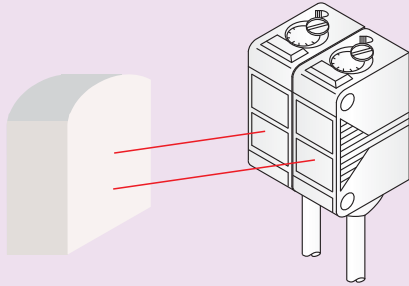


## Advantage and Applications

### Advantage

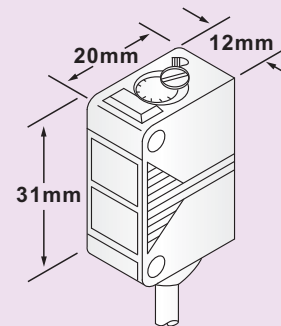
#### Equipped with auto crosstalk prevention function

CP20 series is equipped with the automatic crosstalk prevention function so that two sets of it can be installed closely together or facing each other.



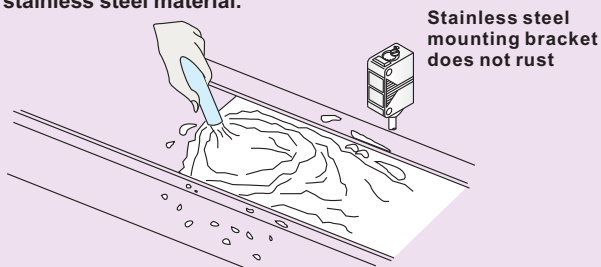
#### Compact Size

It realizes the space-saving. (W12xH31xD20mm)



#### Waterproof

Achieves IP 67. The sensor can be put on machinery washed with water. The mounting bracket (option) is not corrosive as it is made of stainless steel material.

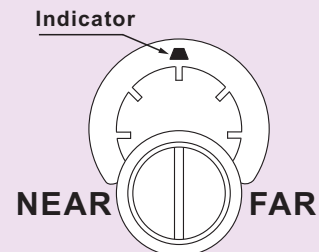


Stainless steel mounting bracket does not rust

Caution: a water drop on the sensing face may cause the sensor generate the output.

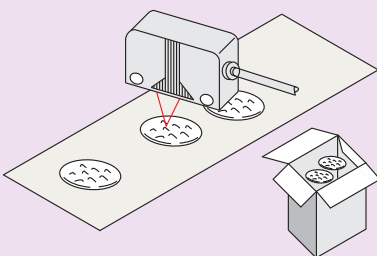
#### Two-turn adjuster with the indicator

It has two turn adjuster that is possible to set the fine distance. Moreover, the indicator shows the adjustment position at a glance.

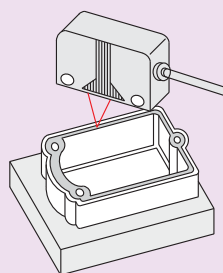


### Applications

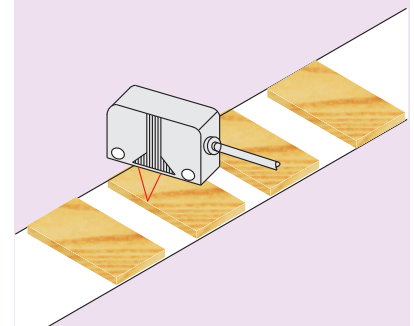
#### Sensing of thin-baked rice crackers



