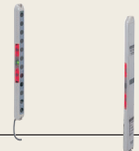
Light Curtain Sensors

- 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.	ϕ30mm 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 c UL us 	**SSC-T801**	50mm	5.55mm	100-500mm	ϕ6mm min.	276
		SSC-T802			0.4-1.2m	ϕ8mm min.	
		SSC-T804		12.5mm	0.5-2m	ϕ15mm min.	
		SSC-T805			100-500mm	ϕ12.5mm min.	
		SSC-T850	150mm	16.6mm	150-800mm	ϕ17mm min.	
		SSC-T810	100mm	11mm		ϕ11mm min.	
		SSC-T815		20mm		ϕ20mm min.	
		SSC-T830		11mm	0.5-2.5m	ϕ13mm min.	
		SSC-T835		20mm		ϕ22mm min.	
SSP-T200 Picking	Through-beam type 	**SSP-T205**	100mm	25mm	2m max.	ϕ35mm 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.	ϕ17mm 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 SA c UL us 	**SS20-T8**	140mm	20mm	7m max.	ϕ32mm min.	
		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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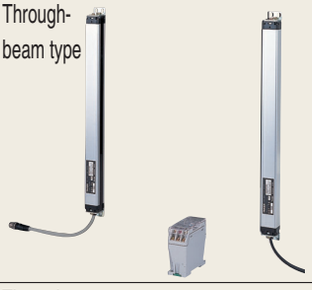
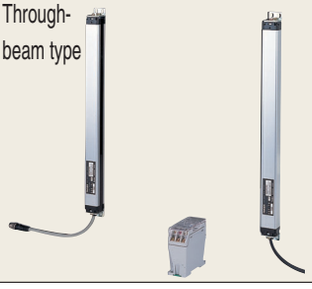
List of models

(*) 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
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.	
		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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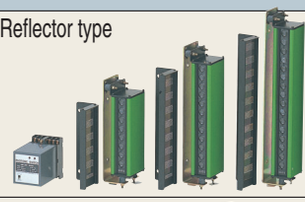
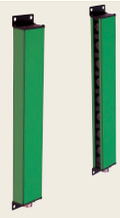
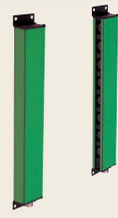
Light Curtain Sensors

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
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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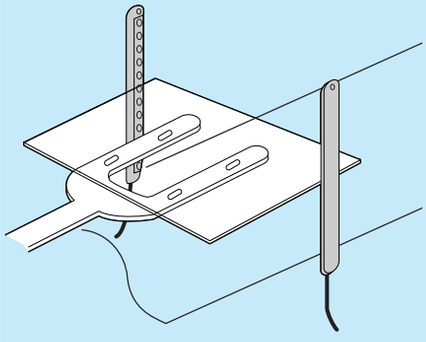
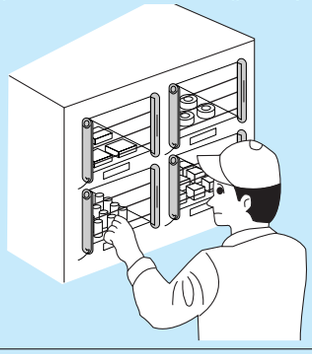
Application Examples

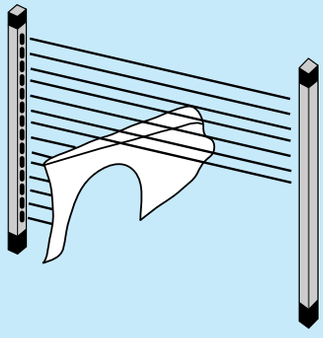
- Robot hand detection



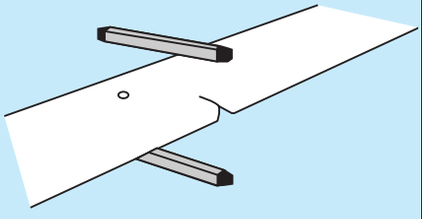
- Operation instruction sensor (instruction for taking out parts)



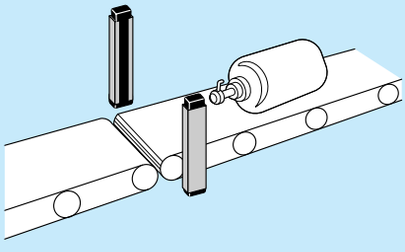
- Checking the shape of work



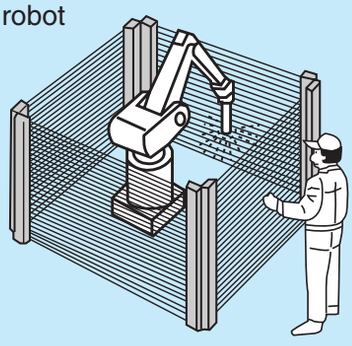
- Detection of hole or tear in opaque sheet



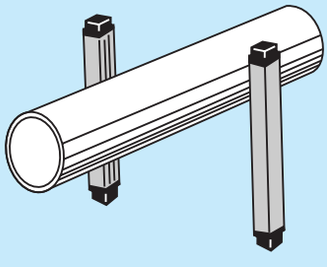
- Container detection



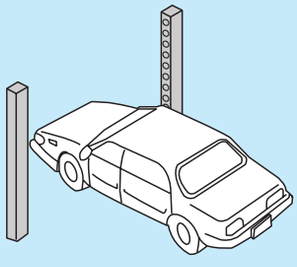
- Detection of ingress around robot



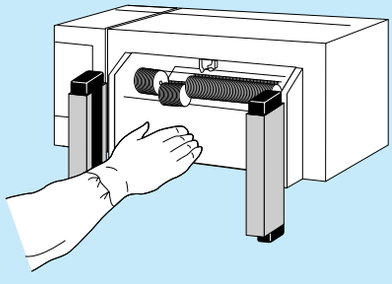
- Diameter measurement/ sorting of pipes



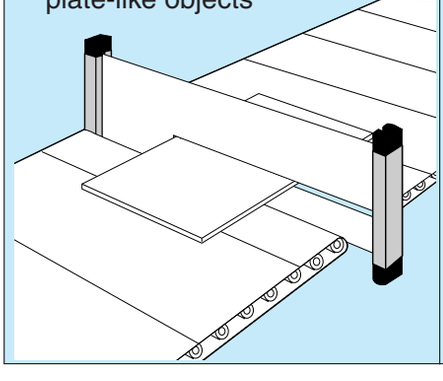
- Vehicle sorting



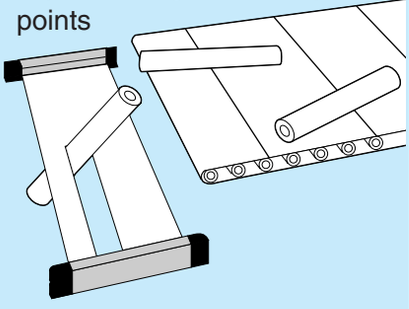
- Safety check of insertion machine



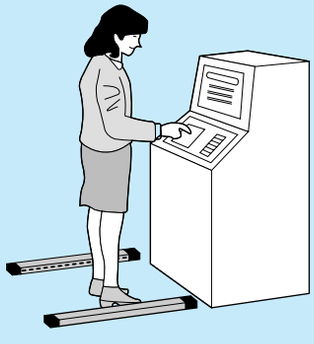
- Detection of passage of thin plate-like objects

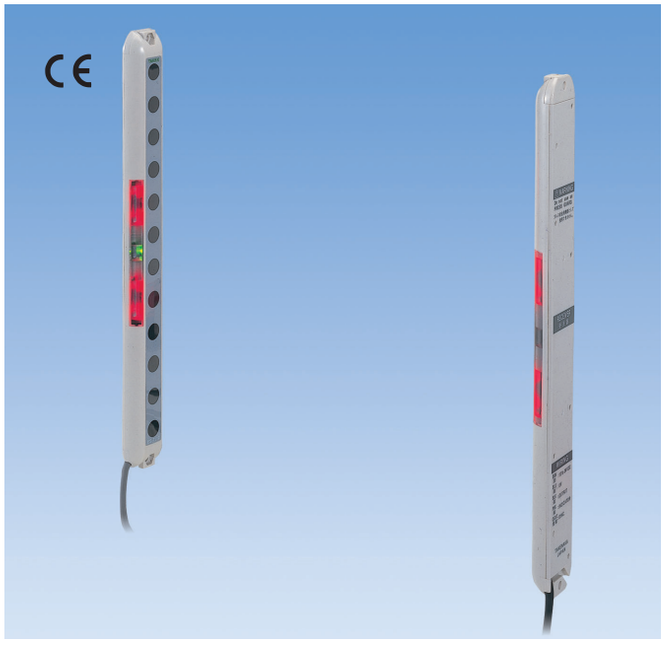


- Detection of passage of objects falling at arbitrary points



- Detection of remaining person



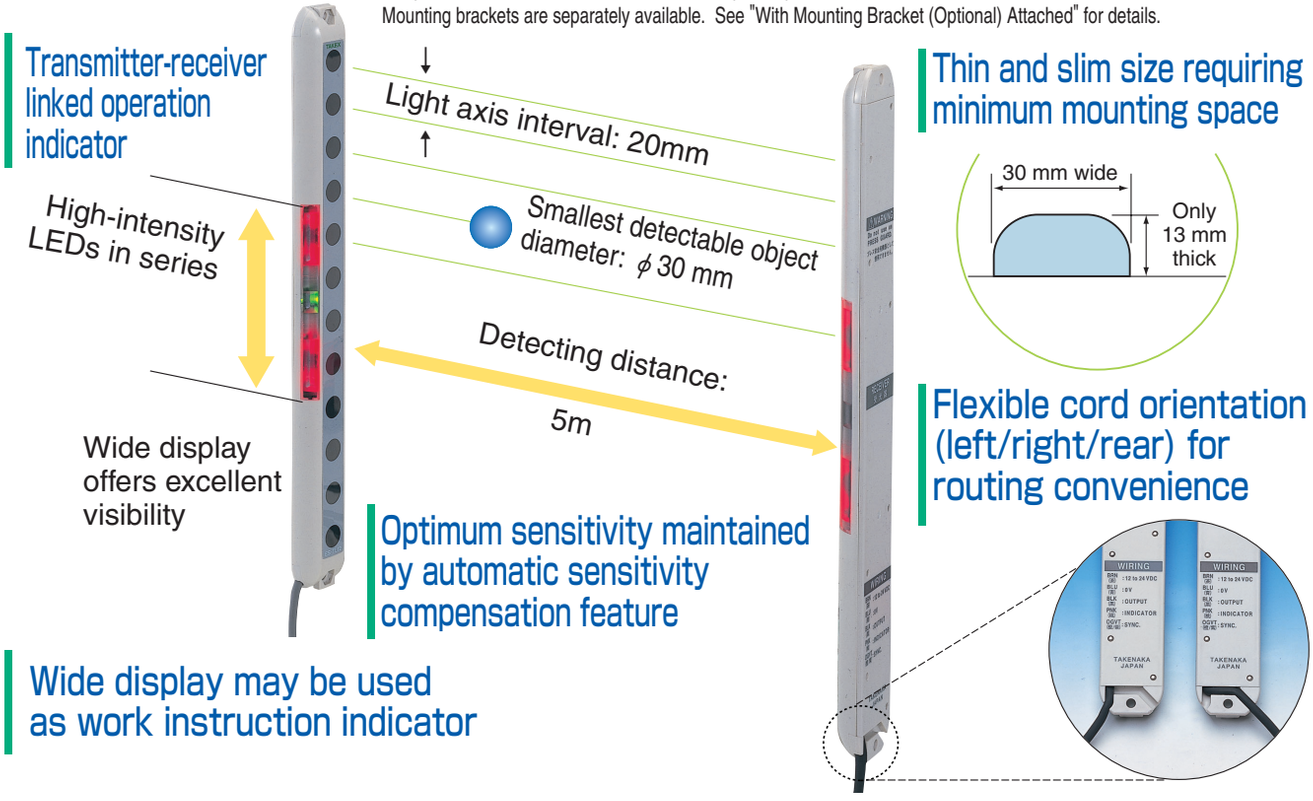


- **Ultra-thin**
  Slim type of only 13 mm thick and 30 mm wide never affecting work efficiency
- **High-intensity red LED employed**
  Large operation indicator of high-intensity LEDs in series offering superb visibility, may double as work instruction indicator
- **Objects as small as ϕ30 detected**
- **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 ϕ30 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.



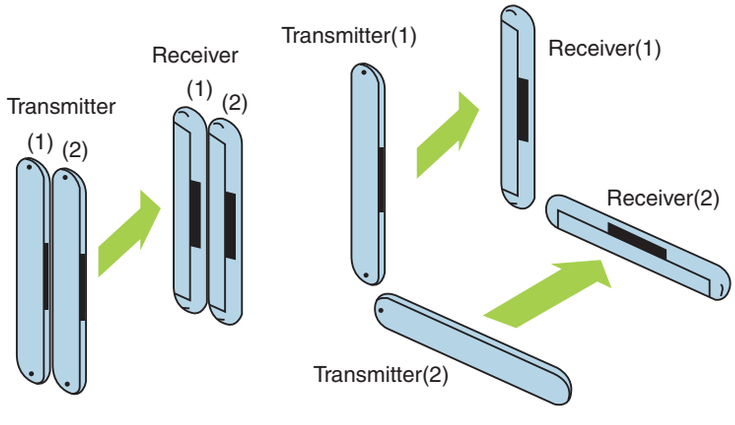
Rating/Performance/Specification

Rating/performance	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）**
	Detection method		Through-beam type			
	Detecting distance		5m max.			
	Detection object		Opaque object of ϕ30mm min.			
	Light axis interval		20mm			
	No. of light axes		8	12	16	20
	Detecting width		140mm	220mm	300mm	380mm
	Power supply		12-24V DC ±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)			
	Response time		7ms max.			
Specification	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 mm² 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.			

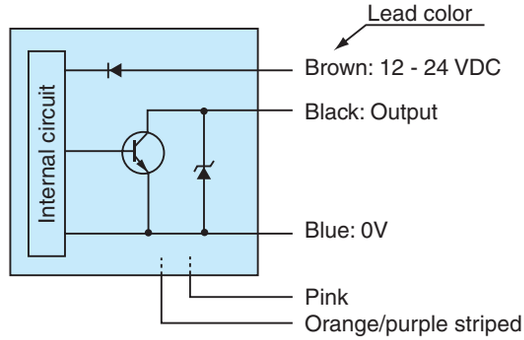
Environmental Specification

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 MΩ.

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

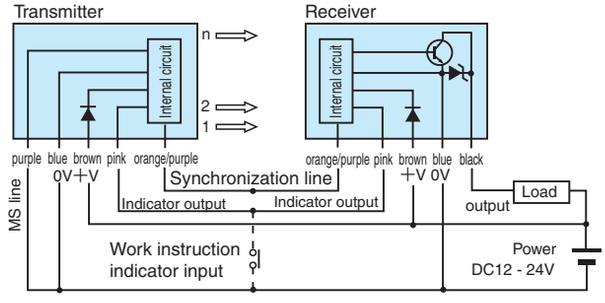


Input/Output Circuit and Connection

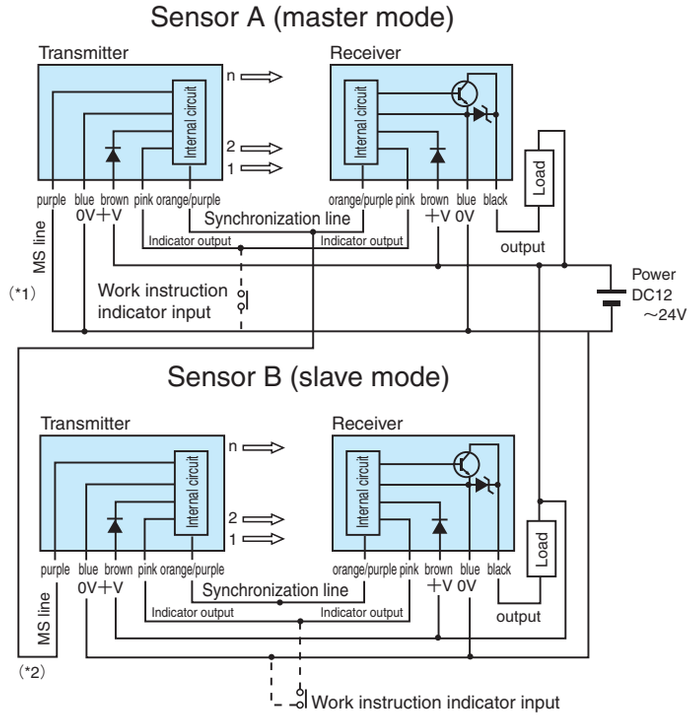


The output is provided with short circuit protection. and turns off when the protection feature is activated. Identify and eliminate the cause of the short circuit and turn the power back on.

• 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.

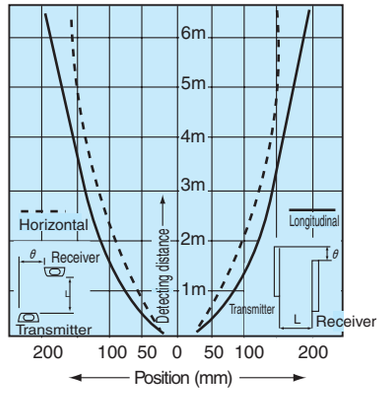
(Note 2) Do not connect the synchronization lines (orange/purple) of Sensors A and B to each other.

Cord Extension

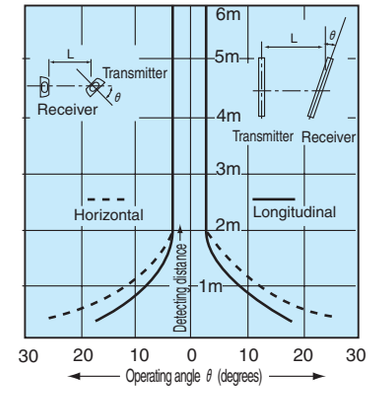
To extend the cord, use wires of at least 0.5 mm2 and limit the length to within 25 m for transmitter and receiver.

Characteristics (Typical Example)

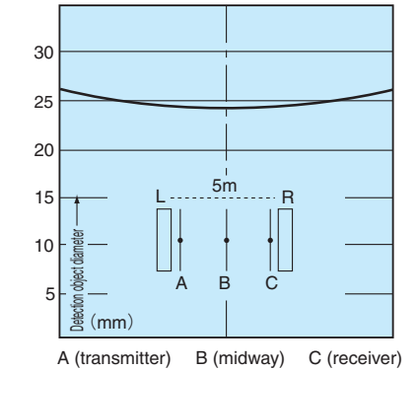
• Parallel displacement characteristics



• Operating angle characteristics



• Smallest detectable object diameter characteristics

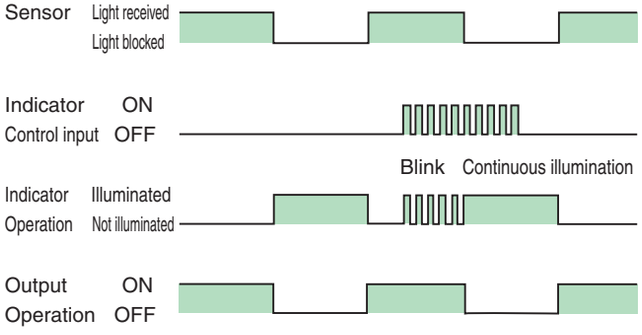


For Correct Use

- 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.

