SSP-S200 series

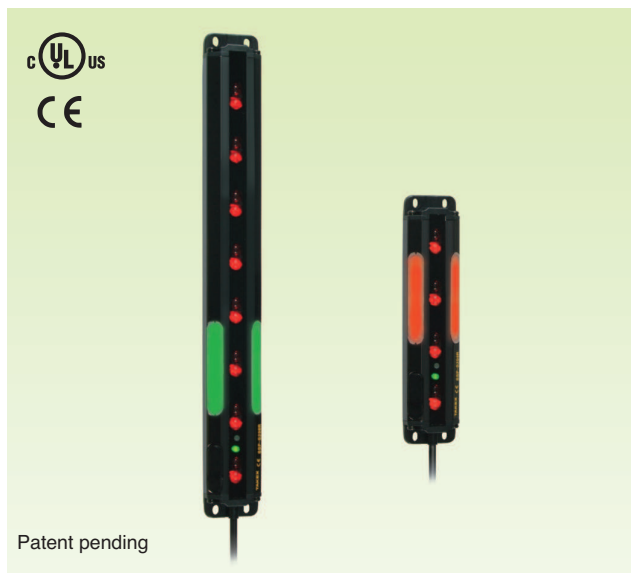## Reflective bin-picking light curtain sensor

Patent pending

- ● Retroreflective and Diffuse reflective mode switching
  It is possible to switch between Retroreflective and Diffuse reflective modes by flipping an Inner switch. You can select either Retroreflective or Diffuse reflective mode depending on the detecting distance for use.

- ● Super thin body at only 13mm thick with sturdy metal case
  The metal case protects against impacts that may occur when an item, which you are taking out from a shelve, hits the case. Also, its space-saving thinness means the sensor does not become an obstacle during work.

- ● Easy-to-see large Job indicator
  On the side of the body, there are two large-sized, high-intensity green LED Job indicators which are easy to see.

- ● NPN/PNP dual output
  You can select either NPN or PNP output with an inner switch of the sensor, which will contribute to reducing your stock of sensors.

- ● Fault indicator
  If you take out the wrong item from a shelve, red lights of the Fault indicator flash on and off, letting you know the item is wrong.

- ● Initial sensitivity setting function
  When you turn on the power after selecting either Retroreflective or Diffuse reflective mode, the optimal sensitivity is automatically set by the initial sensitivity setting function.
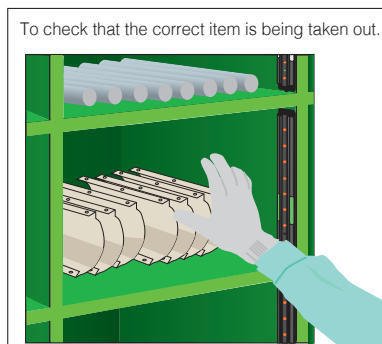
■ Type

Detection method	Detecting distance	Detecting width	Model	Number of beams	Operation mode	Output mode	Connection
Diffuse reflective	700mm	100mm	**SSP-S204R**	4	Normal Open or Normal Close switching	Open collector output NPN/PNP switching	Cable
		225mm	**SSP-S208R**	8			
Retroreflective	2m	100mm	**SSP-S204R-PJ**	4			Cable with connector
		225mm	**SSP-S208R-PJ**	8			

Reflectors and mounting brackets are optional accessories.

■ Optional Parts

Type	Model		Note
Dedicated mounting bracket	**SSP-B1**	Flat type	Mounting brackets a set of two brackets (M4x12 SEMS screws with washers and nuts)
	SSP-B2	L-shape type	
Cable with connector	**FAC-D4R2S**	Straight type	M12 Outer diameter: 6mm Cable: 0.2 mm² x 4 core, 2m (sheath: black)
	FAC-D4R2L	Angle type	
	FAC-D4R5S	Straight type	M12 Outer diameter: 6mm Cable: 0.2 mm² x 4 core, 5m (sheath: black)
	FAC-D4R5L	Angle type	
Protective cover	**SSP-BF205**		Protective cover:1
	SSP-BF210		
Reflector	**S-SSP120**		Adhesive tape on the back side cuttable
	S-SSP245		
Mounting bracket	**SSP-BR1**		Mounting brackets a set of two brackets
	SSP-BR2		

■ Applications

To check that the correct item is being taken out.

