

I N S T R U C T I O N
M A N U A L

OVERVIEW AND NOTES ON SAFETY

- This light curtain sensor model is a work instruction sensor (commonly called a bin picking sensor) intended for helping a worker correctly take out parts, etc. stored on parts shelves according to the instruction.
- This light curtain sensor cannot be used for press safety or as any other safety device to protect human body.

RATING/PERFORMANCE/SPECIFICATION

Model	Permanently attached cord	SSP-S204R	SSP-S208R
	Permanently attached cord with connector	SSP-S204R-PJ	SSP-S208R-PJ
Detecting distance		Reflector type : 2m (max.) Diffuse-reflective type : 700mm (with 300-mm square white drawing paper) 400mm (with A4 size gray card with reflectance of 18%)	
No. of light axes		4	8
Detecting width		100mm	225mm
Power supply		12~24VDC \pm 10% / Ripple 10% max.	
Current consumption		80mA max. / 12VDC 51mA max. / 24VDC	92mA max. / 12VDC 60mA max. / 24VDC
Control output		Transistor output ; Selectable between NPN and PNP with switch	
	Rating	Current : 50mA (30VDC) max. / Residual voltage : 2V max.	
Operation mode		Selectable with switch between normally open and normally closed	
Job indicator input		Contact or non-contact input	
	Operating voltage	NPN : 2V max. / PNP : 8V min.	
Response time		120 ms max.	
Light source		Red LED (640nm)	
Indicator		Sensitivity adjustment indicator (green LED/orange LED) / Operation indicator (orange LED) / Job indicator (green LED) / Warning indicator (red LED)	
Work instruction indicator		Flashing	
Faulty work operation indicator		Flashing	
Short circuit protection		Provided	
Material		Case body : Aluminum / Caps at ends (mounting legs) : glass fiber filled PBT Lens : polycarbonate	
Connection	Permanently attached cord	Outer diameter : 4.1mm / Length : 2m 0.2mm \times 4 cores (black covering)	
	Permanently attached cord with connector	M12 connector (DC) / Cord length : 0.3m Note : cord with connector separately available	
Automatic setting function		Automatic initial setting function / automatic resetting function provided	
Mass		About 120g	About 180g
Accessory		Screwdriver for switch operation, operation manual Note : reflector and mounting brackets separately available (Optional)	

ENVIRONMENTAL SPECIFICATION

Ambient light

10,000 lx max.

Ambient temperature

-10~+50°C (non-freezing)

Storage : -25~+70°C

Ambient humidity

35~85%RH (non-condensing)

Protective structure

I P 62

Vibration

10~55Hz / 1.5mm amplitude

2 hours each in 3 directions

Shock

500m/s² / 3 times each in 3 directions

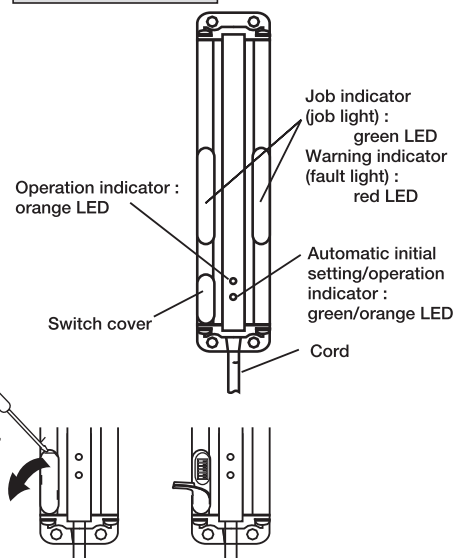
Dielectric strength

1000VAC (50/60Hz) for 1 minute

Insulation resistance

500VDC, 20M Ω or higher

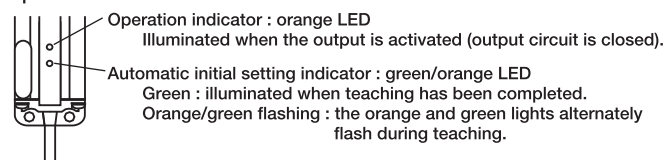
PART NAMES



Use a screwdriver, etc. to open from the top of the switch cover.