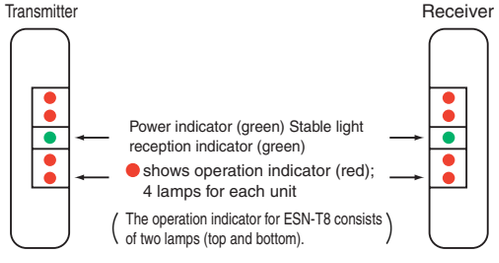


Indicators

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), turned 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), turned off when light beams of all axes are received

Indicator arrangement

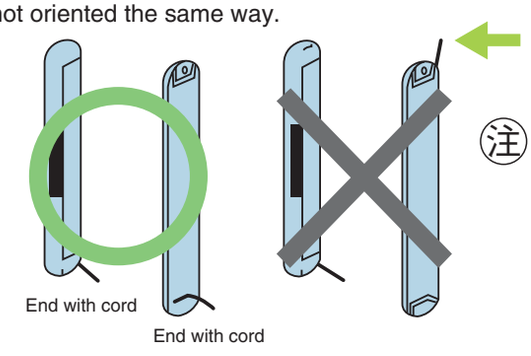


Automatic sensitivity compensation feature

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

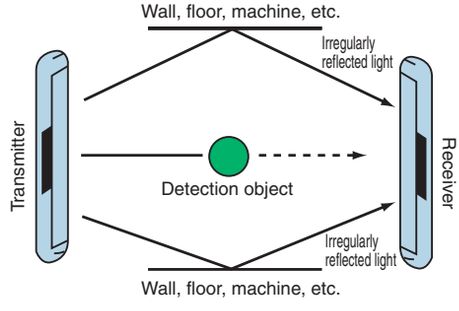
When installing the sensor, make sure that the ends of the transmitter and receiver with the cord are oriented either upward or downward. The sensor does not function if the transmitter and receiver are not oriented the same way.



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

Installation Location

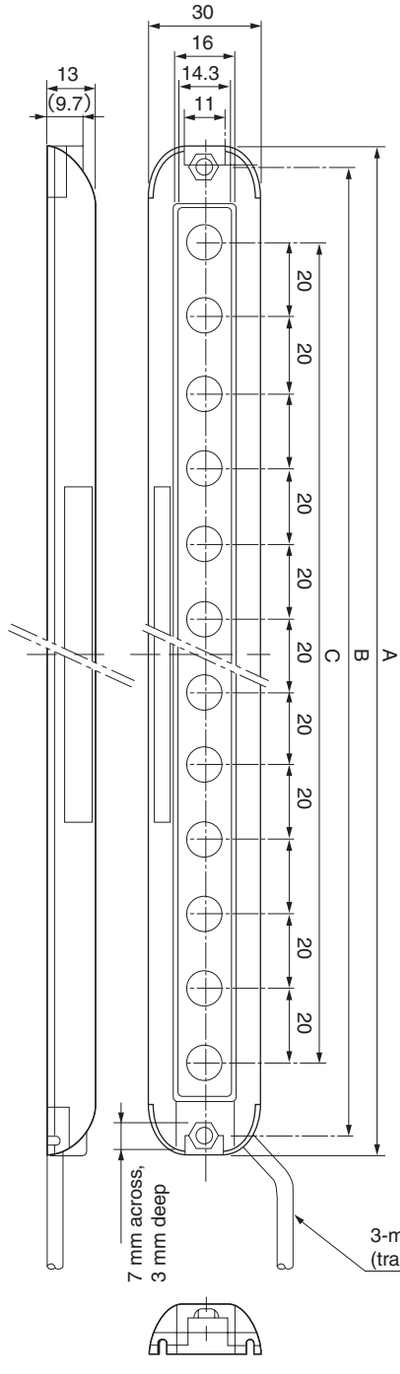
Any reflecting object (wall, floor, machine, etc.) within the effective range between the transmitter and receiver may allow the light of the sensor to go around the detection object, which is supposed to block the light, and reach the receiver. Choose the installation location carefully (any glossy 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).



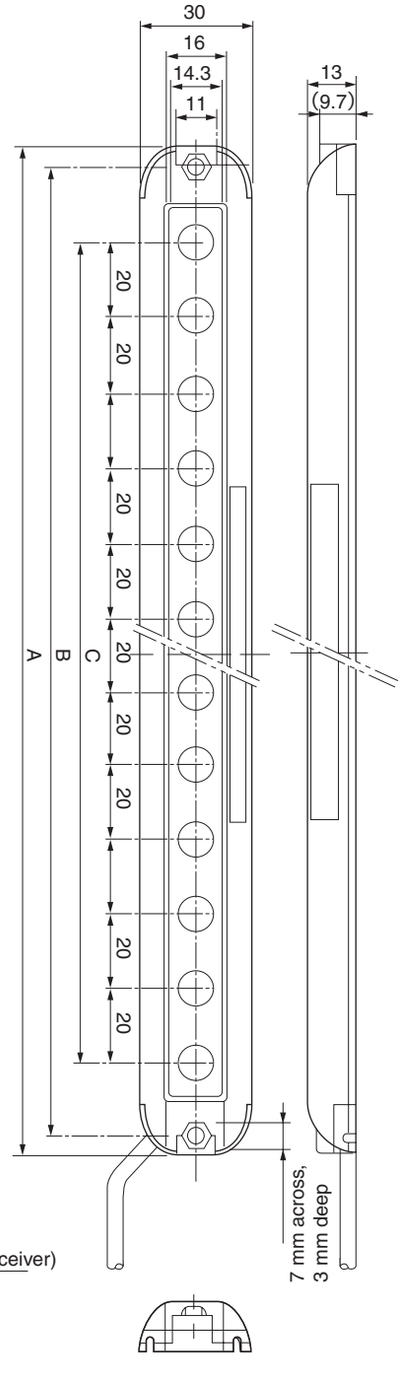
Dimensions (in mm)

CAD

Transmitter



Receiver



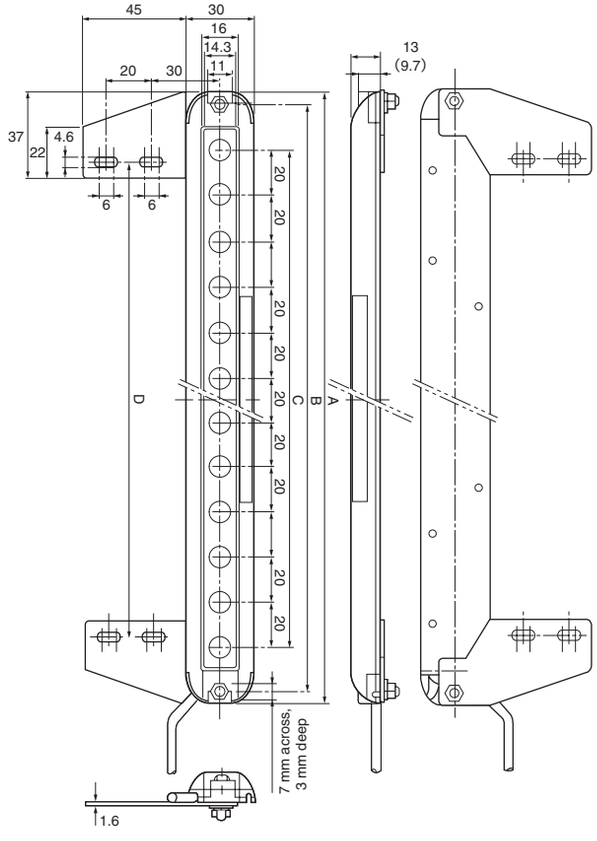
● Dimensions of portions

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

With Mounting Bracket (Optional) Attached (in mm)

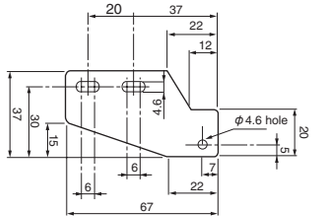
With mounting bracket model ES-BF

CAD



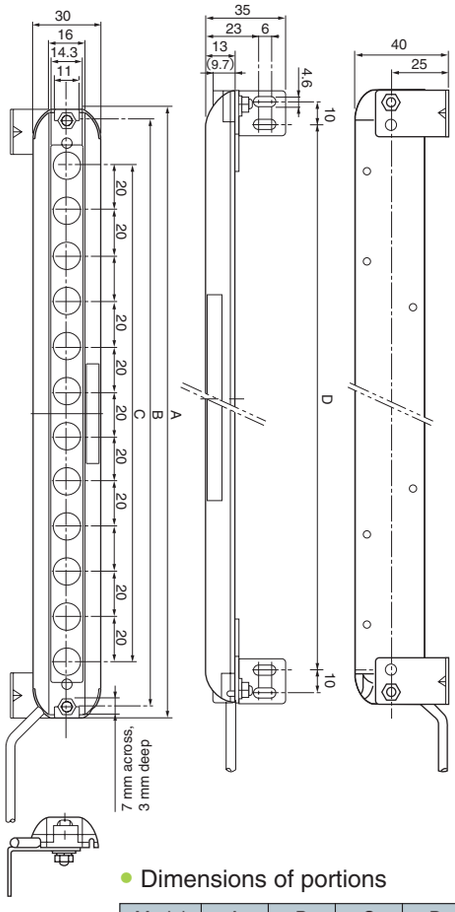
- Dimensions of portions

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



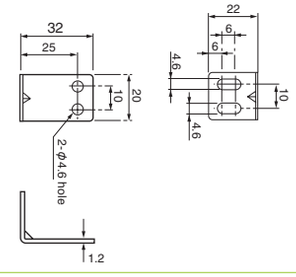
With mounting bracket model ES-BL

CAD



- Dimensions of portions

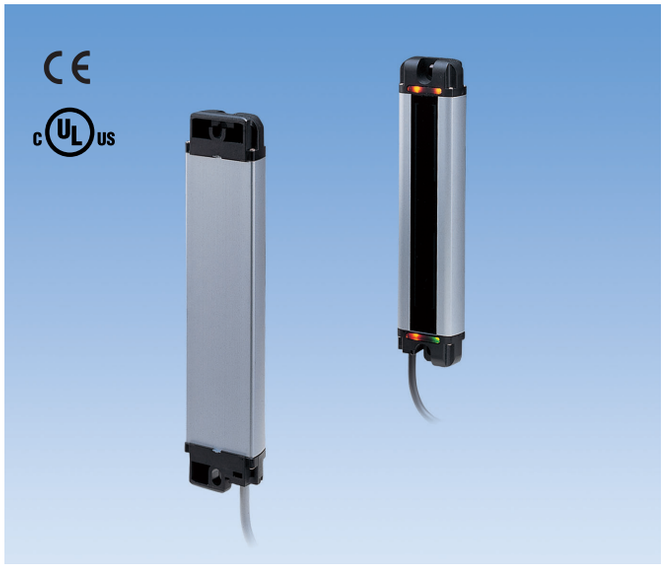
Model	A	B	C	D	No. of light axes
ESN-T8	190	180	140	160	8
ESN-T12	270	260	220	240	12
ESN-T16	350	340	300	320	16
ESN-T20	430	420	380	400	20



Special mounting brackets (optional)

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

SSC-T800 series Light Curtain Sensors



● 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

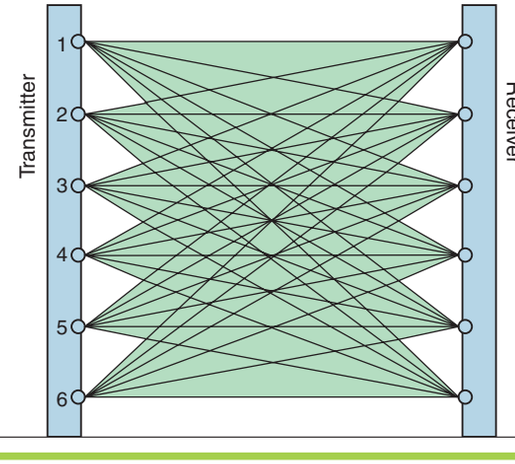
Type

Detection method	Detecting distance	Light axis interval	No. of light axes	Detecting width	Set model No.	Detecting object
Through-beam type	100-500mm	5.55mm	10	50mm	**SSC-T801**	Opaque object of ϕ 6mm min.
	0.4-1.2m				**SSC-T802**	Opaque object of ϕ 8mm min.
	0.5-2m	12.5mm	5		**SSC-T804**	Opaque object of ϕ 15mm min.
	100-500mm				**SSC-T805**	Opaque object of ϕ 12.5mm min.
	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.
	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.



Rating/Performance/Specification

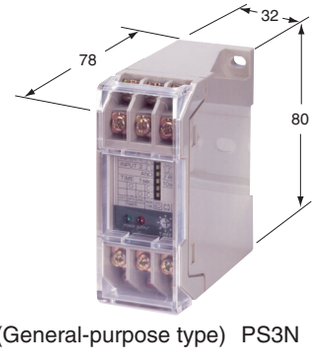
Rating/performance	Model	Set model No.	SSC-T801(PN)	SSC-T802(PN)	SSC-T804(PN)	SSC-T805(PN)	SSC-T850(PN)	SSC-T810(PN)	SSC-T815(PN)	SSC-T830(PN)	SSC-T835(PN)
		Transmitter model No.	SSC-TL801	SSC-TL802	SSC-TL804	SSC-TL805	SSC-TL850	SSC-TL810	SSC-TL815	SSC-TL830	SSC-TL835
		Receiver model No.	SSC-TR801(PN)	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 ϕ6mm min.	Opaque object of ϕ8 mm min.	Opaque object of ϕ15 mm min.	Opaque object of ϕ12.5 mm min.	Opaque object of ϕ17 mm min.	Opaque object of ϕ11 mm min.	Opaque object of ϕ20 mm min.	Opaque object of ϕ13 mm min.	Opaque object of ϕ22 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 ±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 "-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)								
	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 mm2 cores, gray (transmitter) or with three 0.3 mm2 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/s² / Twice each in 3 directions
	Dielectric withstanding	500 VAC for 1 minute
	Insulation resistance	500 VDC, 20 MΩ or higher.

Applicable power supply unit

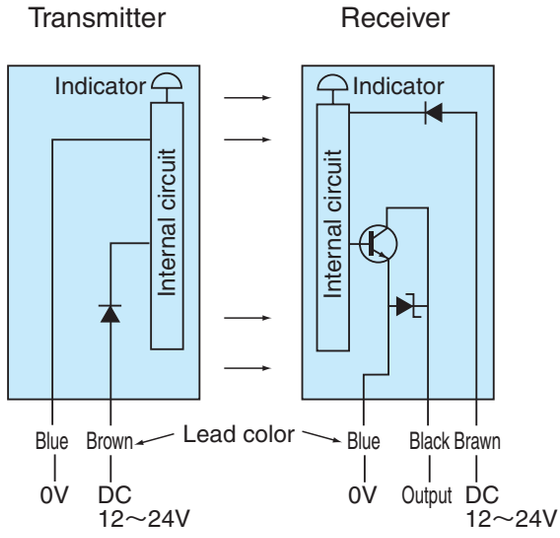
PS Series
High capacity of 200 mA at 12 VDC



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

SSC-T800

Input/Output Circuit and Connection

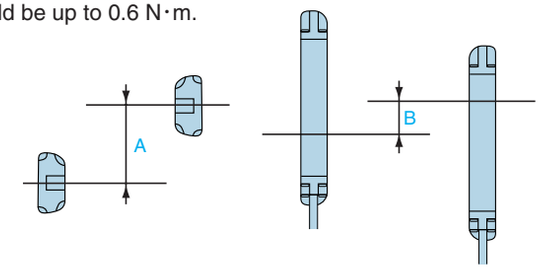


The output transistor turns off when load short circuits or overload occurs. Check the load and turn the power back on

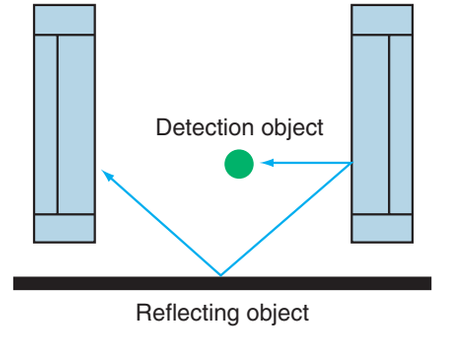
Setting

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 ±30mm. Displacement in the B direction should be within ±10mm.
- 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.



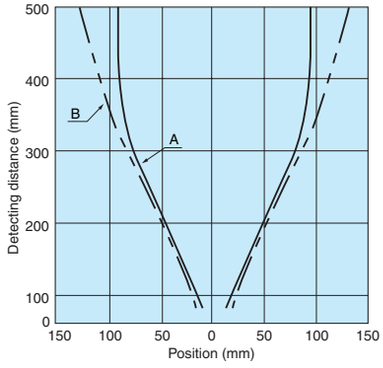
For Correct Use

- 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.

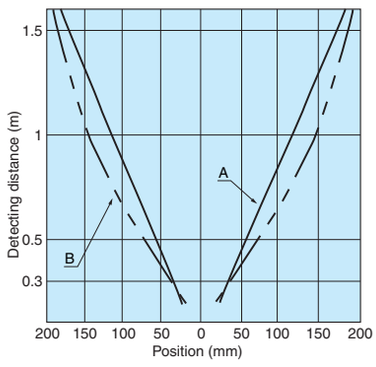
Characteristics (Typical Example)

- Parallel displacement characteristics

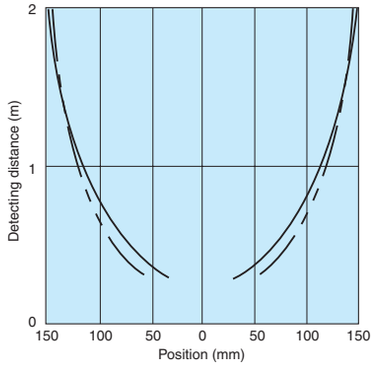
SSC-T801



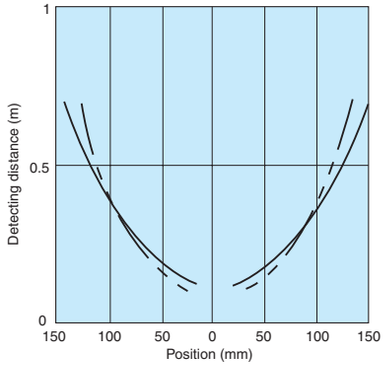
SSC-T802



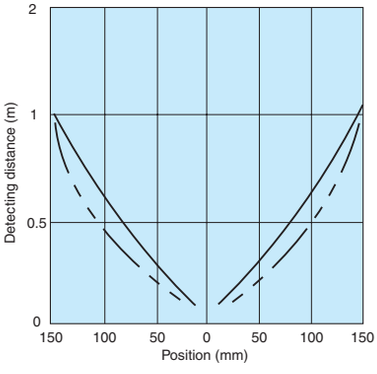
SSC-T804



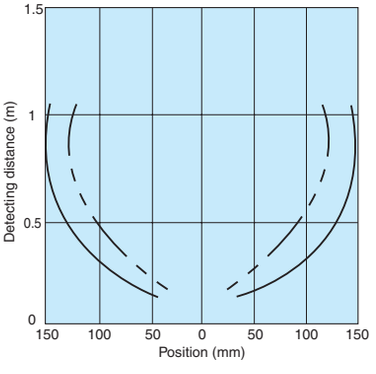
SSC-T805



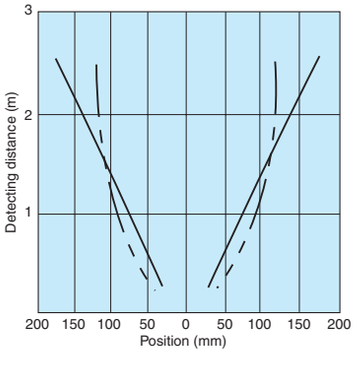
SSC-T850

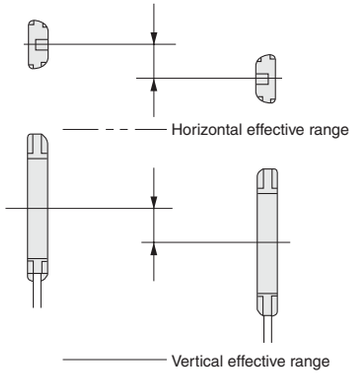


SSC-T810
SSC-T815



SSC-T830
SSC-T835



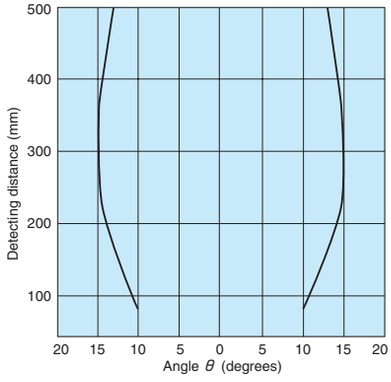


SSC-T800

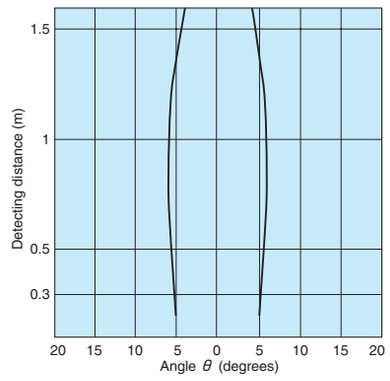
Characteristics (Typical Example)