TAKEX

■ Rating/Performance/Specification

Type	Attached cable	SSP-S204R	SSP-S208R
	Attached cable with connector	SSP-S204R-PJ	SSP-S208R-PJ
Detecting distance		Retro reflective : 2m or less Diffuse reflective: 700mm (White drawing paper 300mm × 300mm) 400mm (18% reflectivity gray card A4 size)	
Number of beams		4	8
Detecting width		100mm	225mm
Power supply		12 - 24VDC±10% Ripple: 10% or less	
Current consumption		80mA or less / DC12V 49mA or less / DC24V	92mA or less / DC12V 58mA or less / DC24V
Output mode	Control output	NPN / PNP output selectable	
	Rating — NPN output	Sink current 50mA (30VDC) or less,residual voltage 2V or less	
	Rating — PNP output	Source current 50mA (30VDC) or less, residual voltage 2V or less	
Operating mode		Normal open/Normal close selectable	
Job indicator	Input	Non-contact or contact input	
	Operating voltage	NPN 2V or less/ PNP 8V or more	
Response time		120ms or less	
Light source		Infrared LED (wave length: 640 nm)	
Indicators		Initial sensitivity setting indicator (green LED/orange LED) / Operating indicator(orange LED) Job indicator (green)/ Fault indicator(red LED)	
Job indicator Fault indicator		Flashing	
Short circuit protection		Provided	
Material		Enclosure: Aluminum, End caps:PBT with glass fiber, Lens : Polycarbonate	
Wiring	Attached cable	Outer diameter: φ 4.1 mm, 0.2mm²x 4 cores, 2m (black)	
	Cable with connector	Cable with M12 connector0.3m (black)	
Auxiliary functions		Automatic initialization function/ Automatic re-initialization function	
Weight	Attached cable	Approx.110g	Approx.170g
	Cable with connector	Approx.120g	Approx.180g
Accessories		Driver for switch operation, operation manual (mounting bracket and reflector are separately available).	

Detecting distance and detected object vary depending on the type of the connected reflectors.
The detecting distance is the range which you can set for the sensor.The sensor can detect an object even in the immediate area of the sensor.

■ Environmental Specifications

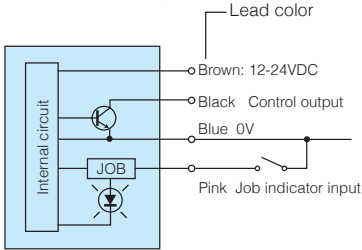|	
Ambient light	10,000 lx or less
Ambient temperature	-10 - +55°C (non- freezing)
storage temperature	-25~+70°C(non-freezing or non-condensing)
Ambient humidity	35~85%RH (non- condensing)
Vibration	10-55 Hz / 1.5 mm double amplitude / 2 hours each in 3 direction
Shock	500 m/s² / 3 times each in 3 directions
Protective structure	IP62
Dielectric withstanding	1,000 VAC for 1 minute
Insulation resistance	500 VDC 20 MΩ or higher

Light Curtain Sensors

SSP-S200

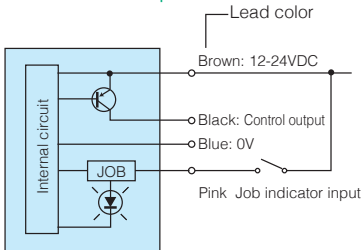## ■ Input/Output Circuit and Connection

With the mode selector switch, you can select for Job indicator input and NPN/PNP type Receiver output.

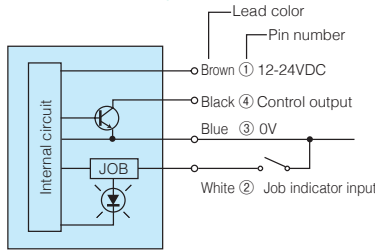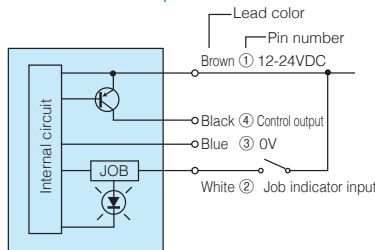● Attached cable type
When NPN output is selected.

Lead color
Internal circuit
JOB
Brown: 12-24VDC
Black   Control output
Blue 0V
Pink Job indicator input

When PNP output is selected.

Lead color
Internal circuit
JOB
Brown: 12-24VDC
Black: Control output
Blue: 0V
Pink Job indicator input

● Cable with connector type(-PJ)
When NPN output is selected.

Lead color
Pin number
Internal circuit
JOB
Brown ① 12-24VDC
Black ④ Control output
Blue ③ 0V
White ② Job indicator input

When PNP output is selected.

Lead color
Pin number
Internal circuit
JOB
Brown ① 12-24VDC
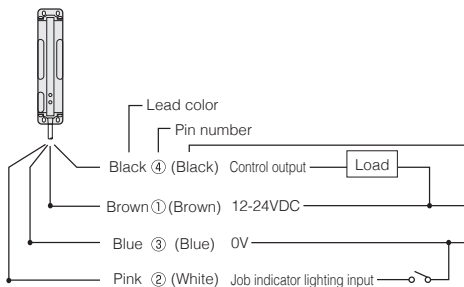Black ④ Control output
Blue ③ 0V
White ② Job indicator input

Connector pin assignment of the cable with connector type(-PJ)

Pin number

Pin	Cable color	specifications
1	Brown	12-24 VDC
2	White	Job indicator input
3	Blue	0V
4	Black	Control output

● Connection
In a case where NPN output is selected

Lead color
Pin number
Black ④ (Black) Control output — Load
Brown ① (Brown) 12-24VDC
Blue ③ (Blue) 0V
Pink ② (White) Job indicator lighting input

Colors shown in parentheses are lead colors of cables with connector
(optional accessories, model: FAC-D4R2S, FAC-D4R2L
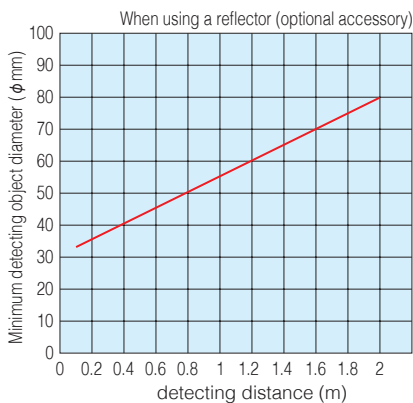   FAC-D4R5S, FAC-D4R5L).