#### Detecting Gasket on Die-casting

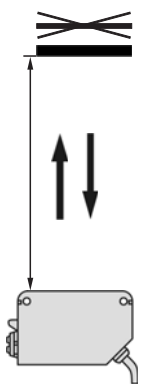





#### Positioning of veneer boards



## Diffuse Mode with Background Suppression

An: CP20 SERIES

Sensing Mode	Connection	Supply Voltage	Output Mode	Part Number
<p>Light Source: Red LED</p>  <p>Sensing Distance: 20 to 40mm ; 30 to 100mm ; 30 to 200mm (Adjustable)</p>	<p>2m Cable</p> 	<p><b>10 -30V DC</b> (Sn=20~40mm)</p>	NPN	<u>GP20-D0040N-CY6C3U2-BS</u>
			PNP	<u>GP20-D0040P-CY6C3U2-BS</u>
		<p><b>10 -30V DC</b> (Sn=30~100mm)</p>	NPN	<u>GP20-D0100N-CY6C3U2-BS</u>
			PNP	<u>GP20-D0100P-CY6C3U2-BS</u>
		<p><b>10 -30V DC</b> (Sn=30~200mm)</p>	NPN	<u>GP20-D0200N-CY6C3U2-BS</u>
			PNP	<u>GP20-D0200P-CY6C3U2-BS</u>
	<p>Quick Disconnect (Pico-Style)</p> 	<p><b>10 -30V DC</b> (SN=20~40mm)</p>	NPN	<u>GP20-D0040N-CY6Q4UP-BS</u>
			PNP	<u>GP20-D0040P-CY6Q4UP-BS</u>
		<p><b>10 -30V DC</b> (Sn=30~100mm)</p>	NPN	<u>GP20-D0100N-CY6Q4UP-BS</u>
			PNP	<u>GP20-D0100P-CY6Q4UP-BS</u>
		<p><b>10 -30V DC</b> (Sn=30~200mm)</p>	NPN	<u>GP20-D0200N-CY6Q4UP-BS</u>
			PNP	<u>GP20-D0200P-CY6Q4UP-BS</u>
<p>6" Pigtail (Pico-Style)</p> 	<p><b>10 -30V DC</b> (SN=20~40mm)</p>	NPN	<u>GP20-D0040N-CY6P4UP-BS</u>	
		PNP	<u>GP20-D0040P-CY6P4UP-BS</u>	
	<p><b>10 -30V DC</b> (Sn=30~100mm)</p>	NPN	<u>GP20-D0100N-CY6P4UP-BS</u>	
		PNP	<u>GP20-D0100P-CY6P4UP-BS</u>	
	<p><b>10 -30V DC</b> (Sn=30~200mm)</p>	NPN	<u>GP20-D0200N-CY6P4UP-BS</u>	
		PNP	<u>GP20-D0200P-CY6P4UP-BS</u>	

**Note:**

Coming Soon : Part numbers with underline

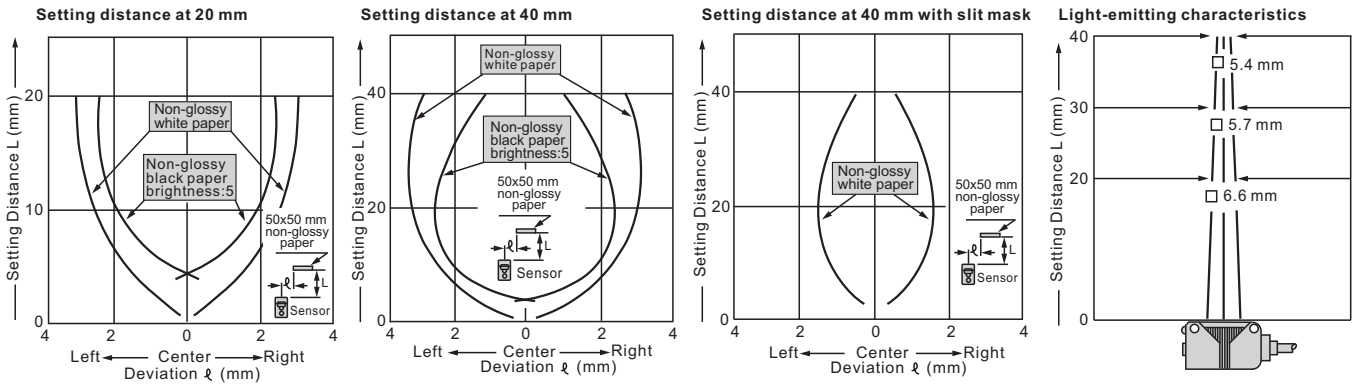
In Preparation: Part numbers with a line through the middle