- Operating angle characteristics

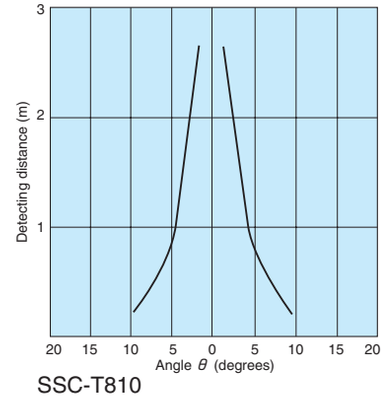
SSC-T801



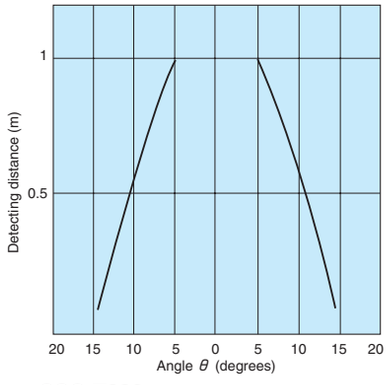
SSC-T802



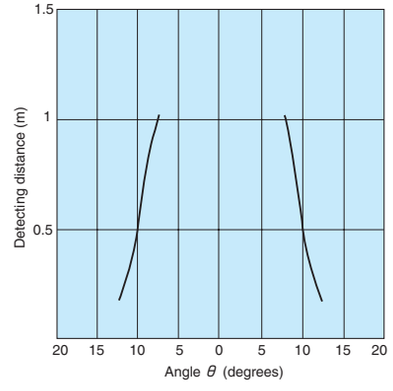
SSC-T804



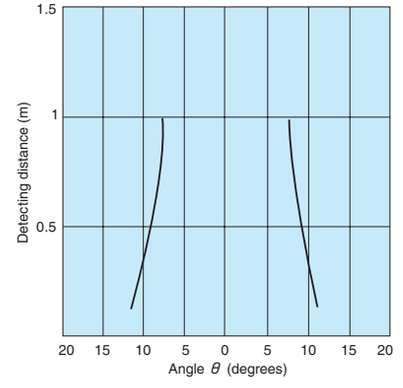
SSC-T805



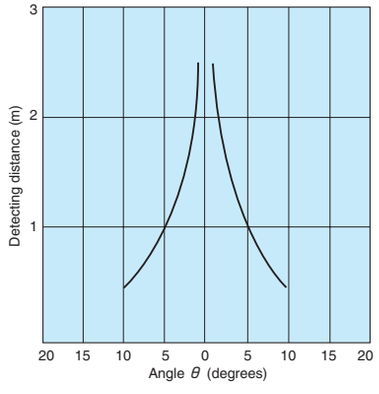
SSC-T850

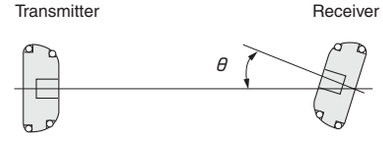


SSC-T810
SSC-T815



SSC-T830
SSC-T835

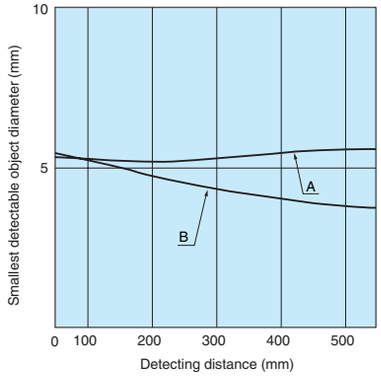




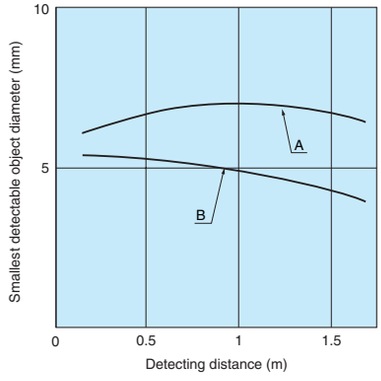
Characteristics (Typical Example)

- Smallest detectable object diameter characteristics

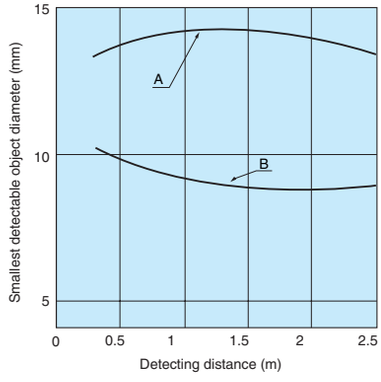
SSC-T801



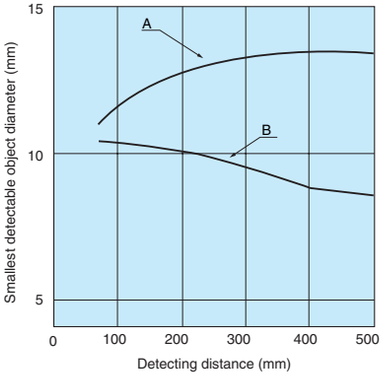
SSC-T802



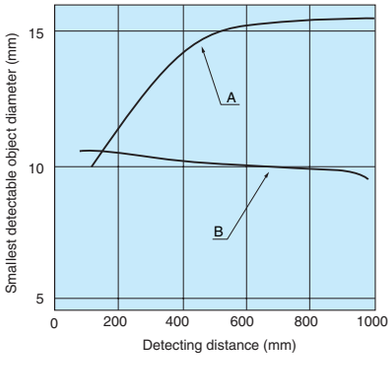
SSC-T804



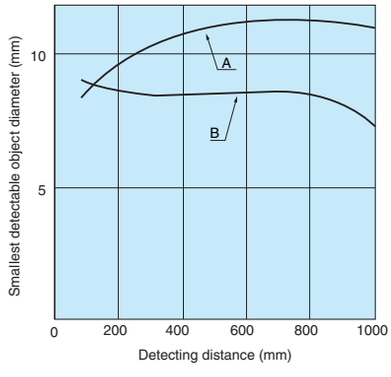
SSC-T805



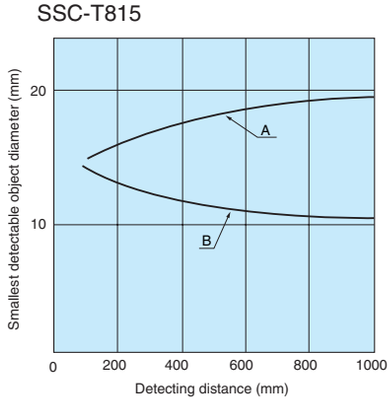
SSC-T850



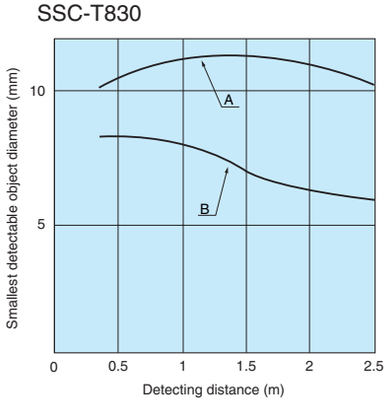
SSC-T810



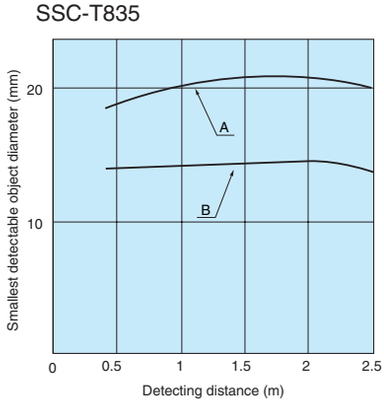
SSC-T815

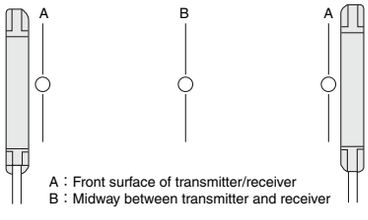


SSC-T830



SSC-T835



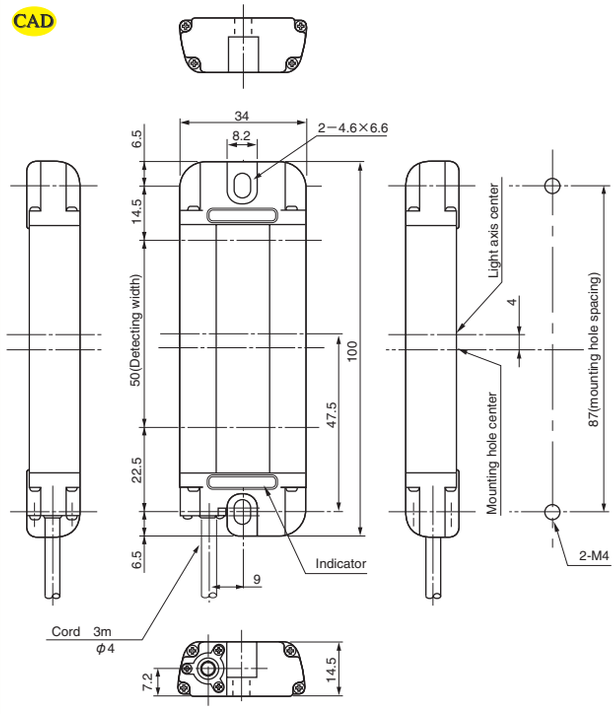


SSC-T800

Dimensions (in mm)

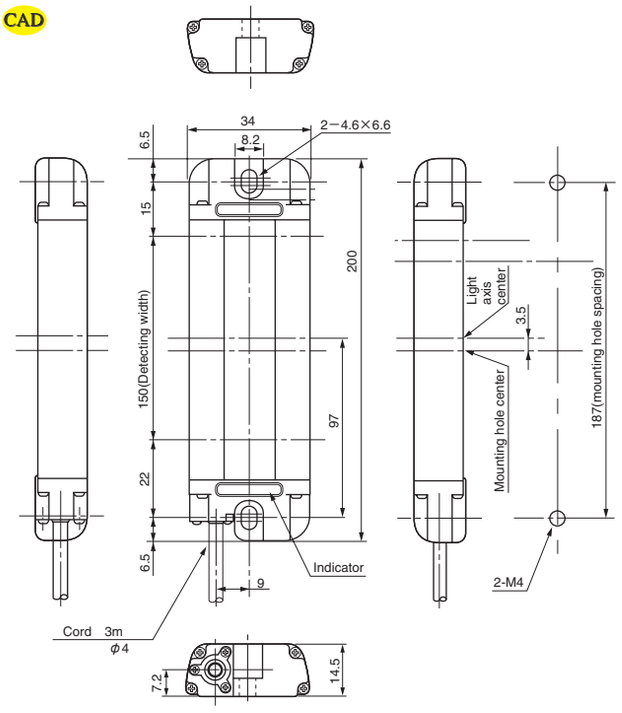
SSC-T801 SSC-T804
SSC-T802 SSC-T805

CAD



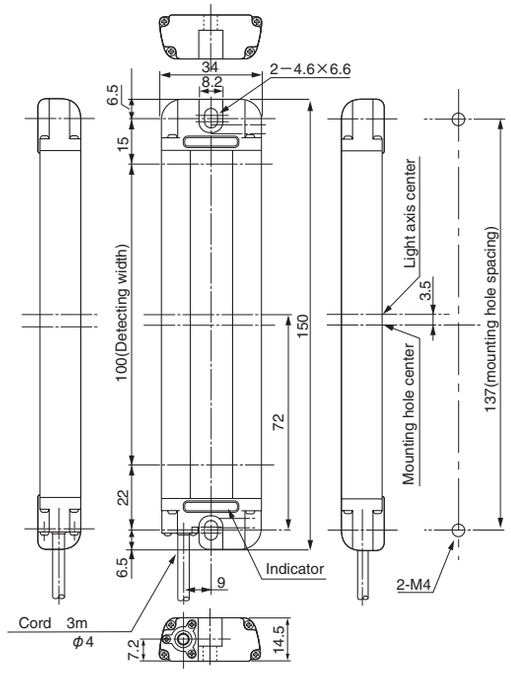
SSC-T850

CAD



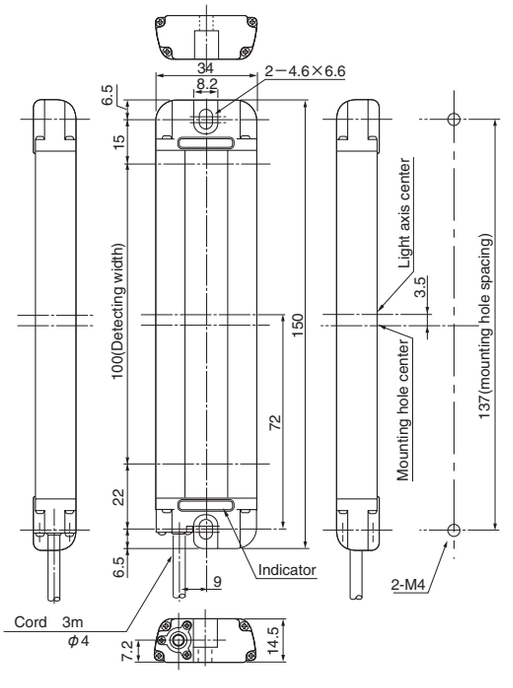
SSC-T810
SSC-T830

CAD

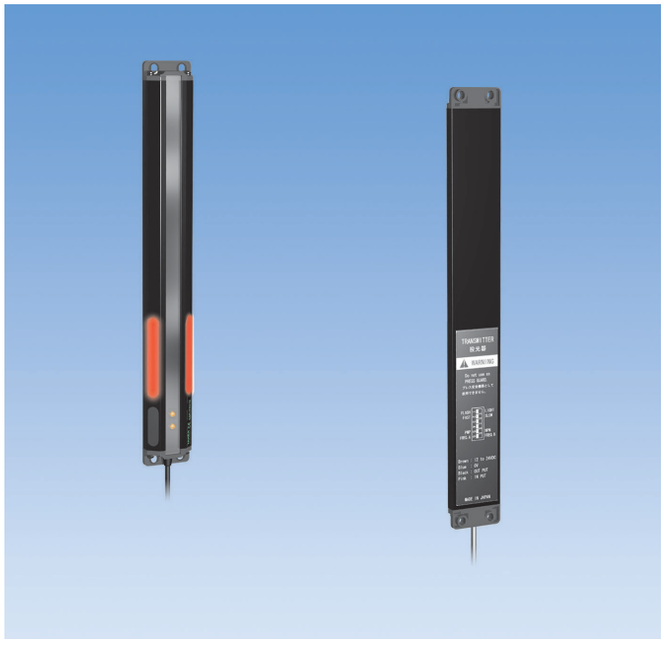


SSC-T815
SSC-T835

CAD



SSP-T200 series 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			
		300mm	**SSP-T213**	13			
		375mm	**SSP-T216**	16			
		100mm	**SSP-T205-J**	5			Permanently attached cord with connector
		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
SSP-B2	L-shaped plate type	(with M4 x 12 sems screws with washers and nuts)

- 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

Rating/performance	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
	Detection method		Through-beam type			
	Detecting distance		2m			
	Detection object		Opaque object of ϕ35mm min.			
	No. of light axes		5	10	13	16
	Detecting width		100mm	225mm	300mm	375mm
	Light axis interval		25mm			
	Power supply		12-24V DC ±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: NPN output	Sink current 50mA (30VDC) max. / Residual voltage: 2V max.			
		Rating: 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.
			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			
Specification	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 0.2mm² cores, gray (transmitter) /with four 0.2mm² 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

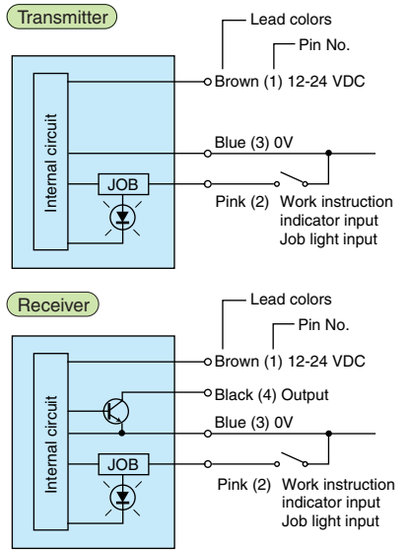
Ambient light	10,000lx max.
Ambient temperature	–10 - +55°C (non-freezing)
Ambient humidity	35-85%RH (non-condensing)
Vibration	10 - 55Hz / 1.5mm amplitude / 2 hours each in 3 directions
Shock	500m/s² / 2 times each in 3 directions
Protective structure	IP62
Dielectric withstanding	1,000VAC 50/60Hz for 1 minute
Insulation resistance	500VDC, 20MΩ or higher.

SSP-T200

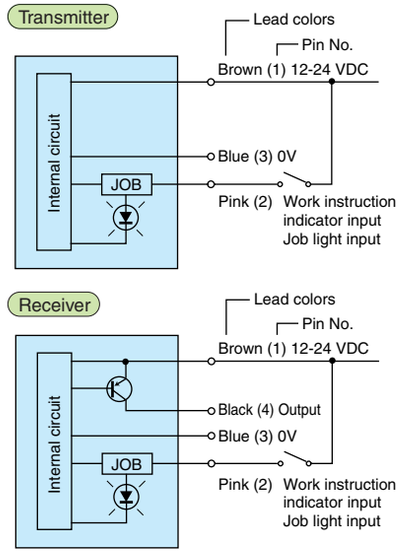
Input/Output Circuit and Connection

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

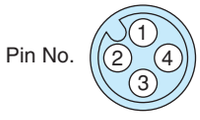
For NPN output



For PNP output

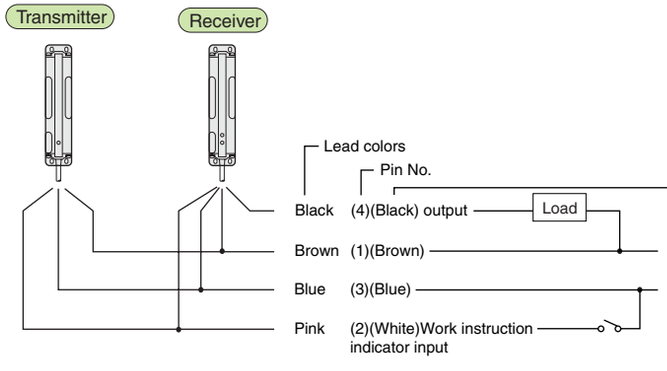


Connector pin arrangement for permanently attached cord with connector (-J type)



Connection

For NPN



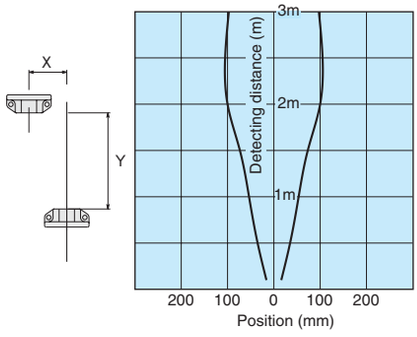
Colors in parentheses show lead colors for use with the optional cord with connector (model: FAC-D4R2/FAC-D4R5).