● About Wiring
When expanding the wiring, use cables with 0.5 mm² or more. The length of expansion has to be 100m or shorter for the transmitter and the receiver each.

■ Performance curves (typical)

● Minimum diameter of detecting object in retroreflective type

When using a reflector (optional accessory)

Minimum detecting object diameter (φmm)
100
90
80
70
60
50
40
30
20
10
0

0 0.2 0.4 0.6 0.8 1 1.2 1.4 1.6 1.8 2
detecting distance (m)

TAKEX

■ Mode selector switch

● Before setting the mode selector switch, be sure to turn off the power.

● By setting slide switches inside the sensor, you can select the functions below.

1	Reflector mode	DIFFUSE	1	RETRO
2	Automatic sensitivity resetting	AUTO ADJUST	2	AUTO ADJ OFF
3	Operation mode	N.O.	3	N.C.
4	Fault indicator	F.L. ON	4	F.L. OFF
5	NPN/PNP output	PNP	5	NPN
6	frequency switch	FREQ. A	6	FREQ. B

1…Reflective mode
Select either Diffuse reflective mode or Retroreflective mode.
  DIFFUSE: Diffuse reflective
  RETRO : Retroreflective

2…Automatic sensitivity resetting
Select whether Automatic sensitivity resetting is activated.
  AUTO ADJ UST: Automatic sensitivity resetting is activated
  AUTO ADJ OFF: Automatic sensitivity resetting is NOT activated

3…Operation mode
Select output mode.
  N. O.: Normal Open
        Close when detecting an object
  N. C.: Normal Close
        Open when detecting an object

4…Fault indicator
Select whether Fault indicator is activated.

5…NPN/PNP output
Select Job indicator input and output type.
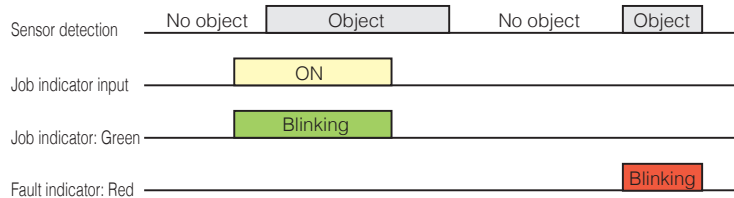
6…Frequency switch
With the frequency switch, either A or B of different frequencies can be set.

■ Indicators

● Job indicator and Fault indicator

Sensor detection	No object	Object	No object	Object
Job indicator input		ON		
Job indicator: Green		Blinking		
Fault indicator: Red				Blinking

When the sensor detects an object while there is no Job indicator input, the red light of Fault indicator blinks.

● Operation indicator

Operation indicator: Orange LED
  It lights up when the output is ON (Close).

Initial sensitivity setting indicator: Green/Orange LED
  Green: Green LED turns on when teaching is completed.
  Orange/ Green blinking: Orange and Green lights blink while teaching is being performed.

■ Initial sensitivity setting function

● Initial sensitivity setting function --- when turning on the power
When you turn on the power, the initial sensitivity setting function runs for about three seconds.
While the initial sensitivity setting function is running (about 3 seconds), the green and orange LED on the front of the sensor blinks. When the initial setting is completed, greed LED turns on.

● Automatic sensitivity resetting function --- during operation (You can turn this feature on or off with a switch.)
When an object continues to be detected for a long time (about 20 seconds), which might occur due to dirt and dust on the lens or optical axis deviation, the automatic sensitivity resetting function runs and the optimal sensitivity is set again. Use the DIP switch to turn this feature on or off.

Light Curtain Sensors

SSP-S200

■ Installation precautions

- The sensor has to face straight to the shelve surface, which is opposite to the sensor, or to a reflector. Attach the sensor firmly so that optical axes will not move due to vibration.

- Install the sensor, using M4 screws, and the tightening torque has to be 0.8 N·m or less. (Screws and the like are separately prepared.)

Install the sensor so that it is parallel to the surface opposite, a shelf board or a reflector, facing the shelf board or the reflector.

Use the sensor in Diffuse reflective mode when the detecting distance (L) is up to 400 mm. When it is 400 mm or more, Retroreflective mode should be used.

Shelf board

Shelf board

Surface of a shelf board or a reflector

L
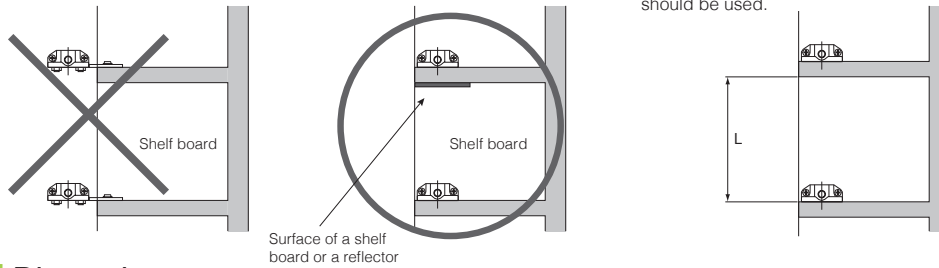
■ Dimensions (in mm)

● **Optional Parts**

Mounting bracket
- There are two types of mounting brackets
- A set includes two brackets.
- Four sets of M4x12 SEMS screws with washers and nuts are included.

