RP31 SERIES

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SENSORS SELECTION GUIDE

RP31 SERIES

Compact Size

Depth is only 200mm. The depth is 5mm shorter comparedto conventional models.

5mm shorter
20mm
31mm
12mm
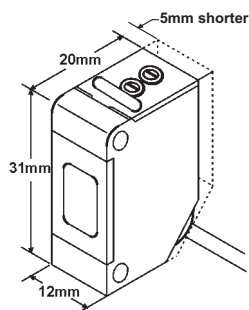
Easy Alignment

Alignment is easy for the thru-beam sensor as an emitted light spreads .In addition , the retroreflective sensor allows easy alignment with a visiblered LED light source.

Light spread of **RP-31□**

Long sensing range and easy alignment

Light spread of conventional models
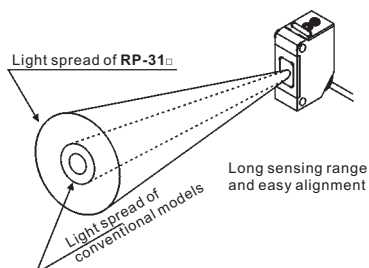
Close Mounting of Two Sensors

RP31 Series Automatic crosstalk prevention function . Two units of sensors can be mounted closely.
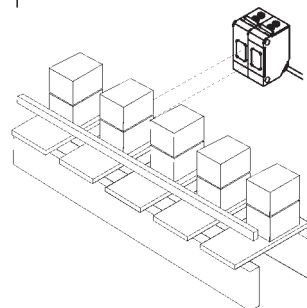
Strong Light Beam

RP-31T □ Offers a strong light beam potential which passes through 20 sheets of copier papers.For easy maintenance , the sensor is an infrared LED light source strong against dust and dirt.

20 sheets of copy paper
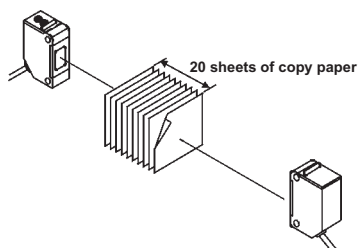
Waterproof

Achieves Ip67. The sensor may be washed by water together with the machine . The mounting bracket is non-corrosive as it is made of stainless steel material.
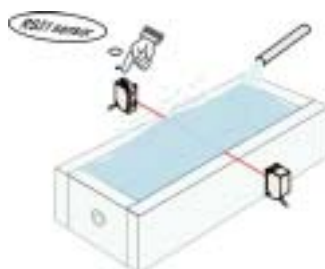
Plug-in Connector Type Is Available

Plug-in Connector type sensor, which can be easily disconnected for replacement , is available . In case a problem occurs anyone can relace the sensor in a minute.

Plug-in connector type

M8 connector

ø9mm

Cable length: 2m
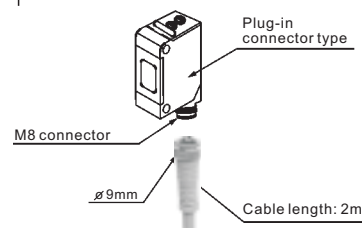
• **RP31-L1000** □ Detects transparent objects reliably because of its unique optical system and electronic circuit.

• **Pass sensing of pet bottles**
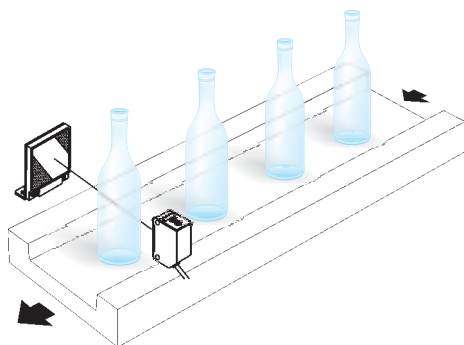
Detectable transparent objects
Reflector setting range: 300 to 500mm
[by using a **RE-6152** Reflector at optimum condition. *1]

*1: When the passing position of the sensing object places at the center of the sensor and reflector The optimum state is the condition that the sensitivity is set at the limit level where a stable operation indicator just starts to turn on.

• **Content check inside paper pouches**
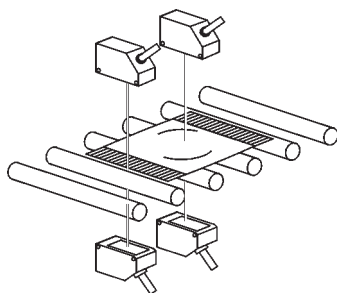
• **Presence sensing of rubber sheets**
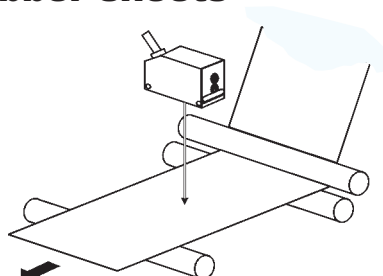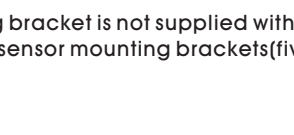
ℓ : Length , t : Thickness

SENSING OBJECT	THE SIZE OF A SENSING OBJECT		
Glass boards	□ 50mm		t=1.0mm
Cylindrical glasses	Ø 50mm	ℓ=50mm	t=2.0mm
	Ø 100mm	ℓ=50mm	t=2.3mm
Acrylic boards	□ 50mm		t=1.5mm
Styrols(floppy cases)	□ 50mm		t=1.2mm
Food wrapping films	□ 50mm		t=10 μ m
Cigarette case films	□ 50mm		t=20 μ m
Venyl sacks	□ 50mm		t=30 μ m
Pet bottles	Ø 55mm		
	Ø 70mm		
Glass bins	Ø 65mm		