Cord extension

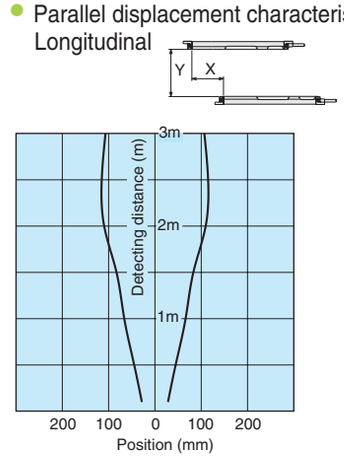
To extend the cord, use wires of at least 0.5mm² and limit the length to within 100m for transmitter and receiver.

Characteristics (Typical Example)

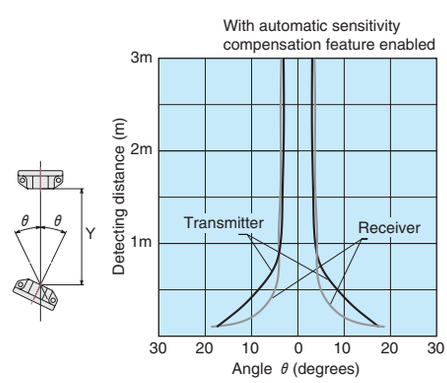
Parallel displacement characteristics



Parallel displacement characteristics Longitudinal



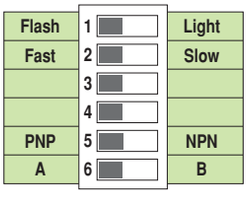
Operating angle characteristics



Mode Switching

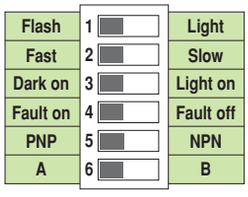
Transmitter

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



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

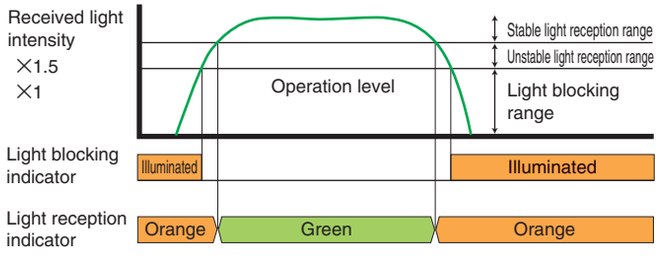


Explanation of modes

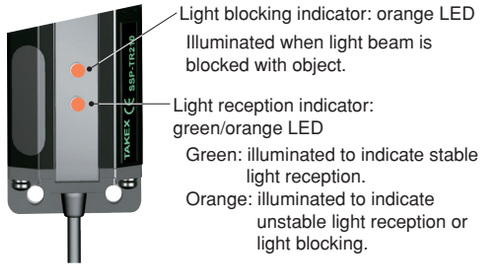
- Job light illumination pattern
  Selects between continuous and flashing illumination for the job light and receiver fault light.
  Light: continuous illumination / Flash: flashing illumination
- Job light flashing speed switch
  Specifies the flashing speed for the job light and receiver fault light.
- 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.

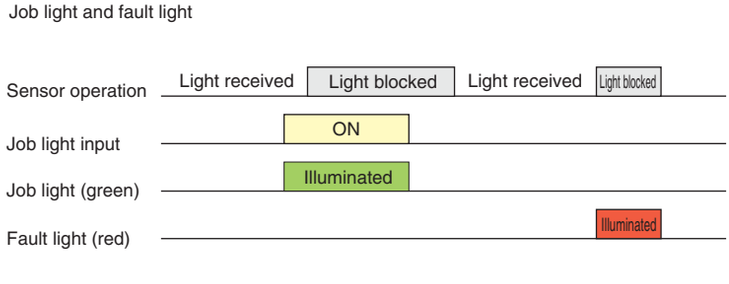
Indicators

Transmitter



Receiver





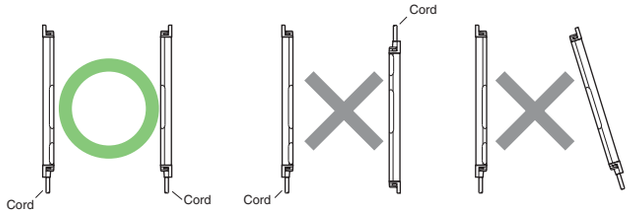
Automatic Sensitivity Compensation Feature

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 0.8N・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.



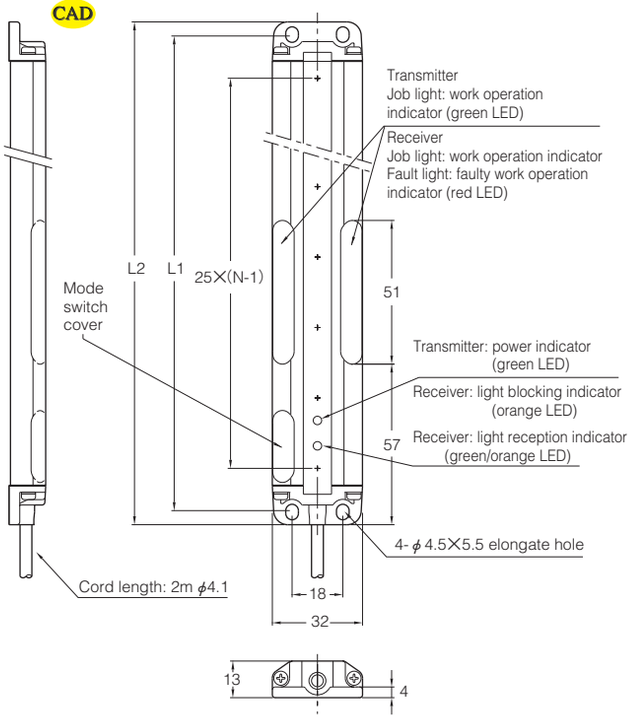
For Correct Use

- 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.

Dimensions (in mm)

SSP-T200 series

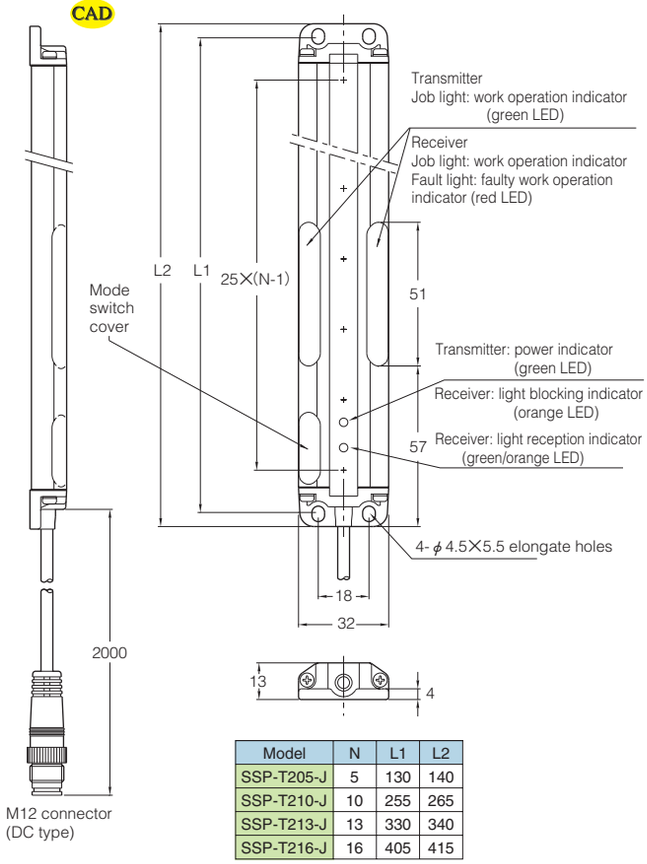
CAD



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

SSP-T200-J series

CAD



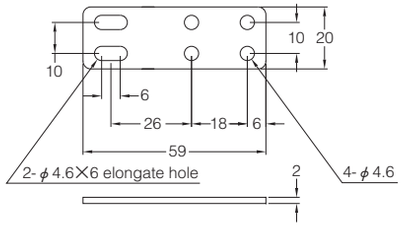
Model	N	L1	L2
SSP-T205-J	5	130	140
SSP-T210-J	10	255	265
SSP-T213-J	13	330	340
SSP-T216-J	16	405	415

Optional parts

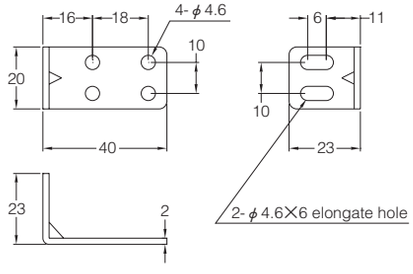
Mounting brackets

- 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.

Model:SSP-B1
Flat plate type



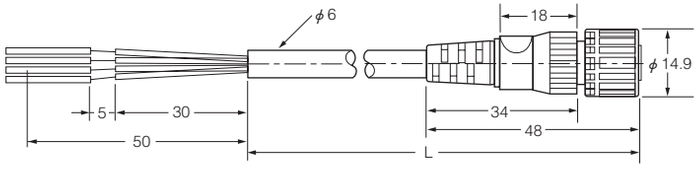
Model:SSP-B2
L-shaped plate type



Cord with connector

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

CAD



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 ϕ17mm min
				24	230mm	**SS10-T24**		
				32	310mm	**SS10-T32**		
				48	470mm	**SS10-T48**		
				64	630mm	**SS10-T64**		
				80	790mm	**SS10-T80**		
				96	950mm	**SS10-T96**		
SS20		7m	20mm	8	140mm	**SS20-T8**		Opaque object of ϕ32mm min
				12	220mm	**SS20-T12**		
				16	300mm	**SS20-T16**		
				20	380mm	**SS20-T20**		
				24	460mm	**SS20-T24**		
				32	620mm	**SS20-T32**		
				40	780mm	**SS20-T40**		
				48	940mm	**SS20-T48**		
SS40			40mm	4	120mm	**SS40-T4**		Opaque object of ϕ52mm min
				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)

Rating/Performance/Specification

	Series	**SS10** series	**SS20** series	**SS40** series
Rating/performance	Detection method	Through-beam		
	Detecting distance	2m max.	7m max.	
	Detecting object	Opaque object of ϕ17mm min.	Opaque object of ϕ32mm min	Opaque object of ϕ52mm min
	No. of light axes	(See "Type.")		
	Detecting width	(See "Type.")		
	Light axis interval	10mm	20mm	40mm
	Power supply	12-24V DC±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 0.5mm² 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

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)

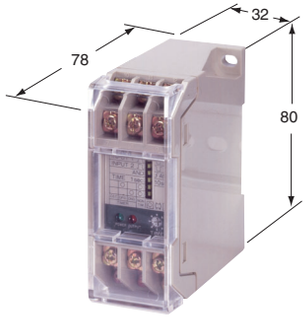
Indicator Operation

	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

Applicable power supply unit

PS Series

High capacity of 200mA at 12VDC

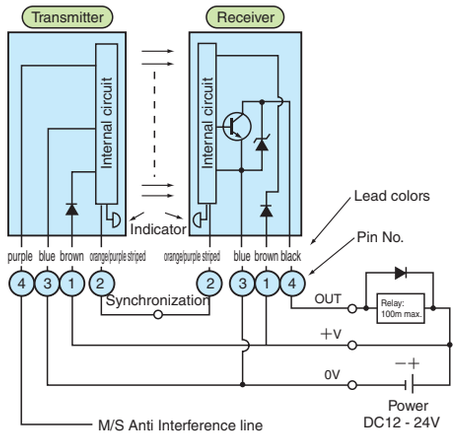


(General-purpose type)
PS3N
PS3N-SR
(Multifunctional type)
PS3F
PS3F-SR

Current consumption by model

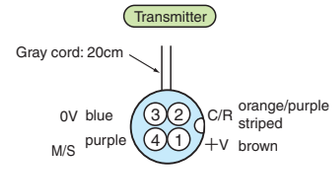
Model	Current consumption
SS10-T16	90mA max.
SS10-T24	103mA max.
SS10-T32	116mA max.
SS10-T48	142mA max.
SS10-T64	168mA max.
SS10-T80	194mA max.
SS10-T96	220mA max.
SS20-T8	70mA max.
SS20-T12	80mA max.
SS20-T16	90mA max.
SS20-T20	100mA max.
SS20-T24	110mA max.
SS20-T32	130mA max.
SS20-T40	150mA max.
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.

Input/Output Circuit and Connection

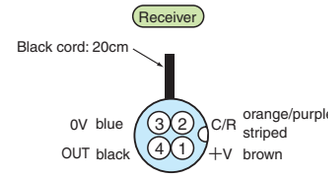


- The output transistor turns off when load short circuit or overload occurs. Check the load and turn the power back on.
- When not using the Anti Interference feature, leave the M/S Anti Interference line unconnected and ensure it will not come in contact with any other cord.

Connector pin assignment



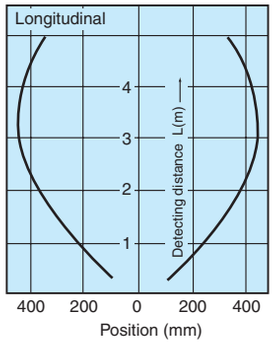
C/R:synchronization line
M/S:Anti Interference line
OUT:output

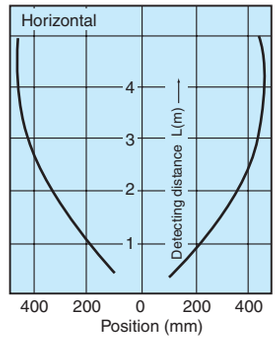


Characteristics (Typical Example)

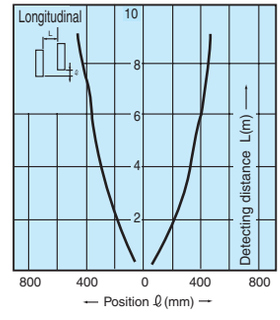
Parallel displacement characteristics

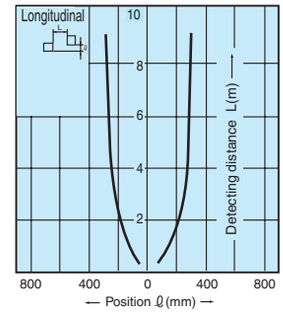
SS10 series





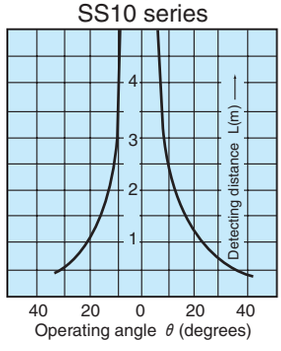
SS20/SS40 series



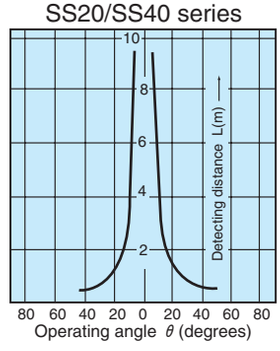


Operating angle characteristics

SS10 series

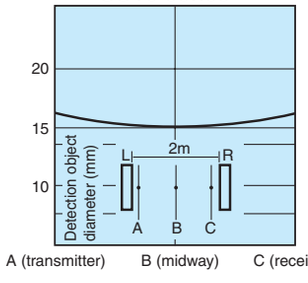


SS20/SS40 series

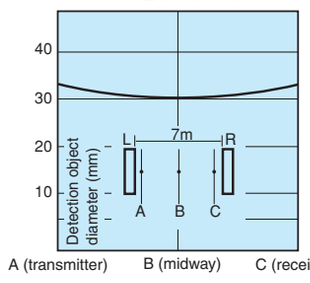


ÅE Smallest detectable object diameter characteristics

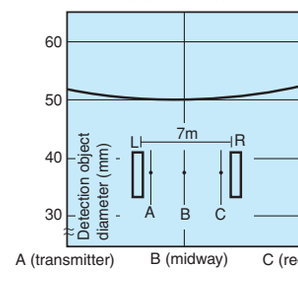
SS10 series



SS20 series



SS40 series

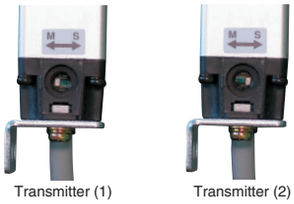


For Correct Use

- 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)



Transmitter (1) Transmitter (2)

- 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)

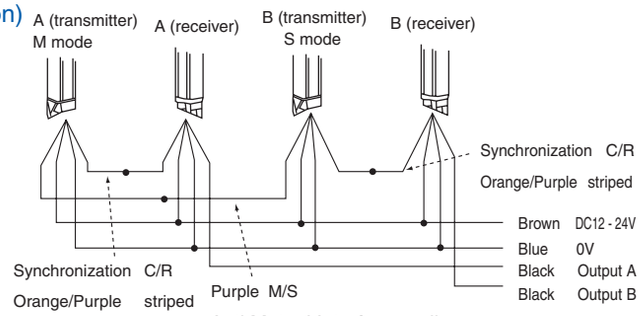
A: output transistor activated when light beams of all axes are received (all axes reception ON)
O: output transistor activated when light beam of any axis is received (any axis reception ON)

(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.

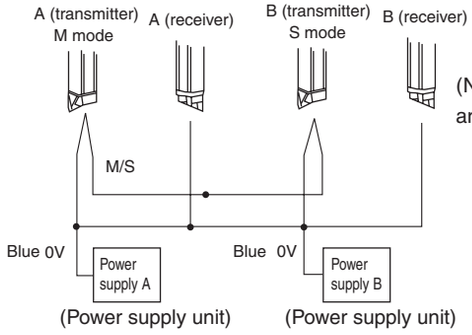
(Connection)



Anti Mutual Interference line

(With more than one power supply)

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

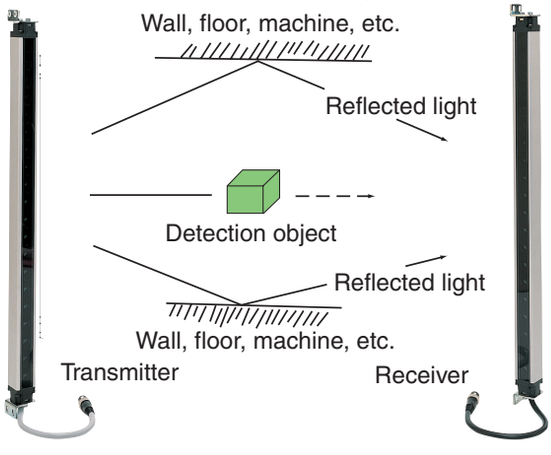


(Power supply unit) (Power supply unit)

(Note) Only 0V lines are shown.

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.