Model: SSP-B1 Flat type

● Accessories
Screw: 4
Nut: 4
● Material
SUS

10 20
10
6
26.5 18 6
59
2-φ4.6×10.6 elongate hole
4-φ4.6
2

Model: SSP-B2 L-shape type

● Accessories
Screw: 4
Nut: 4
● Material
SUS

16 18
4-φ4.6
10
20
40
6 11
10
23
2-φ4.6×10.6 elongate hole
23 2

Cable with connector

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

CAD

M12
φ14
41
φ6
L
50 10

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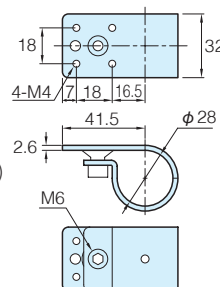FAC-D4R5L(L:5m)

33
φ6
26
φ14
L
50 10
M12
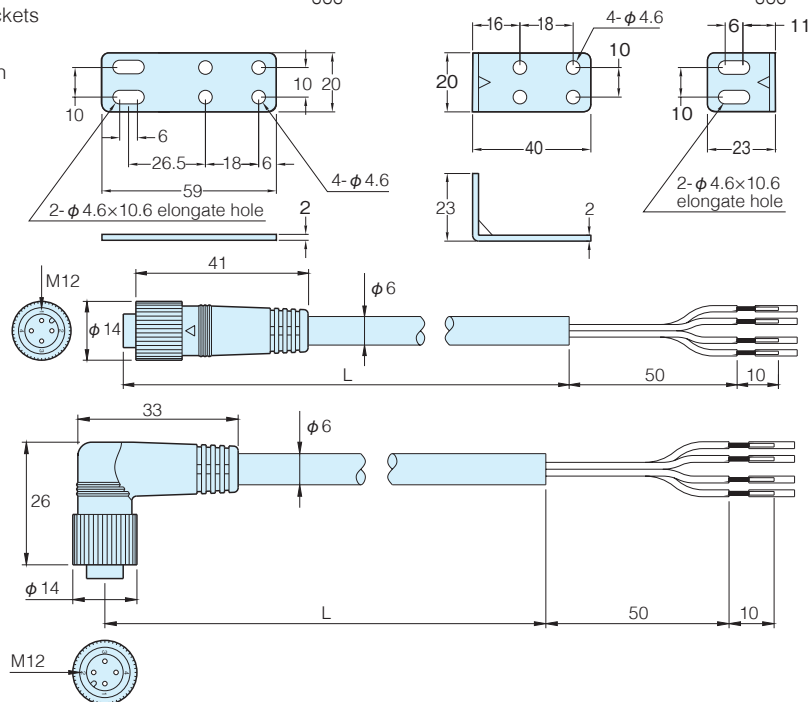
Mounting bracket
- There are two types of mounting brackets.
- A set includes two brackets.

Model: SSP-BR1

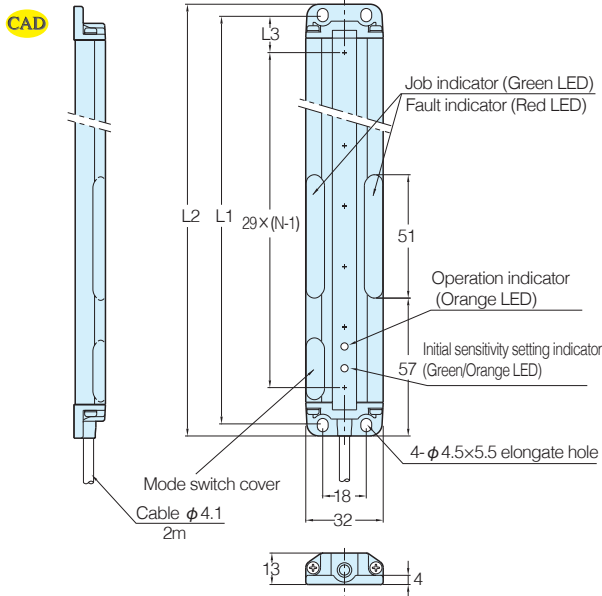● Accessories
Screw: 4
Nut: 4
● Material
Resin (black)

18 32
4-M4 7 18 16.5
41.5 φ28
2.6
M6

Model: SSP-BR2

● Accessories
Screw: 4
Nut: 4
● Material
Resin (black)

18
4-φ4.5 7 18 24.5
φ27

CAD To download CAD data including dimensions, please visit www.takex-elec.co.jp/index_e.html.