• **Detection of specular goods**

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SENSORS TYPE

RP31 SERIES
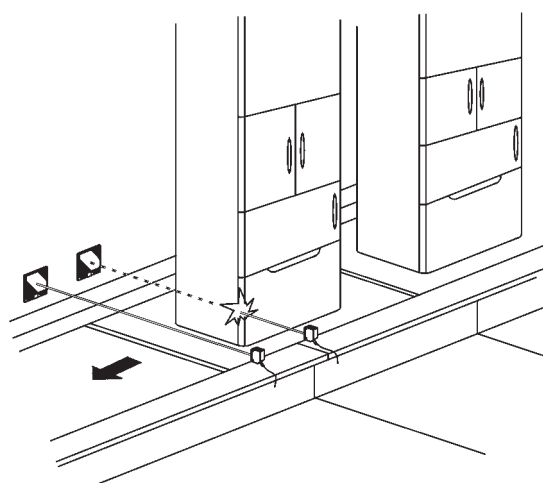
Type			Appearance	Sensing range	Emitting element	Output type	Part Number
CABLE TYPE	Thrubeam	Narrow beam		10m	Infrared LED	NPN	RP31-T010MN-EY9C2L2 (Emitter)
						PNP	RP31-T010MP-EY9C2L2 (Emitter)
						NPN	RP31-T010MN-CY9C3U2 (Receiver)
						PNP	RP31-T010MP-CY9C3U2 (Receiver)
				5m		NPN	RP31-T5000N-EY9C2L2 (Emitter)
						PNP	RP31-T5000P-EY9C2L2 (Emitter)
						NPN	RP31-T5000N-CY9C3U2 (Receiver)
						PNP	RP31-T5000P-CY9C3U2 (Receiver)
	Retro reflective	With polarizing filters		0.1 to 3m	Infrared LED	NPN	RP31-L3000N-CY6Q4UP-PF
						PNP	RP31-L3000P-CY6Q4UP-PF
		For transparent object sensing		50 to 1000mm	Red LED	NPN	RP31-S1000N-CY9C3U2
						PNP	RP31-S1000P-CY9C3U2
	Diffuse reflective	Long range		800mm	Infrared LED	NPN	RP31-D0800N-CY9C3U2
						PNP	RP31-D0800P-CY9C3U2
		Short range		300mm		NPN	RP31-D0300N-CY9C3U2
						PNP	RP31-D0300P-CY9C3U2
PIG TAIL TYPE	Thrubeam	Narrow beam		10m	Infrared LED	NPN	RP31-T010MN-EY9P4LP (Emitter)
						PNP	RP31-T010MP-EY9P4LP (Emitter)
						NPN	RP31-T010MN-CY9P4UP (Receiver)
						PNP	RP31-T010MP-CY9P4UP (Receiver)
				5m		NPN	RP31-T5000N-EY9P4LP (Emitter)
						PNP	RP31-T5000P-EY9P4LP (Emitter)
						NPN	RP31-T5000N-CY9P4UP (Receiver)
						PNP	RP31-T5000P-CY9P4UP (Receiver)
	Retro reflective	With polarizing filters		0.1 to 3m	Infrared LED	NPN	RP31-L3000N-CY6P4UP-PF
						PNP	RP31-L3000P-CY6P4UP-PF
		For transparent object sensing		50 to 1000mm	Red LED	NPN	RP31-S1000N-CY9Q4UP
						PNP	RP31-S1000P-CY9Q4UP
	Diffuse reflective	Long range		800mm	Infrared LED	NPN	RP31-D0800N-CY9P4UP
						PNP	RP31-D0800P-CY9P4UP
		Short range		300mm		NPN	RP31-D0300N-CY9P4UP
						PNP	RP31-D0300P-CY9P4UP
M8 CONNECTOR TYPE	Thrubeam	Narrow beam		10m	Infrared LED	NPN	RP31-T010MN-EY9Q4LP (Emitter)
						PNP	RP31-T010MP-EY9Q4LP (Emitter)
						NPN	RP31-T010MN-CY9Q4UP (Receiver)
						PNP	RP31-T010MP-CY9Q4UP (Receiver)
				5m		NPN	RP31-T5000N-EY9Q4LP (Emitter)
						PNP	RP31-T5000P-EY9Q4LP (Emitter)
						NPN	RP31-T5000N-CY9Q4UP (Receiver)
						PNP	RP31-T5000P-CY9Q4UP (Receiver)
	Retro reflective	With polarizing filters		0.1 to 3m	Infrared LED	NPN	RP31-L3000N-CY6Q4UP-PF
						PNP	RP31-L3000P-CY6Q4UP-PF
		For transparent object sensing	Red LED	50 to 1000mm	Red LED	NPN	RP31-S1000N-CY6Q4UP
						PNP	RP31-S1000P-CY6Q4UP
	Diffuse reflective	Long range		800mm	Infrared LED	NPN	RP31-D0800N-CY9Q4UP
						PNP	RP31-D0800P-CY9Q4UP
		Short range	Infrared LED	300mm		NPN	RP31-D0300N-CY9Q4UP
						PNP	RP31-D0300P-CY9Q4UP

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

RP31 SERIES

Rectangular slit mask .
(For thru-beam type sensor only)

• Fitted on the front face of the sensor with one touch.

Round slit mask .
(For thru-beam type sensor only)
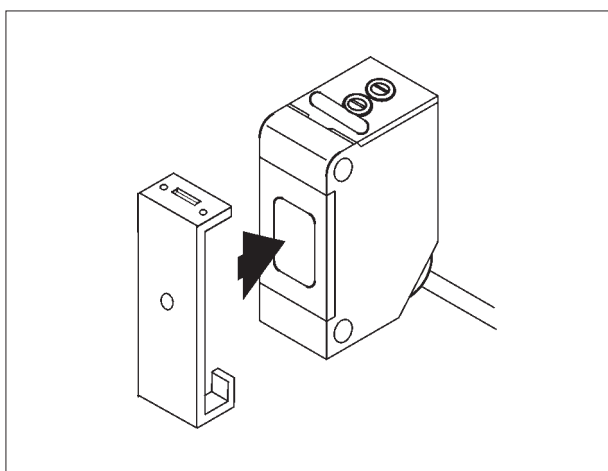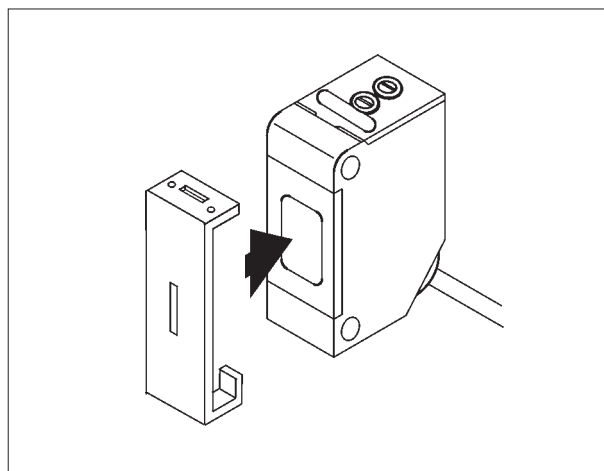
• Fitted on the front face of the sensor with one touch.

OS-RP31-05x6

Slit size: Ø 0.5x6mm	
Slit on one side	Sensing range: **2000mm [RP31-T010MN(p)-CY9C3U2]**
	1200mm [RP31-T5000N(p)-CY9C3U2]
	Min.Sensing object: Ø 12**mm**
Slit on both side	Sensing range: **400mm [RP31-T010MN(p)-CY9C3U2]**
	[RP31-T5000N(p)-CY9C3U2]
	Min.Sensing object: Ø 0.5x6**mm**

OS-RP31-05

Slit size: Ø 0.5mm	
Slit on one side	Sensing range: **400mm [RP31-T010MN(p)-CY9C3U2]**
	300mm [RP31-T5000N(p)-CY9C3U2]
	Min.Sensing object: Ø 12**mm**
Slit on both side	Sensing range: **20mm [RP31-T010MN(p)-CY9C3U2]**
	[RP31-T5000N(p)-CY9C3U2]
	Min.Sensing object: Ø 0.5**mm**

OS-RP31-1x6

Slit size: Ø 1x6mm	
Slit on one side	Sensing range: **3000mm [RP31-T010MN(p)-CY9C3U2]**
	2000mm [RP31-T5000N(p)-CY9C3U2]
	Min.Sensing object: Ø 12**mm**
Slit on both side	Sensing range: **1000mm [RP31-T010MN(p)-CY9C3U2]**
	[RP31-T5000N(p)-CY9C3U2]
	Min.Sensing object: Ø 1x6**mm**

OS-RP31-1

Slit size: Ø 1mm	
Slit on one side	Sensing range: **900mm [RP31-T010MN(p)-CY9C3U2]**
	600mm [RP31-T5000N(p)-CY9C3U2]
	Min.Sensing object: Ø 12**mm**
Slit on both side	Sensing range: **100mm [RP31-T010MN(p)-CY9C3U2]**
	[RP31-T5000N(p)-CY9C3U2]
	Min.Sensing object: Ø 1**mm**

OS-RP31-2x6

Slit size: Ø 2x6mm	
Slit on one side	Sensing range: **5000mm [RP31-T010MN(p)-CY9C3U2]**
	3000mm [RP31-T5000N(p)-CY9C3U2]
	Min.Sensing object: Ø 12**mm**
Slit on both side	Sensing range: **2000mm [RP31-T010MN(p)-CY9C3U2]**
	[RP31-T5000N(p)-CY9C3U2]
	Min.Sensing object: Ø 2x6**mm**

OS-RP31-2

| Slit size: Ø 2mm	
Slit on one side	Sensing range: **2000mm [RP31-T010MN(p)-CY9C3U2]**
	1500mm [RP31-T5000N(p)-CY9C3U2]
	Min.Sensing object: Ø 12**mm**
Slit on both side	Sensing range: **400mm [RP31-T010MN(p)-CY9C3U2]**
	[RP31-T5000N(p)-CY9C3U2]
	Min.Sensing object: Ø 2**mm**

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OPTIONS - Mounting bracket
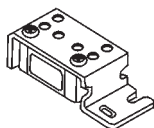- Mounting stand

Sensor mounting bracket

MS-RP31-1
Two M3 (length 12mm) screws with washers are attached.
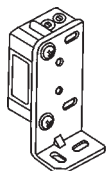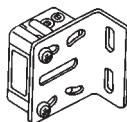
MS-RP31-2
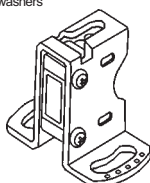■ Two M3 (length 12mm) screws with washers are attached.