End with cord End with cord

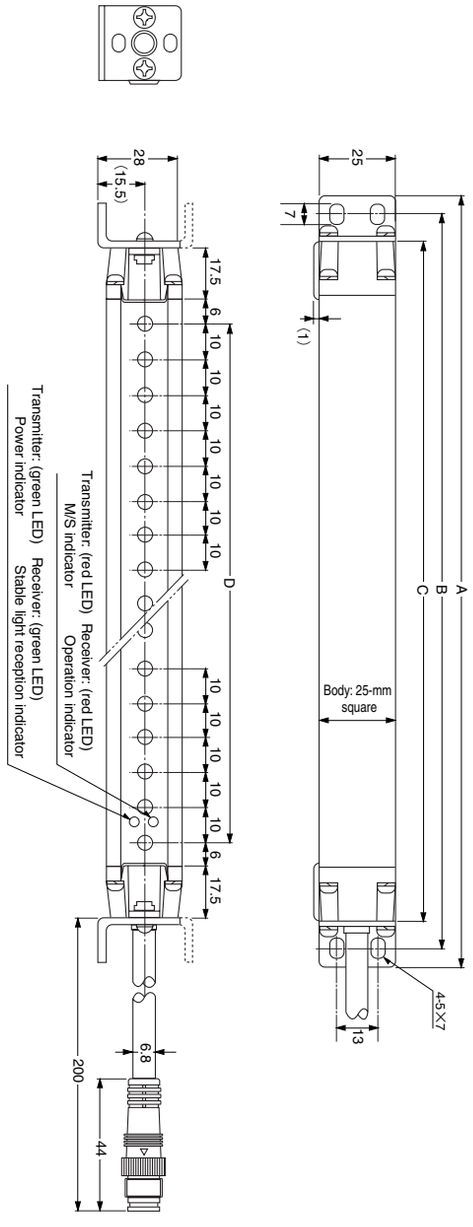
Cord Extension

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.

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

SS10 series

CAD

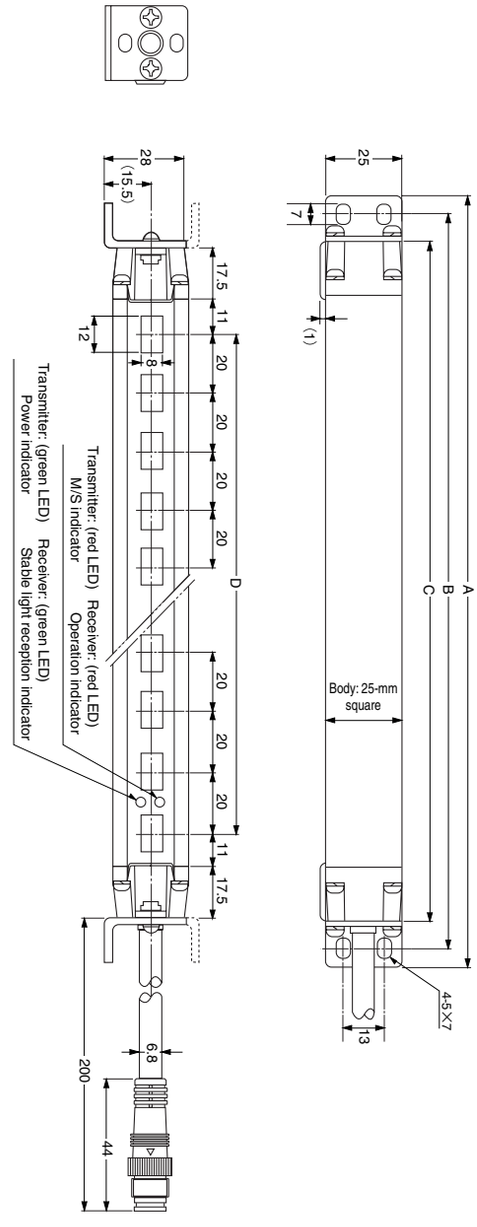


● Dimensions of portions (in mm)

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)

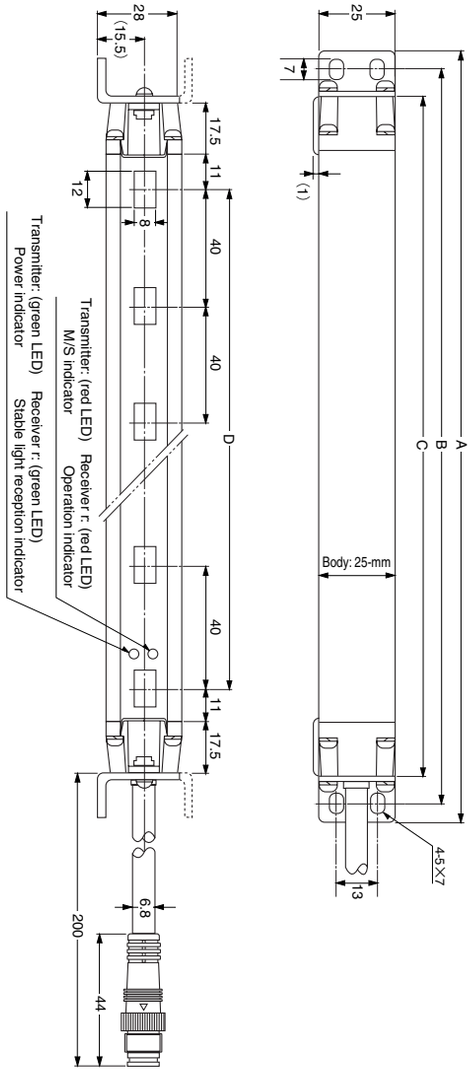
Model	A	B	C	D
SS20-T8	227	215	197	140
SS20-T12	307	295	277	220
SS20-T16	387	375	357	300
SS20-T20	467	455	437	380
SS20-T24	547	535	517	460
SS20-T28	627	615	597	540
SS20-T32	707	695	677	620
SS20-T36	787	775	757	700
SS20-T40	867	855	837	780
SS20-T44	947	935	917	860
SS20-T48	1027	1015	997	940

Dimensions (in mm)

SS40 series

CAD

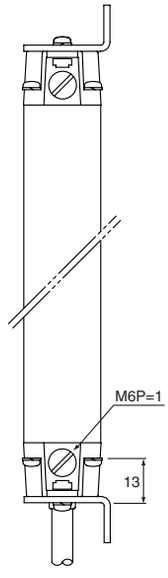
(Only receiver is shown in the figure as an example.
With transmitter, orientation of mounting bracket is reversed.)



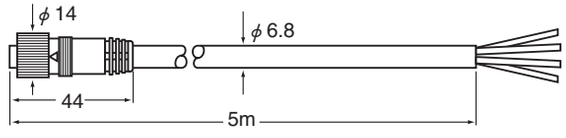
● Dimensions of portions (in mm)

Model	A	B	C	D	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					

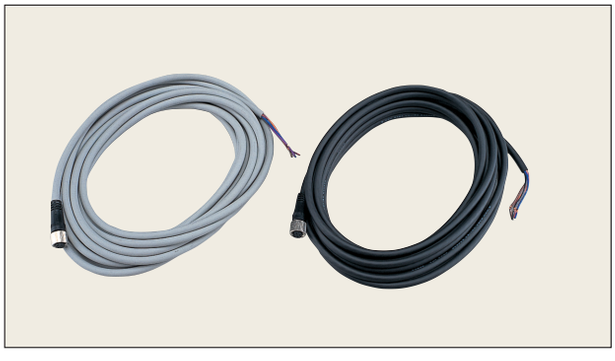
Back view (common to all sensors of the series)



Cord with connector (accessory)



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



SS80 series

Light Curtain Sensors

- 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
↑ SS80	Through-beam type	3～15m	80mm	2	80mm	**SS80-T2**	• 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 ϕ92 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 0.5mm² 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

	Series	SS80 series
Rating/performance	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 ±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

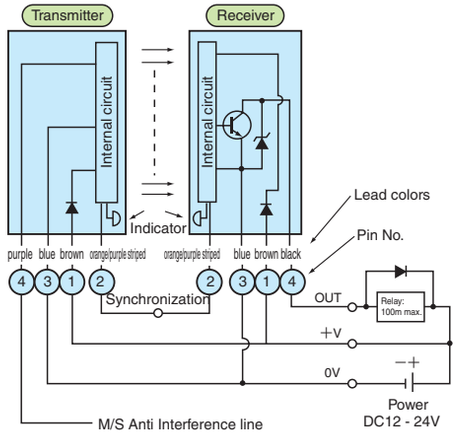
	Name	Color	Description
Transmitter	Power indicator	Green	Illuminated when power is supplied
	M/S indicator	Red	Illuminated to indicate M mode Dis-illuminated to indicate S mode
	Light axis alignment indicator	Green	Illuminated when power is supplied
Receiver	Stable light reception indicator	Green	Illuminated 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.	

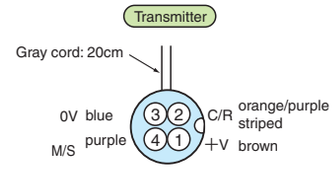
SS80

Input/Output Circuit and Connection

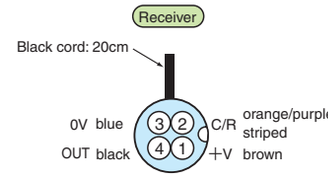


- The output transistor turns off when load short circuit or overload occurs. Check the load and turn the power back on.
- When not using the Anti Mutual Interference feature, leave the M/S Anti Mutual Interference line unconnected and ensure it will not come in contact with any other cord.

Connector pin assignment

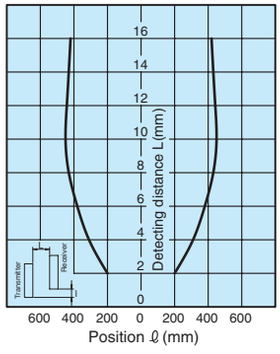


C/R: synchronization line
M/S: Anti Interference line
OUT: output

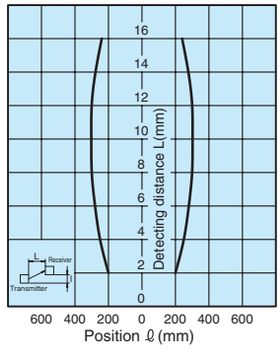


Characteristics (Typical Example)

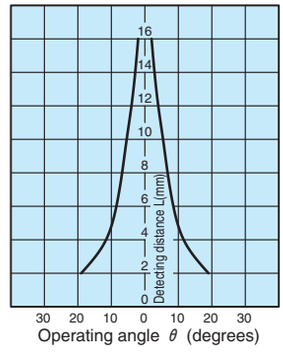
- Parallel displacement characteristics (Longitudinal)

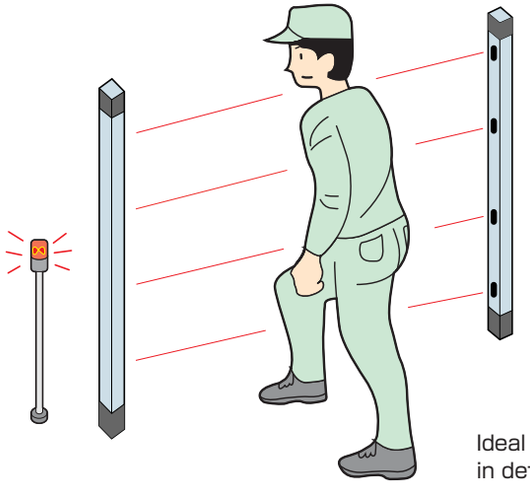


- Parallel displacement characteristics (Horizontal)



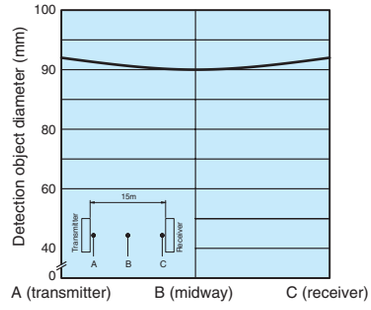
- Operating angle characteristics





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

- Smallest detectable object diameter characteristics

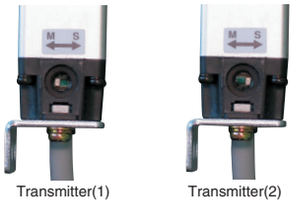


For Correct Use

- 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)



Transmitter(1) Transmitter(2)

- 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)

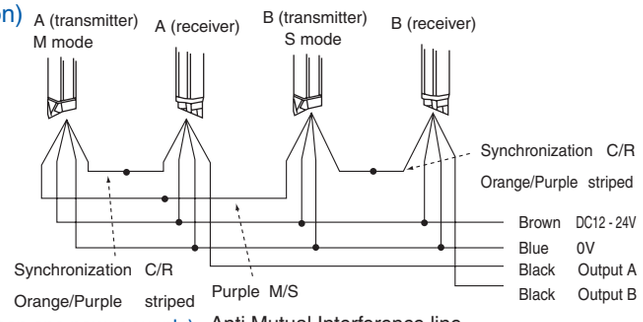
A: output transistor activated when light beams of all axes are received (all axes reception ON)
O: output transistor activated when light beam of any axis is received (any axis reception ON)

(Factory setting: A)

Anti Interference

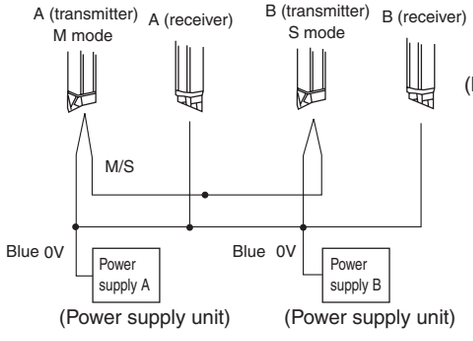
- When using two sets of sensors installed adjacently, connect the Anti Interference lines (purple) of Transmitters A and B with each other.
- Connect the 0 V lines of the Transmitters A and B and Receivers A and B together.
- Set the M/S (master/slave) mode switch of Transmitter A to M and of Transmitter 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) Anti Mutual Interference line

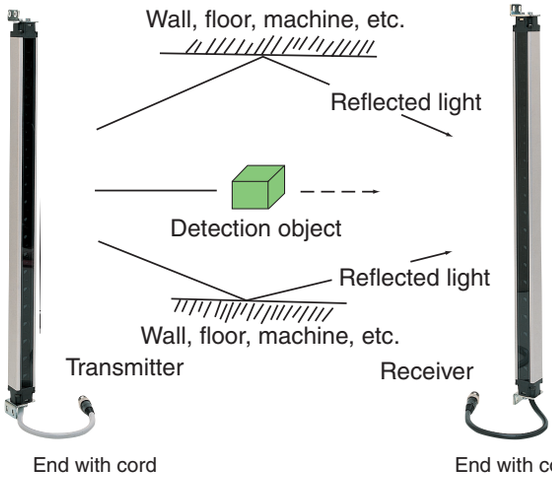
Connect the 0 V lines of the Transmitters A and B and Receivers A and B together.



(Note) Only 0V lines are shown.

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.



End with cord End with cord

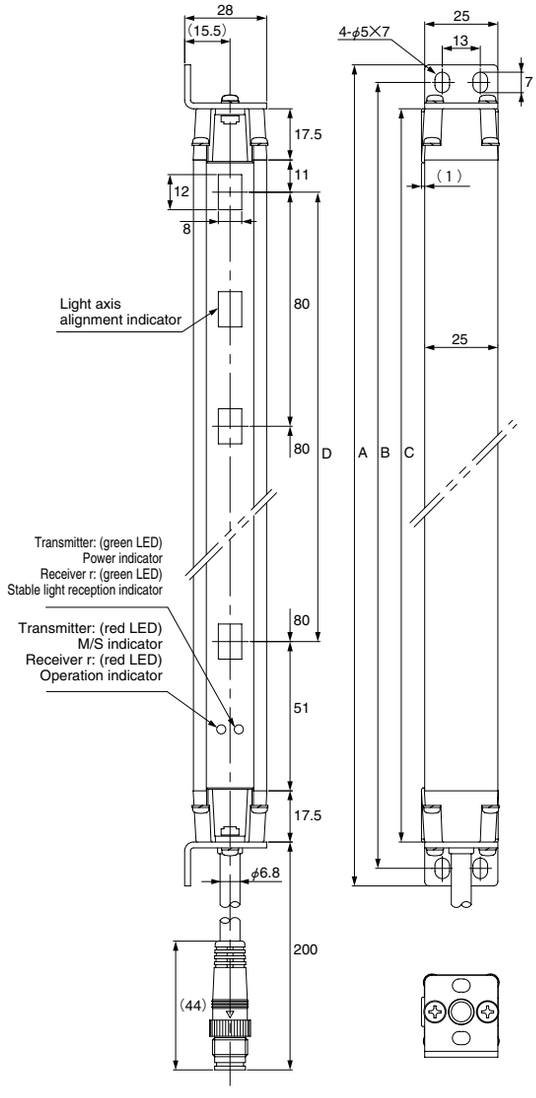
Cord Extension

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.

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

SS800 series

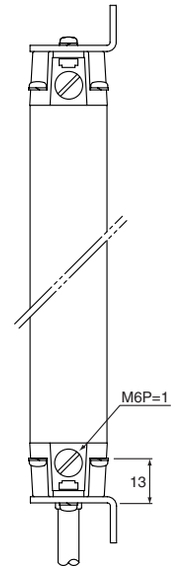
CAD (Only receiver is shown in the figure as an example. With transmitter, orientation of mounting bracket is reversed.)



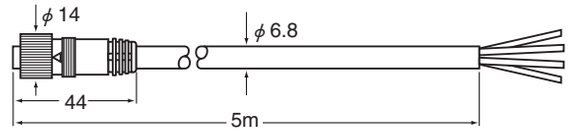
● Dimensions of portions (in mm)

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

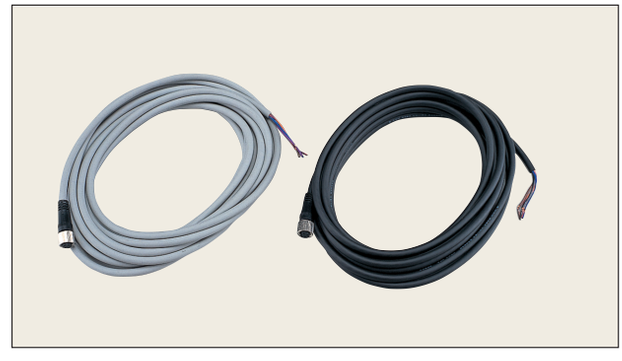
Back view



Cord with connector (accessory)

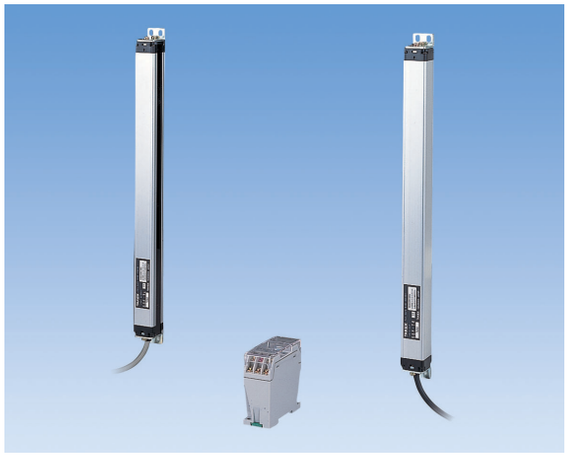


SS-H5L (covering: gray)
SS-H5R (covering: black)