## Specifications

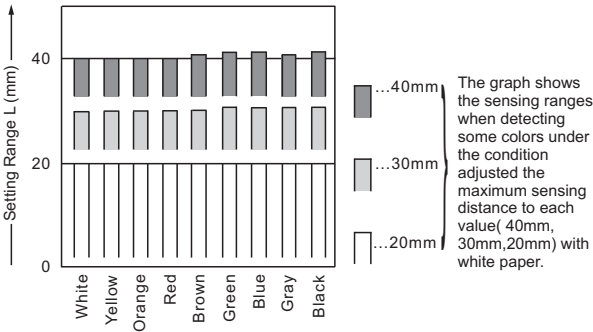
Type		Diffuse Mode with Background Suppression					
		NPN output type			PNP output type		
Item	Model No.	CP20-D0040N-CY6x4Ux-BS	CP20-D0100N-CY6x4Ux-BS	CP20-D0200N-CY6x4Ux-BS	CP20-D0040P-CY6x4Ux-BS	CP20-D0100P-CY6x4Ux-BS	CP20-D0200P-CY6x4Ux-BS
<b>Sensing distance</b>		20 to 40mm	30 to 100mm	30 to 200mm	20 to 40mm	30 to 100mm	30 to 200mm
<b>Detectable target</b>		More than 30x30 mm					
<b>Hysteresis</b>		5% or less of sensing distance		20% or less of sensing distance	5% or less of sensing distance		20% or less of sensing distance
<b>Repeat accuracy</b>		Along sensing axis: 1mm or less , Perpendicular to sensing axis: 0.2mm or less (with non-glossy white paper)					
<b>Power source</b>		10 to 30V DC 10% Ripple P-P: Less than 10%					
<b>Current consumption</b>		Less than 45mA			Less than 50mA		
<b>Sensing output</b>		NPN open-collector transistor Sink current : Max. 100mA Applied voltage: Max. 30V DC Residual voltage: Less than 1.0V at 100mA sink current Less than 0.4V at 16mA sink current			PNP open-collector transistor Source current : Max. 100mA Applied voltage: Max. 30V DC Residual voltage: Less than 1V at 100mA source current Less than 0.4V at 16mA source current		
	<b>Output operation</b>	Light-ON/Dark-ON selectable with selection switch					
	<b>Short-circuit protection</b>	Incorporated					
<b>Response time</b>		Less than 1 ms					
<b>Operation indicator</b>		Red LED(Lights up when the sensing output is ON)					
<b>Stability indicator</b>		Green LED(Lights up under stable light received condition or stable dark condition)					
<b>Distance adjuster</b>		2 turn adjuster with indicator					
<b>Environmental resistance</b>	<b>Protection</b>	IP 67					
	<b>Ambient temperature</b>	-20 to +55°C (No dew condensation or icing allowed), storage: -25 to +70°C					
	<b>Ambient humidity</b>	35 to 85 % RH, Storage:35 to 85 % RH					
	<b>Extraneous light</b>	Sunlight: 10000 lx at the light receiving face, Incandescent light: 3000 lx at the light-receiving face.					
	<b>Noise</b>	Power line: 240Vp with 0.5us pulse duration, Radiation: 600Vp with 0.5us pulse duration (by noise simulator)					
	<b>Dielectric</b>	1000 V AC applied between live parts and enclosure for 1 min.					
	<b>Insulation</b>	More than 20M Ω applied between live parts and enclosure at 250V DC					
	<b>Vibration</b>	3mm amplitude at frequency of 10 to 500Hz in each of X, Y and Z directions for 2 hours each					
	<b>Shock</b>	500m/s <sup>2</sup> (approx.50G) impulse in each of X, Y and Z directions for 3 times each					
<b>Emitting element</b>		Red LED (modulated)					
<b>Material</b>		Enclosure: PBT (polybutylene terephthalate), lens: acrylic, front cover: acrylic					
<b>Cable</b>		0.2mm <sup>2</sup> 4-cores of oil, heat and cold resistant cable of 2m long					
<b>Cable extension</b>		Extension up to total 100m by using a min. 0.3mm <sup>2</sup> cable					
<b>Pigtail and connector</b>		Connector type: 4pins M8 Pico-style; Pigtail type: See <b>Pigtail Series</b> or our <b>Cables &amp; Connectors</b> catalogue.					
<b>Weight</b>		85g approx.					