MS-RP31-3
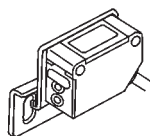■ Two M3 (length 12mm) screws with washers are attached.

MS-RP31-4
Two M3 (length 14mm) screws with washers are attached.

MS-RP31-5
■ Two M3 (length 12mm) screws with washers are attached.

MS-RP31-1

Description
- **Foot angled mounting bracket**
- **It can also be used for mounting RE-6152.**
- **(The thru-beam type sensor needs two brackets.)**

MS-RP31-2

Description
- **Foot biangled mounting bracket**
- **Flat mounting saves height.**
- **It can also be used for mounting RE-6152.**
- **(The thru-beam type sensor needs two brackets.)**

MS-RP31-3

Description
- **Protective mounting bracket**
- **It protects the sensor from damage and maintains alignment.**
- **(The thru-beam type sensor needs two brackets .)**

MS-RP31-4

Description
- **Back biangled mounting bracket**
- **Suitable for sensing from bottom of conveyors, etc.**
- **(The thru-beam type sensor needs two brackets.)**

MS-RP31-5

Description
- **Back angled mounting bracket**
- **(The thru-beam type sensor needs two brackets.)**

MS-RP-B

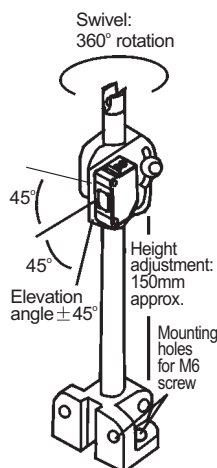**Description**   Basic assembly

MS-RP-L
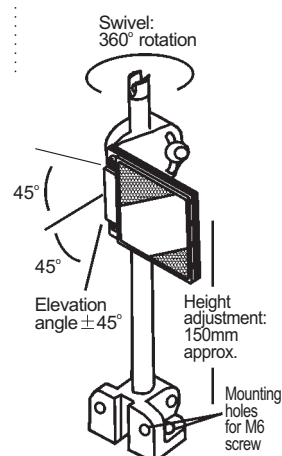
Description   Lateral arm assembly

MS-RP-R

Description   Assembly for reflector
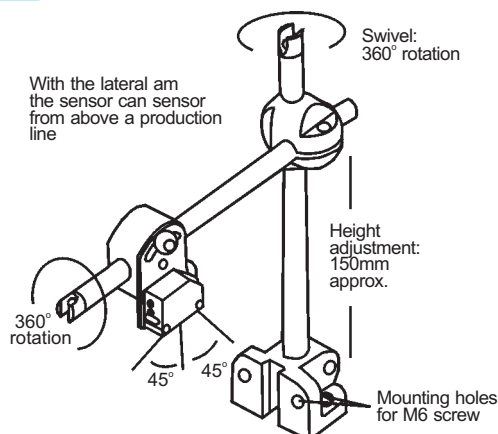
Universal sensor mounting stand

MS-RP-B

Swivel: 360° rotation
45°
45°
Elevation angle ±45°
Height adjustment: 150mm approx.
Mounting holes for M6 screw

MS-RP-L

Swivel: 360° rotation
45°
45°
Elevation angle ±45°
Height adjustment: 150mm approx.
Mounting holes for M6 screw

MS-RP-R

Swivel: 360° rotation
With the lateral am the sensor can sensor from above a production line
Height adjustment: 150mm approx.
360° rotation
45° 45°
Mounting holes for M6 screw

RP31 SERIES

Reflector For retroreflective sensor only

RE-6152	RE-6041

RE-D63	RE-D31

RE-822	RE-Q52

RE-6152
Description | Sensing range : 3m[RP31-L3000]

RE-6041
Description | Sensing range :2.8m[RP31-L3000]

RE-D63
Description | Sensing range : 2.3m[RP31-L3000]

RE-D31
Description | Sensing range : 0.7m[RP31-L3000]

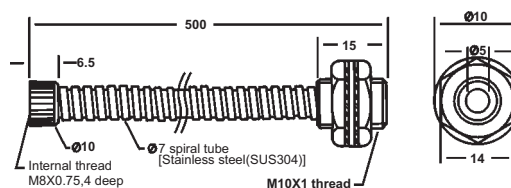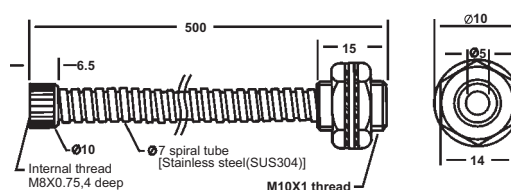### RE-822
Description | Sensing range : 1m[RP31-L3000]

RE-Q52
Description | Sensing range : 2.5m[RP31-L3000]

Protective tube

PT-RP500

500
6.5
Ø10
Ø10
Ø5
15
14
Internal thread M8X0.75,4 deep
Ø7 spiral tube [Stainless steel(SUS304)]
M10X1 thread

PT-RP1000

500
6.5
Ø10
Ø10
Ø5
15
14
Internal thread M8X0.75,4 deep
Ø7 spiral tube [Stainless steel(SUS304)]
M10X1 thread

PT-RP500
Description | Length: **500mm**
Cable is protected from external forces.
It does not rust as it is made of stainless steel.

PT-RP1000
Description | Length: **1000mm**
Cable is protected from external forces.
It does not rust as it is made of stainless steel.

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SPECIFICATIONS

RP31 SERIES

Type	Thru-beam		Retroreflective		Diffuse reflective	
Model No.		Narrow beam	with polarizing filters	For transparent object sensing	Long sensing range	Short sensing range
NPN output type	RP31-T010MN*	RP31-T5000N*	RP31-L3000N*	RP31-S1000N*	RP31-D0800N*	RP31-D0300N*
PNP output type	RP31-T010MP*	RP31-T5000P*	RP31-L3000P*	RP31-S1000P*	RP31-D0800P*	RP31-D0300P*
Sensing range	10m	5m	0.1 to 3m	50 to 1,000 mm	800mm	300mm
Sensing object	Ø 12mm or more opaque object		Ø 50mm or more opaque, translucent or specular object	Ø 50mm or more opaque, translucent or specular object	Opaque, translucent or transparent object	
Hysteresis	———————				15% or less of operation distance	
Repeatability	0.5mm or less	0.05mm or less	0.5mm or less		1mm or less	
Supply voltage	10 to 30V DC Ripple P-P 10% or less					
Current Consumption	Emitter: 30mA or less Receiver: 30mA or less		30mA or less		30mA or less	
Sensing output	**NPN open-collector transistor** • Maximum sink Current : 100mA • Applied voltage : 30V DC or less (between sensing output and 0V) • Residual voltage : 1.5V or less (at 100mA sink current)		**PNP open-collector transistor** • Maximum sink Current : 100mA • Applied voltage : 30V DC or less (between sensing output and +V) • Residual voltage : 1.5V or less (at 100mA sink current)			
Utilization category	DC-12 or DC-13					
Output operation	Switchable either Light-ON or Dark-ON					
Short-circuit protection	Incorporated					
Response time	1ms or less					
Operation indicator	Red LED (lights up when the sensing output is ON)					
Stability indicator	Green LED (lights up under stable light received condition or stable dark condition)					
Power indicator	Red LED (lights up when the power is ON)		———————			
Sensitivity adjuster	Continuously variable adjuster					
Automatic interference prevention function	———————		Incorporated (Two units of sensors can be mounted closely.)	—————	Incorporated (Two units of sensors can be mounted closely.)	
Environmental resistance	Pollution degree	3 (Industrial environment)				
	Protection	IP67(IEC)				
	Ambient temperature	-25 to +55°C (No dew condensation or icing allowed), Storage:-30 to +70°C				
	Ambient humidity	35 to 85% RH, Storage: 35 to 85% RH				
	Ambient illuminance	Sunlight: 11,000ℓx at the light-receiving face, Incandescent light: 3,000ℓx at the light-receiving face				
	EMC	IEC 60947-5-2, Parts 7.2.6.1.2.3 or RFI>3V/m(in 30-1000MHZ), EFT>1KV, ESD>4KV(contact)				
	Voltage withstandability	1,000V AC for one min. Between all supply terminals connected together and enclosure				
	Insulation resistance	20MΩ ,or more, with 250V DC megger between all supply terminals connected together and enclosurre				
	Vibration resistance	IEC 60947-5-2, Part 7.4.2 or 10-55HZ, 1.0mm amplitude In X, Y and Z directions for 30 min				
	Shock resistance	IEC 60947-5-2, Part 7.4.1 or 30g,11ms in X,Y and Z directions for six times each				
Emitting element	Infrared LED (modulated)		Red LED (modulated)	Infrared LED (modulated)		
Material	Enclosure: Polycarbonate , Lens: Polycarbonate , Indicator cover: Polycarbonate, Front cover: Polycarbonate					
Cable	0.2mm² 3-core (thru-beam type emitter: 2-core) oil resistant cabtyre cable, 2m long					
Cable extension	Extension up to total 100m is possible with 0.3mm² ,or more, cable(thru-beam type: both emitter and receiver).					
Pigtail type	M8 pico 4pin+6″ . cable					
Connection type	M8 pico 4pin					
Weight	50g approx.					
Accessories	Adjusting screwdriver: 1 NO.		**RE-6152**(Reflector):1 NO. Adjusting screwdriver:1 No.		Adjusting screwdriver: 1 NO.	