TAKEX
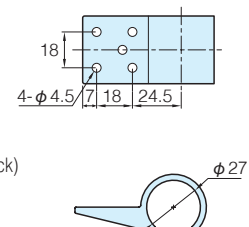
SSP-S200

■ Dimensions (in mm)

Model: SSP-S204R
　　　 SSP-S208R

CAD

Job indicator (Green LED)
Fault indicator (Red LED)

L2　L1　29×(N-1)

51

Operation indicator
(Orange LED)

Initial sensitivity setting indicator
57 (Green/Orange LED)

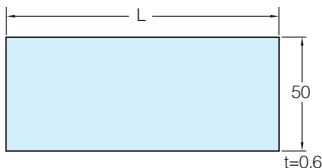4-φ4.5×5.5 elongate hole

Mode switch cover

Cable φ4.1
2m

—18—
—32—

13 —4

● **Parts dimensions**　　(in mm)

Model	N	L1	L2	L3
SSP-S204R	4	130	140	21
SSP-S208R	8	255	265	30

Model: SSP-S204R-PJ
　　　 SSP-S208R-PJ

Job indicator (Green LED)
Fault indicator (Red LED)

L2　L1　29×(N-1)

51

Operation indicator
(Orange LED)

Initial sensitivity setting indicator
57 (Green/Orange LED)

4-φ4.5×5.5 elongate hole

Mode switch cover

—18—
—32—

13 —4

300

M12 connector
(DC type)

-PJ type
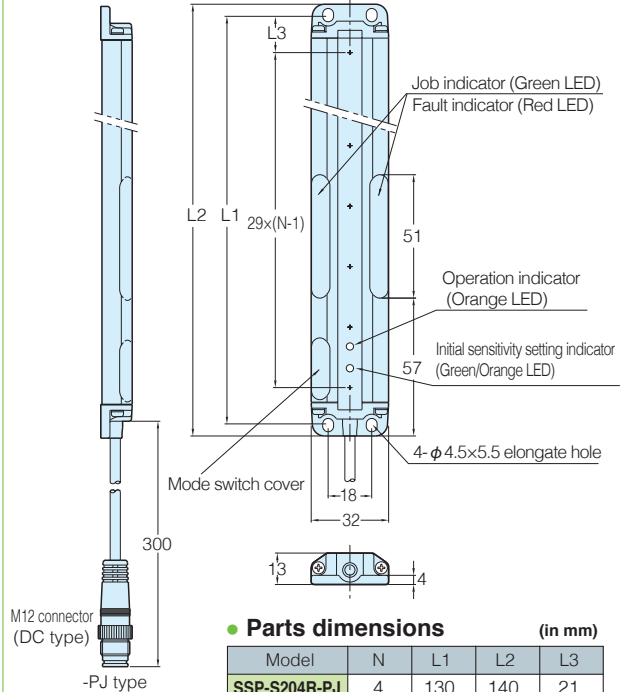
● **Parts dimensions**　　(in mm)

Model	N	L1	L2	L3
SSP-S204R-PJ	4	130	140	21
SSP-S208R-PJ	8	255	265	30

● Optional Parts (separately sold items)　●Material Resin
Reflector

Model: S-SSP120
　　　 S-SSP245

L

50

t=0.6

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

L3
L2　　　12
4-φ5

9　　　　　　　　　　　　6 18 35

45
24　　　12
50.5　　23
16
L1

10

Protective cover　●Material SUS

Model: SSP-BF

9

16
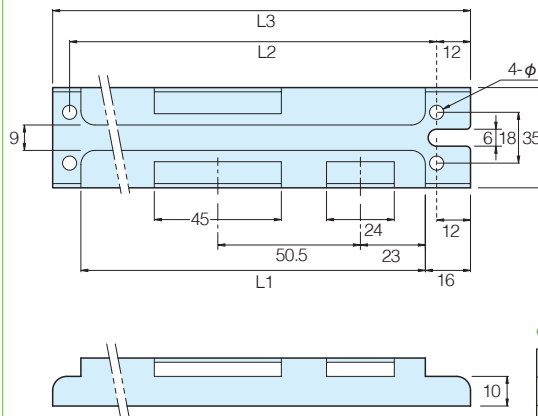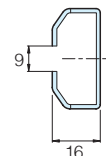
● **Parts dimensions**　　(in mm)

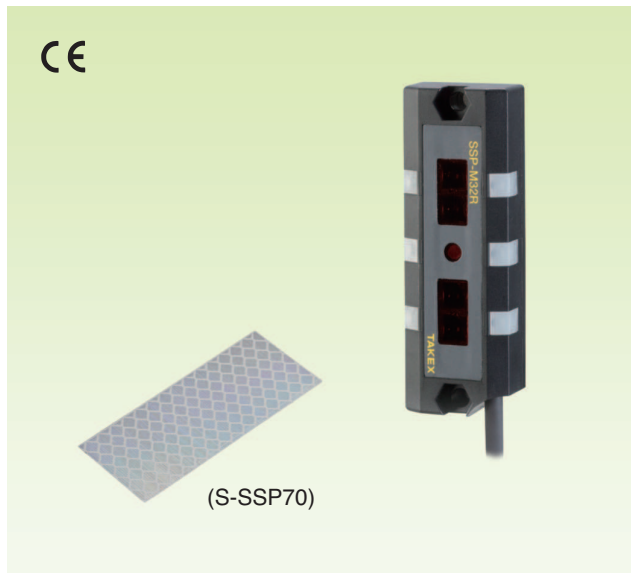| Model	L1	L2	L3
SSP-BF205	122	130	148
SSP-BF210	247	255	273

Fore 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 power press safety device or other safety device to prevent death or injury that requires conformity to domestic or overseas standards or certification concerning protection of the human body. Use for such purposes may lead to death or serious injury.
- This designed to detect an object passing over a certain point or line.
- For safety applications, ensure safe operation of the detection and control system as a whole.

