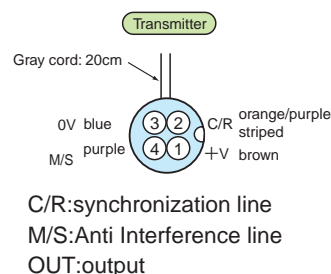
SS10 • SS20 • SS40

Input/Output Circuit and Connection



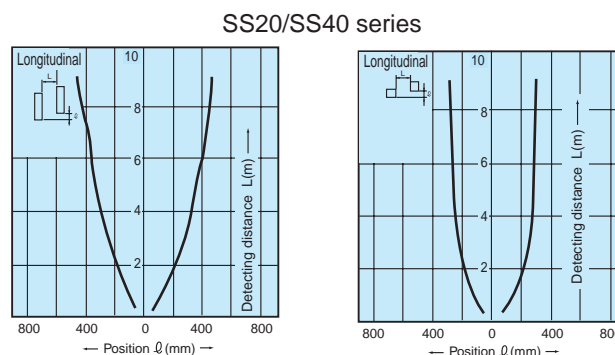
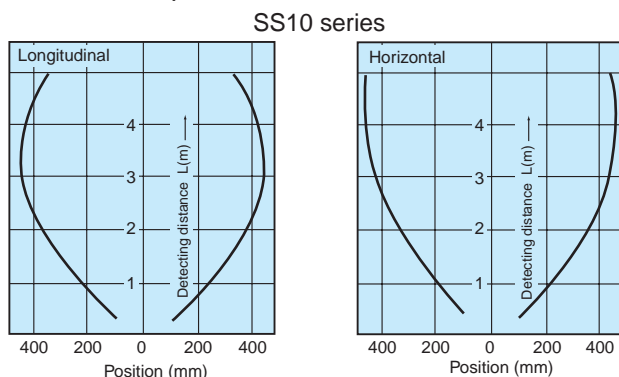
- The output transistor turns off when load short circuit or overload occurs. Check the load and turn the power back on.
- When not using the Anti Interference feature, leave the M/S Anti Interference line unconnected and ensure it will not come in contact with any other cord.

Connector pin assignment

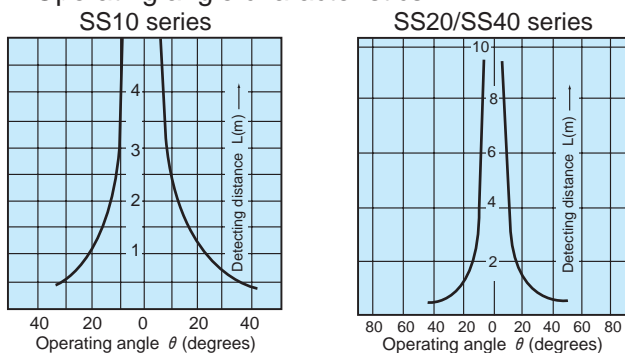


Characteristics (Typical Example)

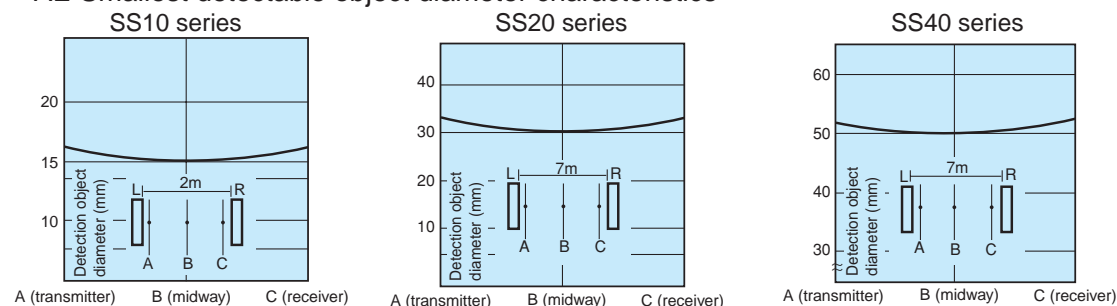
- Parallel displacement characteristics



- Operating angle characteristics



- ÅE Smallest detectable object diameter characteristics



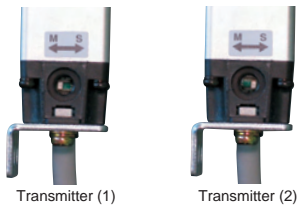
For Correct Use



- Be sure to follow the instructions in the operation manual provided for correct use of the product.
- This sensor cannot be used as a press safety device or other safety device for protection of human body that requires conformity to domestic or overseas standards or certification concerning protection of human body. Use for such purposes may lead to death or serious injury in the unlikely event of failure.
- This sensor is intended for detection of ingress of human body or object passing through an arbitrary point not involving protection of human body or safety.
- When using this sensor for safety purposes, ensure safe operation of the system as a whole including detection and control.

M/S (master/slave) Switching

This feature is for prevention of interference.
(With the screw on the back of the transmitter removed)



- Set the switch of either transmitter to M (master) and of the other to S (slave) and connect the Anti Interference lines of both (purple (orange) = pin No. 4) to each other. The M/S indicator of the master transmitter is illuminated (when activated) and the M/S indicator of the slave transmitter remains unilluminated. For standalone use, be sure to set the switch to M to enable the M/S indicator.

Operation Mode Switching

(With the screw on the back of the receiver removed)



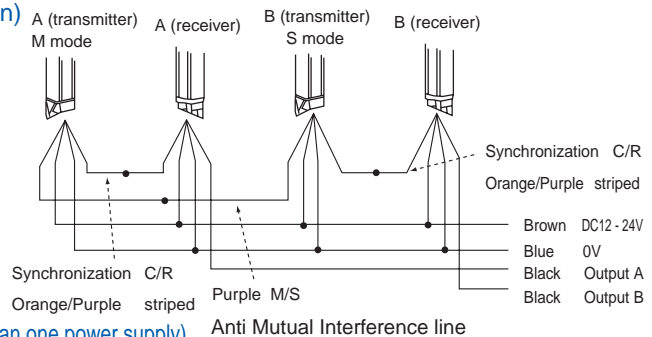
- A: output transistor activated when light beams of all axes are received (all axes reception ON)
- O: output transistor activated when light beam of any axis is received (any axis reception ON)

(Factory setting: A)

Anti Interference

- When using two sets of sensors installed adjacently, connect the Anti Interference lines (purple) of Transmitters A and B with each other.
- Connect the 0 V lines of the Transmitters A and B and Receivers A and B together.
- Set the M/S (master/slave) mode switch of Transmitter A to M and of Transmitter B to S.
- When all wiring has been completed, supply power and check the operation of the M/S indicators of the transmitters:
Transmitter A (M mode): M/S indicator illuminated
Transmitter B (S mode): M/S indicator not illuminated
- When not using Anti Interference, leave the line for this feature unconnected and ensure it will not come in contact with any other cord.

(Connection)

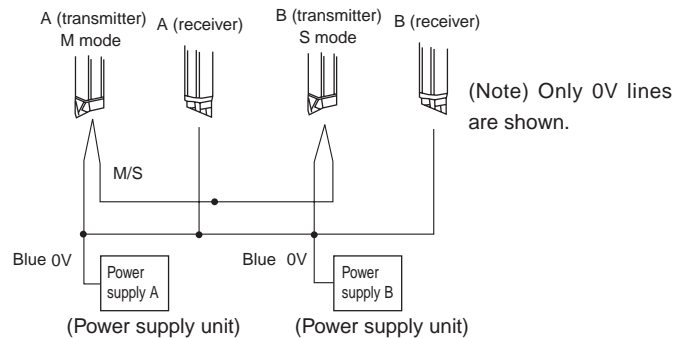
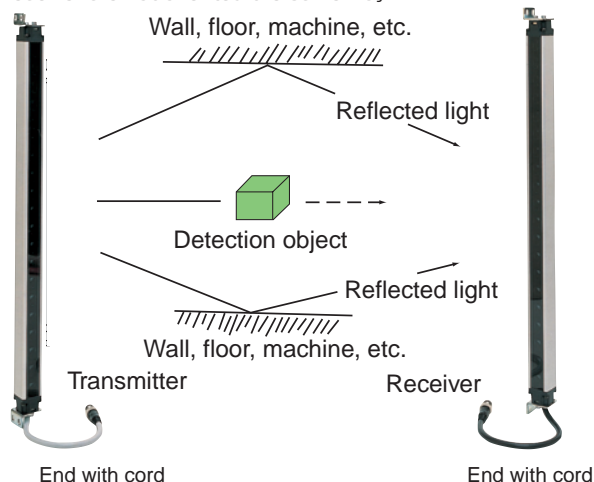


(With more than one power supply)

Connect the 0V lines of the Transmitters A and B and Receivers A and B together.

Notes on Installation

- Any reflecting object (wall, floor, machine, etc.) within the effective range between the transmitter and receiver may allow the light of the sensor to go around the detection object, which is supposed to block the light, and reach the receiver. Choose the installation location carefully.
- Make sure that the ends of the transmitter and receiver with the cord are oriented either upward or downward. The sensor does not function if the transmitter and receiver are not oriented the same way.



Cord Extension

C/R synchronization line (orange/purple striped)

The total length of the cord between the transmitter and receiver should be within 50 m.

M/S Anti Interference line (purple)

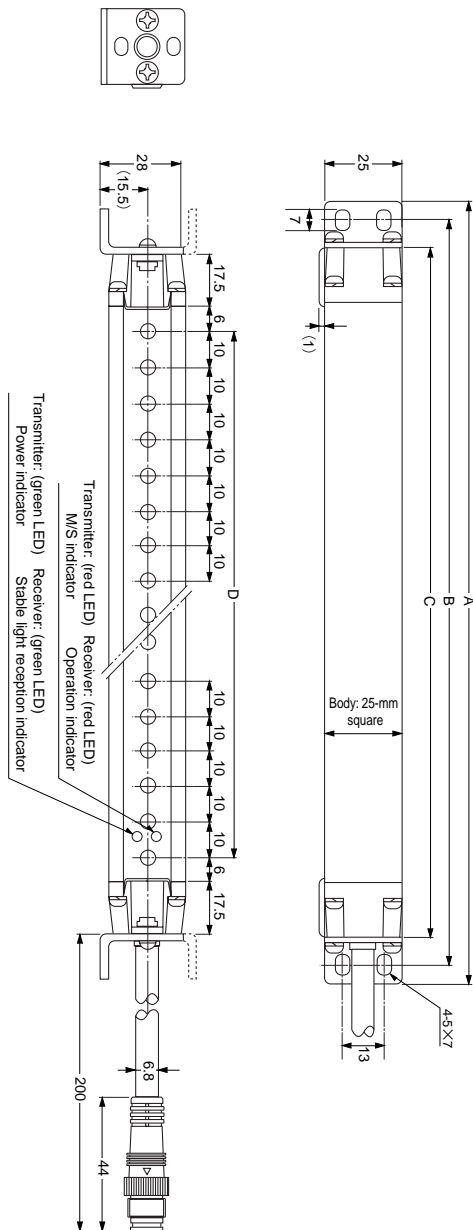
The total length of the cord between the transmitters of the two sets of sensors should be within 50 m.

SS10·SS20·SS40

Dimensions (in mm)(Only receiver is shown in the figure as an example. With transmitter, orientation of mounting bracket is reversed.)

SS10 series

CAD

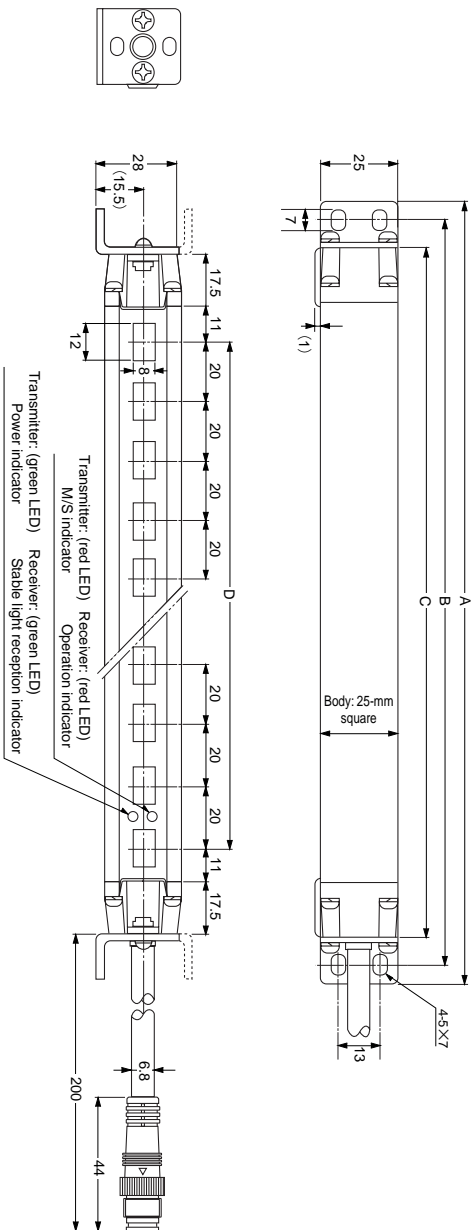


• Dimensions of portions (in mm)

Model	A	B	C	D
SS10-T16	227	215	197	150
SS10-T24	307	295	277	230
SS10-T32	387	375	357	310
SS10-T40	467	455	437	390
SS10-T48	547	535	517	470
SS10-T56	627	615	597	550
SS10-T64	707	695	677	630
SS10-T72	787	775	757	710
SS10-T80	867	855	837	790
SS10-T88	947	935	917	870
SS10-T96	1027	1015	997	950

SS20 series

CAD



• Dimensions of portions (in mm)

Model	A	B	C	D
SS20-T8	227	215	197	140
SS20-T12	307	295	277	220
SS20-T16	387	375	357	300
SS20-T20	467	455	437	380
SS20-T24	547	535	517	460
SS20-T28	627	615	597	540
SS20-T32	707	695	677	620
SS20-T36	787	775	757	700
SS20-T40	867	855	837	780
SS20-T44	947	935	917	860
SS20-T48	1027	1015	997	940

SS10 · SS20 · SS40

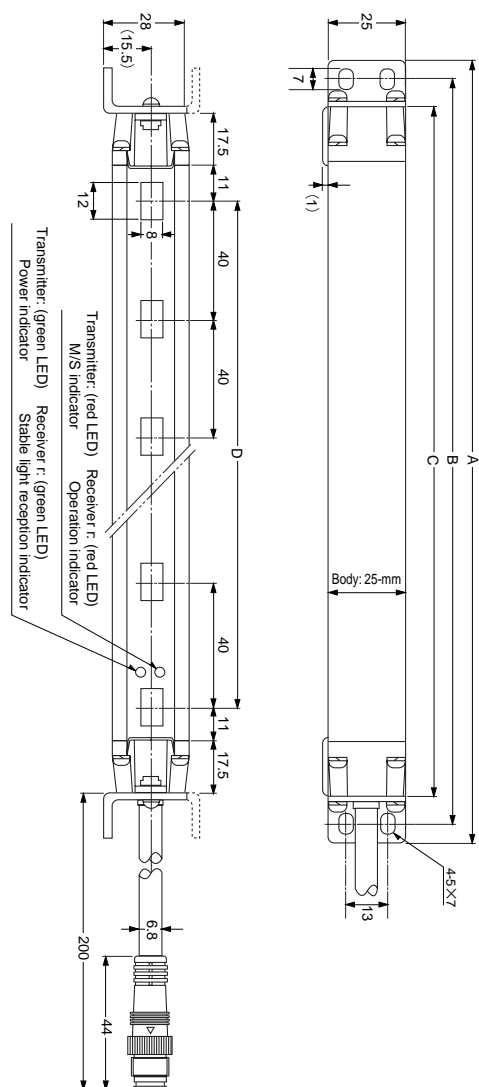
Dimensions (in mm)

SS40 series

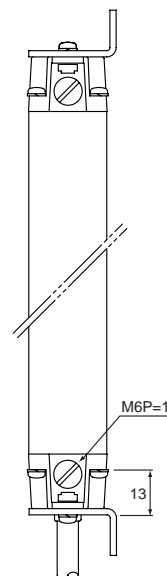
CAD



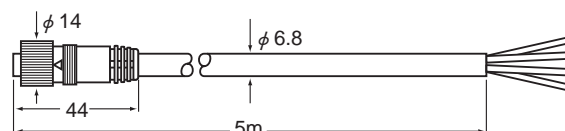
(Only receiver is shown in the figure as an example.
With transmitter, orientation of mounting bracket is reversed.)