NPN output type

1. I/O circuit diagram
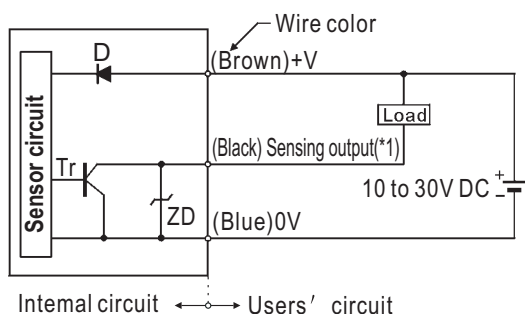
Wire color
(Brown)+V
(Black) Sensing output(*1)
(Blue)0V

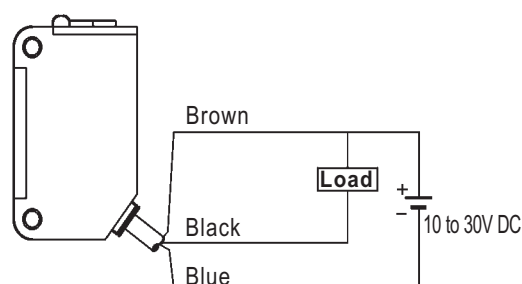Sensor circuit

D

Tr

ZD
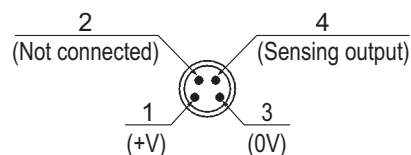
Load

10 to 30V DC

Intemal circuit ←——→ Users' circuit

(*1) : The sensing output is not equipped with the emitter of the thru-beam sensor.

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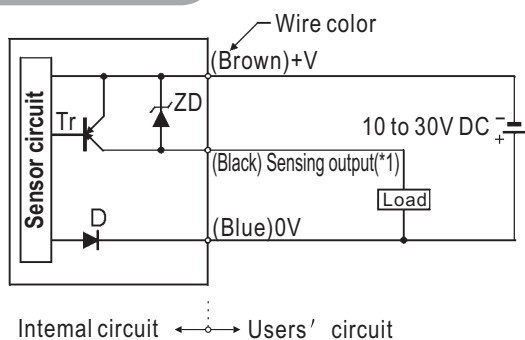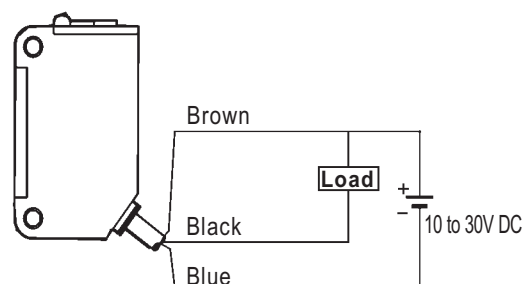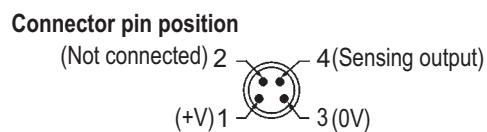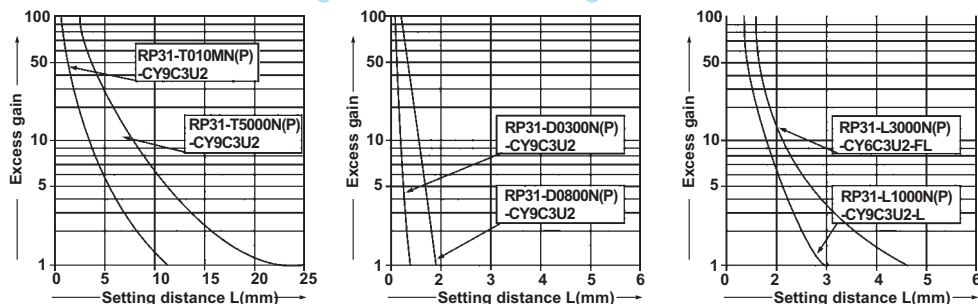Tr : NPN output transistor

2. Wiring diagram

Brown

Load

Black

Blue

10 to 30V DC

3. Connector pin position
(Plug-in connector type)

2
(Not connected)

4
(Sensing output)

1
(+V)

3
(0V)

PNP output type

1. I/O circuit diagram

Wire color
(Brown)+V
10 to 30V DC
(Black) Sensing output(*1)
(Blue)0V

Sensor circuit

ZD

Tr

D

Load

Intemal circuit ←——→ Users' circuit

(*1) : The sensing output is not equipped with the emitter of the thru-beam sensor.

Symbol...D : Reverse polarity protection diode
ZD: Surge absorption zener diode
Tr : PNP output transistor

2. Wiring diagram

Brown

Load

Black

Blue

10 to 30V DC

3. Connector pin position
(Plug-in connector type)

Connector pin position
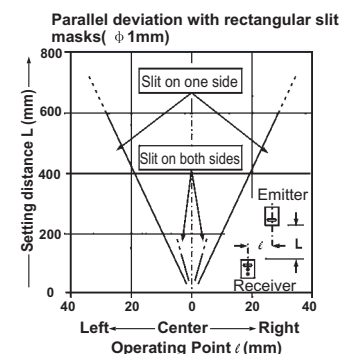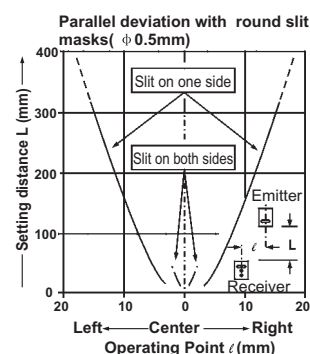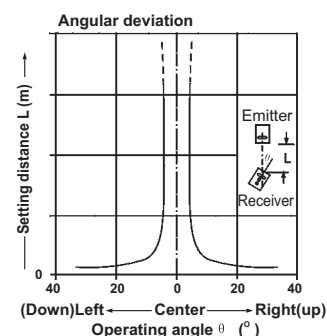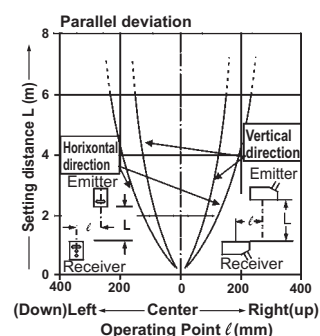(Not connected) 2