## Sensing Characteristics (Typical)

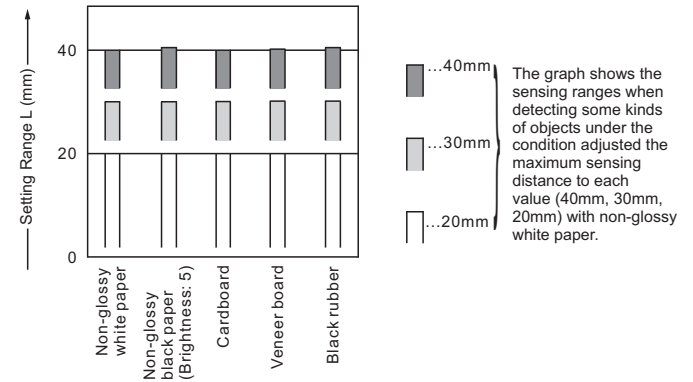
### CP20-D0040N(P)... (Sensing Range=40mm)



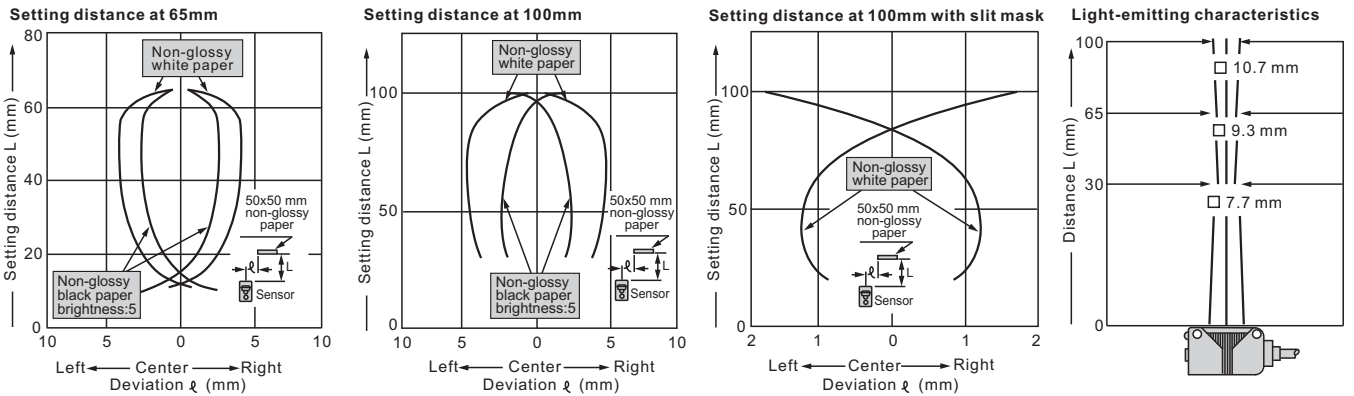
Correlation between color (50x50mm) and sensing range



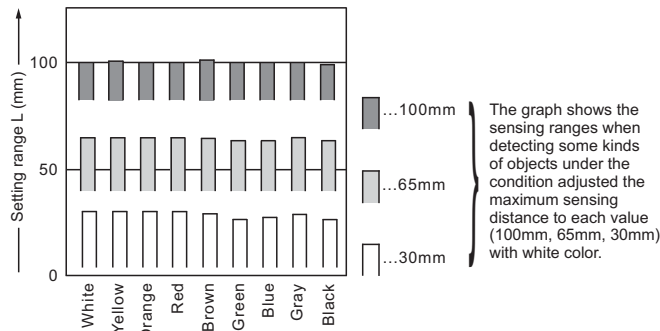
Correlation between material (50x50mm) and sensing range