Back view (common to all sensors of the series)



Cord with connector (accessory)

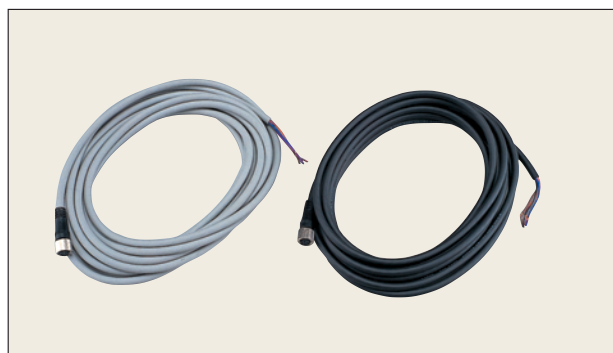


SS-H5L (covering: gray)
SS-H5R (covering: black)

• Dimensions of portions

(in mm)

Model	A	B	C	D	Model	A	B	C	D
SS40-T4	207	195	177	120	SS40-T28	1167	1155	1137	1080
SS40-T6	287	275	257	200	SS40-T30	1247	1235	1217	1160
SS40-T8	367	355	337	280	SS40-T32	1327	1315	1297	1240
SS40-T10	427	435	417	360	SS40-T34	1407	1395	1377	1320
SS40-T12	527	515	497	440	SS40-T36	1487	1475	1457	1400
SS40-T14	607	595	577	520	SS40-T38	1567	1555	1537	1480
SS40-T16	687	675	657	600	SS40-T40	1647	1635	1617	1560
SS40-T18	767	755	737	680	SS40-T42	1727	1715	1697	1640
SS40-T20	847	835	817	760	SS40-T44	1807	1795	1777	1720
SS40-T22	927	915	897	840	SS40-T46	1887	1875	1857	1800
SS40-T24	1007	995	977	920	SS40-T48	1967	1955	1937	1880
SS40-T26	1087	1075	1057	1000					





- Light axis interval 80mm
- Anti Interference feature for adjacent installation (M/S switching)
- Longest -in-class detecting distance of 15 m
- Large indicators

Type

Series	Detection method	Detecting distance	Light axis interval	No. of light axes	Detecting width	Set model No.	Operation mode	Detecting object
<div>↑</div> SS80	Through-beam type	3~15m	80mm	2	80mm	SS80-T2	<ul style="list-style-type: none"> • A (activated when beams of all axes are received)/O (activated when beam of any axis is received) switching • M/S switching M: master S: slave (For prevention of interference between adjacently installed units) 	Opaque object of $\phi 92$ mm min
				4	240mm	SS80-T4		
				6	400mm	SS80-T6		
				8	560mm	SS80-T8		
				10	720mm	SS80-T10		
				12	880mm	SS80-T12		
				14	1040mm	SS80-T14		
				16	1200mm	SS80-T16		
				18	1360mm	SS80-T18		
				20	1520mm	SS80-T20		
				22	1680mm	SS80-T22		
				24	1840mm	SS80-T24		

Optional Parts

Set model No.	Discrete model No.	Length	Description
SS-H5 (Accessory)	SS-H5L (for transmitter)	5m	Cord with connector (6.8mm outer diameter, four 0.5mm ² cores, gray (transmitter) or black (receiver) covering)
	SS-H5R (for receiver)		
SS-H10	SS-H10L (for transmitter)	10m	
	SS-H10R (for receiver)		

Rating/Performance/Specification

Rating/performance	Series	SS80 series
	Detection method	Through-beam type
	Detecting distance	3-15m max.
	Detecting object	Opaque object of ϕ 92 min.
	Light axis interval	80mm
	Power supply	12-24V DC \pm 10%
	Output mode	NPN open collector output Rating: sink current 100mA (30VDC) max. (PNP output type (model No. ending with "-PN") is separately available)
	Operation mode	A/O mode switching A mode: activated when beams of all axes are received (deactivated when beam of any axis is blocked) O mode: activated when beam of any axis is received (deactivated when beams of all axes are blocked)
	Response time	15ms max.
Specification	Light source(wavelength)	Infrared LED (880nm)
	Light-sensitive element	Photo transistor
	Indicator	Transmitter: Power indicator (green LED) / M/S indicator (red LED) / Light axis alignment indicator (green LED) Receiver: Operation indicator (red LED) / Stable light reception indicator (green LED) / Light axis alignment indicator (green LED)
	Switch (SW)	Transmitter: M/S mode switch provided Receiver: A/O mode switch provided
	Auxiliary functions	Anti Interference feature for adjacent installation, output short circuit protection
	Material	Case: aluminum / Front cover/lens: Acrylic
	Connection	Permanently attached cord with connector (cord length: 0.2m) / Cord with connector Cord: with four 0.5mm ² cores (Outer dimension: dia.6.8)
	Accessory	Cord with connector (cord length: 5m), mounting brackets, operation manual
	Notes	(PNP output type is separately available.)

Environmental Specification

Environmental specification	Ambient light	9,000lx max.
	Ambient temperature	-10 - +55°C (non-freezing)
	Ambient humidity	35-85%RH (non-condensing)
	Protective structure	IP66
	Vibration	10 - 55Hz / 1.5mm amplitude / 2 hours each in 3 directions

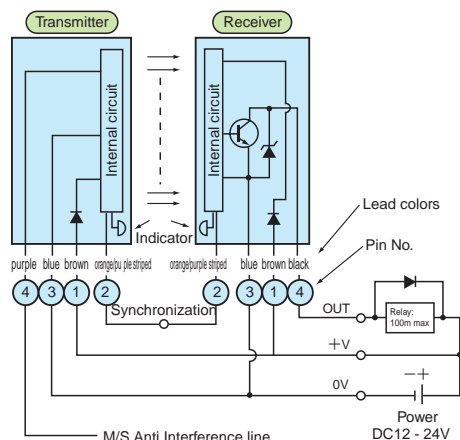
Indicator Operation

	Name	Color	Description
Transmitter	Power indicator	Green	Illuminated when power is supplied
	M/S indicator	Red	Illuminated to indicate M mode Dis-illuminated to indicate S mode
	Light axis alignment indicator	Green	Illuminated when power is supplied
Receiver	Stable light reception indicator	Green	Illuminated when the receive light intensity level is 120% or more of the operation level
	Operation indicator	Red	Illuminated when output transistor is activated A: illuminated when light beams of all axes are received O: illuminated when light beam of any axis is received
	Light axis alignment indicator	Green	Illuminated when power is supplied

Specification by model

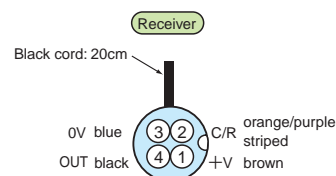
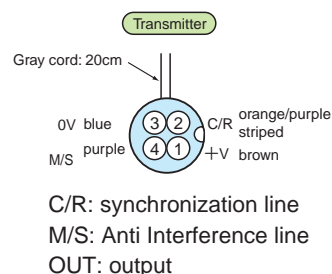
Set model No.	No. of light axes	Detecting width	Current consumption (mA)	Mass (about in g)	
				Transmitter	Receiver
SS80-T2	2	80	50	250g max.	
SS80-T4	4	240	56	350g max.	
SS80-T6	6	400	63	450g max.	
SS80-T8	8	560	69	550g max.	
SS80-T10	10	720	75	650g max.	
SS80-T12	12	880	82	750g max.	
SS80-T14	14	1040	88	850g max.	
SS80-T16	16	1200	95	950g max.	
SS80-T18	18	1360	101	1050g max.	
SS80-T20	20	1520	107	1150g max.	
SS80-T22	22	1680	114	1250g max.	
SS80-T24	24	1840	120	1350g max.	

Input/Output Circuit and Connection



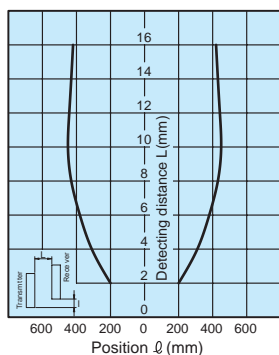
- The output transistor turns off when load short circuit or overload occurs. Check the load and turn the power back on.
- When not using the Anti Mutual Interference feature, leave the M/S Anti Mutual Interference line unconnected and ensure it will not come in contact with any other cord.

Connector pin assignment

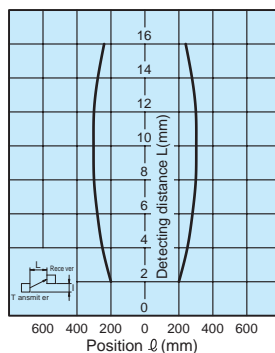


Characteristics (Typical Example)

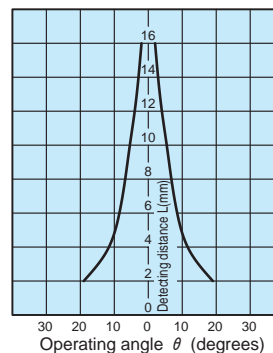
- Parallel displacement characteristics (Longitudinal)



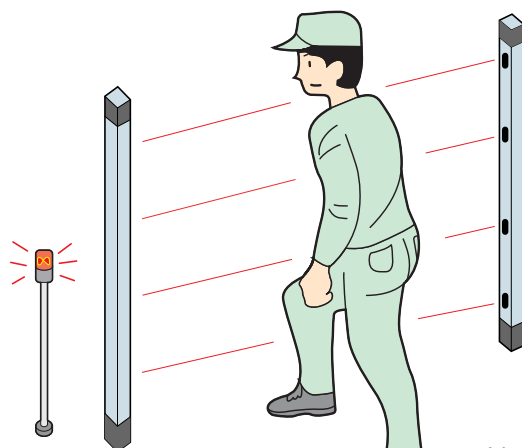
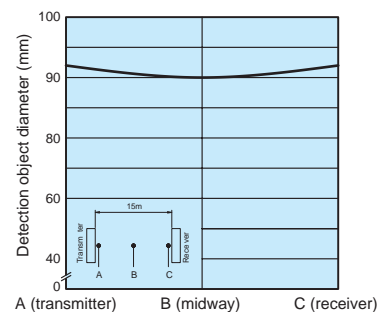
- Parallel displacement characteristics (Horizontal)



- Operating angle characteristics



- Smallest detectable object diameter characteristics



Ideal for comparatively large works as in detection of passage or ingress.

For Correct Use



- Be sure to follow the instructions in the operation manual provided for correct use of the product.
- This sensor cannot be used as a press safety device or other safety device for protection of human body that requires conformity to domestic or overseas standards or certification concerning protection of human body. Use for such purposes may lead to death or serious injury in the unlikely event of failure.
- This sensor is intended for detection of ingress of human body or object passing through an arbitrary point not involving protection of human body or safety.
- When using this sensor for safety purposes, ensure safe operation of the system as a whole including detection and control.

M/S (master/slave) Switching

This feature is for prevention of interference.
(With the screw on the back of the transmitter removed)



- Set the switch of either transmitter to M (master) and of the other to S (slave) and connect the Anti Interference lines of both (purple (orange) = pin No. 4) to each other. The M/S indicator of the master transmitter is illuminated (when activated) and the M/S indicator of the slave transmitter remains unilluminated. For standalone use, be sure to set the switch to M to enable the M/S indicator.

Operation Mode Switching

(With the screw on the back of the receiver removed)



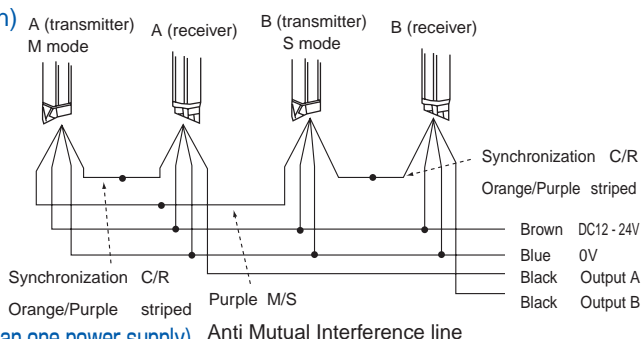
- A: output transistor activated when light beams of all axes are received (all axes reception ON)
- O: output transistor activated when light beam of any axis is received (any axis reception ON)

(Factory setting: A)

Anti Interference

- When using two sets of sensors installed adjacently, connect the Anti Interference lines (purple) of Transmitters A and B with each other.
- Connect the 0 V lines of the Transmitters A and B and Receivers A and B together.
- Set the M/S (master/slave) mode switch of Transmitter A to M and of Transmitter B to S.
- When all wiring has been completed, supply power and check the operation of the M/S indicators of the transmitters:
Transmitter A (M mode): M/S indicator illuminated
Transmitter B (S mode): M/S transmitter not illuminated
- When not using Anti Interference, leave the line for this feature unconnected and ensure it will not come in contact with any other cord.