4(Sensing output)

(+V)1

3 (0V)

All models

Correlation between setting distance and excess gain

RP31-T010MN(P)-CY9C3U2
RP31-T5000N(P)-CY9C3U2
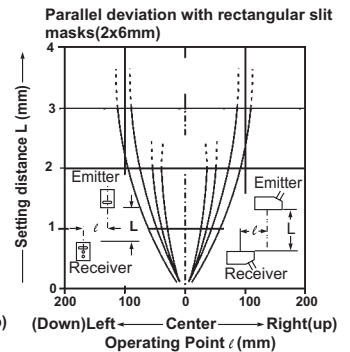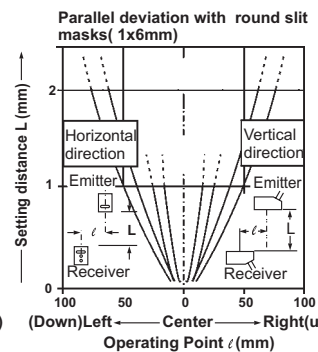
RP31-D0300N(P)-CY9C3U2
RP31-D0800N(P)-CY9C3U2

RP31-L3000N(P)-CY6C3U2-FL
RP31-L1000N(P)-CY9C3U2-L

RP31-T010MN*
RP31-T010MP*

Parallel deviation

Angular deviation

Parallel deviation with round slit masks(φ 0.5mm)

Parallel deviation with rectangular slit masks(φ 1mm)

Parallel deviation with round slit masks(φ 2mm)

Parallel deviation with round slit masks(0.5x6mm)

Parallel deviation with round slit masks(1x6mm)

Parallel deviation with rectangular slit masks(2x6mm)

RP31-T5000N*
RP31-T5000P*

Parallel deviation

Angular deviation

Parallel deviation with round slit masks(φ 0.5mm)

Parallel deviation with rectangular slit masks(φ 1mm)

RP31 SERIES

RP31-T5000N*
RP31-T5000P*

Parallel deviation with round slit masks(φ2mm)

Slit on one side
Slit on both sides
Emitter
Receiver

Setting distance L (m)
2
1.5
1
0.5
0
100 50 0 50 100
Left ← Center → Right
Operating Point ℓ (mm)

Parallel deviation with round slit masks(0.5x6mm)

Horizontal direction
Vertical direction
Emitter
Emitter
Receiver
Receiver

Setting distance L (m)
2
1.5
1
0.5
0
100 50 0 50 100
(Down)Left ← Center → Right(up)
Operating Point ℓ (mm)

Parallel deviation with round slit masks(1x6mm)

Horizontal direction
Vertical direction
Emitter
Emitter
Receiver
Receiver

Setting distance L (mm)
2
1
100 50 0 50 100
(Down)Left ← Center → Right(up)
Operating Point ℓ (mm)

Parallel deviation with rectangular slit masks(2x6mm)

Emitter
Emitter
Receiver
Receiver

Setting distance L (mm)
4
3
2
1
200 100 0 100 200
(Down)Left ← Center → Right(up)
Operating Point ℓ (mm)

RP31-L3000N*
RP31-L3000P*

Parallel deviation

Reflector
Sensor

Setting distance L (m)
4
3
2
1
0
100 50 0 50 100
Left ← Center → Right
Operating Point ℓ (mm)

Angular deviation

Sensor angular deviation
Reflector angular deviation
Reflector
Reflector
Sensor
Sensor

Setting distance L (m)
4
3
2
1
0
40 20 0 20 40
Left ← Center → Right
Operating angle θ (°)

RP31-S1000N*
RP31-S1000P*

Parallel deviation

Reflector
Sensor

Setting distance L (m)
1000
500
0
100 50 0 50 100
Left ← Center → Right
Operating Point ℓ (mm)

Angular deviation

Sensor angular deviation
Reflector angular deviation
Reflector
Reflector
Sensor
Sensor

Setting distance L (m)
1000
500
0
40 20 0 20 40
Left ← Center → Right
Operating angle θ (°)

RP31-D0800N*
RP31-D0800P*

Parallel deviation

200x200 mm White non-glosssy paper
Sensor

Setting distance L (m)
1000
500
0
40 20 0 20 40
Left ← Center → Right
Operating Point ℓ (mm)

Correlation between sensing object size and sensing range

200x200 mm White non-glosssy paper
Sensor

Setting distance L (m)
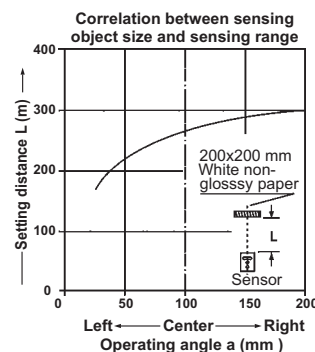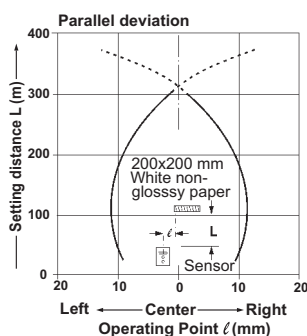800
400
0
0 50 100 150 200
Left ← Center → Right
Operating angle a (mm)

- As the sensing object size becomes smaller than the standard size(white non-glossy paper 200x200mm), the sensing range shortens, as shown in the left graph.

- (For plotting the left graph, the sensitivity has been set such that a 200x200mm white non-glossy paper is just detectable at a distance of 800mm).

RP31-D0300N*
RP31-D0300P*

Parallel deviation

200x200 mm White non-glosssy paper
Sensor

Setting distance L (m)
400
300
200
100
0
20 10 0 10 20
Left ← Center → Right
Operating Point ℓ (mm)

Correlation between sensing object size and sensing range

200x200 mm White non-glosssy paper
Sensor

Setting distance L (m)
400
300
200
100
0
0 50 100 150 200
Left ← Center → Right
Operating angle a (mm)

- As the sensing object size becomes smaller than the standard size(white non-glossy paper 200x200mm), the sensing range shortens, as shown in the left graph.

- (For plotting the left graph, the sensitivity has been set such that a 200x200mm white non-glossy paper is just detectable at a distance of 300mm).
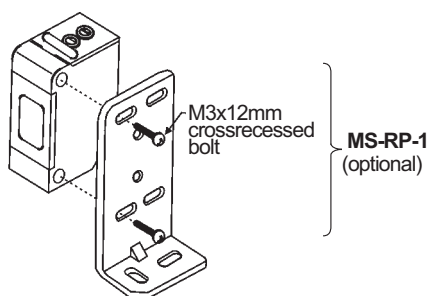
PHOTOELECTRIC
PRECAUTIONS FOR PROPER USE

⚠ This product is not a safety sensor. Its use is not intended or designed to protect life and prevent body injury or property damage from dangerous parts of machinery. It is a normal object detection sensor.

Mounting

• **Tightening torque must not exceed 0.5N・m{5.1kgf・cm}.**

M3x12mm crossrecessed bolt

MS-RP-1 (optional)

Operation mode selection switch

D L	Light-ON mode is obtained when the switch is turned fully counterclockwise.
D L	Dark-ON mode is obtained when the switch is turned fully clockwise.

• Stable operation indicator

The stable operation indicator (green) turns on when the light-receiving intensity of the signal light is sufficient against the operation level .