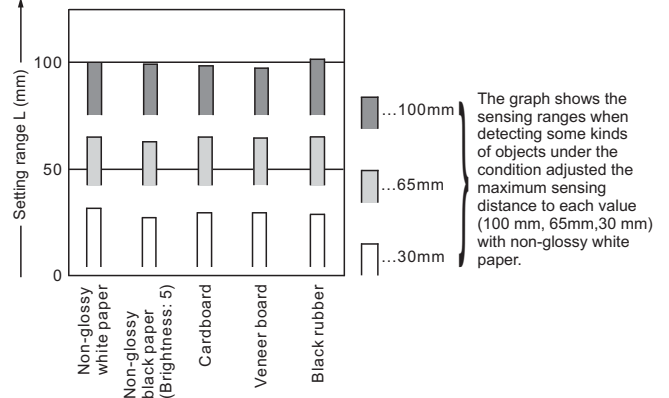
### CP20-D0100N(P)...(Sensing Range=100 mm)



Color (50x50mm)--Sensing range correlation

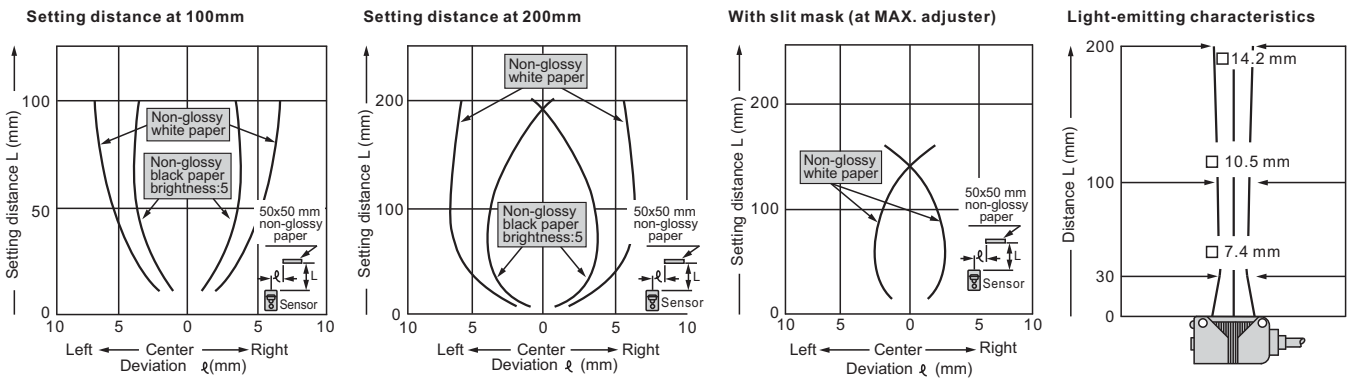


Material (50x50mm)--Sensing range correlation

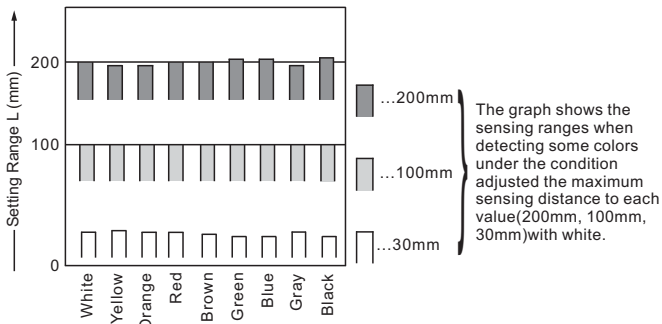


## Sensing Characteristics (Typical)

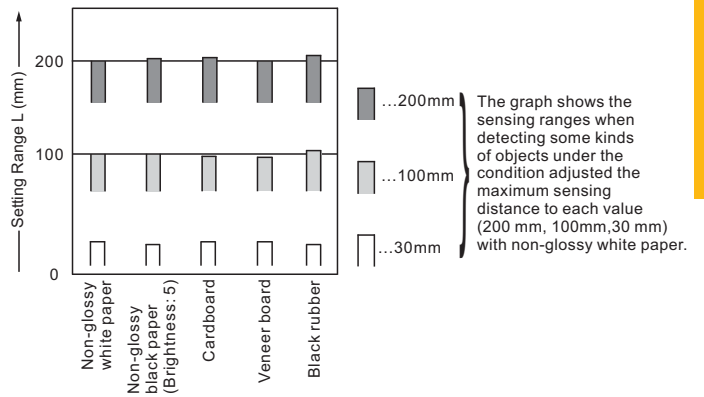
### CP20-D0200N(P)... (Sensing Range=200 mm)



#### Correlation between color (50x50mm) and sensing range

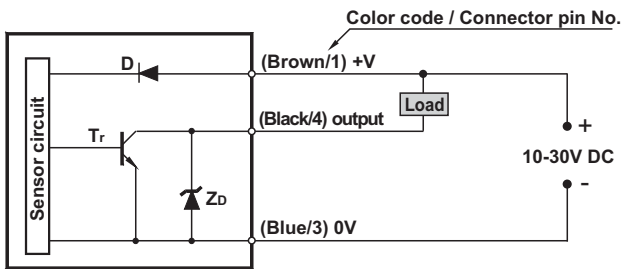


#### Correlation between material (50x50mm) and sensing range



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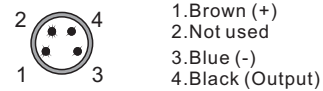
### NPN Output Type



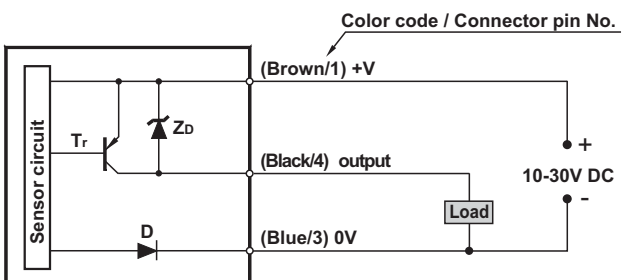
Symbol...D: Reverse polarity protection diode.  
 Zd: Surge absorption zener diode.  
 Tr: NPN output transistor.

#### Connector face view

##### Pico-Style



### PNP Output Type



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

#### Connector face view

##### Pico-Style



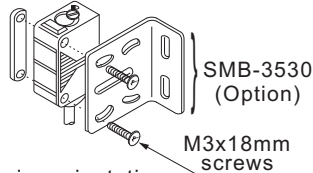
## Precautions For Proper Use



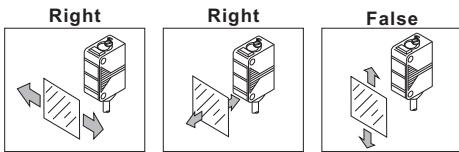
This products is not a safety sensor designed to intend to protect life and prevent bodily injury or property damage from dangerous parts of machinery, but a normal object detection sensor.

### Mounting

Tightening torque should be 0.5N m{5.1kgf cm} or less.



Notice must be taken of the sensing orientation of the sensor against the moving direction or objects.



Do not make the sensor aim at an object on the left because it may cause the unstable detection.

Sensing object Sensing object Sensing object  
Neither specular objects such as aluminum foil, copper foil, or so nor shiny materials painted or coated might be detected on condition with some sensing angle error or wrinkles on their surfaces.

Tilt the sensor upwards to prevent an unexpected missdetection where a specular material presents under it.