(Connection)

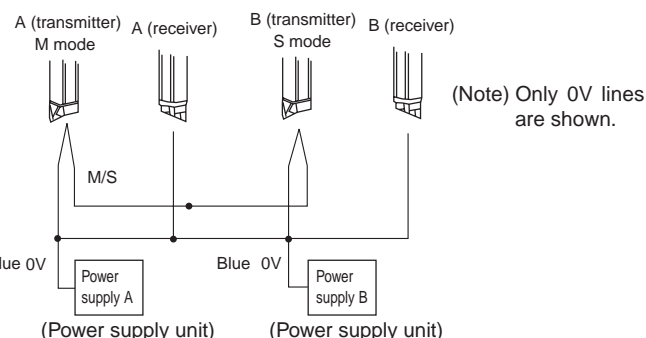
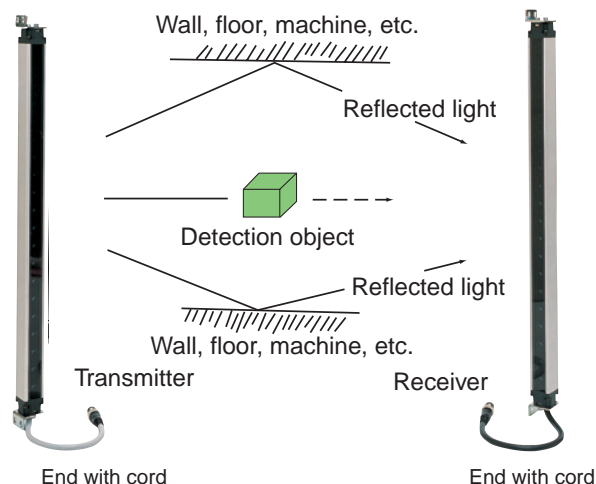


(With more than one power supply)

Connect the 0 V lines of the Transmitters A and B and Receivers A and B together.

Notes on Installation

- Any reflecting object (wall, floor, machine, etc.) within the effective range between the transmitter and receiver may allow the light of the sensor to go around the detection object, which is supposed to block the light, and reach the receiver. Choose the installation location carefully.
- Make sure that the ends of the transmitter and receiver with the cord are oriented either upward or downward. The sensor does not function if the transmitter and receiver are not oriented the same way.



Cord Extension

C/R synchronization line (orange/purple striped)

The total length of the cord between the transmitter and receiver should be within 50m.

M/S Anti Interference line (purple)

The total length of the cord between the transmitters of the two sets of sensors should be within 50m.

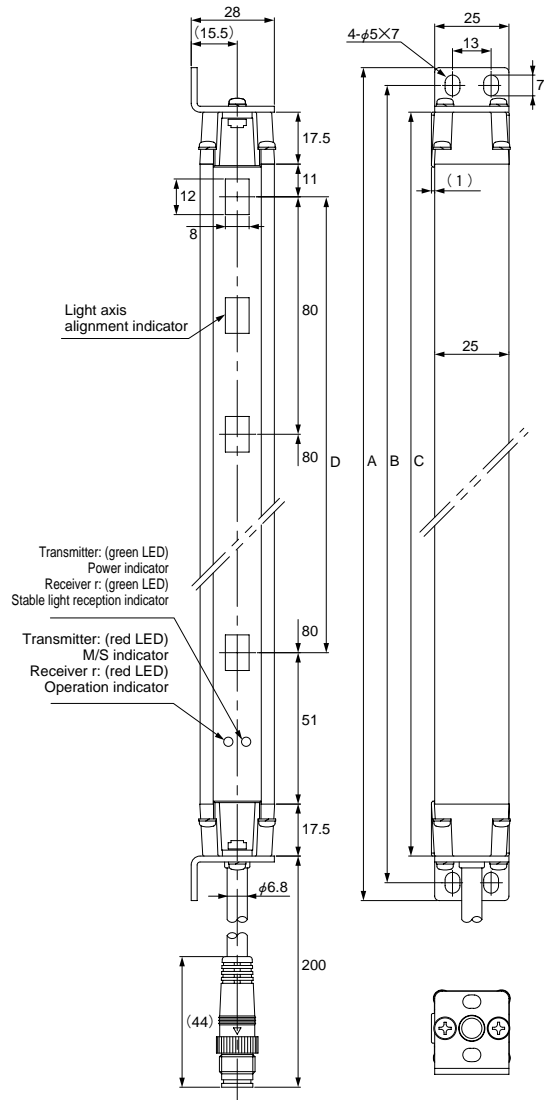
SS80

Dimensions (in mm)(Only receiver is shown in the figure as an example. With transmitter, orientation of mounting bracket is reversed.)

SS800 series

CAD

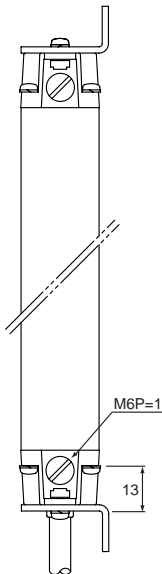
(Only receiver is shown in the figure as an example. With transmitter, orientation of mounting bracket is reversed.)



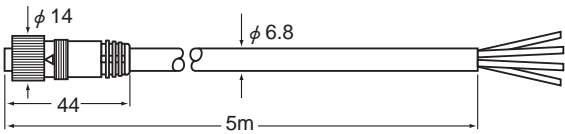
• Dimensions of portions (in mm)

Model	A	B	C	D
SS80-T2	207	195	177	80
SS80-T4	367	355	337	240
SS80-T6	527	515	497	400
SS80-T8	687	675	657	560
SS80-T10	847	835	817	720
SS80-T12	1007	995	977	880
SS80-T14	1167	1155	1137	1040
SS80-T16	1327	1315	1297	1200
SS80-T18	1487	1475	1457	1360
SS80-T20	1647	1635	1617	1520
SS80-T22	1807	1795	1777	1680
SS80-T24	1967	1955	1937	1840

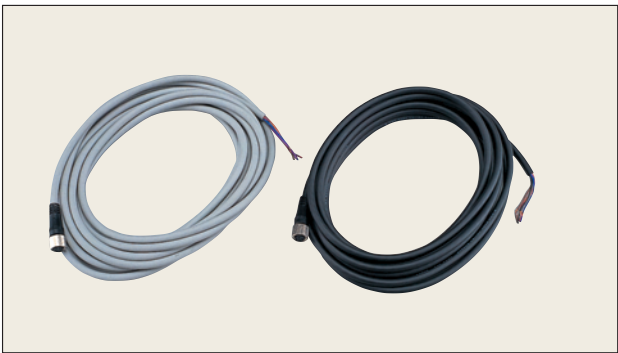
Back view



Cord with connector (accessory)



SS-H5L (covering: gray)
SS-H5R (covering: black)

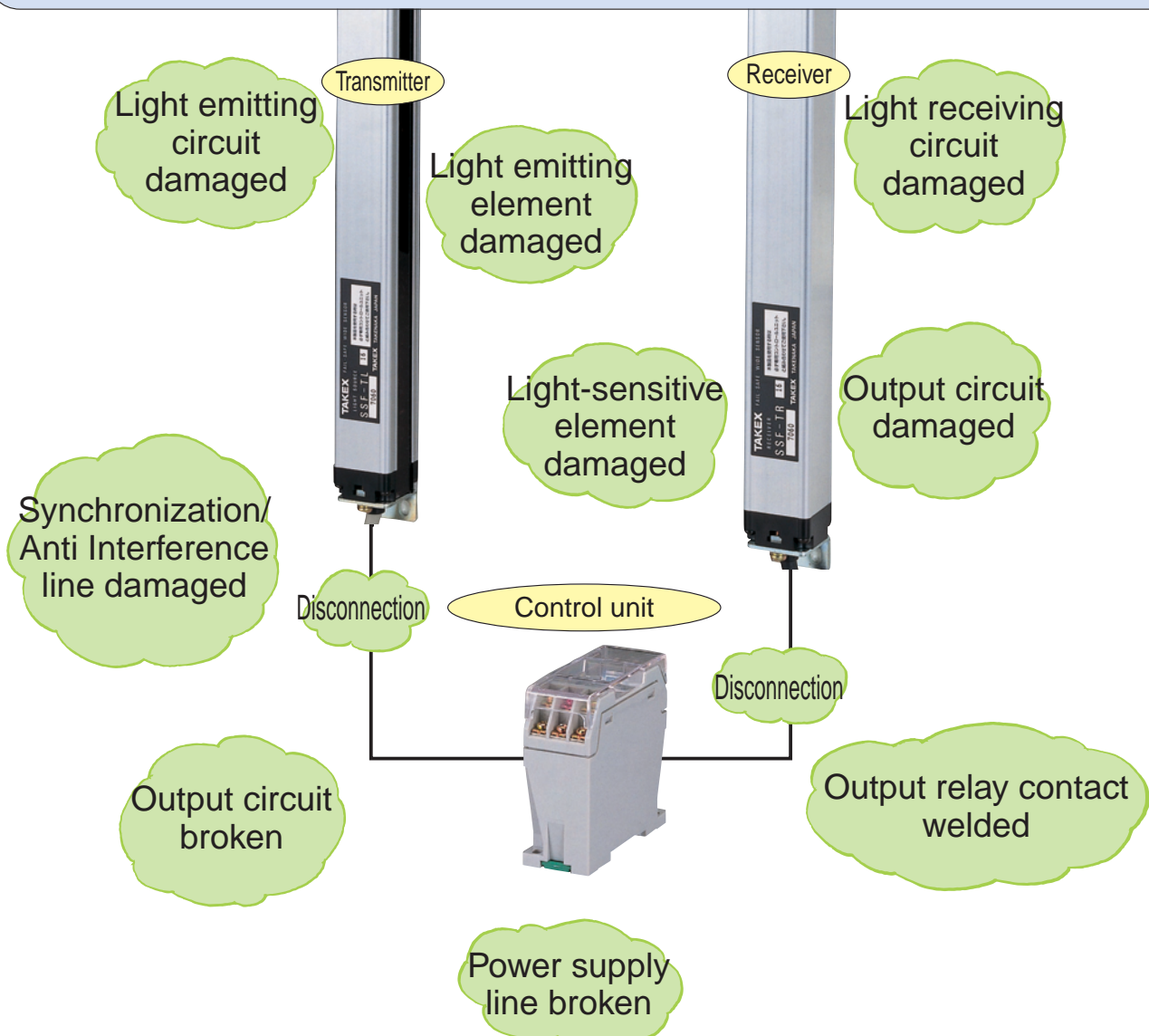


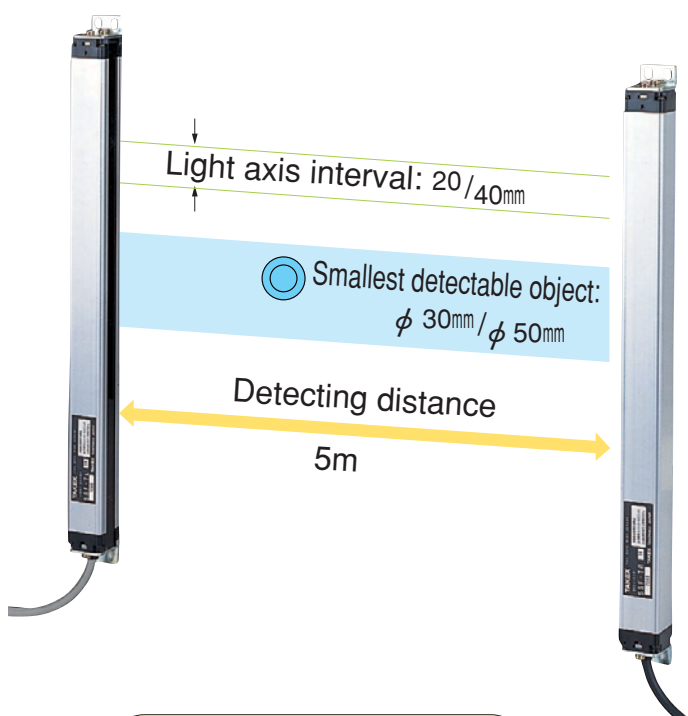
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- Safety ensured in the unlikely event of failure
Fail-safe feature
- Enhanced safety with high performance and user-friendliness
Multifunctional
- 20- and 40-mm light axis intervals available
Wide variation

Output relay turns OFF (safe side) when failure occurs





Light axis alignment indicator for ease of use



Light axis alignment indicator lamps for the top (H) and bottom (L) light axes are provided at the center of the receiver for assistance with light axis adjustment and check.

2 sets of sensors mounted adjacently or face-to-face without interference

Anti Interference feature counteracts the installation restrictions and ensures reliability.

Relay contacts used for all outputs for enhanced fail-safe feature

Contact relays are used for control and lockout outputs. Failure-safe is taken into consideration for failure mode as well.

Easy maintenance thanks to robust and slim case provided with spatter-resistant plate

Robust aluminum drawn case is employed. Front cover that protects the lenses from scattered oil dust or spatters may be removed for cleaning and replacement.

Fail-safe automatic sensitivity compensation feature provided

After the light axis alignment is completed, turn the power off once and back on. The automatic sensitivity compensation feature is enabled and the sensitivity is set at the optimum. If the lens is soiled with dirt or dust, the sensitivity is automatically compensated to achieve the optimum sensitivity after the soil is removed.

CHECK switches provided for simple operation check



The CHECK switches on the control unit allow simple operation check and lockout release check.

Wide variation

A wide range of sizes from 4 (120mm) to 64 axes (2520 mm) offered for various applications (compatible to supersized machines).



Type

Series name	Detecting distance	Detecting width	Set model No.	No. of light axes	Light axis interval	Detecting object
<div><div>↑</div><div>SSF-T200</div></div>	<div>5m</div>	140mm	SSF-T8C	8	20mm	Opaque object of ϕ 30 min
		300mm	SSF-T16C	16		
		460mm	SSF-T24C	24		
		620mm	SSF-T32C	32		
		780mm	SSF-T40C	40		
		940mm	SSF-T48C	48		
		1100mm	SSF-T56C	56		
		1260mm	SSF-T64C	64		
<div><div>↑</div><div>SSF-T400</div></div>		120mm	SSF-T404C	4	40mm	Opaque object of ϕ 50 min
		280mm	SSF-T408C	8		
		440mm	SSF-T412C	12		
		600mm	SSF-T416C	16		
		760mm	SSF-T420C	20		
		920mm	SSF-T424C	24		
		1080mm	SSF-T428C	28		
		1240mm	SSF-T432C	32		

For prices of the individual transmitter, receiver and special control unit, see the Price List at the end of the book.

Set model description

Transmitter: SSF-TL } indicates the number of axes
Receiver: SSF-TR

Control unit: SSF-C

Cord with connector for transmitter: SS-H5L

Cord with connector for receiver: SS-H5R

- Products with countermeasures provided in the event of faulty operation due to spatter or arc light are available (SSF-T400 Series).

Transmitter: SSF-TL4 -HP

Receiver: SSF-TR4 A-HP

Set model: SSF-T4 AC-HP

2-output type

Products with two 1a contact outputs are available on request.

Optional Parts

- Corner reflector

Deflects light at a corner.