INDICATORS

● Operation indicator



● Job indicator (job light) and warning indicator (fault light)

Sensor operation	Object not present	Object present	Object not present	Object present
Job indicator input (job input)		O N		
Job indicator : green (job light)		Illuminated (flashing)		
Warning indicator : red (fault light)				Illuminated (flashing)

If any object is detected with no job input supplied, the red fault light starts flashing.

FUNCTION MODES AND SELECTOR SWITCH OPERATION

- Be sure to turn off the power before attempting to operate the mode selector switches. Operation of the switch while power is supplied may hamper normal operation.
- Operating the sliding switches on the sensor allows selection of the following functions :
 1. Function selection
Selects between the diffuse-reflective and reflector types.
DIFFUSE : diffuse-reflective / RETRO : reflector
 2. Automatic resetting function selection
Enables / disables the automatic sensitivity resetting function.
AUTO ADJUST : automatic resetting enabled
AUTO ADJ OFF : automatic resetting disabled
 3. Operation mode switching
Selects between the output modes
N.O. : normally open, closed when object is detected
N.C. : normally closed, open when object is detected
 4. Job indicator (fault light) mode selection
Selects between the operation modes of the fault light.
 5. NPN/PNP switching
Selects between the Job indicator input and receiver output modes.
 6. Frequency switching
When mutual interference is expected, the frequency selector switch can be used to switch between frequencies A and B to mitigate mutual interference.
- Sliding switch positions and functions

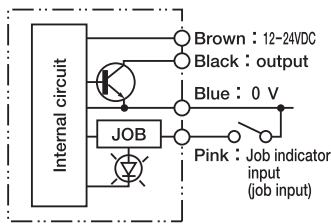
1	Function selection	DIFFUSE	1	RETRO
2	Automatic resetting function selection	AUTO ADJUST	2	AUTO ADJ OFF
3	Operation mode switching	N.O.	3	N.C.
4	Warning indicator (fault light) mode selectipon	F.L.ON	4	F.L.OFF
5	NPN/PNP switching	PNP	5	NPN
6	Frequency switching	FREQ.A	6	FREQ.B

INPUT/OUTPUT CIRCUIT AND CONNECTION

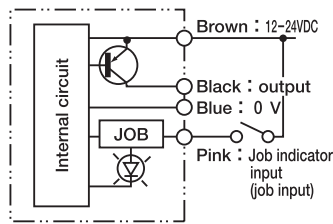
Use the relevant mode switch to select between PNP and NPN for the Job indicator input and output.

Flying lead type

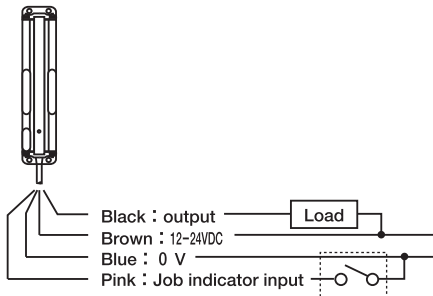
NPN mode



PNP mode



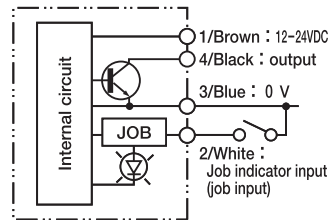
Connection example (Example of NPN mode)



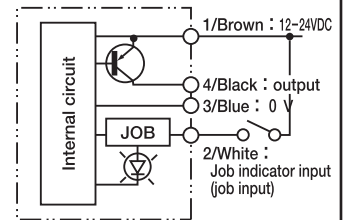
Permanently attached cord with connector

Pin No.	Cord color	Assignment	Pin arrangement
1	Brown	12-24VDC	
2	White	Job indicator input (job input)	
3	Blue	0 V	
4	Black	Output	

NPN mode



PNP mode

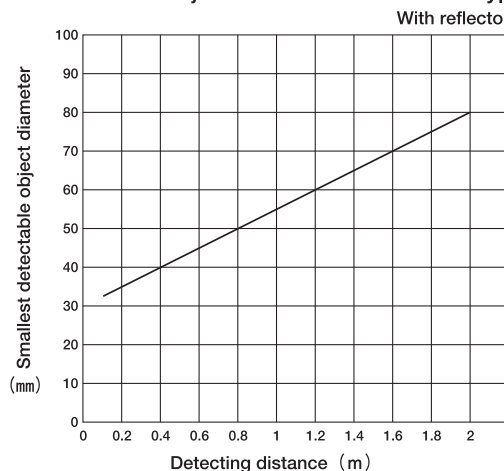


INITIAL SETTING FUNCTION

- Automatic initial setting function : automatic initial setting at power-up
When power is supplied, the automatic initial setting function becomes active for about 3 seconds.
While the function is active (for about 3 seconds), the orange and green LEDs on the front side of the sensor flash during teaching.
When the initial setting has been completed, the green LED is illuminated.