The sensor should lose the detect ability if any specular or shiny materials behind objects might slightly change the angle toward it (background influence). In such case, the sensor should be angled against them and fixed again, then tested the operation to eliminate any miss-detection.

Notice that the sensor compulsory goes into the light condition (ON) when much excessive ambient light is received.

Notice that a dead zone will appear in right front of the sensor when the distance adjuster is set in NEAR side.

### Distance adjustment

<Adjusters>

Stable operation indicator(green)

(Lights under the stable light condition or the stable dark condition)

Distance adjuster(two turns)  
(The sensing range lengthens by turning it clockwise.)

Operation indicator(red)

Lights when the sensing output is ON.

Operation mode switch

L: Sensing ON

D: Sensing OFF

(Turn the switch fully)

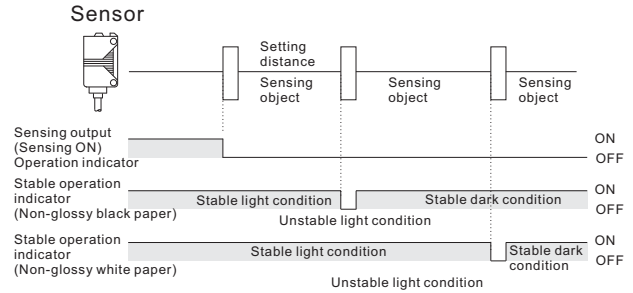
<Setting procedure>

①	Turn the distance adjuster fully counterclockwise to take the minimum setting position (about 30mm or 20mm with CP20-D0040N-xX6x4Ux and CP20-D0040P-xX6x4Ux).	
②	Place an object at a certain distance from the sensor, turn the distance adjuster gradually clockwise, and find out "A" point where the sensor changes into the light condition.	
③	Remove the object, turn the distance adjuster still clockwise, and find out "B" point where the sensor changes into the light condition again with only a background. (When the sensor does not go into the light condition until the adjuster is fully turned clockwise, "B" point should be at the maximum point in the range.)	
④	The optimum position to stably detect objects must be the center between "A" and "B" point.	

(\*1): in order to protect itself, notice that the distance adjuster idles if turned fully

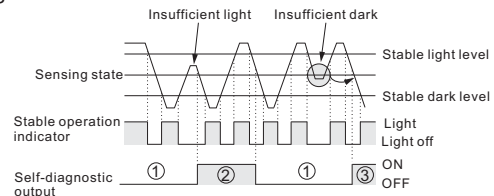
### Stable operation indicator

CP20 series avails PSD inside as a beam-receiving device and recognizes where the beam is received, not how much the beam is received as standard diffuse reflective sensors work. Notice that the positions where the stable operation indicator lights off vary by the dissimilar reflective ratio of objects instead of the same detecting position. Do not have the sensor detect objects where the stable indicator lights off (in the unstable light condition).



### Self-diagnostic output

The self-diagnostic output is in the ON state when the light-receiving intensity is reduced due to dirty lens and/or alignment deviation.



- ① The self-diagnostic output transistor is in the ON state during the stable sensing.
- ② If the sensor does not arrive at either stable light level or stable dark level when the sensing output turns on or off, the self-diagnostic output turns on.
- ③ If the light is insufficient intensity, there will be a time lag before the self-diagnostic output turns on.

### Wiring

Short-circuit protection is not equipped for the self-diagnostic output. Do not connect it directly to the power supply or capacitive load.

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 readily available in the market for the power supply, always ground the frame ground(F.G)terminal.

When using equipment which generates the noises (switching regulator or inverter motor, etc.) Near the sensor, ground the frame ground(F.G.) Terminal of equipment.

Do not run sensor cables near high-voltage lines or power lines, nor put them together in the same raceway. Doing so may cause malfunctions due to inductive interference.