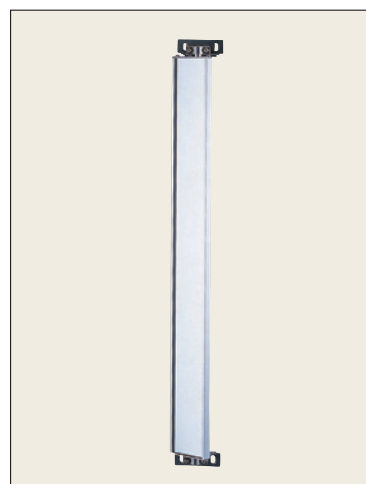
Model	Applicable model (*)
SSM-F8N	SSF-T8
SSM-F16N	SSF-T16
SSM-F24N	SSF-T24
SSM-F32N	SSF-T32
SSM-F40N	SSF-T40
SSM-F48N	SSF-T48
SSM-F56N	SSF-T56
SSM-F64N	SSF-T64

(Note) The detecting distance will be reduced to 4m max.

*May also be used for the SSF-T400 Series. Note the number of axes and the overall length of the reflector.

- Front cover

Model: SSF-K* indicates the number of axes (unified price for all models).



Rating/Performance/Specification

Rating/performance	Series		SSF-T200 series	SSF-T400 series
	Detection method		Through-beam type	
	Detecting distance		5m max.	
	Detecting object		Opaque object of ϕ 30mm min.	Opaque object of ϕ 50mm min.
	Light axis interval		20mm	40mm
	No. of light axes		(See “Type.”)	
	Detecting width			
	Power supply		24V DC \pm 10%	
	Current consumption		300mA max.	
	Control output	Output mode	Output: relay contact 1a (2 relay outputs in series) Rating: 250V 3A AC noninductive load 30V 2A DC noninductive load	
		Operation mode	Activated when light beams of all axes are received	
Response time		Light blocking: 20 ms max / Light reception: 30 ms max.		
Lockout output	Output mode	Output: relay contact 1a Rating: 250V 1A AC noninductive load 30V 1A DC noninductive load		
	Operation mode	ON for normal operation, OFF for failure		
	Response time	50ms or less		
Specification	Light source		Infrared LED (wavelength 880nm)	
	Light-sensitive element		Photo IC	
	Indicator	Transmitter	Circuit failure indicator (Orange) RUN indicator (Green)	Synchronization failure indicator (Red) Slave indicator (Orange)
		Receiver	Top light axis alignment indicator (Green)/Disturbing light indicator (Orange) /Bottom light axis alignment indicator (Green) Operation indicator (Red)/Unstable light reception indicator (Orange) /Stable light reception indicator (Green)	
		Control unit	POWER (Green) SENSOR FAIL (Red)	OUTPUT (Yellow) LOCK OUT (Red)
	Auxiliary functions		Anti Sensitivity feature for adjacent installation, automatic sensitivity compensation	
	Switch		Control unit: CHECK switch	
	Material		Transmitter/receiver: aluminum / Front cover: acrylic Control unit: polycarbonate	
	Connection		Permanently attached cord with connector (ϕ 6.8 4-core cord of 0.2 m in length for transmitter/receiver) Control unit: terminal block type with M3.5 screws	
	mass	Sensor	230g max. -1000g max.	
		Control unit	160g max.	
	Accessory		Cord with connector (cord length: 5 m), mounting brackets, operation manual	

Environmental Specification

Ambient light	9000lx max.
Ambient temperature	-10 - +55 °C (non-freezing)
Ambient humidity	35-85%RH (non-condensing)
Vibration	10-55 Hz / 1.5 mm amplitude / 2 hours each in 3 directions
Protective structure	Sensor: IP65 (except for connector) / Control unit: IP40
Dielectric withstanding	1500 VAC for 1 minute
Insulation resistance	500 VDC, 20 M Ω or higher.

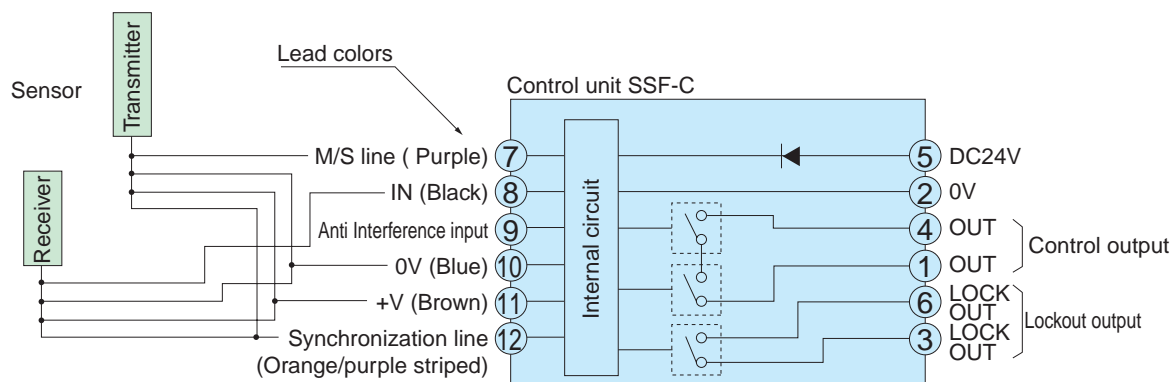
Optional Parts

Cord with connector (10 m)

For transmitter: SS-H10L (gray covering)

For receiver: SS-H10R (black covering)

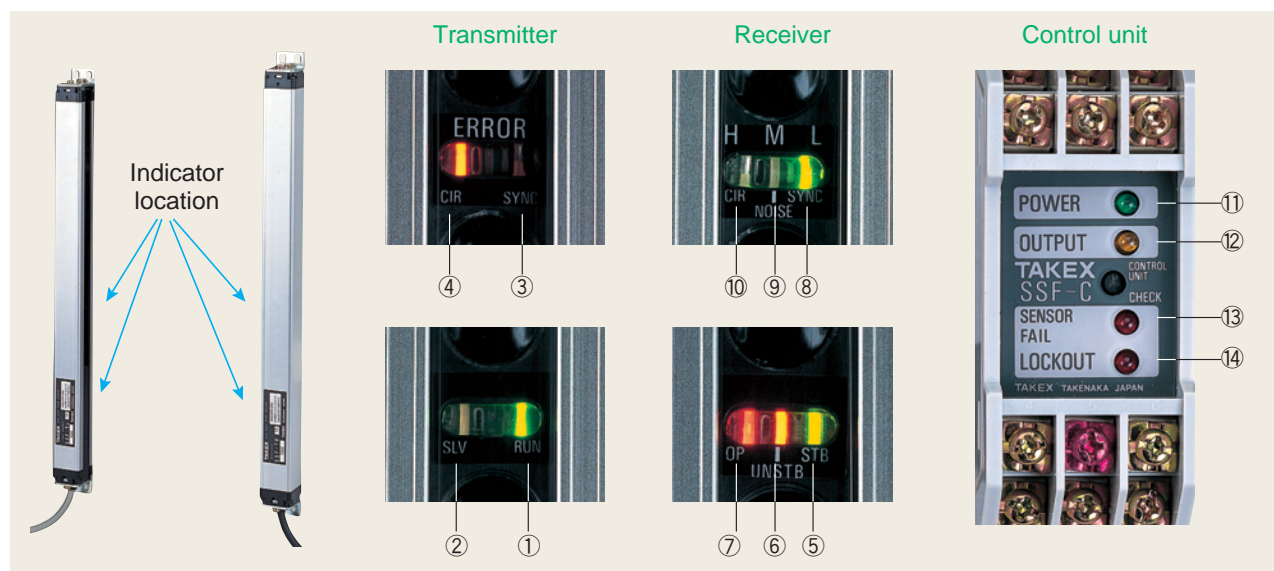
Input/Output Circuit and Connection



(Circled numbers show pin Nos.)

Indicators and Operation

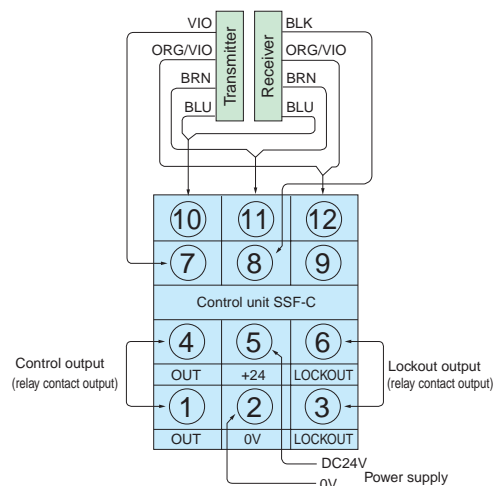
The indicators provided for the transmitter, receiver and control unit and their operation are outlined as follows:



Type	No.	Indicator name	Color	Normal operation	Failure description and indication
Transmitter	①	RUN indicator	Green	Illuminated	Flashes to indicate transmitter failure
	②	Slave indicator	Orange	Illuminated to indicate slave	Flashes to indicate abnormal operation of slave
	③	Synchronization failure indicator	Red	Not illuminated	Flashes to indicate broken synchronization line
	④	Circuit failure indicator	Orange	Not illuminated	Flashes to indicate circuit failure
Receiver	⑤	Stable light reception indicator	Green	Illuminated when beams of all axes are stably received	Flashes to indicate receiver failure
	⑥	Unstable light reception indicator	Orange	Illuminated when beam of any axis is unstably received	
	⑦	Operation indicator	Red	Illuminated when beam of any axis is received/blocked	Flashes to indicate receiver failure
	⑧	Bottom light axis alignment indicator	Green	Illuminated when beam of bottom axis is received	
	⑨	Disturbing light indicator	Orange	Not illuminated	
Control unit	⑩	Top light axis alignment indicator	Green	Illuminated when beam of top axis is received	Flashes to indicate receiver failure
	⑪	Power indicator	Green	Illuminated when power is supplied	Illuminated when power supply is cut off
	⑫	Control output indicator	Yellow	Illuminated when beam of any axis is unstably received	—
	⑬	Sensor failure indicator	Red	Not illuminated	Illuminated to indicate sensor failure/unconnected/power short circuit
	⑭	Lockout output indicator	Red	Not illuminated	Illuminated to indicate lockout output

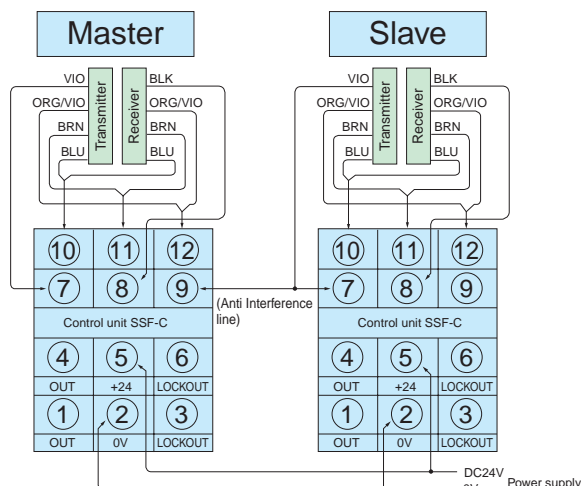
Connection Examples

Connection for standalone use



Connection for Anti Interference

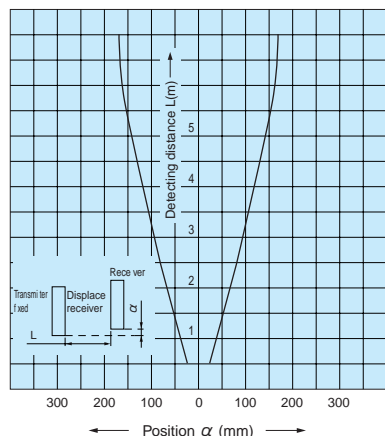
Connect as shown below for adjacent installation of two sets of sensors.



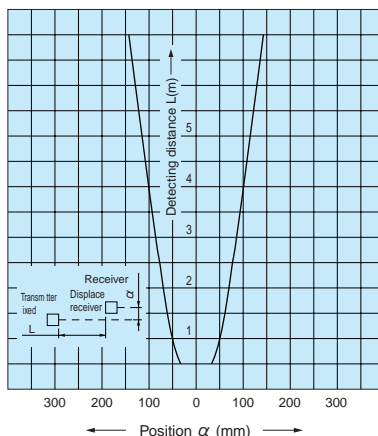
- Be sure to use the same power supply for the master and slave control units.
- The terms master and slave are only used for convenience in distinguishing between two units of the same model that function differently depending on the wiring. The unit with its Anti Interference line connected to Terminal 9 is referred to as the master.
- Do not connect the transmitter and receiver to separate control units.
- For wiring length, see Cord Extension.

Characteristics (Typical Example)

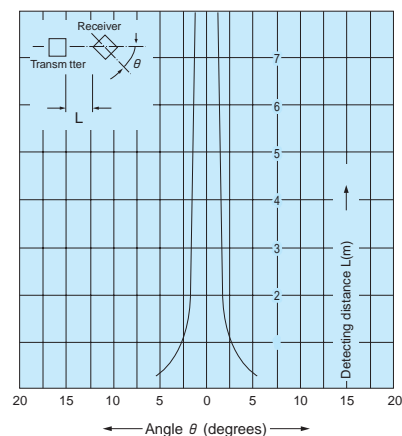
Parallel displacement characteristics (Longitudinal) (All models)



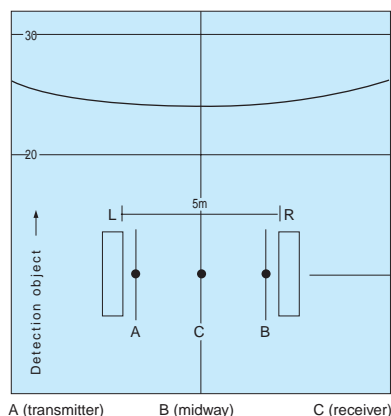
Parallel displacement characteristics (Horizontal) (All models)



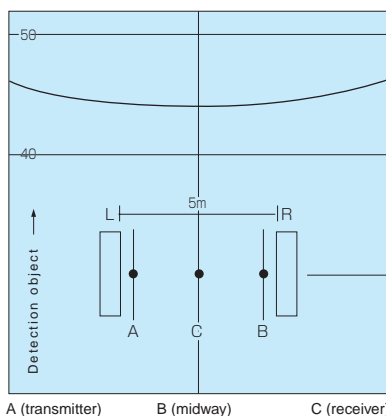
Operating angle characteristics (All models)



Smallest detectable object diameter characteristics SSF-T200 series



Smallest detectable object diameter characteristics SSF-T400 series



Indication/Operation Matrix

The operations of the indicators and outputs of the sensor and control unit are as shown in the table below. ● : Illuminated ✱ : Flashing ● : Unilluminated ▲ : Operation depending on situation