CAD To download CAD data including dimensions, please visit www.takex-elec.co.jp/index_e.html.

TAKEX

509

SSP-M32R

(S-SSP70)

- ● **Super thin body at only 12mm thick.**
  One-side wiring of the retroreflective type makes installation easier.
  Space-saving sensors also remove obstacles from work.

- ● **Easy-to-see large Job indicator**
  On the side of the body, there are large-sized, high intensity green LED Job indicators which are easy to see.

- ● **Fault indicator**
  When the wrong item is taken from a shelf,red lights of the Fault indicator flash on and off, letting you know the item is wrong.

■ Type

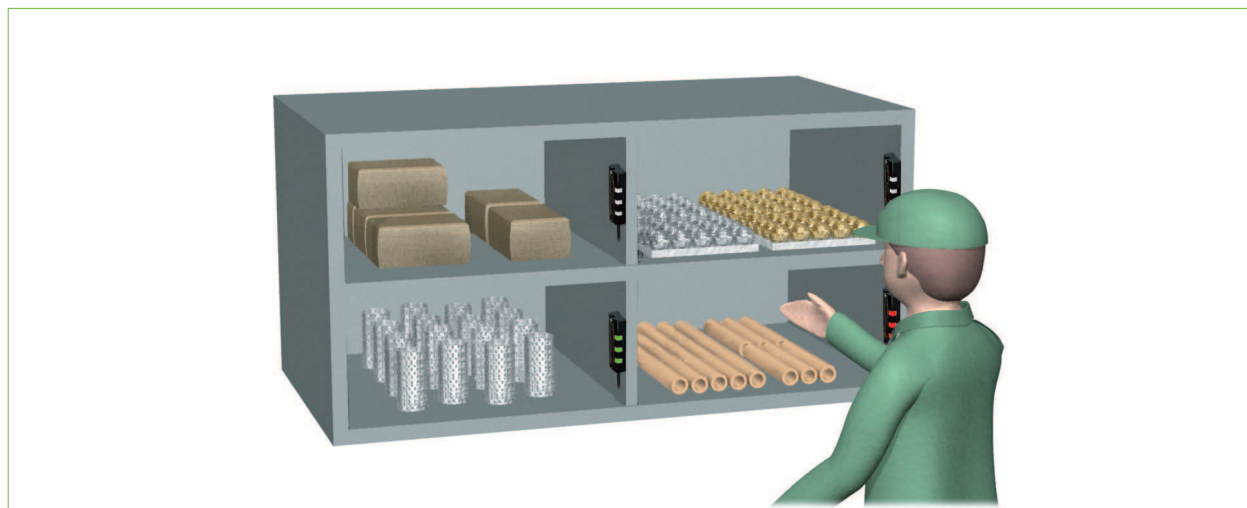| Detection method	Detecting distance	Detecting width	Set model	Number of beams	Operation mode	Output mode
⬆⬇ Polarized retroreflective	60~300mm (when using S-SSP70)	40 ㎜	**SSP-M32R**	2	Dark ON	NPN open collector output

The detecting distance and detection object varies, depending on reflector types combined with the sensor.
The detecting distance is the range which you can set for the sensor. The sensor can detect an object even in the immediate area of the sensor.

■ Optional Parts

Type	Model
Reflector (supplied accessory)	**S-SSP70**
Protective cover	**SSP-BF32**

■ Applications

TAKEX

■ Rating/Performance/Specification

Model Name		SSP-M32R
Detection method		Polarized retroreflective
Detecting distance		60 - 300㎜ (S-SSP70 is used)
Number of beams		2
Detecting width		40㎜
Power supply		12 - 24VDC ±10% Ripple 10% or less
Current consumption		60mA or less
Output mode		NPN open collector output, rating : sink current 100mA(DC30V) or less
Operating mode		Dark on
Job indicator	Input	Contact or Non contact input
	Voltage	NPN: 2V or less
Response time		1ms or less
Light source(wave length)		Red LED (630nm)
Indicators		Job indicator (green LED), Fault indicator (red LED), Operation indicator (orange LED)
Job indicator Fault indicator		Continuous lightning
Short circuit protection		Provided
Material		Case: ABS, Indicator window: polycarbonate, Optical window :acrylic
Connection		Attached cable(outer diameter: φ4 ㎜) 0.2mm² x 4 cores, 2m, black
Weight		Approx.60g(including cables)
Accessories		Operation manual, reflector (S-SSP70)

Detecting distances and detected objects vary depending on the type of the connected reflectors.
The detecting distance is the range which you can set for the sensor.The sensor can detect an object in the immediate area of the sensor.