- Automatic resetting function : automatic initial setting function during operation (can be enabled with switch)
If the sensor stays activated to indicate the presence of an object for an extended period of time (about 20 seconds) due to soiled lens surface, light axis misalignment, etc., the automatic resetting function is activated and readjusts the sensitivity at the optimum level.
This function can be enabled/disabled with a DIP switch.

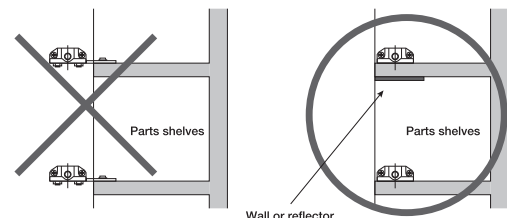
Smallest detectable object diameter with reflector type



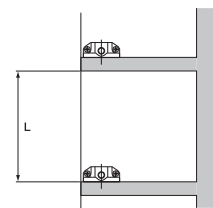
SENSITIVITY SETTING

1. Installation

Install the sensor parallel to the opposite surface (the wall of the parts shelves or reflector) on the same level with the sensor and the wall or reflector facing each other.



As a rough guide, use a diffuse-reflective type for a detecting distance (L) of up to 400mm and a reflector type for 400mm or longer.



2. Mounting

- Ensure that the sensor directly faces the wall of the parts shelves or reflector and secure the light axis firmly to prevent misalignment due to vibration, etc.
- Use M4 screws for mounting and limit the tightening torque to within 0.8N·m. (Prepare screws, etc. separately.)

3. Operation check

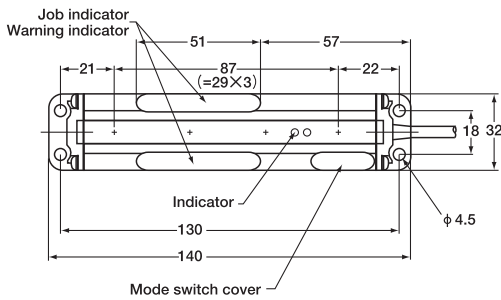
- ① Ensure correct connection, supply power and make sure that the automatic initial setting indicator (green/orange) alternately flashes. The green LED should be illuminated when teaching has been completed.
- ② Place an object in front of the sensor to check output operation.

4. Automatic sensitivity compensation

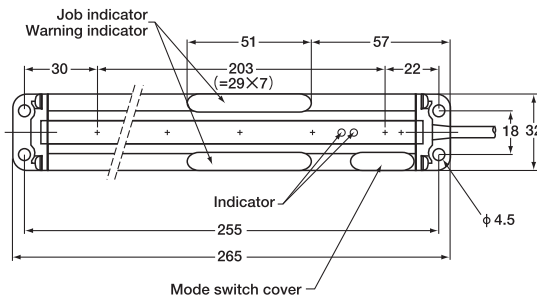
When power is supplied, the automatic initial setting function becomes active for about 3 seconds.
If the sensor stays activated to indicate the presence of an object for an extended period of time (about 20 seconds) due to soiled lens surface, light axis misalignment, etc., the automatic resetting function is activated and readjusts the sensitivity at the optimum level.
If the lens is soiled with dirt or dust, the sensitivity is automatically compensated to achieve the optimum sensitivity even after the soil is removed.