Item		Sensor						Control unit		
		Transmitter indicator		Receiver indicator				Indicator	Control output	Lockout output
Normal operation	Stable light reception	●	●	●	●	●	CIR SYNC	● POWER ● OUTPUT ● FAIL ● LOCKOUT		
		▲	●	●	●	●		● POWER ● OUTPUT ● FAIL ● LOCKOUT		
	Light blocking	●	●	▲	●	▲	CIR SYNC	● POWER ● OUTPUT ● FAIL ● LOCKOUT		
		▲	●	●	●	●		● POWER ● OUTPUT ● FAIL ● LOCKOUT		
	Disturbing light (when detected)	●	●	●	●	●	CIR SYNC	● POWER ● OUTPUT ● FAIL ● LOCKOUT		
		▲	●	●	●	●		● POWER ● OUTPUT ● FAIL ● LOCKOUT		
	Light emitting element damaged	●	●	▲	●	▲	CIR SYNC	● POWER ● OUTPUT ● FAIL ● LOCKOUT		
		▲	●	●	●	●		● POWER ● OUTPUT ● FAIL ● LOCKOUT		
	Light-sensitive element damaged	●	●	●	●	●	CIR SYNC	● POWER ● OUTPUT ● FAIL ● LOCKOUT		
		▲	●	●	●	●		● POWER ● OUTPUT ● FAIL ● LOCKOUT		
	Light emitting circuit damaged	●	●	●	●	●	CIR SYNC	● POWER ● OUTPUT ● FAIL ● LOCKOUT		
		▲	●	●	●	●		● POWER ● OUTPUT ● FAIL ● LOCKOUT		
	Light receiving circuit damaged	●	●	●	●	●	CIR SYNC	● POWER ● OUTPUT ● FAIL ● LOCKOUT		
		▲	●	●	●	●		● POWER ● OUTPUT ● FAIL ● LOCKOUT		
	Output circuit damaged	●	●	▲	▲	▲	CIR SYNC	● POWER ● OUTPUT ● FAIL ● LOCKOUT		
		▲	●	●	●	●		● POWER ● OUTPUT ● FAIL ● LOCKOUT		
	Output line broken	●	●	●	●	●	CIR SYNC	● POWER ● OUTPUT ● FAIL ● LOCKOUT		
		▲	●	●	●	●		● POWER ● OUTPUT ● FAIL ● LOCKOUT		
	Transmitter power supply line broken	●	●	●	●	●	CIR SYNC	● POWER ● OUTPUT ● FAIL ● LOCKOUT		
		▲	●	●	●	●		● POWER ● OUTPUT ● FAIL ● LOCKOUT		
	Receiver power supply line broken	●	●	●	●	●	CIR SYNC	● POWER ● OUTPUT ● FAIL ● LOCKOUT		
		▲	●	●	●	●		● POWER ● OUTPUT ● FAIL ● LOCKOUT		
	Synchronization line broken	●	●	●	●	●	CIR SYNC	● POWER ● OUTPUT ● FAIL ● LOCKOUT		
		▲	●	●	●	●		● POWER ● OUTPUT ● FAIL ● LOCKOUT		
	Anti Interference line broken (slave)*	●	●	●	●	●	CIR SYNC	● POWER ● OUTPUT ● FAIL ● LOCKOUT		
		▲	●	●	●	●		● POWER ● OUTPUT ● FAIL ● LOCKOUT		
	Relay contact welded	●	●	●	●	●	CIR SYNC	● POWER ● OUTPUT ● FAIL ● LOCKOUT		
		▲	●	●	●	●		● POWER ● OUTPUT ● FAIL ● LOCKOUT		
	Circuit damaged	●	●	●	●	●	CIR SYNC	● POWER ● OUTPUT ● FAIL ● LOCKOUT		
		▲	●	●	●	●		● POWER ● OUTPUT ● FAIL ● LOCKOUT		
	Power supply line broken	●	●	●	●	●	CIR SYNC	● POWER ● OUTPUT ● FAIL ● LOCKOUT		
		▲	●	●	●	●		● POWER ● OUTPUT ● FAIL ● LOCKOUT		
	Power supply cut off	●	●	●	●	●	CIR SYNC	● POWER ● OUTPUT ● FAIL ● LOCKOUT		
		▲	●	●	●	●		● POWER ● OUTPUT ● FAIL ● LOCKOUT		

(Note) "Locked" refers to a state in which the output relay stays open due to circuit failure.

(Note) When the output circuit is damaged, the control output stays open.

*When the Anti Interference line is broken in the master/slave configuration, the indicator on the slave flashes and the slave control output relay opens.

■ Control Unit Operation and Output

The control unit outputs control and lockout signals depending on the detection by sensor and of different types of failure.

● Control output

The control unit has duplicate circuits and the control output is composed of two output relays connected in series.

Contact closed

- When light beams of all sensor axes are received (normal operation)

Contact open

- When light beam of any axis is blocked
- When control unit lockout has been tripped
- When circuit damage or disconnection has occurred in components
- When power has been supplied with the sensor wired in a wrong way
- When power supply line has been broken
- When the power supply, GND, detection output, synchronization or Anti Interference line, etc. has been broken
- When the sensor output line has been short-circuited to the sensor power supply line (+V or 0 V) of the control unit

● Lockout output

Lockout is a feature that forces the control output relay to stay open when any internal failure has been detected. The control unit SSF-C has completely duplicated internal circuitry and any inconsistency found is regarded as failure, which trips lockout. In addition to lockout, the contact is opened for 2 seconds after power-up or when power supply line to the control unit has been broken.

Condition of lockout

- (1) Inconsistency between the two control output relays
When either of the output relays does not operate due to welding of contact
- (2) Inconsistency between the duplicate circuits
When the operation of the two circuits do not agree due to failure in output circuit components of the control unit

Notes on lockout release

Lockout can be released by pressing the CHECK switch on the control unit.
Before releasing lockout, identify and eliminate the cause of the lockout.
If lockout cannot be released by pressing the CHECK switch, the control unit output circuit may be damaged or the output relay may be welded. Replace the control unit.
Use the lockout output for monitoring. Do not use the output for control.
For control, be sure to use the control output.

For Correct Use

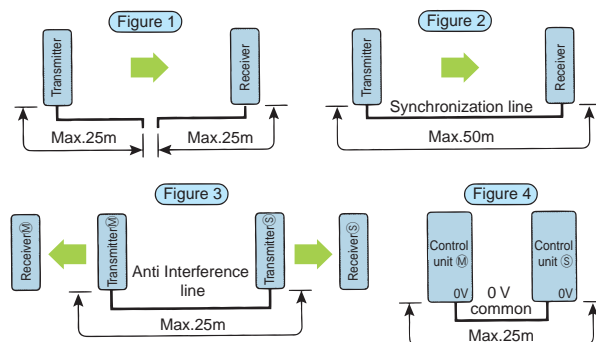


- Be sure to follow the instructions in the operation manual provided for correct use of the product.
- This sensor cannot be used as a press safety device or other safety device for protection of human body that requires conformity to domestic or overseas standards or certification concerning protection of human body. Use for such purposes may lead to death or serious injury in the unlikely event of failure.
- This sensor is intended for detection of ingress of human body or object passing through an arbitrary point not involving protection of human body or safety.
- When using this sensor for safety purposes, ensure safe operation of the system as a whole including detection and control.

Cord Extension

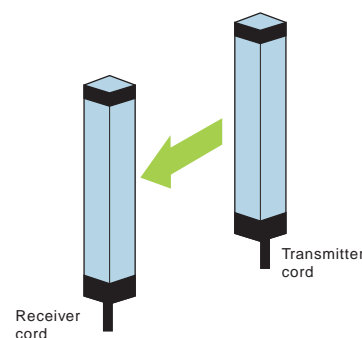
To extend the cord, use wires of at least 0.5 mm² and limit the length as follows:

- Basic wiring : within 25 m between the transmitter/receiver and control unit (Figure 1)
- Synchronization wiring : within 50 m between transmitter and receiver (Figure 2)
- Anti Interference wiring : within 25 m between the two transmitters (Figure 3)
- Power supply wiring for M/S wiring : within 25 m between the two control units (Figure 4)

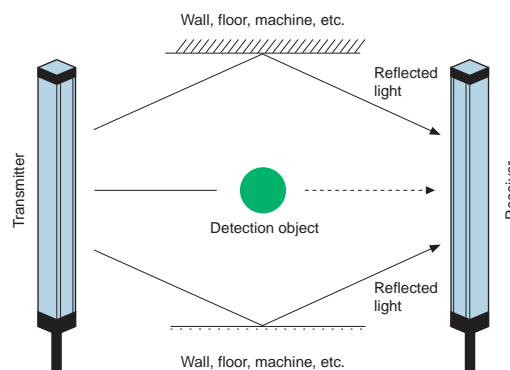


Notes on installation

- When installing the sensor, make sure that the ends of the transmitter and receiver with the cord are oriented either upward or downward. The sensor does not function if the transmitter and receiver are not oriented the same way.
- The tightening torque for installing the sensor should be up to 2 N · m. The tightening torque for installing the control unit with screws should be up to 0.78 N · m.



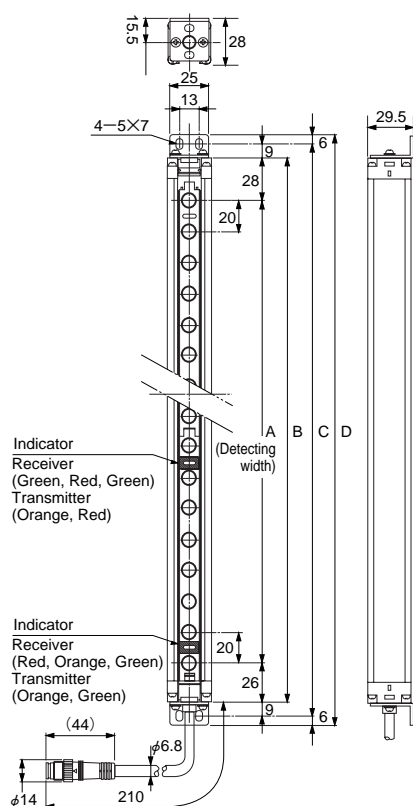
- Any reflecting object (wall, floor, machine, etc.) within the effective range between the transmitter and receiver may allow the light of the sensor to go around the detection object, which is supposed to block the light, and reach the receiver. Choose the installation location carefully (Any glossy object such as stainless steel in the surrounding area must be at least 30 cm away from the center of the light transmission and reception area both vertically (up and down) and horizontally (left and right)).
- Do not install the sensor in a place subject to steam, large amount of dust or direct exposure to water or rain.



Dimensions (in mm)

SSF-T200 Series transmitter/receiver

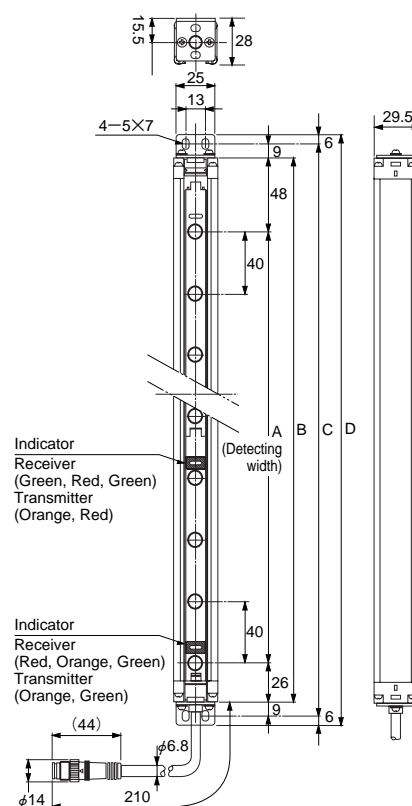
CAD



• Dimensions of portions (in mm)

Model	A	B	C	D
SSF-T8	140	194	212	224
SSF-T16	300	354	372	384
SSF-T24	460	514	532	544
SSF-T32	620	674	692	704
SSF-T40	780	834	852	864
SSF-T48	940	994	1012	1024
SSF-T56	1100	1154	1172	1184
SSF-T64	1260	1314	1332	1344

SSF-T400 Series transmitter/receiver

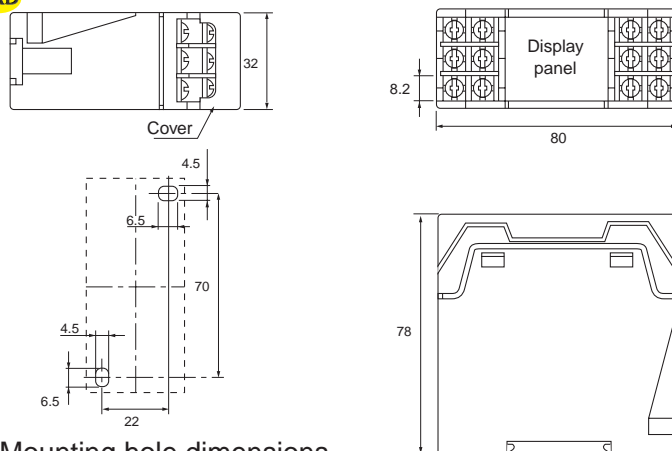


• Dimensions of portions (in mm)

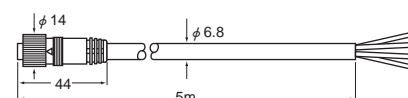
Model	A	B	C	D
SSF-T404	120	194	212	224
SSF-T408	280	354	372	384
SSF-T412	440	514	532	544
SSF-T416	600	674	692	704
SSF-T420	760	834	852	864
SSF-T424	920	994	1012	1024
SSF-T428	1080	1154	1172	1184
SSF-T432	1240	1314	1332	1344
SSF-T436	1400	1474	1492	1504
SSF-T440	1560	1634	1652	1664
SSF-T444	1720	1794	1812	1824
SSF-T448	1880	1954	1972	1984
SSF-T452	2040	2114	2132	2144
SSF-T456	2200	2274	2292	2304
SSF-T460	2360	2434	2452	2464
SSF-T464	2520	2594	2612	2624

Model SSF-C (Control unit)

CAD

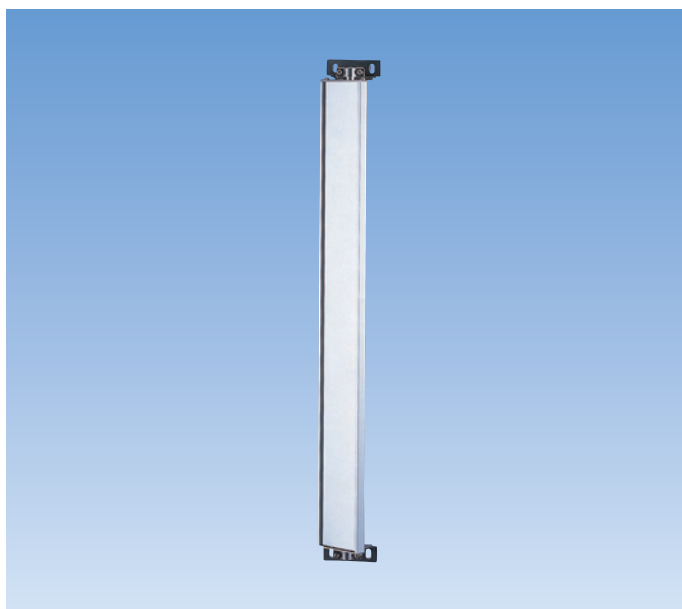


Cord with connector (accessory)



SS-H5L (covering: gray)
SS-H5R (covering: black)

[illegible]