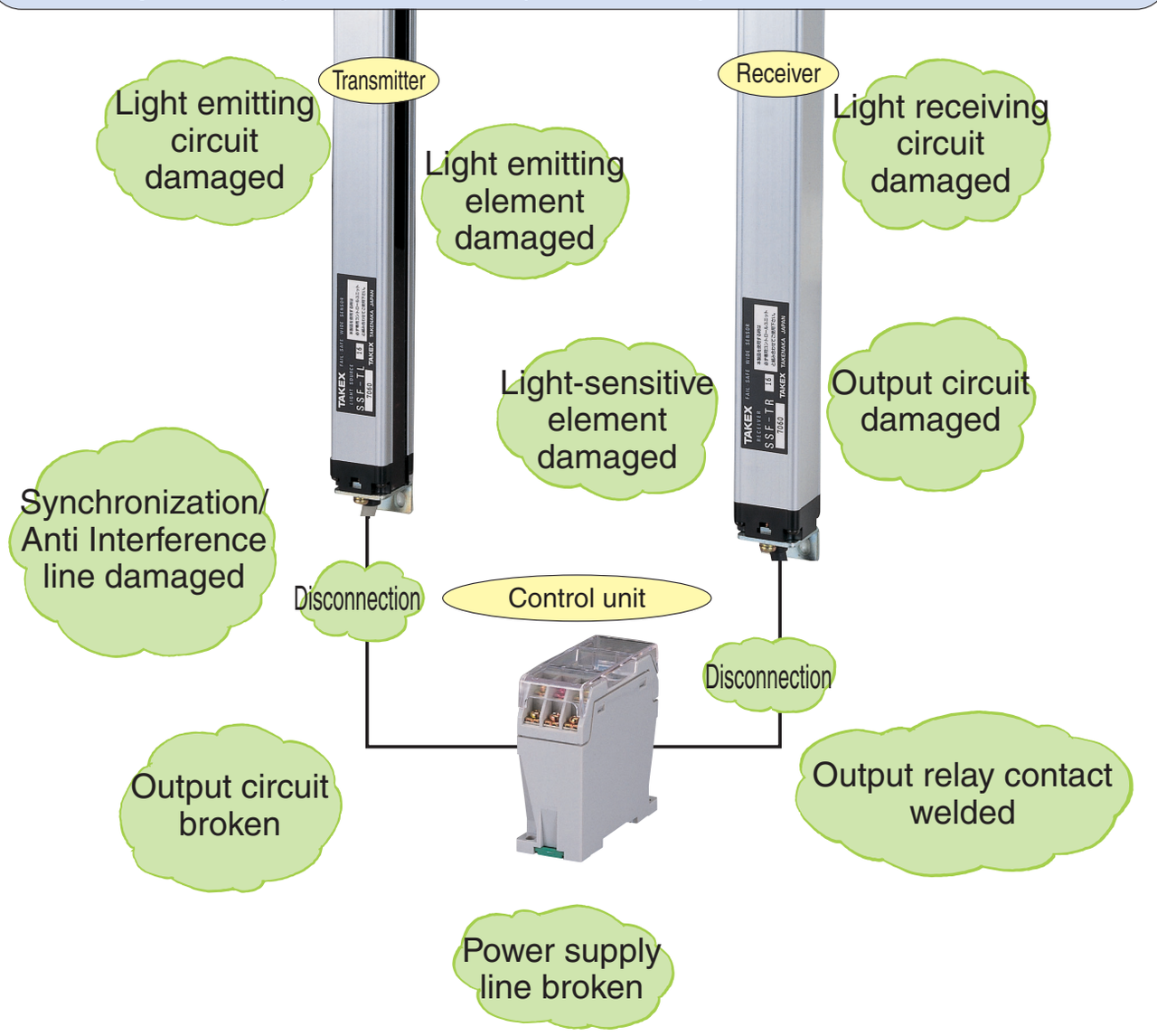
SSF series

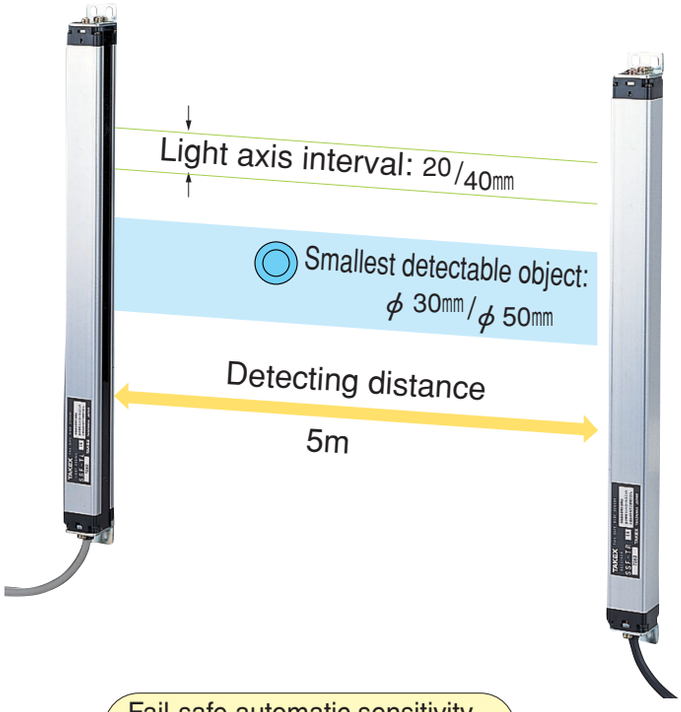
Fail-safe
light curtain sensors



- 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

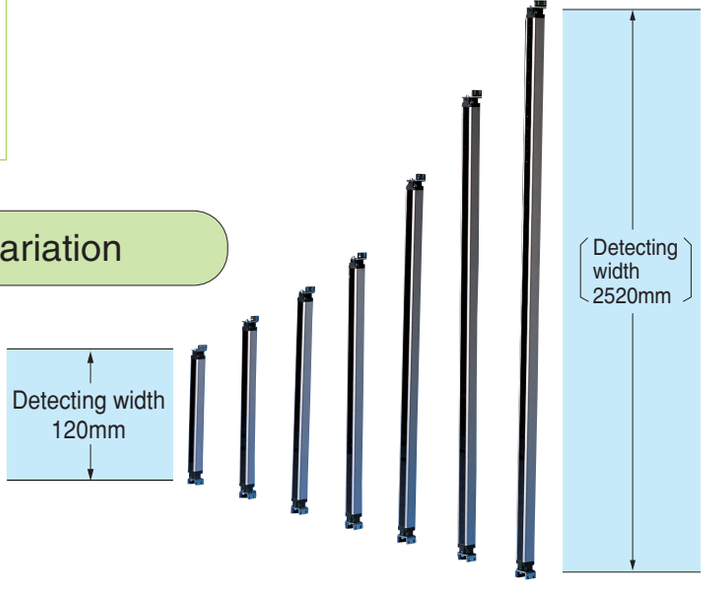
After the light axis alignment is completed, turn the power off once and back on. The automatic sensitivity compensation feature is enabled and the sensitivity is set at the optimum. If the lens is soiled with dirt or dust, the sensitivity is automatically compensated to achieve the optimum sensitivity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



SSF

Type

Series name	Detecting distance	Detecting width	Set model No.	No. of light axes	Light axis interval	Detecting object
SSF-T200	5m	140mm	**SSF-T8C**	8	20mm	Opaque object of ϕ30 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		
SSF-T400		120mm	**SSF-T404C**	4	40mm	Opaque object of ϕ50 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 Prize List at the end of the book.

Set model description

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

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

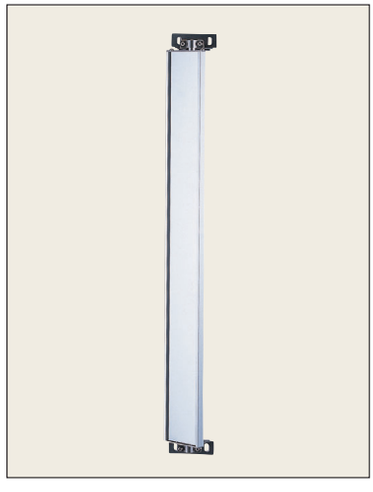
Products with two 1a contact outputs are available on request.

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

	Series		SSF-T200 series	SSF-T400 series
Rating/performance	Detection method		Through-beam type	
	Detecting distance		5m max.	
	Detecting object		Opaque object of ϕ30mm min.	Opaque object of ϕ50mm min.
	Light axis interval		20mm	40mm
	No. of light axes		(See "Type.")	
	Detecting width			
	Power supply		24V DC ±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) Synchronization failure indicator (Red) RUN indicator (Green) 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) OUTPUT (Yellow) SENSOR FAIL (Red) 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 (ϕ6.8 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	

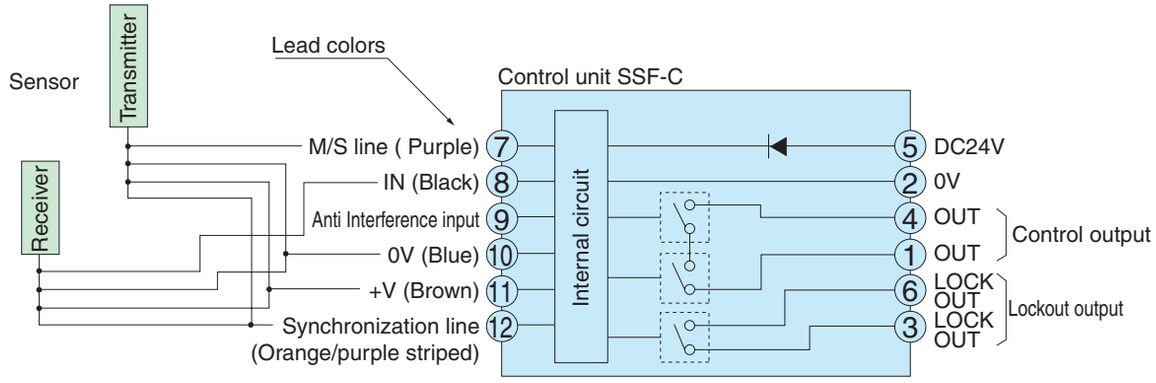
Environmental Specification

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 MΩ or higher.

Optional Parts

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

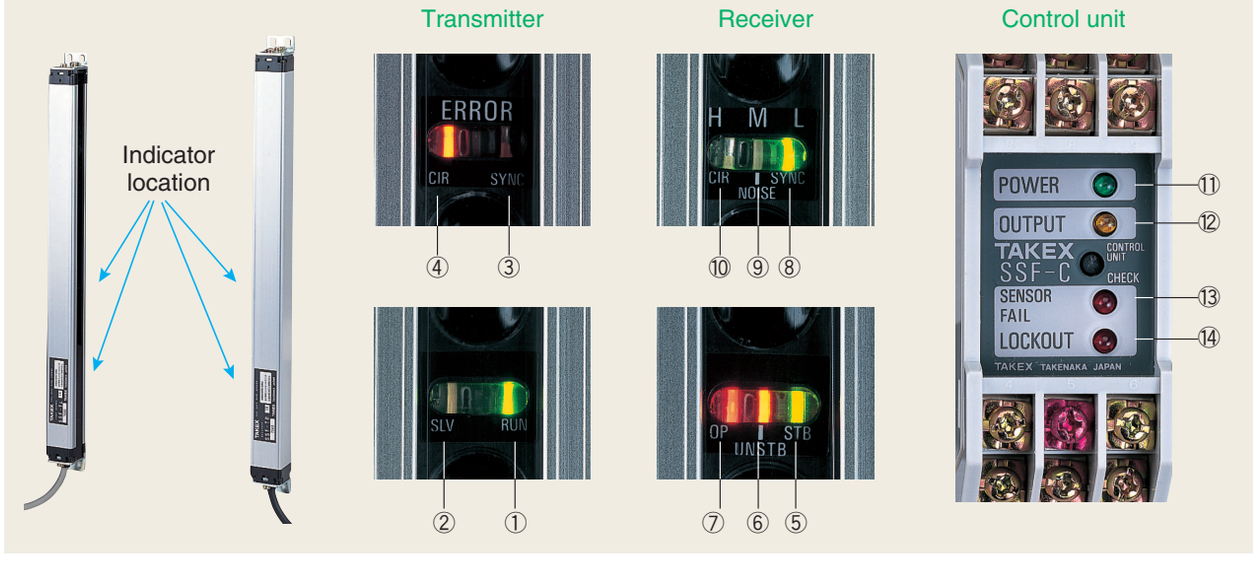
Input/Output Circuit and Connection



(Circled numbers show pin Nos.)

Indicators and Operation

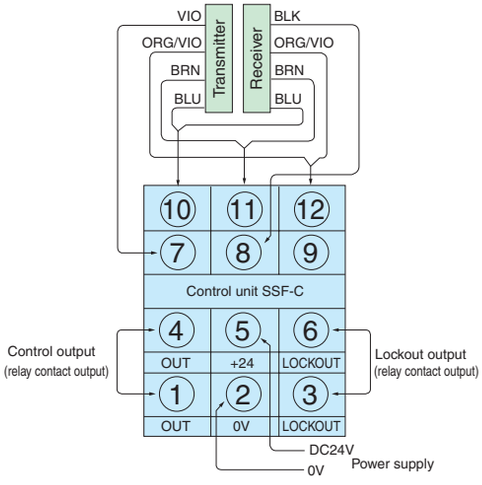
The indicators provided for the transmitter, receiver and control unit and their operation are outlined as follows:



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	
	⑧	Bottom light axis alignment indicator	Green	Illuminated when beam of bottom axis is received	Flashes to indicate broken synchronization line/transmitter failure
	⑨	Disturbing light indicator	Orange	Not illuminated	Illuminated when disturbing light/noise is detected
	⑩	Top light axis alignment indicator	Green	Illuminated when beam of top axis is received	Flashes to indicate receiver failure
Control unit	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

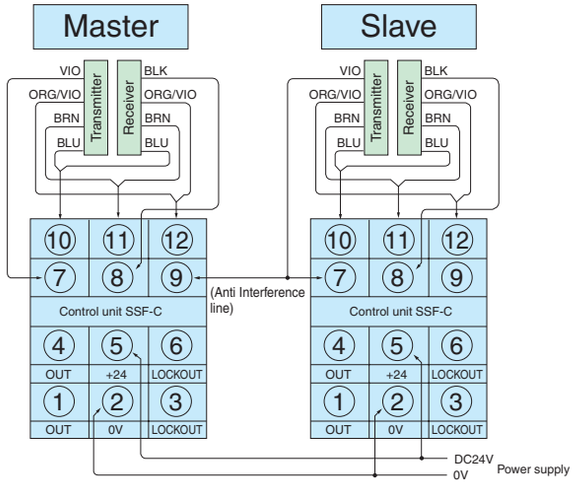
Connection Examples

Connection for standalone use



Connection for Anti Interference

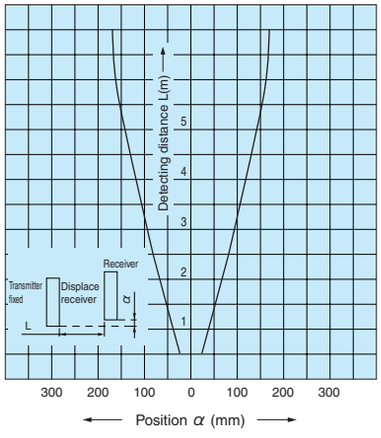
Connect as shown below for adjacent installation of two sets of sensors.



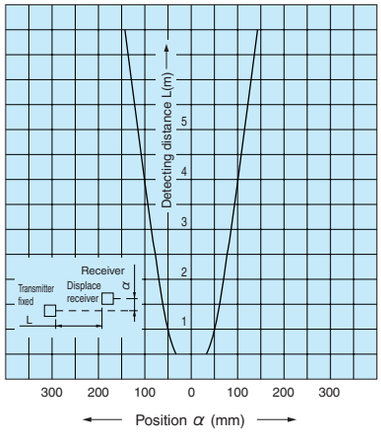
- Be sure to use the same power supply for the master and slave control units.
- The terms master and slave are only used for convenience in distinguishing between two units of the same model that function differently depending on the wiring. The unit with its Anti Interference line connected to Terminal 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)

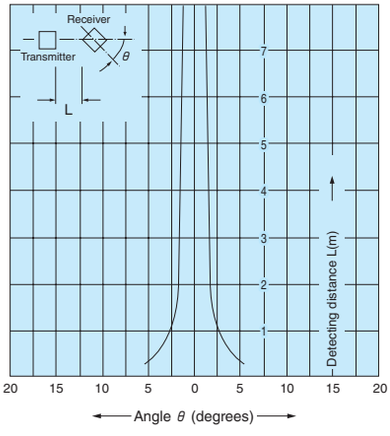
Parallel displacement characteristics (Longitudinal) (All models)



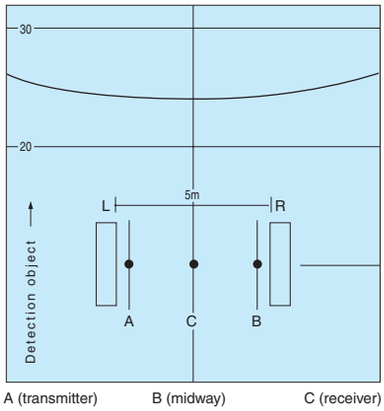
Parallel displacement characteristics (Horizontal) (All models)



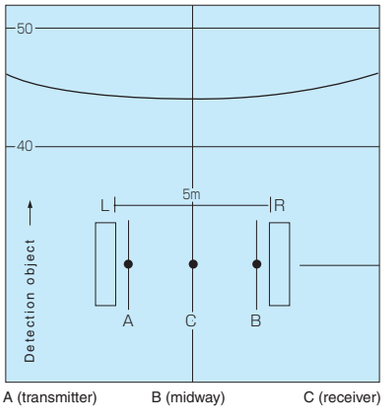
Operating angle characteristics (All models)



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: Transmitter indicator	Sensor: Receiver indicator	Control unit: Indicator	Control output	Lockout output
Normal operation	Sensor	Stable light reception	CIR ● SYNC ● SLV ▲ RUN ●	CIR ● NOISE ● SYNC ● OP ● UNSTB ● STB ●	●POWER ●OUTPUT ●FAIL ●LOCKOUT	●–●	●–●
		Light blocking	CIR ● SYNC ● SLV ▲ RUN ●	CIR ▲ NOISE ● SYNC ▲ OP ● UNSTB ● STB ●	●POWER ●OUTPUT ●FAIL ●LOCKOUT	○–○	●–●
Failure	Sensor	Disturbing light (when detected)	CIR ● SYNC ● SLV ▲ RUN ●	CIR ● NOISE ● SYNC ● OP ● UNSTB ● STB ●	●POWER ●OUTPUT ●FAIL ●LOCKOUT	○–○	●–●
		Light emitting element damaged Light-sensitive element damaged	CIR ● SYNC ● SLV ▲ RUN ●	CIR ▲ NOISE ● SYNC ▲ OP ● UNSTB ● STB ●	●POWER ●OUTPUT ●FAIL ●LOCKOUT	○–○ Locked	●–●
		Light emitting circuit damaged	CIR ☼ SYNC ● SLV ▲ RUN ☼	CIR ● NOISE ● SYNC ☼ OP ☼ UNSTB ☼ STB ☼	●POWER ●OUTPUT ●FAIL ●LOCKOUT	○–○ Locked	●–●
		Light receiving circuit damaged	CIR ● SYNC ● SLV ▲ RUN ●	CIR ☼ NOISE ● SYNC ● OP ☼ UNSTB ☼ STB ☼	●POWER ●OUTPUT ●FAIL ●LOCKOUT	○–○ Locked	●–●
		Output circuit damaged Output line broken	CIR ● SYNC ● SLV ▲ RUN ●	CIR ▲ NOISE ▲ SYNC ▲ OP ▲ UNSTB ▲ STB ▲	●POWER ●OUTPUT ●FAIL ●LOCKOUT	○–○	●–●
		Transmitter power supply line broken	CIR ● SYNC ● SLV ● RUN ●	CIR ● NOISE ● SYNC ☼ OP ☼ UNSTB ☼ STB ☼	●POWER ●OUTPUT ●FAIL ●LOCKOUT	○–○ Locked	●–●
		Receiver power supply line broken	CIR ● SYNC ● SLV ▲ RUN ●	CIR ● NOISE ● SYNC ● OP ● UNSTB ● STB ●	●POWER ●OUTPUT ●FAIL ●LOCKOUT	○–○	●–●
		Synchronization line broken	CIR ● SYNC ● SLV ▲ RUN ●	CIR ● NOISE ● SYNC ☼ OP ☼ UNSTB ☼ STB ☼	●POWER ●OUTPUT ●FAIL ●LOCKOUT	○–○ Locked	●–●
		Anti Interference line broken (slave)*	CIR ● SYNC ☼ SLV ☼ RUN ☼	CIR ● NOISE ● SYNC ☼ OP ☼ UNSTB ☼ STB ☼	●POWER ●OUTPUT ●FAIL ●LOCKOUT	○–○ Locked	●–●
	Control unit	Relay contact welded	CIR ● SYNC ● SLV ▲ RUN ●	CIR ● NOISE ● SYNC ● OP ▲ UNSTB ▲ STB ▲	●POWER ●OUTPUT ●FAIL ●LOCKOUT	●–● Welded	○–○
		Circuit damaged	CIR ● SYNC ● SLV ▲ RUN ●	CIR ● NOISE ● SYNC ● OP ▲ UNSTB ▲ STB ▲	●POWER ●OUTPUT ●FAIL ●LOCKOUT	○–○	○–○
		Power supply line broken Power supply cut off	CIR ● SYNC ● SLV ● RUN ●	CIR ● NOISE ● SYNC ● OP ● UNSTB ● STB ●	●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.