If the light-receiving level where the stable operation indicator turns on, the sensor can detect stable without affecting the temperature and the voltage change at the Light-ON and the Dark-ON operation.
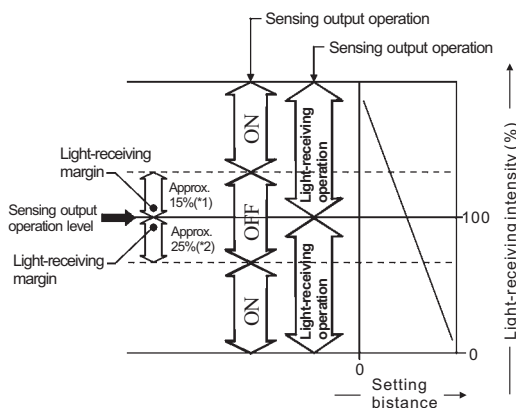
	"Light" state	"Dark" state
Thru-beam	Emitter — Receiver	Emitter — Sensing object — Receiver
Retroreflective With polarizing filter	Sensor — Reflector	Sensor — Sensing object — Reflector
Retroreflective For the trans- parent sensing	Sensor — Reflector	Sensor — Sensing object — Reflector
Diffuse reflective	Sensor — Sensing object	Sensor —

Wiring

• Power supply should be turned off before wiring.
Verify voltage fluctuation so that it should not exceed the rated value.
When using a switching regulator for the power supply readily available in the market , always ground the frame ground (F.G.)Terminal.
When using an equipment which generates the noises(switching regulator or inverter motor ,etc.) Near the sensor ,ground the frame ground (F.G.)Terminal of the equipment .Do not run sensor cables high-voltage lines or power lines , nor put them together in the same raceway .
Doing so may cause malfunctions due to inductive interference .

● Retroreflective type sensor for sensing transparent objects
Optimum sensing is possible when the position of the transparent sensing object is set at the center of the sensor and the reflector. If the sensing position is set near the sensor or the reflector, the sensing may be unstable. In this case, set the sensing position at the center of the sensor and the reflector.

Sensor **Reflector**

Transparent sensing object
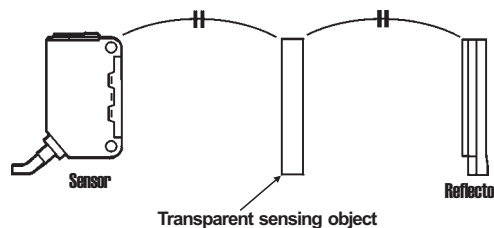
▪ When the sensor detects an uneven plastic receptacle or glass bin, the received light intensity may differ with the sensing position or direction. Adjust the sensitivity after confirming the stable sensing condition by turning the sensing object, etc.
▪ If the object is a transparent cylinder, feed it in a position as shown in Figure A. The sensor may fail to detect an object fed in a position as shown in Figure B.
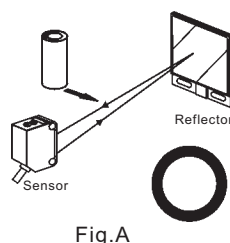
Reflector
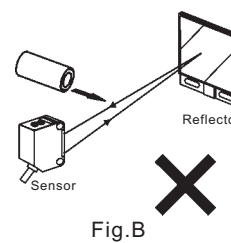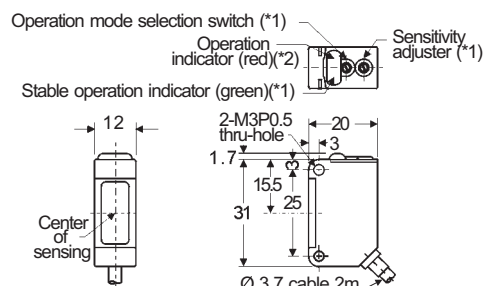Sensor
Fig.A

Reflector
Sensor
Fig.B

Sensor type

DIMENSIONS(Unit: mm)

1. RP31 Cable type

Operation mode selection switch (*1)
Operation indicator (red)(*2)
Sensitivity adjuster (*1)
Stable operation indicator (green)(*1)

12
2-M3P0.5 thru-hole
20
1.7
3
15.5
25
31
Center of sensing
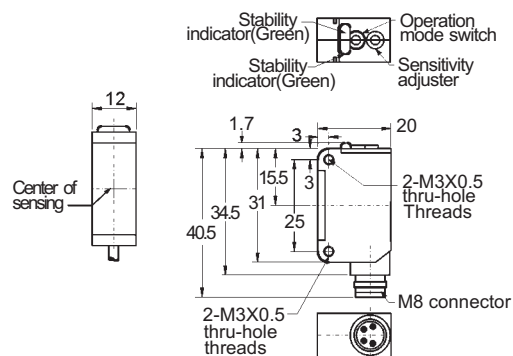Ø 3.7 cable 2m

(*1) : Not equipped with the emitter of the thru-deam sensor.
(*2) : It is the power indicator (red) for the emitter of the thru-deam sensor.
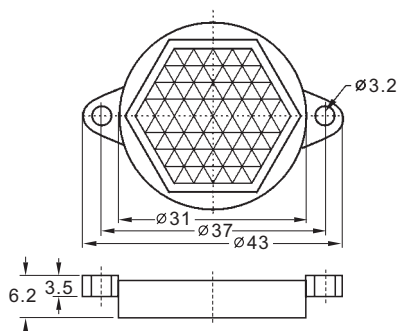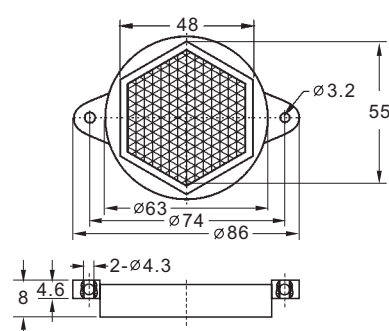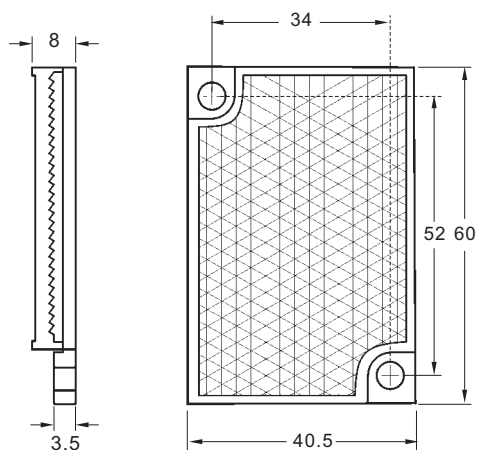
2. RP31 Connector type

Stability indicator(Green)
Operation mode switch
Stability indicator(Green)
Sensitivity adjuster

12
Center of sensing

1.7
3
20
15.5
3
34.5
31
25
40.5
2-M3X0.5 thru-hole Threads
M8 connector
2-M3X0.5 thru-hole threads

Reflecor

DIMENSIONS(Unit: mm)

1. RE-D31

Ø3.2
ø31
ø37
ø43
6.2
3.5

2. RE-D63

48
Ø3.2
55
ø63
ø74
ø86
2-Ø4.3
8
4.6

3. RE-6041

8
34
52 60
3.5
40.5

4. RE-6152

8
51.5
51
61
3.5
4.3
10
20
10
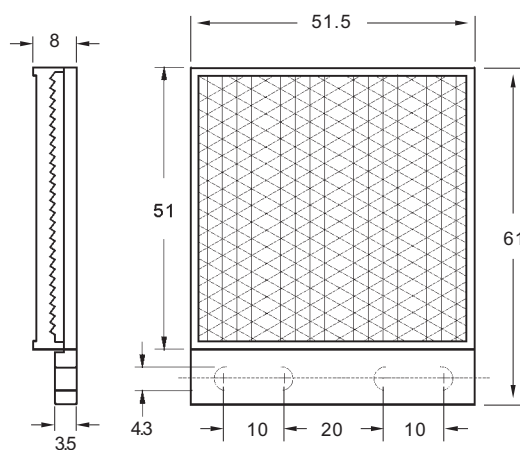
RE-8222
Assembly dimensions

1.