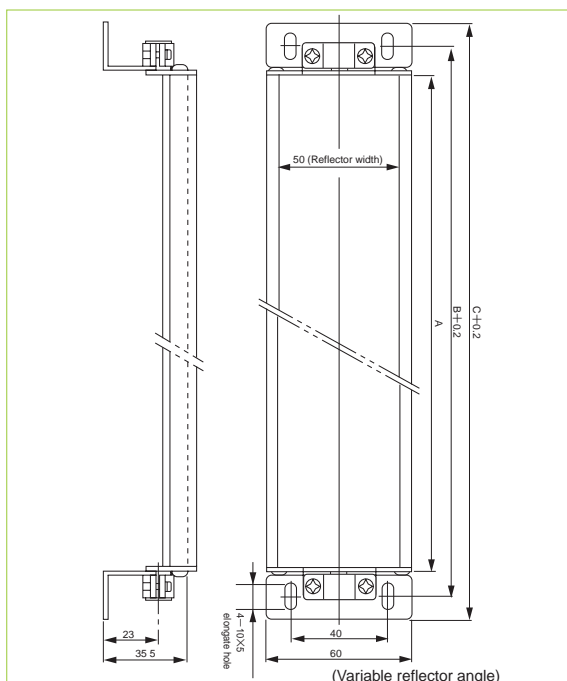
- Installation at corner allows detection of more than one area with one set of sensor

Type/Rating/Performance/Specification

Model	SSM-F8N	SSM-F16N	SSM-F24N	SSM-F32N	SSM-F40N	SSM-F48N	SSM-F56N	SSM-F64N
Reflection method	Plane mirror reflection							
Detecting object	4m max.(in combination with SSF Series)							
Reflector length	179mm	339mm	498mm	658mm	818mm	978mm	1137mm	1297mm
Reflector width	50mm							
Material	Case: aluminum / Reflector: glass							
Mass (max.)	350g	500g	650g	800g	950g	1100g	1250g	1400g
Notes	Reflection angle adjustable bracket provided							

Ambient temperature	-10 - +55°C (non-freezing)
Ambient humidity	35-85%RH (non-condensing)
Protective structure	IP54

Dimensions (in mm)

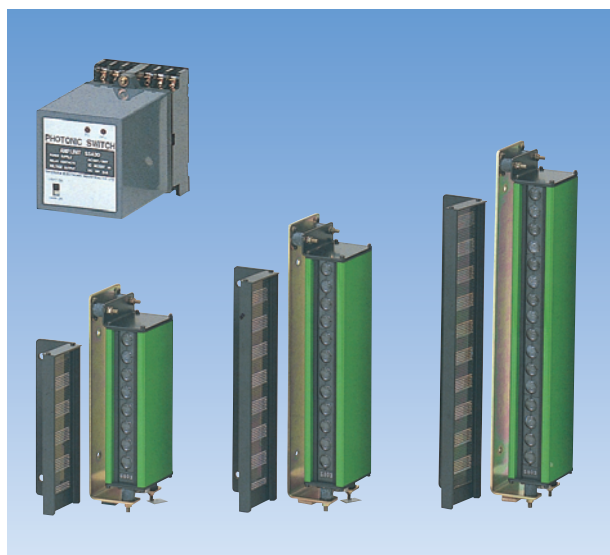


Dimensions of portions

Model	Dimension A	Dimension B	Dimension C	Applicable model
SSM-F8N	180mm	204mm	223mm	SSF-T8
SSM-F16N	340mm	364mm	383mm	SSF-T16
SSM-F24N	500mm	524mm	543mm	SSF-T24
SSM-F32N	660mm	684mm	703mm	SSF-T32
SSM-F40N	820mm	844mm	863mm	SSF-T40
SSM-F48N	980mm	1004mm	1023mm	SSF-T48
SSM-F56N	1140mm	1164mm	1183mm	SSF-T56
SSM-F64N	1300mm	1324mm	1343mm	SSF-T64

Handling

The reflecting surface of the corner reflector is made of glass. Use caution to avoid damage due to shock, etc. Damaged glass may cause injury with broken pieces. Use of the corner reflector reduces the detecting distance of the sensor by about 20 percent. Note the distance between the transmitter and receiver.



- Suitable for location not allowing use of through-beam type

The SSR Series is a series of light curtain sensors used together with a reflector and ideal for locations with a wall or other obstacle on one side that hinders the installation of the transmitter or receiver of through-beam type.

- Metal connector for simple connection and handling
- Reflective type for simple installation and wiring
- No adjustment on sensor required
- Compact size achieved by unitization of transmitter and receiver
- Wide variation of detecting widths: 140/220/300/380/460 mm

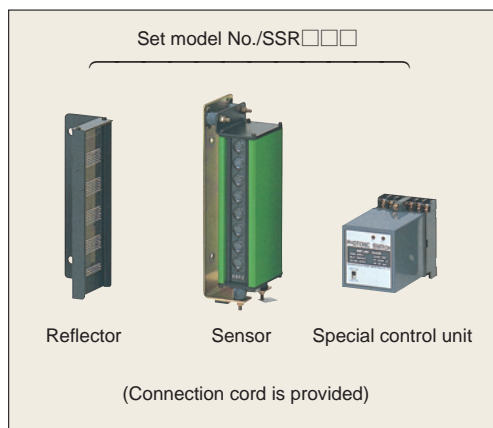
Type

Detection method	Detecting distance	Detecting width	Set model No.	No. of light axes	Light axis interval	Detecting object
 Reflector type		140mm	SSR304	4	40mm	Opaque object of ϕ 60 mm min. (At 1.5 m from sensor; ϕ 80 mm min. near reflector)
		220mm	SSR306	6		
		300mm	SSR308	8		
		380mm	SSR310	10		
		460mm	SSR312	12		

Optional parts

Type	Appearance	Model	Description
Reflector		SSM304S	For 0.4-1 m detecting distance
		SSM306S	
		SSM308S	
		SSM310S	
		SSM312S	
Mounting bracket		PSZ300	Applicable sensor SSB304-SSB308 Applicable reflector SSM304-SSM308
		PSZ300L	Applicable sensor SSB-310-SSB312 Applicable reflector SSM310-SSM312
		PSZ300S	
Connection cord		SSR-H10	Cord with connector (10 m)

*For prices of the sensor, reflector and control unit for separate purchase, see the Price List at the end of this book.



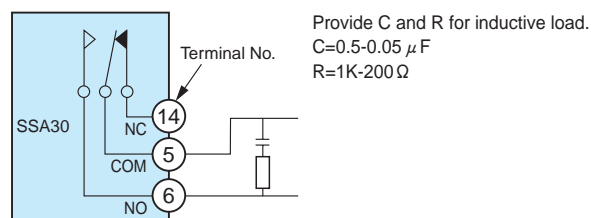
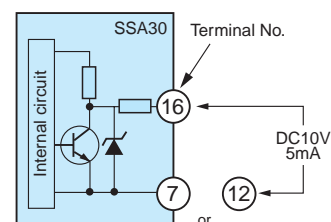
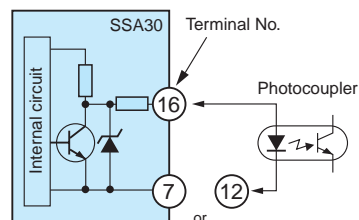
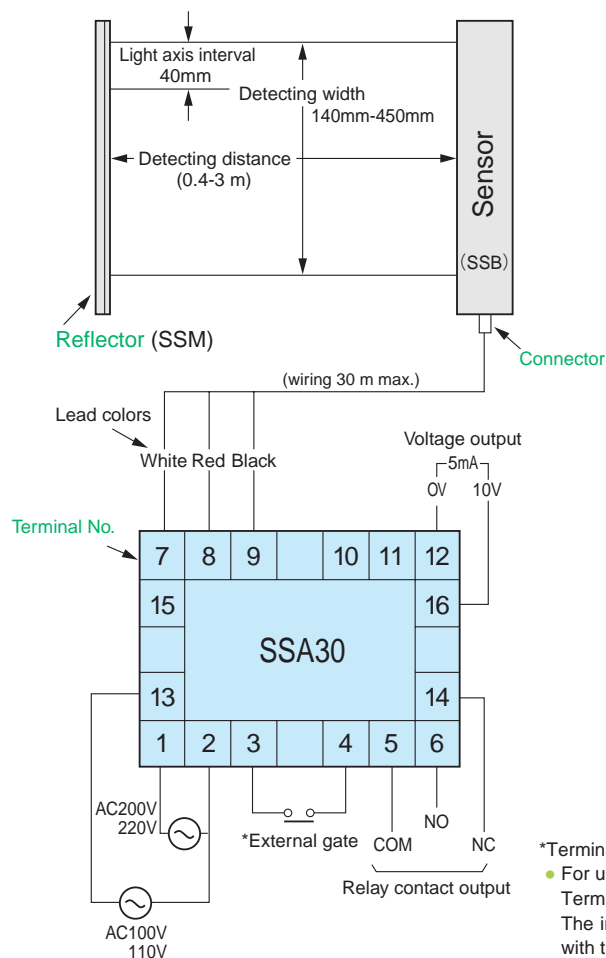
Rating/Performance/Specification

Rating/performance	Model	Set model No.	SSR304	SSR306	SSR308	SSR310	SSR312
		Sensor only	SSB304	SSB306	SSB308	SSB310	SSB312
		Reflector only	SSM304	SSM306	SSM308	SSM310	SSM312
		Control unit	SSA30				
	Detection method	Reflector type					
	Detecting distance	1-3m (0.4-1m)*					
	Detection object	Opaque object of ϕ 60 mm min. (At 1.5 m from sensor; ϕ 80 mm min. near reflector)					
	No. of light axes	4	6	8	10	12	
	Detecting width	140mm	220mm	300mm	380mm	460mm	
	Light axis interval	40mm					
	Power supply	100VAC 110V / 200V 220V \pm 10% 50/60Hz					
	Power consumption	4VA max.					
	Output mode	Relay output 1c Voltage output	(Rating)	{ Relay output :5 A (250 VAC) max. noninductive load Voltage output :output impedance 4.7 k Ω (10 VDC)			
	Operation mode	Light-ON/Dark-ON selectable (with switch on control unit)					
External gate	Contact/voltage input			H:6V min. L:1V max.			
Response time	Relay output Voltage output			25ms max. 5ms max.			
Specification	Light source (light wavelength)		Infrared LED(950nm)				
	Light-sensitive element		Photo transistor				
	Indicator		Sensor: Light reception indicator (red LED) × No. of light axes	Control unit: PL OP.L	Power indicator (red LED) Operation indicator (red LED)		
	Switch (SW)		Light-ON/Dark-ON selector switch provided (on control unit)				
	Material		Case: aluminum / Reflector and control unit: resin				
	Connector		Sensor: connector connection with VCT cord with 3-pin connector / three 0.75 mm ² cores / 5 m Control unit :terminal block with M3.5 screws				
	Mass	Sensor	1.3kg max.	1.7kg max.	2.1kg max.	2.5kg max.	2.9 kg max.
		Reflector	300g max.	400g max.	500g max.	600g max.	700g max.
		Control unit	400g max.				
	Notes		*For a detection distance between 0.4-1 m, use an appropriate model of special reflector (see Optional Parts on the previous page).				

Environmental Specification

Environment	Ambient light	8,000lx max.
	Ambient temperature	-10 - +55°C (non-freezing)
	Ambient humidity	35-85%RH (non-condensing)
	Protective structure	Sensor : IP42 Control unit:IP20
	Vibration	10-55 Hz / 1.5 mm amplitude / 2 hours each in 3 directions
	Shock	1000 m/s ² / 2 times each in 3 directions
	Dielectric withstanding	1500 VAC for 1 minute
	Insulation resistance	500 VDC, 20 M Ω

Input/Output Circuit and Connection



*Terminals 3 and 4 compose the external gate (shorting bar is provided).

- For use by external voltage input to the external gate, connect the positive electrode to Terminal 3 and negative electrode to Terminal 12. The internal circuit is activated when the gate is closed. The circuit does not function with the gate open. The applicable voltage range is 5-25 V.

CAD

- Reflector

[illegible]

Technical drawing of a mounting bracket showing front and side views with dimensions.

Front View Dimensions:

- Top hole spacing: $4 - \phi 7$
- Top hole offset from left edge: 34
- Top hole offset from right edge: 16
- Top hole diameter: $\phi 7$
- Top hole center-to-center distance: 50
- Top hole offset from bottom edge: 1.6
- Bottom hole offset from left edge: 34
- Bottom hole offset from right edge: 16
- Bottom hole diameter: $\phi 7$
- Bottom hole center-to-center distance: 50
- Bottom hole offset from top edge: 1.6
- Overall width: 66
- Mounting hole spacing: D

Side View Dimensions:

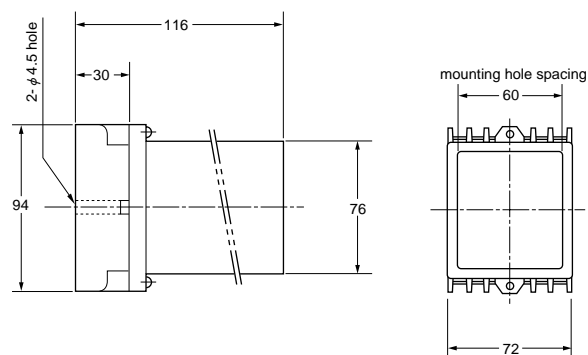
- Overall depth: 63
- Mounting hole offset from front face: 51
- Mounting hole offset from back face: 14.5

(Dimensions same for S type)

Model	Type	Sensor (SSB)		Se	
	Portion mm	A (overall length)	B (detecting width)	C (overall length)	D (mounting spacing)
SSB (M) 304		232	140	183.2	140
SSB (M) 306		312	220	263.2	220
SSB (M) 308		392	300	343.2	300
SSB (M) 310		472	380	423.2	380
SSB (M) 312		552	460	503.2	460

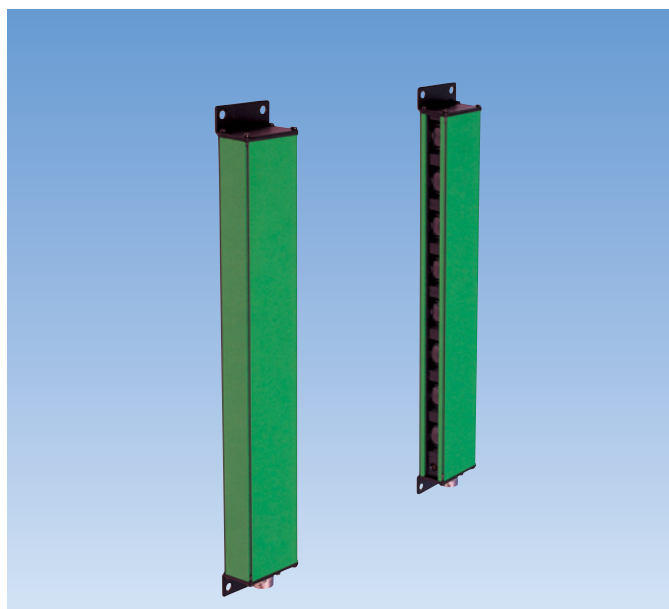
CAD

SSA30

[illegible]




- Dimensions of portions

Model	A(mm)	B(mm)	Applicable sensor and reflector model
PSZ300	228	500	SSB304-SSB308 SSM304-SSM308
PSZ300L	328	750	SSB310/SSB312
PSZ300S	78	750	SSM310/SSM312



- Long detecting distance of 10 m
(Detecting distance up to 15 with HP type)
- UL Standard-compliant
(E-94173)
- Light axis interval 40 mm
 - Generic type offers excellent cost performance

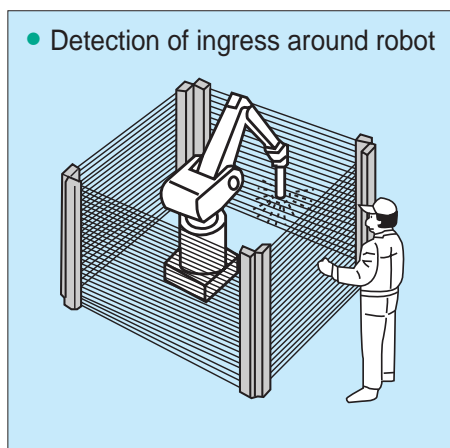
Type

Series name	Detection method	Detecting distance	Light axis interval	No. of light axes	Detecting width	Set model No.	Operation mode	Output mode
SST100 	 Through-beam type	 10m	40mm	4	120mm	SST104	Light-ON/Dark-ON selectable	Current output
				8	280mm	SST108		
				12	440mm	SST112		Voltage output
				16	600mm	SST116		
				20	760mm	SST120		
				24	920mm	SST124		

Cords with connector come as accessories.