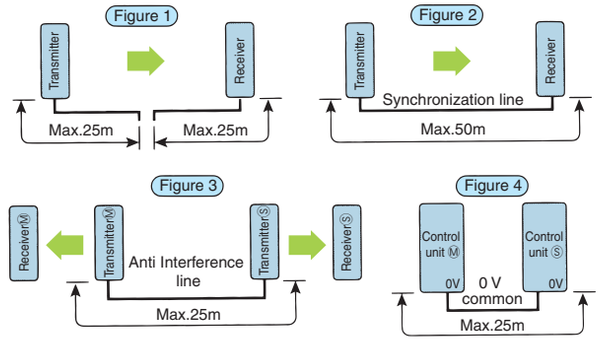
For Correct Use

- 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

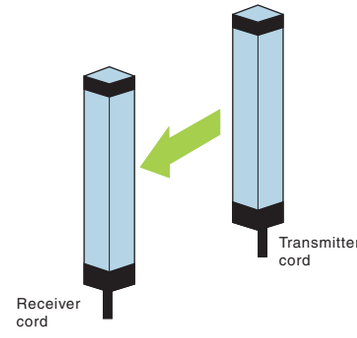
To extend the cord, use wires of at least 0.5 mm^2 and limit the length as follows:

- 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)

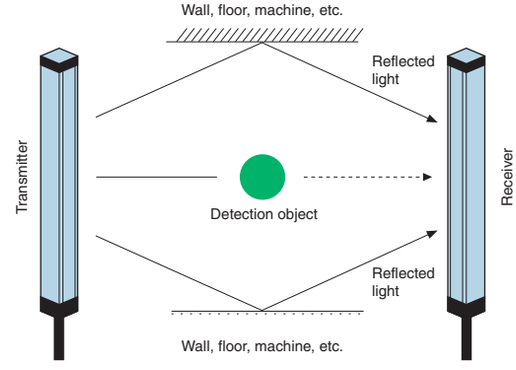


Notes on installation

- 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.



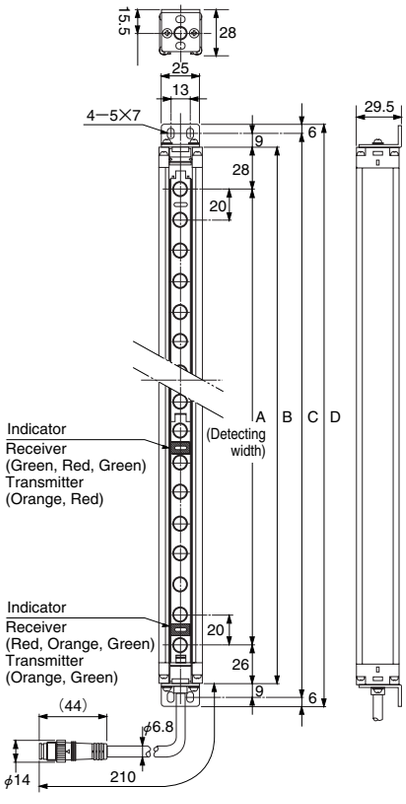
- Any reflecting object (wall, floor, machine, etc.) within the effective range between the transmitter and receiver may allow the light of the sensor to go around the detection object, which is supposed to block the light, and reach the receiver. Choose the installation location carefully (Any glossy 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

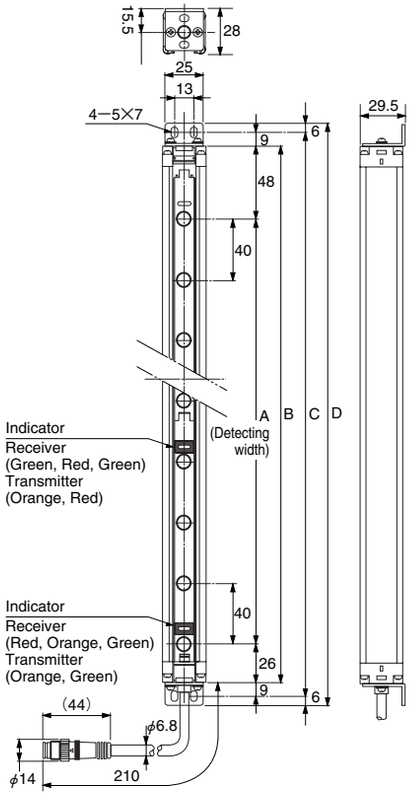
CAD



● 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

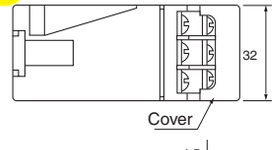


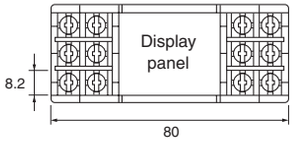
● Dimensions of portions (in mm)

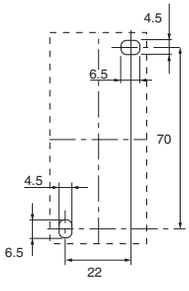
Model	A	B	C	D
SSF-T404	120	194	212	224
SSF-T408	280	354	372	384
SSF-T412	440	514	532	544
SSF-T416	600	674	692	704
SSF-T420	760	834	852	864
SSF-T424	920	994	1012	1024
SSF-T428	1080	1154	1172	1184
SSF-T432	1240	1314	1332	1344
SSF-T436	1400	1474	1492	1504
SSF-T440	1560	1634	1652	1664
SSF-T444	1720	1794	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

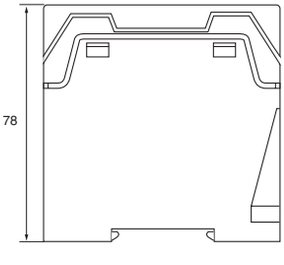
Model SSF-C (Control unit)

CAD



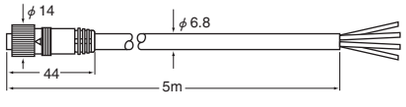






Mounting hole dimensions

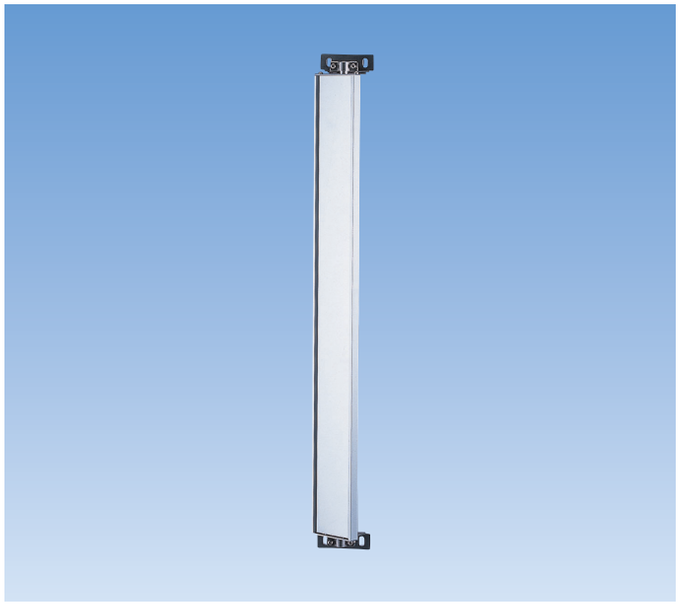
Cord with connector (accessory)



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

SSM-F

Corner Reflectors



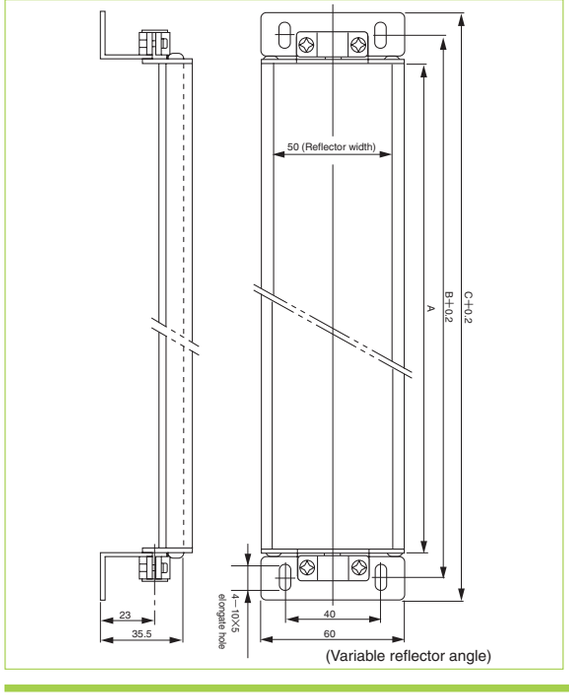
- Installation at corner allows detection of more than one area with one set of sensor

Type/Rating/Performance/Specification

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							

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

Dimensions (in mm)

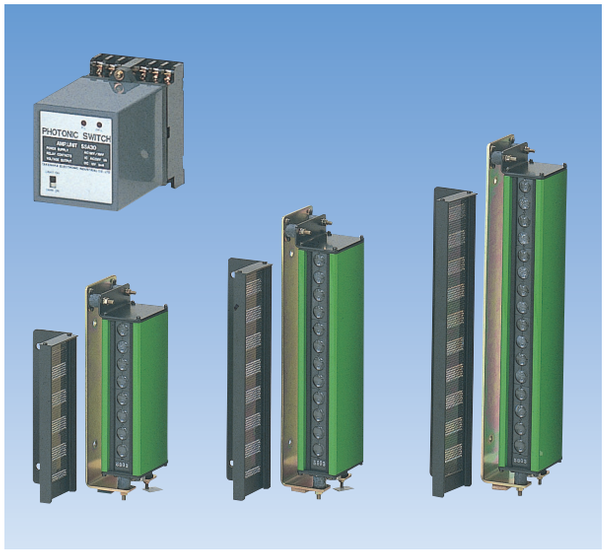


- Dimensions of portions

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

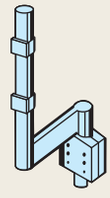
The SSR Series is a series of light curtain sensors used together with a reflector and ideal for locations with a wall or other obstacle on one side that hinders the installation of the transmitter or receiver of through-beam type.

- 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

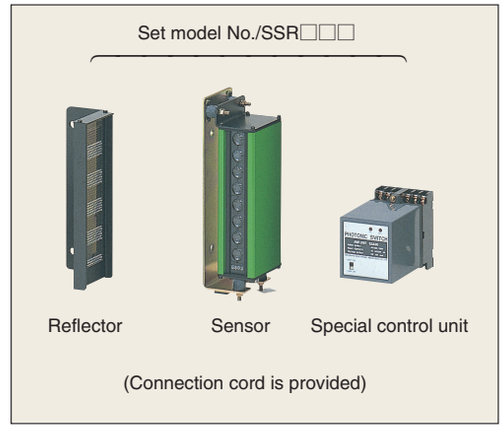
Type

Detection method	Detecting distance	Detecting width	Set model No.	No. of light axes	Light axis interval	Detecting object
Reflector type	1-3m (0.4-1m)	140mm	**SSR304**	4	40mm	Opaque object of ϕ60 mm min. (At 1.5 m from sensor; ϕ80 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.



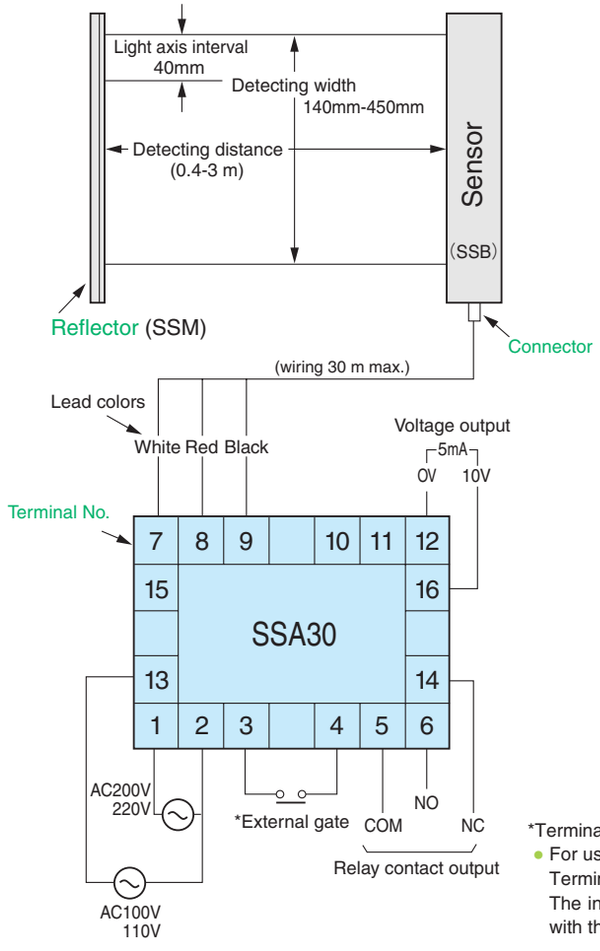
Rating/Performance/Specification

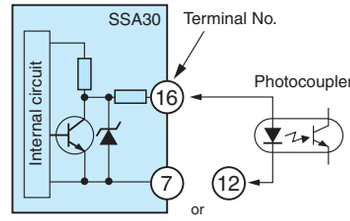
Rating/performance	Model	Set model No.	**SSR304**	**SSR306**	**SSR308**	**SSR310**	**SSR312**
		Sensor only	**SSB304**	**SSB306**	**SSB308**	**SSB310**	**SSB312**
		Reflector only	**SSM304**	**SSM306**	**SSM308**	**SSM310**	**SSM312**
		Control unit	**SSA30**				
	Detection method		Reflector type				
	Detecting distance		1-3m (0.4-1m)*				
	Detection object		Opaque object of ϕ60 mm min. (At 1.5 m from sensor; ϕ80 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 ±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 kΩ (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 25ms max. Voltage output 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 Power indicator (red LED) OP.L 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 mm² 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).				

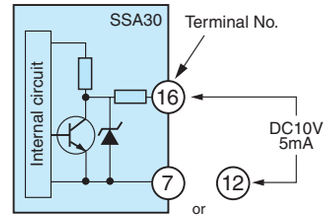
Environmental Specification

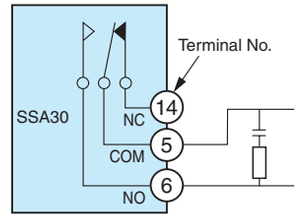
Environment	Ambient light	8,000lx max.
	Ambient temperature	–10 - +55°C (non-freezing)
	Ambient humidity	35-85%RH (non-condensing)
	Protective structure	Sensor : IP42 Control unit:IP20
	Vibration	10-55 Hz / 1.5 mm amplitude / 2 hours each in 3 directions
	Shock	1000 m/s² / 2 times each in 3 directions
	Dielectric withstanding	1500 VAC for 1 minute
	Insulation resistance	500 VDC, 20 MΩ

Input/Output Circuit and Connection









Provide C and R for inductive load.
C=0.5-0.05 μF
R=1K-200 Ω

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

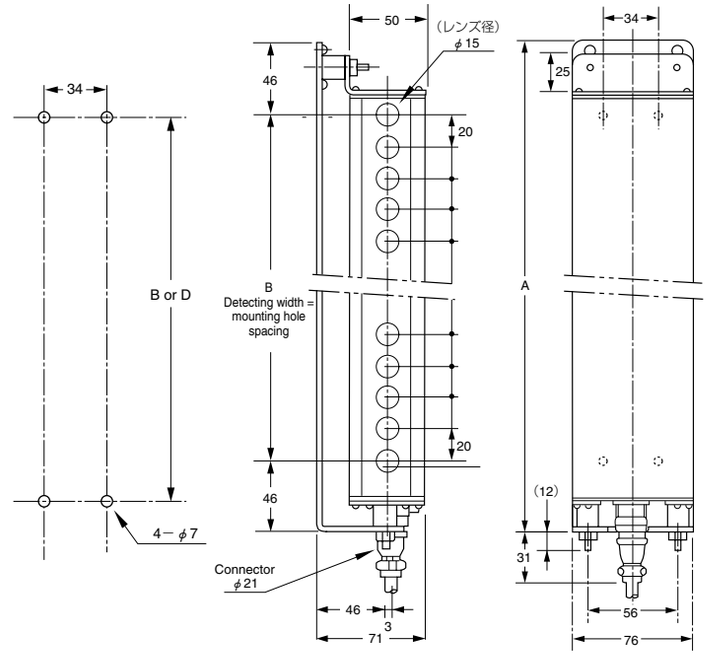
- For use by external voltage input to the external gate, connect the positive electrode to Terminal 3 and negative electrode to Terminal 12.
  The internal circuit is activated when the gate is closed. The circuit does not function with the gate open. The applicable voltage range is 5-25 V.