22

2.

ø8
ø4.5
7.4
3.4
71
82

RE-Q52
Assembly dimensions

1.

52
60
6
8
14

2.

48.5
10
M4X6
11.5
37
11.5
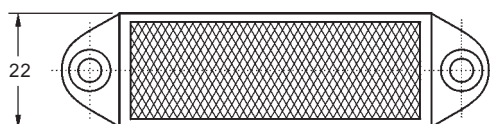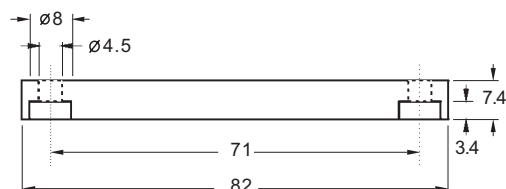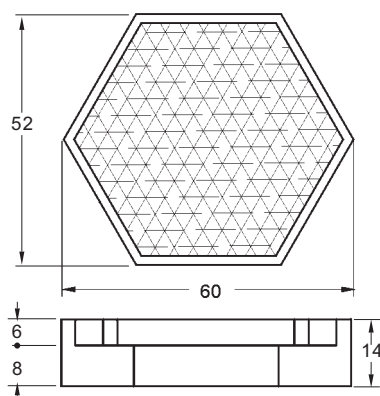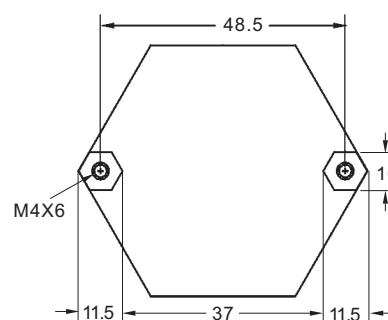
MS-RP31-1
Assembly dimensions

1.

5
30
3.4
6
R20
14
8
7°
7°
3.4

30
10°
22
3.3
2-Φ3.3 holes (for RF-210)
41
25
R25
10
12.5
19
10°
2.5
t1.2
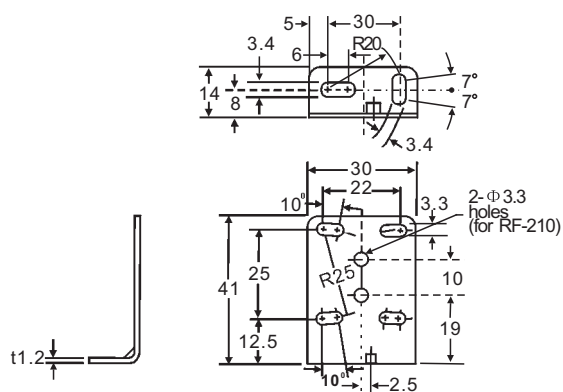
Material:Stainless steel(SUS30).Two M3(length 12mm) screws with washers are attached.

2.

1
25
14
14
14
R20
6
3.4
5
20
3.4
20

16.5
12
Beam-receiveing part
5
40.5
Beam-emitting part
4
9.5

4
30
(1.4)
25
41
12.5
t1.2
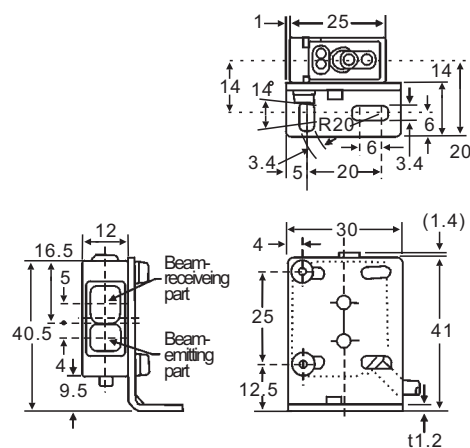
MS-RP31-2
Assembly dimensions
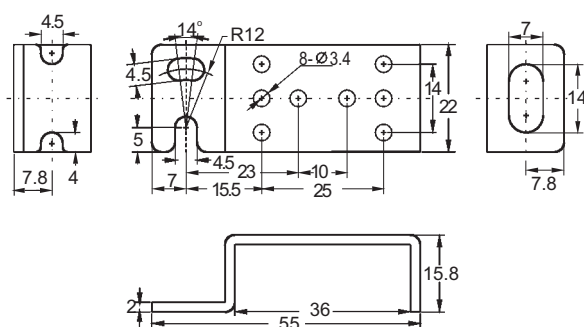
1.

2.

Material: Stainless steel(SUS304). Two M3 (length 12mm) screws with washers are attached.

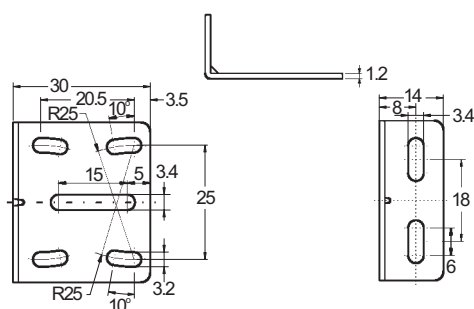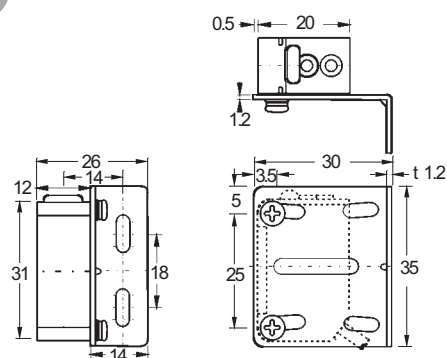## MS-RP31-3
Assembly dimensions

1.

2.

Material: Stainless steel(SUS304). Two M3 (length 12mm) screws with washers are attached.

MS-RP31-4
Assembly dimensions

1.

2.

Material: Stainless steel(SUS304). Two M3 (length 14mm) screws with washers are attached.

MS-RP31-5

Assembly dimensions

1.

Material: Stainless steel(SUS304).
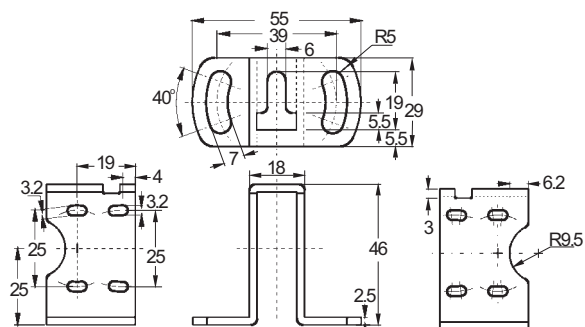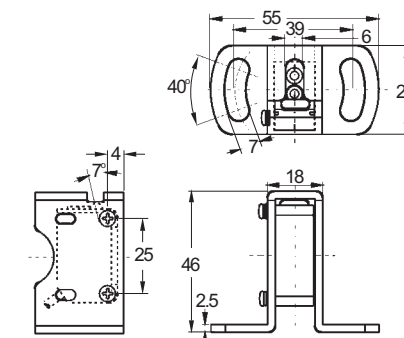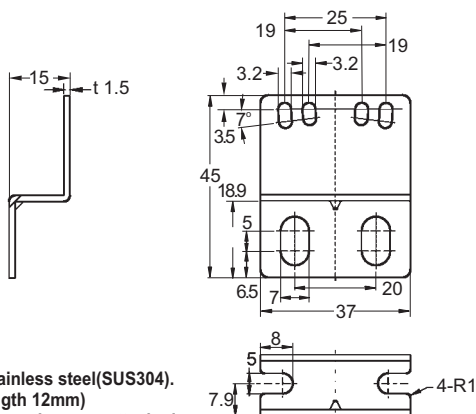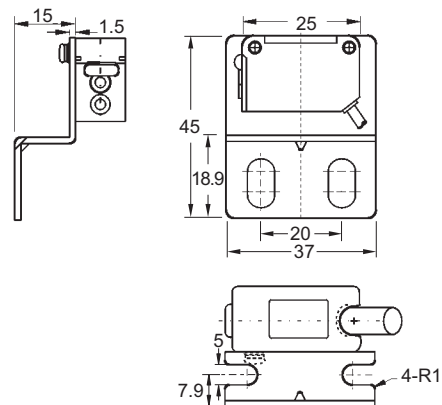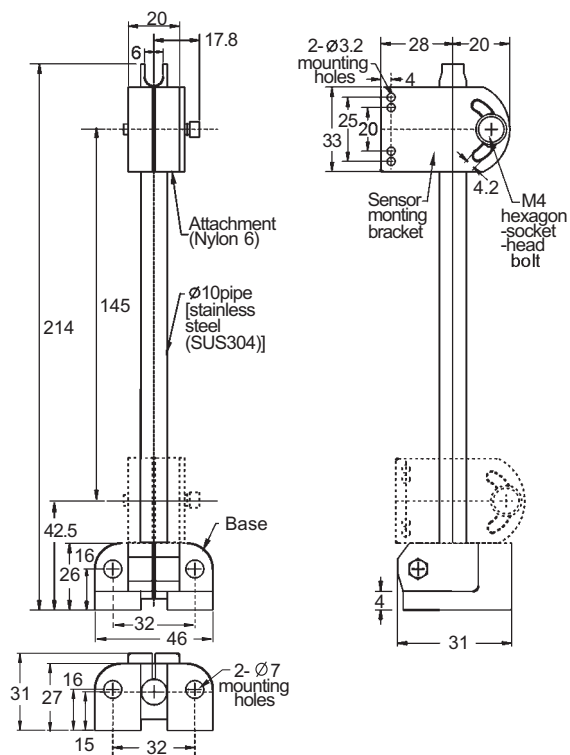Two M3 (length 12mm)
screws with washers are attached.