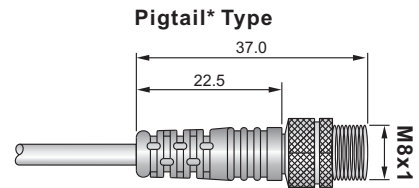
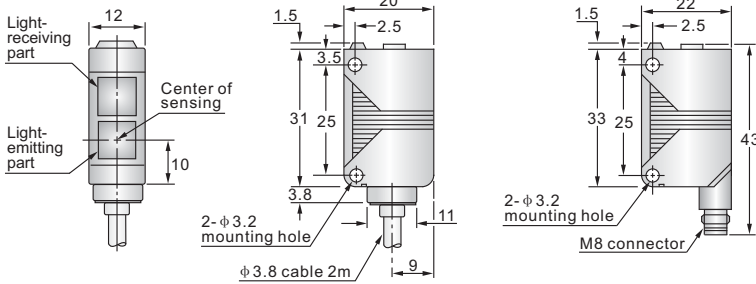
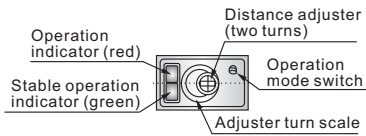
### Others

Do not use the sensor output signal for 50ms immediately after the power is supplied to the sensor.

Avoid places where the sensor may be directly exposed to fluorescent lights with rapid-starters or high frequency lighting as it may affect the sensing performance.

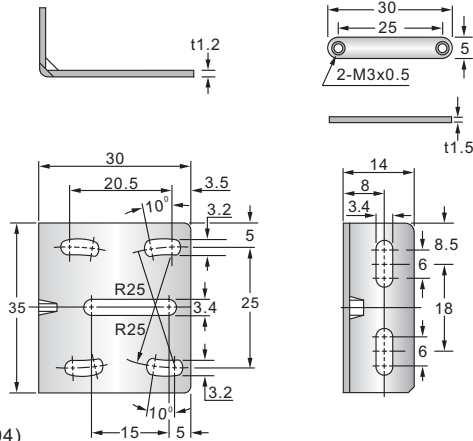
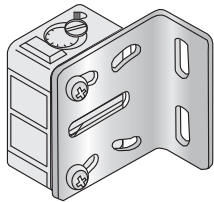
## Dimensions (Unit: mm)

### Sensor Type

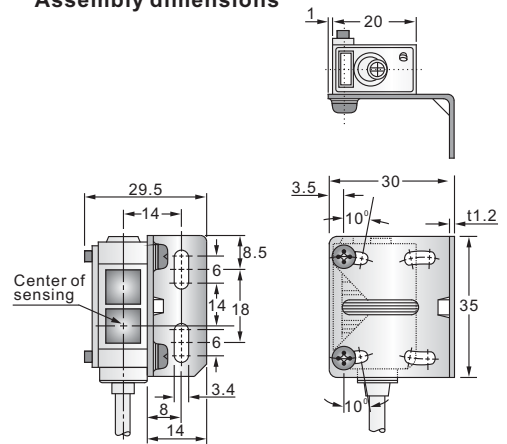


\*: Please see **Pigtail Series** or our **Cables & Connectors** catalogue for more information.

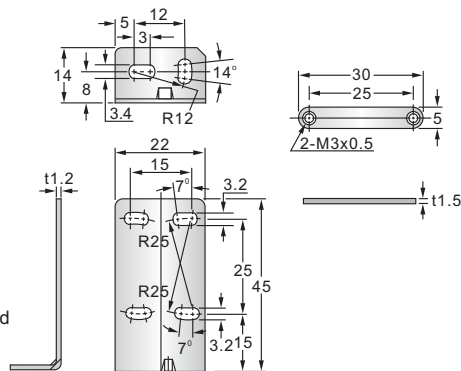
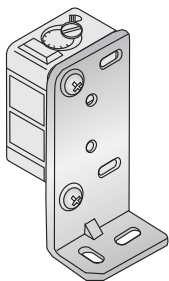
### MB-3530 (Sensor mounting bracket-optional)



### Assembly dimensions



### MB-4522 (Sensor mounting bracket-optional)



### Assembly dimensions