Dimensions (in mm)

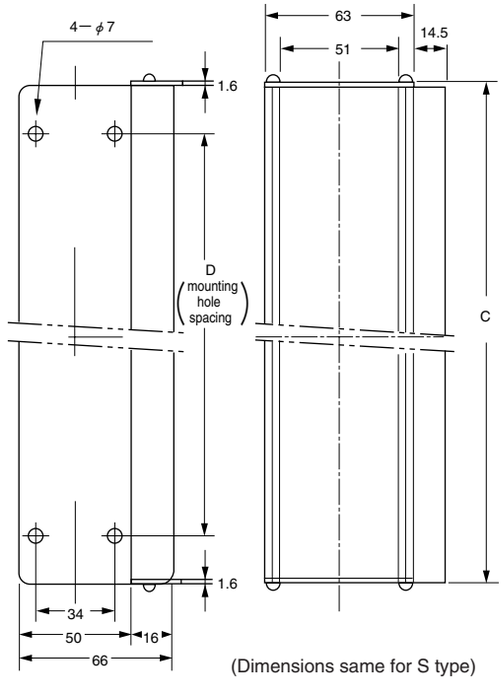
CAD

Sensor

Sensor mounting hole dimensions



Reflector



(Dimensions same for S type)

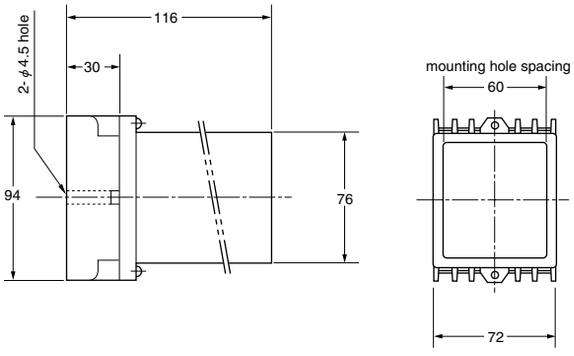
Dimensions of portions

Type / Portion mm / Model	Sensor (SSB)		Se	
	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

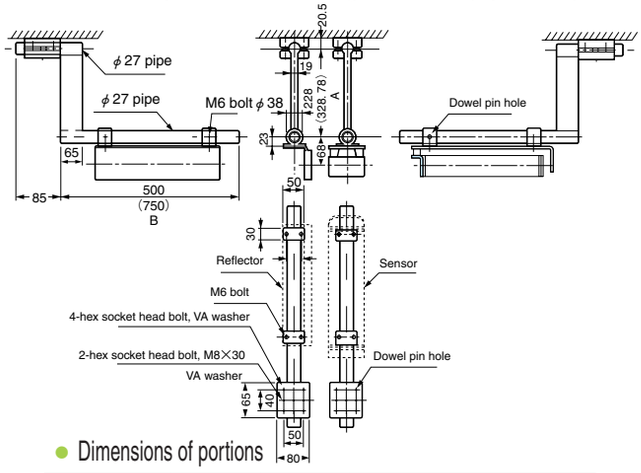
CAD

Control unit

SSA30

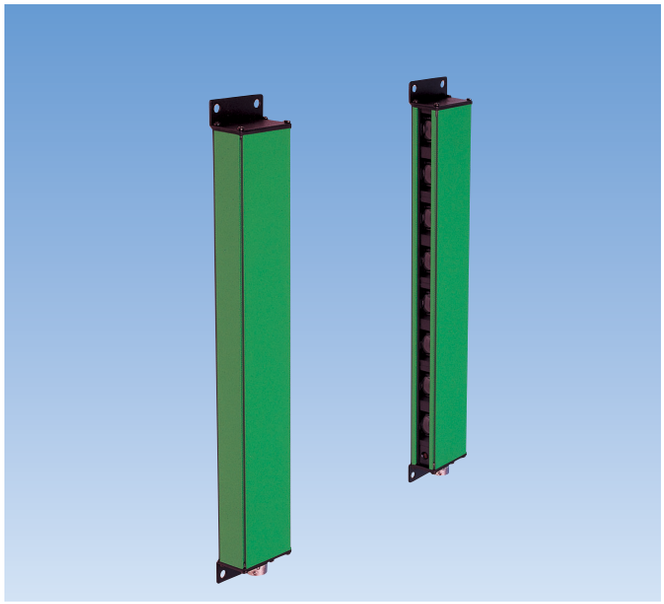


With special mounting bracket (optional)



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

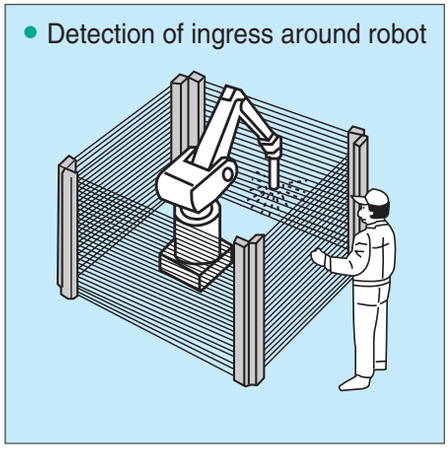
Type

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 / Voltage output
				8	280mm	**SST108**		
				12	440mm	**SST112**		
				16	600mm	**SST116**		
				20	760mm	**SST120**		
				24	920mm	**SST124**		

Cords with connector come as accessories.

Sample Application

- Detection of ingress around robot



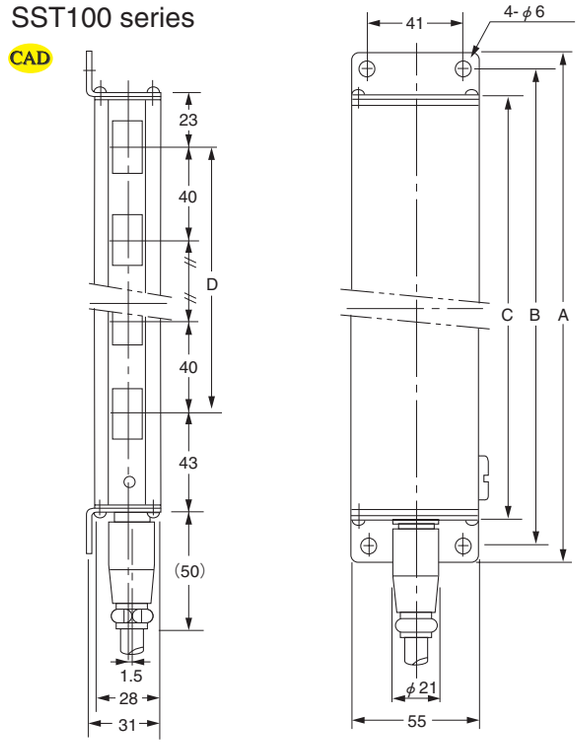
Rating/Performance/Specification

Rating/performance	Series name	**SST100シリーズ**
	Detection method	Through-beam type
	Detecting distance	10m max. (*1)
	Detecting object	Opaque object of ϕ60 mm min.
	No. of light axes	(See "Type.")
	Detecting width	(See "Type.")
	Light axis interval	40mm
	Power supply	12-24V DC ±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 kΩ
	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) SW1……ON SW2……ON (Light-ON) SW1……OFF SW2……ON (All axes reception ON) SW1……ON SW2……OFF (All axes blocking ON) 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 mm² cores/ 5 m Receiver: VCT with four 0.5 mm² 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

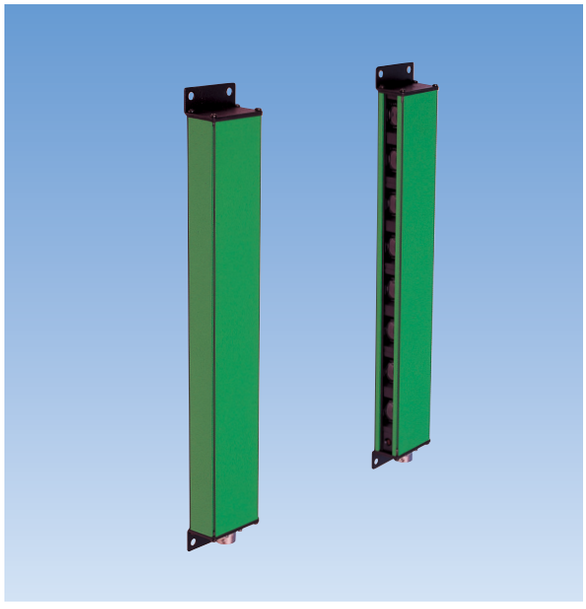
CAD



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

Dimensions of portions

Model	Section lengths				
	A	B	C	D	No. of light axes
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

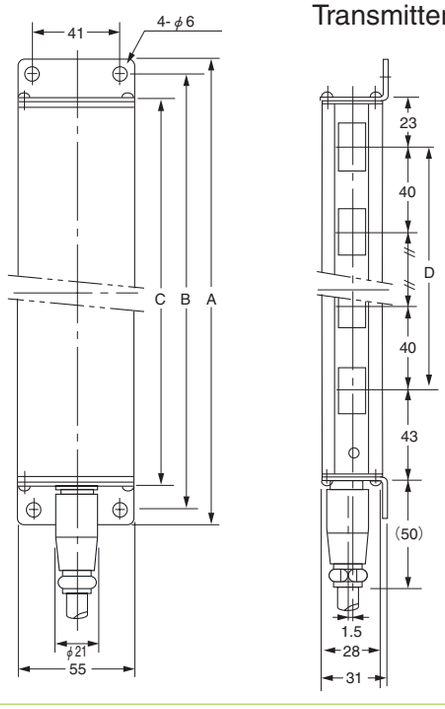
Rating/Performance/Specification

Rating/performance	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
	Detection method		Through-beam type					
	Detecting distance		10m max.					
	Detecting object		Opaque object of ϕ60 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 ±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% / °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) × 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 mm² cores/ 5 m Receiver: VCT with four 0.5 mm² cores / VCT with many 0.2mm² 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)

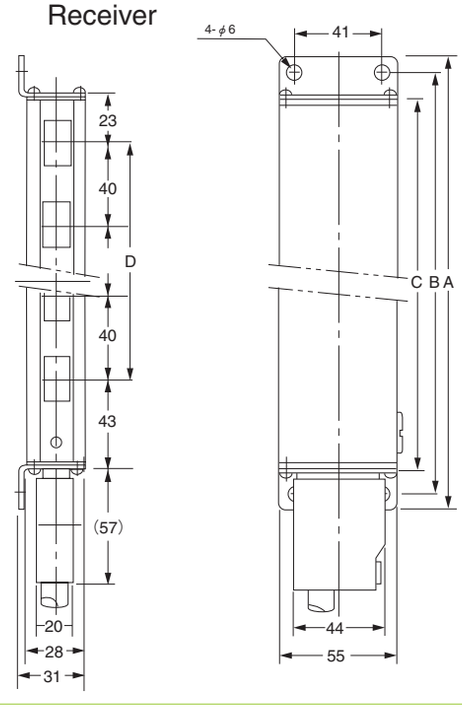
CAD

Transmitter



CAD

Receiver



SST300 series

Light Curtain Sensors

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

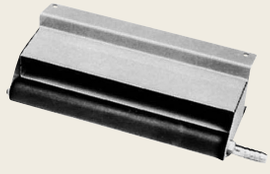
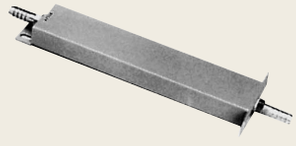
- Fully synchronized scanning
- Infrared light beams with high penetrating power allow use in adverse environment
- Light reception indicator for simple light axis alignment
- Special power unit available for use with AC power supply in addition to direct operation with DC power supply
- Wide variation 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.

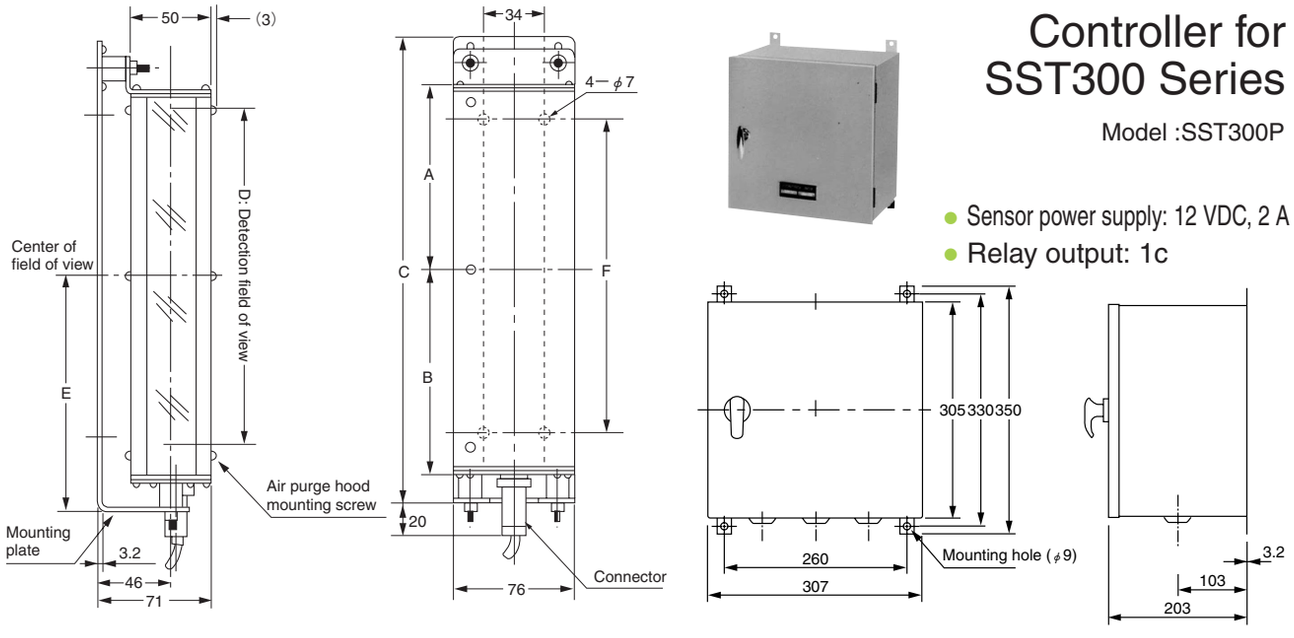
Optional Parts (Separately available.)

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** L R
		F332		**SST332** L R
		F348		**SST348** L R
		F364		**SST364** L R
		F396		**SST396** 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** L R
		WJ332		**SST332** L R
		WJ348		**SST348** L R
		WJ364		**SST364** L R
		WJ396		**SST396** 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 ±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 kΩ				
	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 mm² cores/ 2 m Receiver: VCT with four 0.3 mm² 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)



Controller for SST300 Series

Model :SST300P

- Sensor power supply: 12 VDC, 2 A
- Relay output: 1c

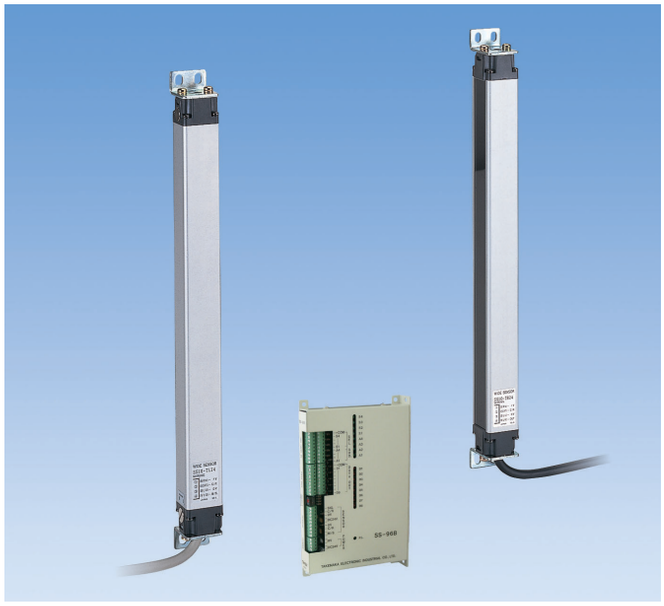
- Dimensions of portions

Model	Section lengths					
	A	B	C	D	E	F(mounting hole spacing)
SST316	85mm	98mm	232mm	150mm	116mm	140mm
SST332	165mm	178mm	392mm	310mm	196mm	300mm
SST348	245mm	258mm	552mm	470mm	276mm	460mm
SST364	325mm	338mm	712mm	630mm	356mm	620mm
SST396	485mm	498mm	1032mm	950mm	516mm	940mm

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

SS-CH series

Separate light axis output light curtain sensors



- 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 ϕ17 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		7m	20mm	8	140mm	**SS20-T8-CH**	Serial output (8 ms max.)	Opaque object of ϕ32 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			40mm	4	120mm	**SS40-T4-CH**	Serial output (3 ms max.)	Opaque object of ϕ52 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.

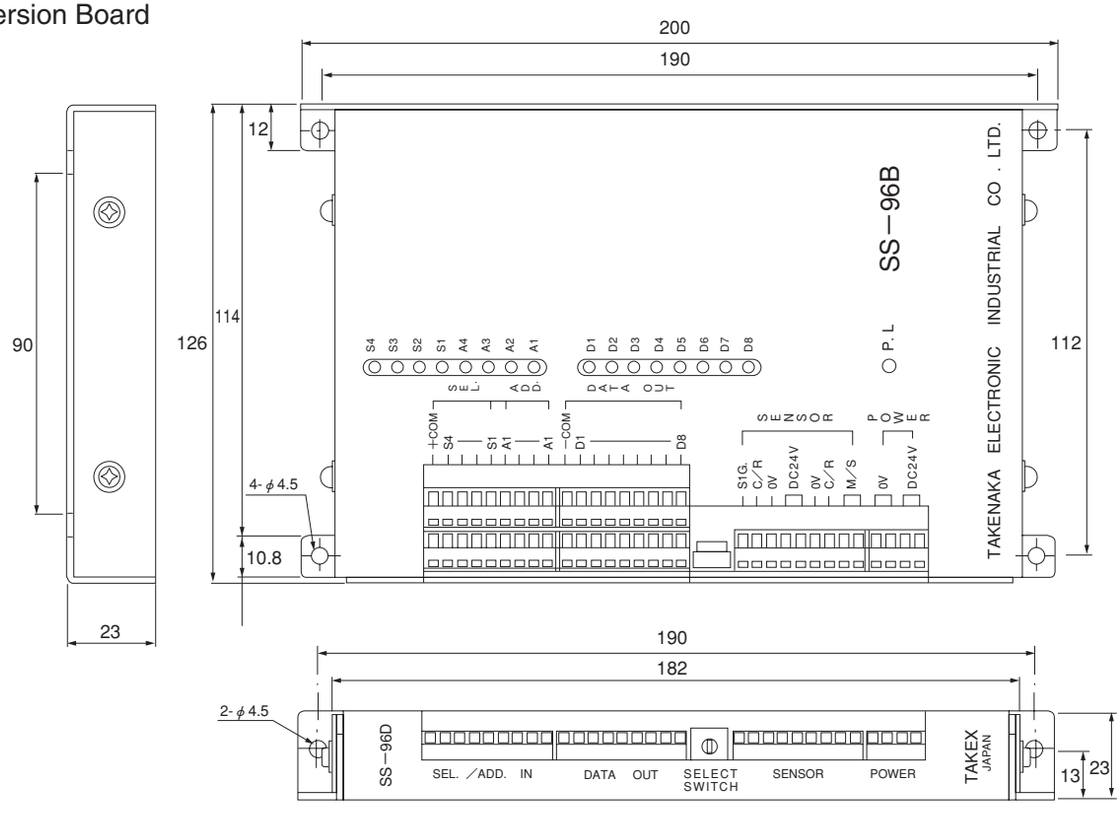
Conversion Board Rating/Performance/Specification

	Model	SS-96B
Rating/performance/ Specification	Power supply	12-24V DC ±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 μs 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
	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)

Environmen	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



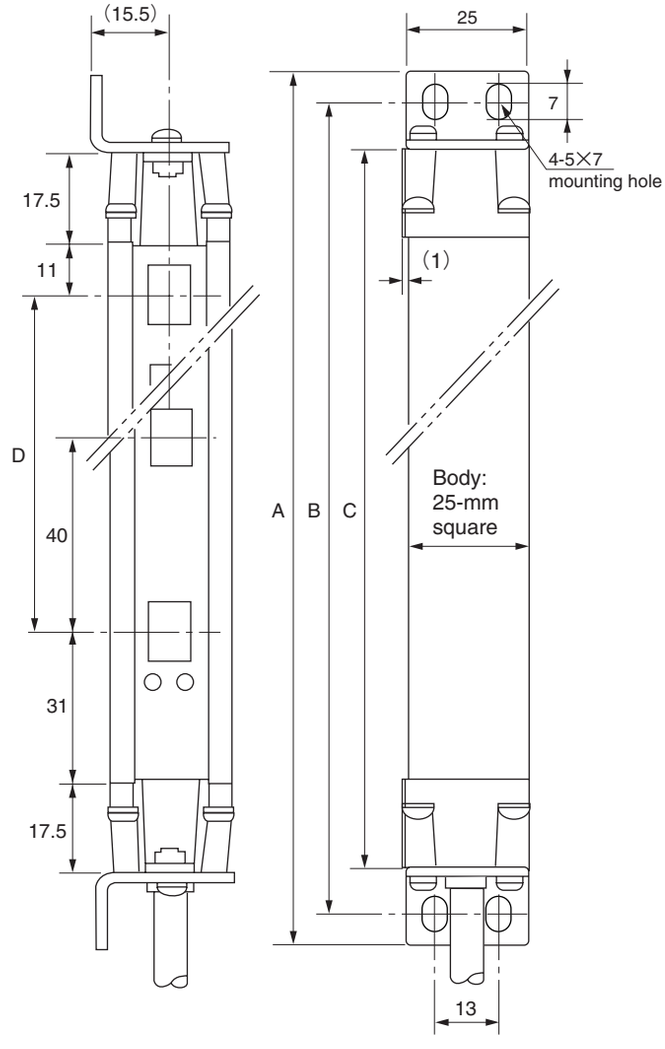
For sensor dimensions see:

- 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