2.

MS-RP-B

Assembly dimensions

1.

Attachment
(Nylon 6)

Ø10pipe
[stainless
steel
(SUS304)]

Base

2-Ø3.2
mounting
holes

Sensor-
monting
bracket

M4
hexagon
-socket
-head
bolt

2- Ø7
mounting
holes
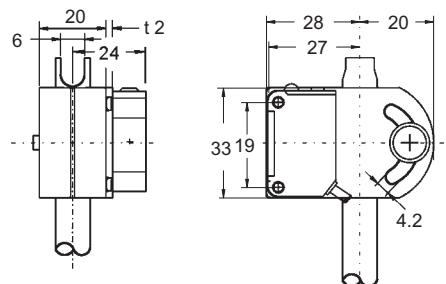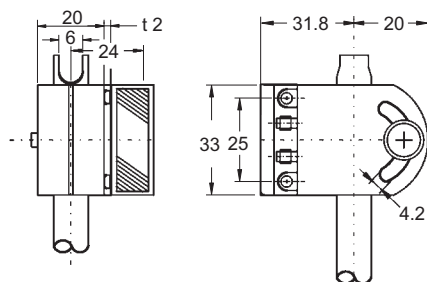
Two M3(length 14mm)screws with washers,
two M3 (length 16mm) screws with wasshers,
two M3 (length 18mm)screws with washers.
Note: The dimensions in the brackets indicate the adjustable range of the movable part.

2.

Assembly dimensions with RP31 series
(Mounting part only)

Assembly dimensions with RF-210-RP31(Reflector)
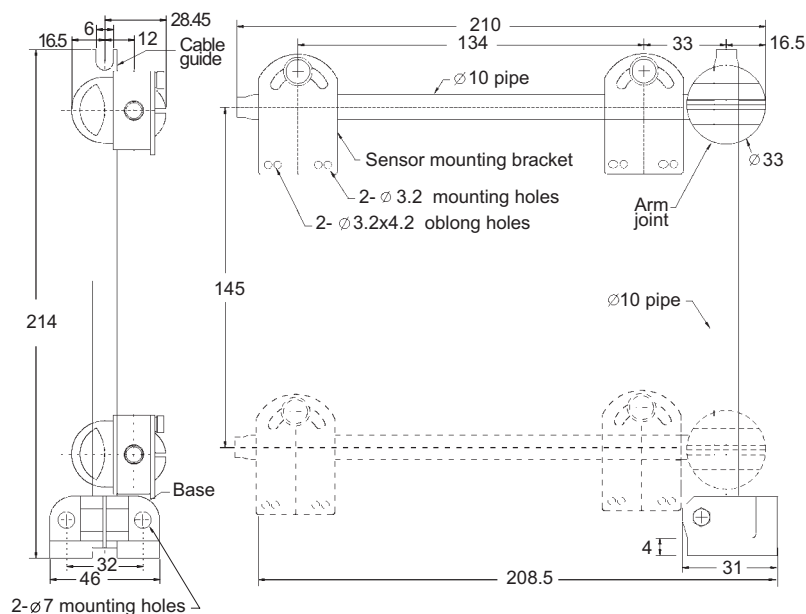(Mounting part only)

MS-RPL — Assembly dimensions

1.

28.45 Cable guide
16.5 6 12
210
134 33 16.5
∅10 pipe
Sensor mounting bracket
2- ∅3.2 mounting holes
2- ∅3.2x4.2 oblong holes
∅33
Arm joint
145
∅10 pipe
214
Base
32
46
2-∅7 mounting holes
4
31
208.5

Notes:
(1) The dimensions in the brackets indicate the adjustable range of the movable part.
(2) Refer to MS-RP-B (basic assembly) for the assembled diagram with the base, sensor mounting bracket, sensor or reflector.
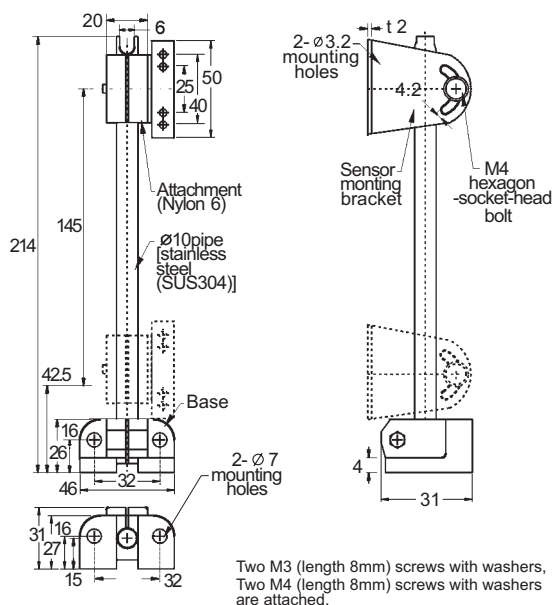
Two M3 (length 14mm) screws with washers,
Two M3 (length 16mm) screws with washers,
Two M3 (length 18mm) screws with washers.

MS-RP-R — Assembly dimensions

2.

20 6
25 50
40
2-∅3.2 mounting holes
t 2
4.2
Attachment (Nylon 6)
Sensor monting bracket
M4 hexagon -socket-head bolt
∅10pipe [stainless steel (SUS304)]
214
145
42.5
Base
16
26
2-∅7 mounting holes
46 32
4
31
31 16
27
15 32

Two M3 (length 8mm) screws with washers,
Two M4 (length 8mm) screws with washers are attached.

Note: The dimensions in the brackets indicate the adjustable range of the movable part.

Assembly dimensions with RF-220-RP31(Reflector)
(Mounting part only)

20
6 55.3
t 2
35.3
45.3
4.2
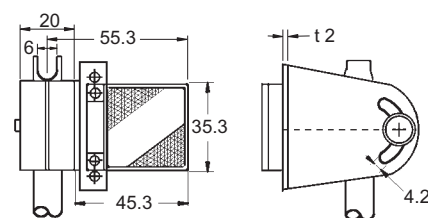
Assembly dimensions with RF-230-RP31(Reflector)
(Mounting part only)

20
6 71.3
t 2
50.3
61.3
4.2