DIMENSIONS (in mm)

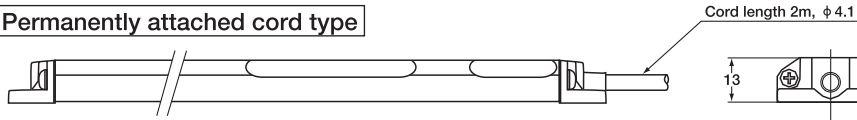
SSP-S204R (—PJ)



SSP-S208R (—PJ)

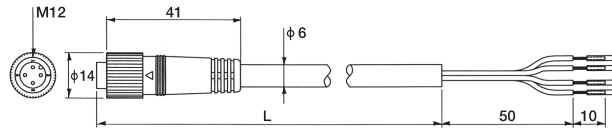


Permanently attached cord type

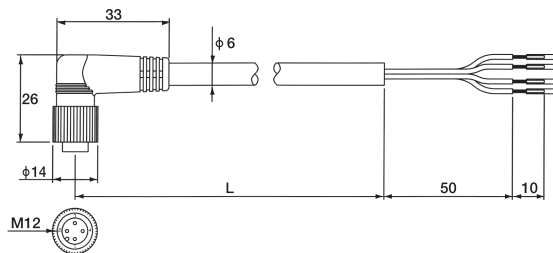


● Cord with connector (optional)

Model FAC-D4R2S (L : 2m)
Model FAC-D4R5S (L : 5m)



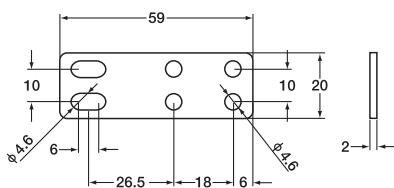
Model FAC-D4R2L (L : 2m)
Model FAC-D4R5L (L : 5m)



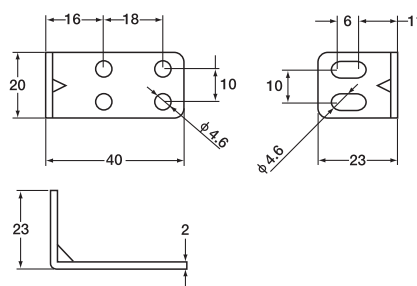
Mounting bracket

(Mounting brackets are optional, which come with semi screws with M4X12 washers and nuts. A pair of two sets is required for each of the transmitter and receiver.)

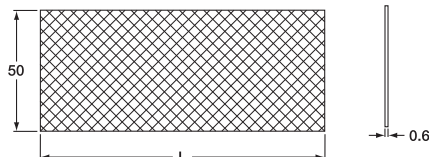
Model SSP-B1 : flat plate type



Model SSP-B2 : L-shaped plate type



Reflector (optional)



Model	L
S-SSP120	120mm
S-SSP245	245mm

Adhesive on rear side,
cuttable

NOTES ON USE

- This sensor is intended only for bin picking. When used for detection of passage of an object, etc., the object may not be correctly detected if the reflection from the detection object is similar to the reflection from the background.
 - This sensor is a reflective type. If the worker's hand, etc. has a similar reflectance to that of the background, chattering may occur. If chattering is not acceptable for the purpose of control, use a timer, etc. to prevent unwanted operation.
 - The automatic initial setting function is active for about 3 seconds after power-up. Do not put a hand or detection object in front of the sensor during this period.
 - Be sure to turn off the power before attempting to operate the mode selector switches. Operation of the switch with the power supplied may prevent normal operation.
 - To clean the lens surfaces or cases, use a dry cloth and wipe gently. Do not use any oily solution such as thinner or alcohol.
 - Ensure that the power voltage is according to the specification.
 - Do not allow the power to turn on and off repeatedly.
 - Output is not available for about 3 seconds after power-up because the automatic initial setting function is active. To extend the cord, use wires of at least 0.3mm² and limit the length to within 100m.
 - When any high-voltage or power line is routed near photo sensor cords, provide independent metal piping for prevention of faulty operation or damage due to induction noises.
 - Make sure that the power fluctuation is within an allowable range so that the power input will not exceed the rating.
 - Provide the power supply with a current limit (2A) according to the sensor lead size.
 - When using a commercially-available switching regulator for the power supply, use the frame ground terminals (FG and G).
- Do not use the sensor in a place subject to a large amount of steam, dust, etc.

- This sensor is designed to detect an object ; it is not a safety device. TAKENAKA is not responsible for damage or losses caused by accident, calamity, acts of God, abuse, misuse abnormal usage, faulty installation or improper maintenance.
- Specifications and external dimensions described herein may be subject to change without notice, if necessary for the purpose of improvements.