Sample Application

- Detection of ingress around robot



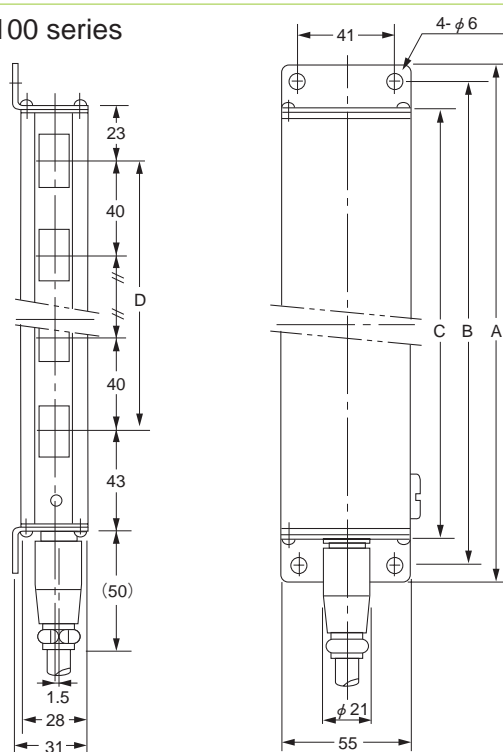
Rating/Performance/Specification

Rating/performance	Series name	SST100シリーズ			
	Detection method	Through-beam type			
	Detecting distance	10m max. (*1)			
	Detecting object	Opaque object of ϕ 60 mm min.			
	No. of light axes	(See "Type.")			
	Detecting width	(See "Type.")			
	Light axis interval	40mm			
	Power supply	12-24V DC \pm 10% / Ripple 10% or less			
	Current consumption	100mA max.			
	Output mode	Current output Voltage output	Rating	{ Current output: sink current 100 mA (30 VDC) max. Voltage output: output impedance 4.7 k Ω	
	Operation mode	Light-ON/Dark-ON selectable (with switch)			
	Response time	15ms max.			
	Specification	Light source (wavelength)	Infrared LED(900nm)		
Light-sensitive element		Photo transistor			
Indicator		Transmitter: Power indicator (green LED) / Receiver: Operation indicator (red LED)			
Switch (SW)		Light-ON/Dark-ON selector switch provided (Remove the screwed lid on the back of the receiver and set the mode with SW 1 and 2.)			
		(Dark-ON)	(Light-ON)	(All axes reception ON)	(All axes blocking ON)
		SW1.....ON SW2.....ON	SW1.....OFF SW2.....ON	SW1.....ON SW2.....OFF	SW1.....OFF SW2.....OFF
Material		Case: aluminum / Lens: plastic			
Connection		Connector connection Transmitter: 3-pin Receiver: 4-pin	Cord with connector Transmitter: VCT with three 0.75 mm ² cores/ 5 m Receiver: VCT with four 0.5 mm ² cores/ 5 m		
Mass	About 350-1,000 g max. (transmitter/receiver)				
Notes	(1*) High-powered types (with detecting distance of 15 m) are also available, for which "-HP" is added at the end of the set model numbers.				

Dimensions (in mm) (Only receiver is shown in the figure as an example.)

SST100 series

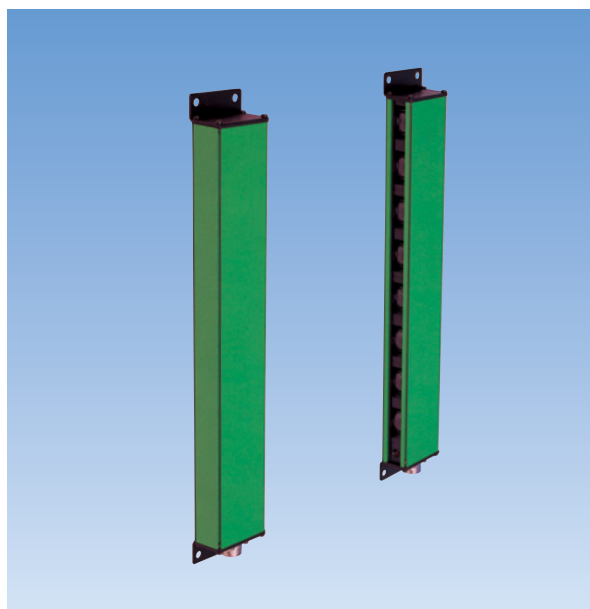
CAD



(Only receiver is shown in the figure as an example.
With transmitter, orientation of mounting bracket is reversed.)

• Dimensions of portions

Model	Section lengths				No. of light axes
	A	B	C	D	
SST104	223mm	209mm	186mm	120mm	4
SST108	383mm	369mm	346mm	280mm	8
SST112	543mm	529mm	506mm	440mm	12
SST116	703mm	689mm	666mm	600mm	16
SST120	863mm	849mm	826mm	760mm	20
SST124	1023mm	1009mm	986mm	920mm	24



- Separate outputs for individual channels and analog output available

- Separate output for each channel available, allowing use of only required number of channels when any obstacle is in detection area
- Light-ON/Dark-ON selector switch is provided
- Analog output in proportion to the number of received/blocked light beams available, span voltage variable
- Long detecting distance of 10 m available, simple light axis alignment
- Fully synchronized scanning light emission

Type

Detection method	Detecting distance	Detecting width	Set model No.	Operation mode	Output mode	
 Through-beam type	10m	120mm	MST104	Light-ON/Dark-ON selectable (with switch)	NPN open collector (for individual channels)	Analog output (output in proportion to number of light beams received/blocked)
		280mm	MST108			
		440mm	MST112			
		600mm	MST116			
		760mm	MST120			
		920mm	MST124			

*For prices of the transmitter and receiver for separate purchase, see the Price List at the end of this book.
Cords with connector come as accessories.

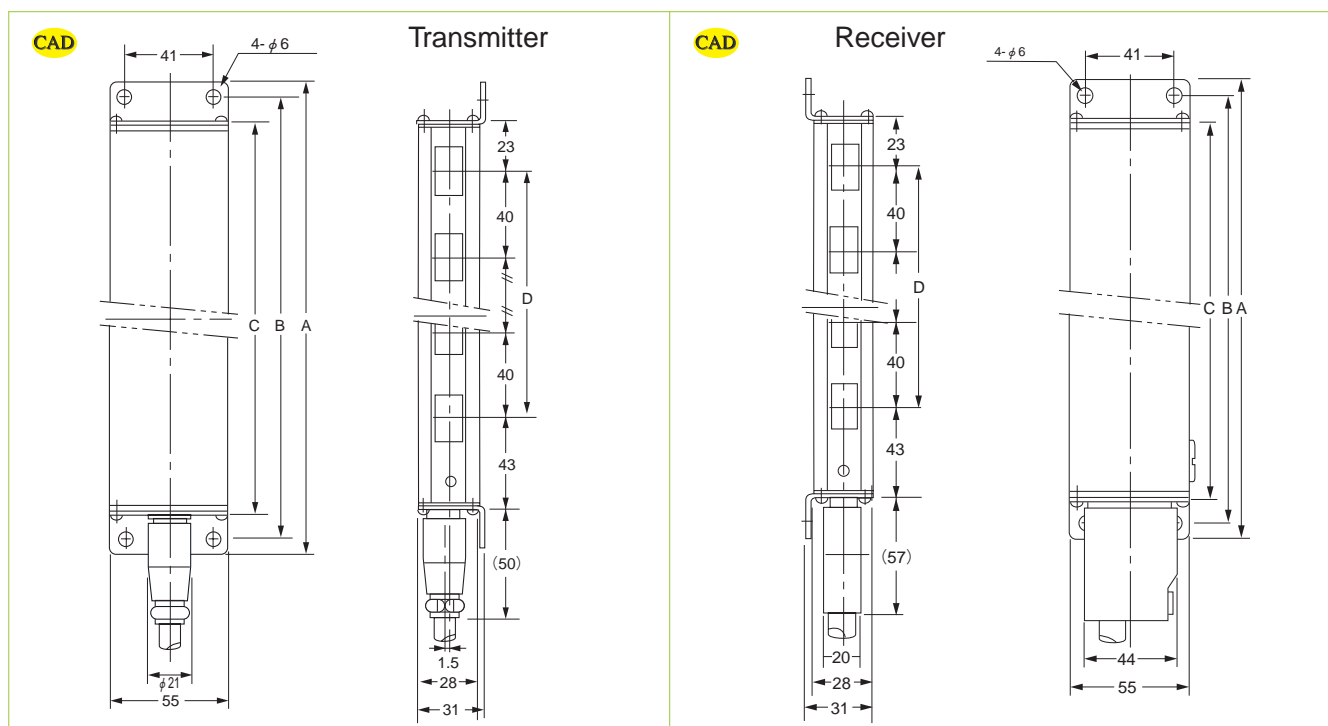
- Dimensions of portions (see Dimensions)

Model	Section lengths				
	A	B	C	D	No. of light axes
MST104	223mm	209mm	186mm	120mm	4
MST108	383mm	369mm	346mm	280mm	8
MST112	543mm	529mm	506mm	440mm	12
MST116	703mm	689mm	666mm	600mm	16
MST120	863mm	849mm	826mm	760mm	20
MST124	1023mm	1009mm	986mm	920mm	24

Rating/Performance/Specification

Model	Set model No.	MST104	MST108	MST112	MST116	MST120	MST124	
	Transmitter model No.	MST104L	MST108L	MST112L	MST116L	MST120L	MST124L	
	Receiver model No.	MST104R	MST108R	MST112R	MST116R	MST120R	MST124R	
Rating/performance	Detection method	Through-beam type						
	Detecting distance	10m max.						
	Detecting object	Opaque object of ϕ 60 mm min.						
	No. of light axes	4	8	12	16	20	24	
	Detecting width	120mm	280mm	440mm	600mm	760mm	920mm	
	Light axis interval	40mm						
	Power supply	12-24V DC \pm 10% / Ripple 10% max.						
	Current consumption	40mA max.	60mA max.	80mA max.	100mA max.	120mA max.	140mA max.	
	Output mode	NPN open collector (for individual channels) / Rating: sink current 100 mA (30 VDC) max. Analog output (in proportion to number of beams received/blocked) / Rating: 1-7V (span voltage variable), output current 2 mA max.						
	Operation mode	Light-ON/Dark-ON selectable (with switch)						
	Response time	NPN open collector output (for individual channels): 20ms max. Analog output: 20ms max.						
	Temperature drift	0.1% / $^{\circ}$ C(analog output)						
Specification	Light source (wavelength)	Infrared LED (900nm)						
	Light-sensitive element	Photo transistor						
	Indicator	Transmitter: Power indicator (green LED)			Receiver: Power indicator (green LED) Operation indicator (red LED) \times No. of light axes			
	Switch (SW)	Light-ON/Dark-ON selector switch (integrated under screw on the back of receiver)						
	Volume (VR)	SPAN VR : span voltage adjustment ZERO VR : zero adjustment } (integrated under screw on the back of receiver)						
	Material	Case: aluminum / Lens: plastic						
	Connection	Connector connection Transmitter: 3-pin Receiver: 28-pin		Cord Transmitter: VCT with three 0.75 mm ² cores/ 5 m Receiver: VCT with four 0.5 mm ² cores / VCT with many 0.2mm ² cores/ 5 m				
	Mass	Transmitter	350g max.	500g max.	650g max.	750g max.	900g max.	1,000g max.
		Receiver	400g max.	550g max.	700g max.	800g max.	950g max.	1,100g max.

Dimensions (in mm)







- High performance detecting ϕ 15 mm object allowing detection of bar steel and pipe

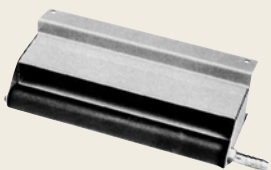
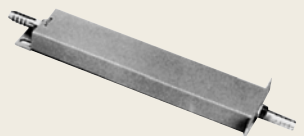
- Fully synchronized scanning
- Infrared light beams with high penetrating power allow use in adverse environment
- Light reception indicator for simple light axis alignment
- Special power unit available for use with AC power supply in addition to direct operation with DC power supply
- Wide variation of detecting widths: 150/310/470/630/950 mm
- Ensured safety with compliance to UL Standard (E-94173)

Type

Detection method	Detecting distance	Detecting width	Set model No.	No. of light axes	Operation mode	Output mode
 Through-beam type	 2m	150mm	SST316	16	Dark-ON	Current output Voltage output
		310mm	SST332	32		
		470mm	SST348	48		
		630mm	SST364	64		
		950mm	SST396	96		

Cords with connector come as accessories.