■ Environmental Specifications

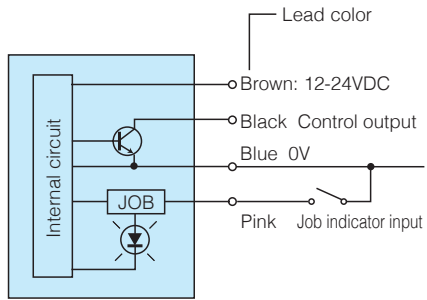|	
Ambient light	5,000 lx or less
Ambient temperature	-10 - +55°C (non- freezing)
Ambient humidity	35 - 85%RH (non- condensing)
Vibration	10-55 Hz / 1.5 mm double amplitude / 2 hours each in 3 direction
Shock	500 m/s² / 3 times each in 3 directions
Protective structure	IP40
Dielectric withstanding	1,000 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
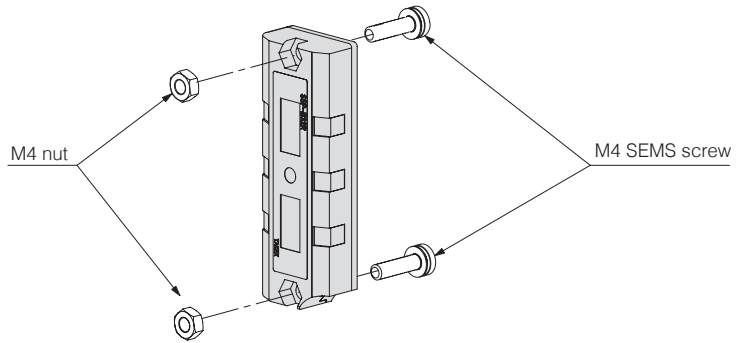
PS3N-SR

(Multifunctional type)PS3F

PS3F-SR

SSP-M32R

■ Input/Output Circuit and Connection

Lead color

Internal circuit

JOB

- Brown: 12-24VDC
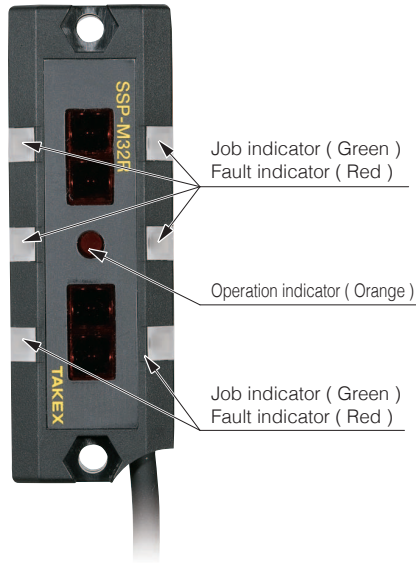- Black Control output
- Blue 0V
- Pink Job indicator input

- The output transistor will turn off if a load short-circuit or overload occurs.

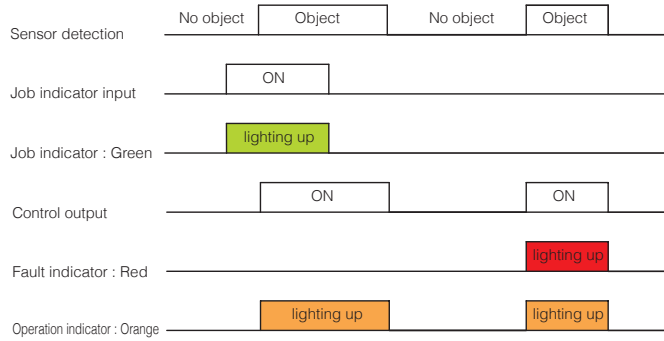- Check the load state before restarting.

■ About Installation

M4 nut

M4 SEMS screw

- Install the sensor, using M4 screws and M4 nuts, and the tightening torque has to be 0.8 N·m or less. (Screws and nuts are optional accessories.)
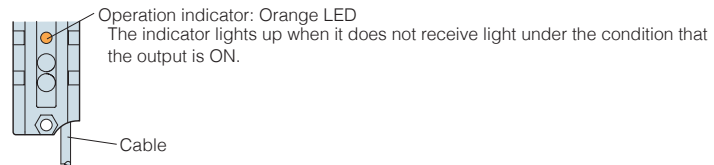
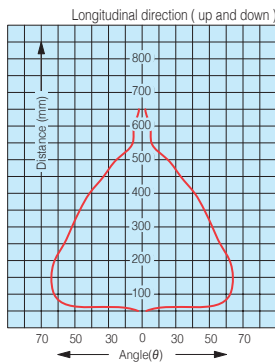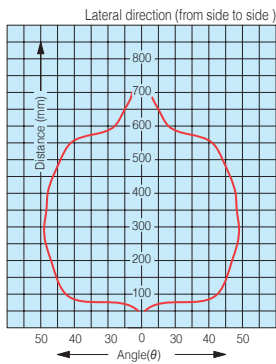## ■ Indicators

SSP-M32R

TAKEX

Job indicator (Green)
Fault indicator (Red)

Operation indicator (Orange)

Job indicator (Green)
Fault indicator (Red)

● Job indicator and Fault indicator

Sensor detection	No object	Object	No object	Object
Job indicator input		ON		
Job indicator : Green		lighting up		
Control output		ON		ON
Fault indicator : Red				lighting up
Operation indicator : Orange		lighting up		lighting up

● operation indicator

Operation indicator: Orange LED
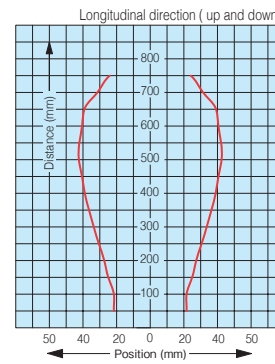The indicator lights up when it does not receive light under the condition that the output is ON.

Cable

■ Performance curves (typical)

Response Curves: Tilt Angle

Reflector S-SSP70 (Distance)
θ θ

Lateral direction (from side to side)

Distance (mm)

800
700
600
500
400
300
200
100

50 40 30 0 30 40 50
Angle(θ)

Reflector S-SSP70 (Distance)
θ θ

Longitudinal direction (up and down)

Distance (mm)

800
700
600
500
400
300
200
100

70 50 30 0 30 50 70
Angle(θ)
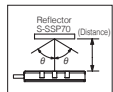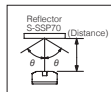
Response Curves: Detecting Position

Reflector S-SSP70
Position (Distance)

Lateral direction (from side to side)

Distance (mm)

800
700
600
500
400
300
200
100

50 40 20 0 20 40 50
Position (mm)

Reflector S-SSP70
Position (Distance)

Longitudinal direction (up and down)

Distance (mm)

800
700
600
500
400
300
200
100

50 40 20 0 20 40 50
Position (mm)

TAKEX
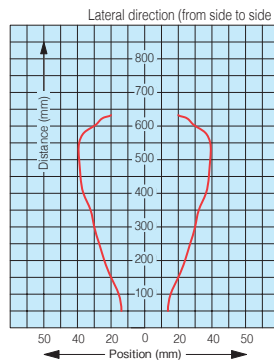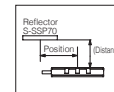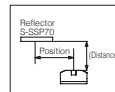
SSP-M32R

■ Dimensions (in mm)

Main unit
Model: SSP-M32R
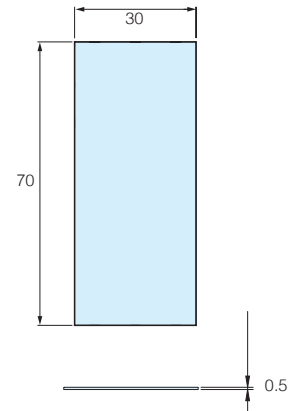
CAD

2-φ4.2

70 | 63

12

24

12
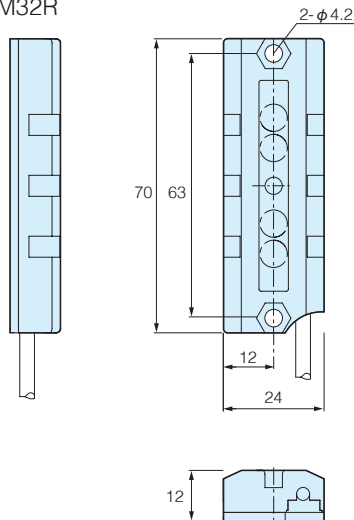
Reflector
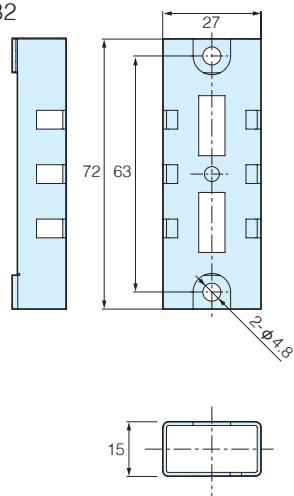Model: S-SSP70 (supplied accessory)

● Material
Resin

30

70

0.5

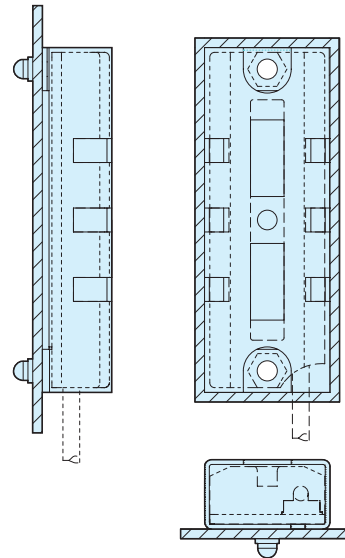Effective reflecting surface: 70×30mm
Mounting: Pasted: adhesive on back side

● Optional Parts (separately sold item)
Protective cover
Model: SSP-BF32

● Material
Galvanized SPC
(black)

27

72 | 63

2-φ4.8

15

Protective cover attached

● Install the sensor, using M4 screws and M4 nuts, and the tightening torque has to be 0.8 N·m or less.
(Screws and nuts are optional accessories.)

Fore 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 power press safety device or other safety device to prevent death or injury that requires conformity to domestic or overseas standards or certification concerning protection of the human body. Use for such purposes may lead to death or serious injury in the unlikely event of failure.
- This sensor is designed to detect an object passing over a certain point or line.
- For safety applications, ensure safe operation of the detection and control system as a whole.

Light Curtain Sensors

TAKEX