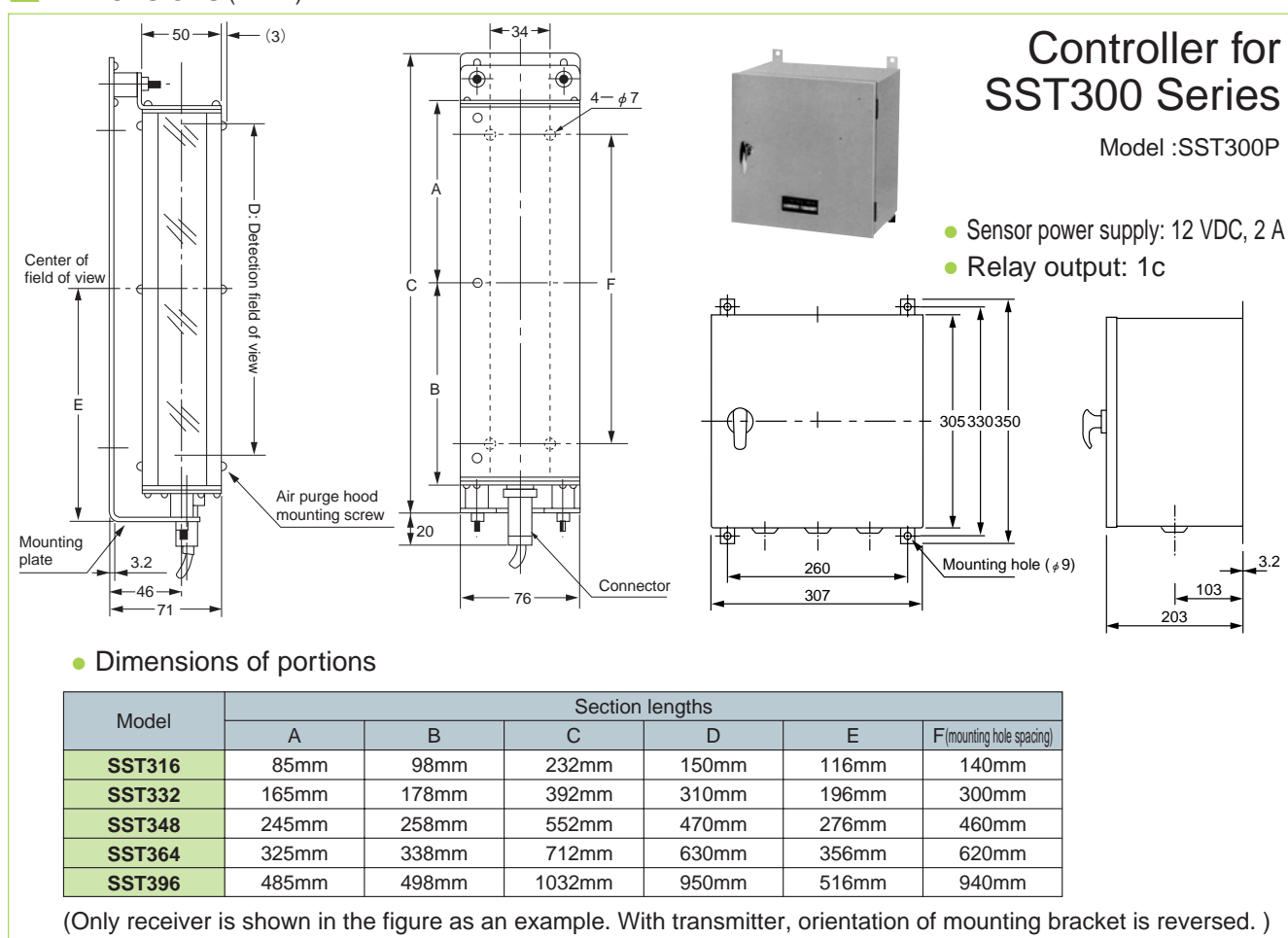
Optional Parts (Separately available.)

Type	Appearance	Model	Description	Applicable transmitter/receiver
Air purge hood		F316	Air purge hood for transmitter/receiver lens ● Air flow rate: 150-200 l/min	SST316 $\frac{L}{R}$
		F332		SST332 $\frac{L}{R}$
		F348		SST348 $\frac{L}{R}$
		F364		SST364 $\frac{L}{R}$
		F396		SST396 $\frac{L}{R}$
Water-cooling jacket		WJ316	Water-cooling jacket for transmitter/receiver ● Water temperature: 20°C max. ● Water flow rate: 2 l/min min. ● Ambient temperature: 80°C or less	SST316 $\frac{L}{R}$
		WJ332		SST332 $\frac{L}{R}$
		WJ348		SST348 $\frac{L}{R}$
		WJ364		SST364 $\frac{L}{R}$
		WJ396		SST396 $\frac{L}{R}$

Rating/Performance/Specification

Rating/performance	Model	Set model No.	SST316	SST332	SST348	SST364	SST396
		Transmitter model No.	SST316L	SST332L	SST348L	SST364L	SST396L
		Receiver model No.	SST316R	SST332R	SST348R	SST364R	SST396R
	Detection method	Through-beam type					
	Detecting distance	2m max.					
	Detecting object	Opaque object of ϕ 15 mm min.					
	No. of light axes	16	32	48	64	96	
	Detecting width	150mm	310mm	470mm	630mm	950mm	
	Light axis interval	10mm					
	Power supply	12-24V DC \pm 10% / Ripple 10% or less					
	Power consumption	70mA max.	90mA max.	110mA max.	130mA max.	170mA max.	
	Output mode	Relay outpu Voltage output	Rating { Current output: sink current 100 mA (30 VDC) max. Voltage output: output impedance 4.7 k Ω				
	Operation mode	Dark-ON					
Response time	40ms max.						
Specification	Light source (wavelength)		Infrared LED (910nm)				
	Light-sensitive element		Photo transistor				
	Indicator		Transmitter: Power indicator (green LED) /Receiver: Light reception indicator (red LED)				
	Material		Case: aluminum				
	Connection		Connector connection Transmitter: 3-pin Receiver: 4-pin Cord with connector Transmitter: VCT with three 0.3 mm ² cores/ 2 m Receiver: VCT with four 0.3 mm ² cores/ 2 m				
	Mass	Transmitter	1.4kg max.	2.3kg max.	3.2kg max.	4.1kg max.	5.9kg max.
		Receiver	1.4kg max.	2.3kg max.	3.2kg max.	4.1kg max.	5.9kg max.

Dimensions (in mm)





- Slim light curtain sensor SS10/20/40 with separate outputs for individual light axes
- Ideal for height/size checking of passing objects
 - SS10-CH: 17 mm
 - SS20-CH: 32 mm
 - SS40-CH: 52 mm

(Rough guidelines for detectable size difference)

Type Sensor

Series	Detection method	Detecting distance	Light axis interval	No. of light axes	Detecting width	Transmitter/receiver set model No.	Output mode (response time)	Detecting object
SS10-CH	Through-beam type	2m	10mm	16	150mm	SS10-T16-CH	Serial output (15 ms max.)	Opaque object of ϕ 17 mm min.
				24	230mm	SS10-T24-CH		
				32	310mm	SS10-T32-CH		
				48	470mm	SS10-T48-CH		
				64	630mm	SS10-T64-CH		
				80	790mm	SS10-T80-CH		
				96	950mm	SS10-T96-CH		
SS20-CH		3m	20mm	8	140mm	SS20-T8-CH	Serial output (8 ms max.)	Opaque object of ϕ 32 mm min.
				12	220mm	SS20-T12-CH		
				16	300mm	SS20-T16-CH		
				20	380mm	SS20-T20-CH		
				24	460mm	SS20-T24-CH		
				32	620mm	SS20-T32-CH		
				40	780mm	SS20-T40-CH		
				48	940mm	SS20-T48-CH		
SS40-CH		7m	40mm	4	120mm	SS40-T4-CH	Serial output (3 ms max.)	Opaque object of ϕ 52 mm min.
				6	200mm	SS40-T6-CH		
				8	280mm	SS40-T8-CH		
				10	360mm	SS40-T10-CH		
				12	440mm	SS40-T12-CH		
				16	600mm	SS40-T16-CH		
				20	760mm	SS40-T20-CH		
				24	920mm	SS40-T24-CH		

*For prices of the transmitter and receiver for separate purchase, see the Price List at the end of this book.

Conversion board

Shape	Model	Output mode
Board-shaped	SS-96B	8-bit open collector

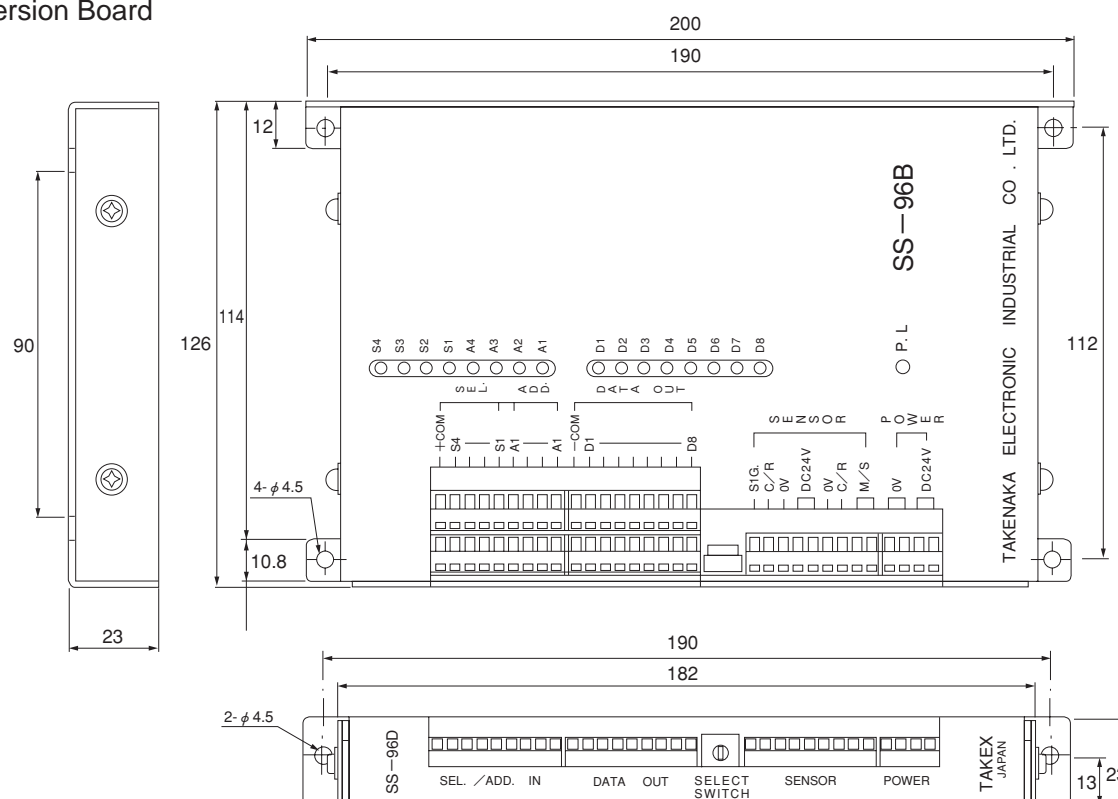
Contact Takex for details of this series.

Conversion Board Rating/Performance/Specification

Rating/performance/ Specification	Model	SS-96B
	Power supply	12-24V DC $\pm 10\%$ / Ripple 10% or less
	Current consumption	100mA max. (sensor excluded)
	Output mode	(Photocoupler insulation, open collector output (8 bits))
	Output rating	Sink current 10 mA / Voltage: 30 V / Residual voltage: 2 V max. / Negative common (0 V) input
	Input mode	Photocoupler insulation, Data address input (4 bits) Photocoupler insulation, Board select address input (4 bits)
	Input rating	Open collector positive common (24 VDC) input
	Address input cycle	Data address 500 μ s min.
	Indicator	Power supply indicator: 2 green LEDs Data output indicator: 8 red LEDs Data address indicator: 4 green LEDs Board select address input indicator: 4 green LEDs
	Connection	Terminal block M3
Environmen	Applicable sensor	SS10-T**-CH series (T16 – T96) SS20-T**-CH series (T8 – T48) SS40-T**-CH series (T4 – T24)
	Applicable PLC	Positive common (24 VDC)
	Ambient temperature	-10 - +55°C (non-freezing)
	Ambient humidity	35-85%RH (non-condensing)
	Vibration	10-55 Hz / 1.5 mm amplitude / 2 hours each in 3 directions
Protective structure		IP40

Dimensions (in mm)

Conversion Board



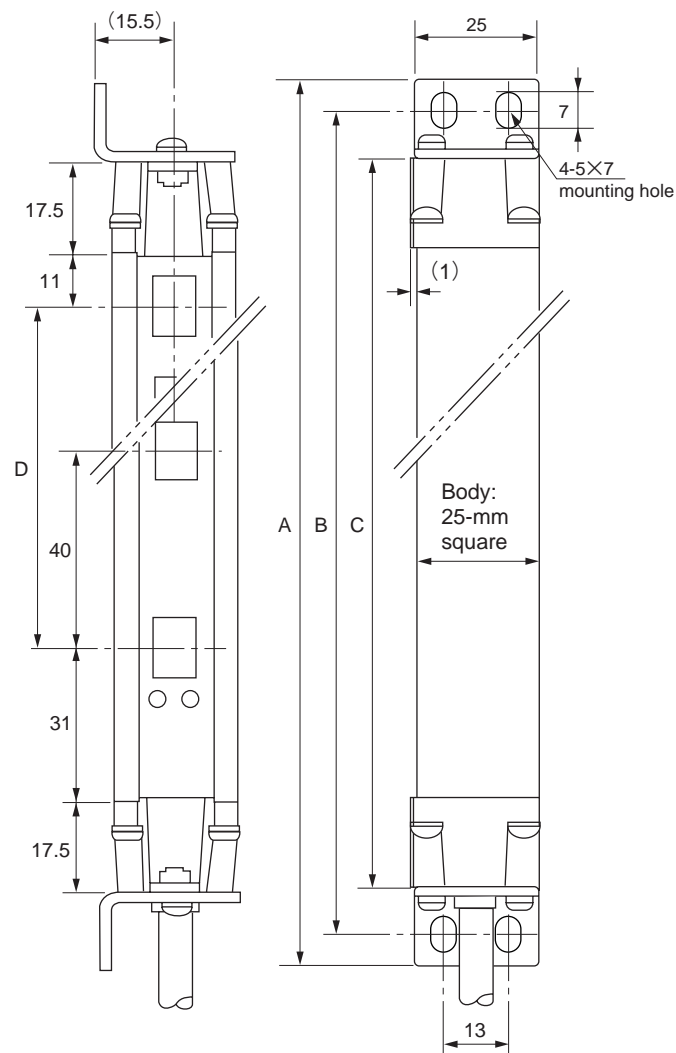
For sensor dimensions see:

- SS10-CH P.294 (equivalent to SS10)
- SS20-CH P.294 (equivalent to SS20)
- SS40-CH See the next page.

■ Dimensions (in mm) (Only receiver is shown in the figure as an example. With transmitter, orientation of mounting bracket is reversed.)

SS40-CH series

CAD



● Dimensions of portions (in mm)

Model	A	B	C	D
SS40-T4-CH	227	215	197	120
SS40-T6-CH	307	295	277	200
SS40-T8-CH	387	375	357	280
SS40-T10-CH	467	455	437	360
SS40-T12-CH	547	535	517	440
SS40-T16-CH	707	695	677	600
SS40-T20-CH	867	855	837	760
SS40-T24-CH	1027	1015	997	920