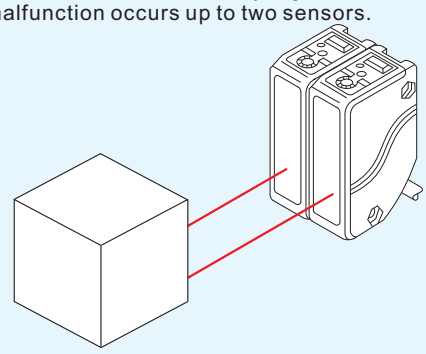
Advantage & Applications

Advantage

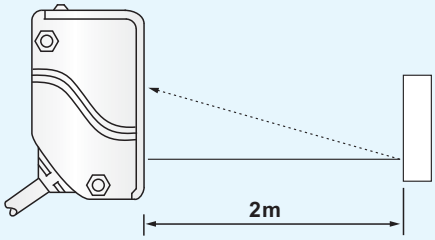
Automatic crosstalk prevention

Until the CP68 series, no other fixed-field sensing sensor has been equipped with the automatic crosstalk prevention. Even if mounted closely together or face to face, no malfunction occurs up to two sensors.



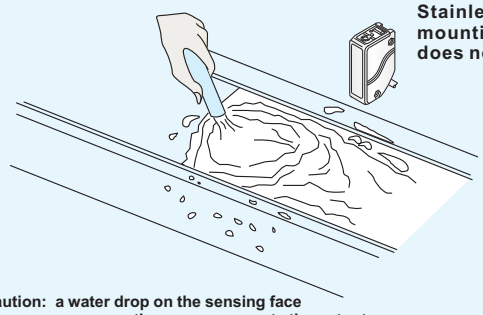
Long sensing range 2 m

The CP68 series catches an object 2m away. Long-range fixed-field sensing with sharp beam gives a variety of new ideas for your applications such as linear positioning or wide range detecting.



Waterproof

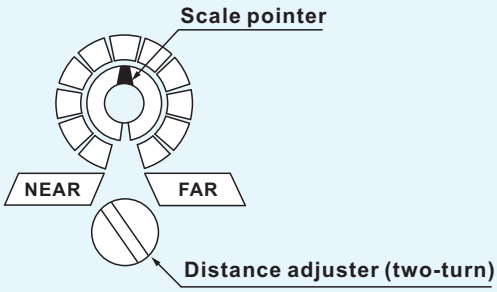
Achieves IP 67. The sensor can be put on machinery washed with water. The mounting bracket (option) is not corrosive as it is made of stainless steel material.



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

Two-turn adjuster with the indicator

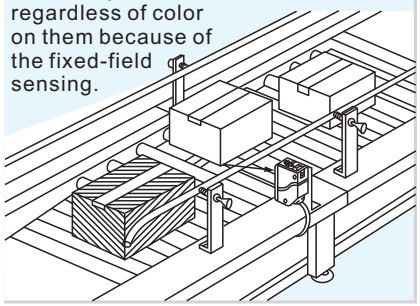
The CP68 series features the mechanical two-turn distance adjuster and the scale pointer that shows the set distance remarkably.



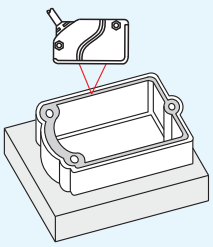
Applications

Detecting cardboard boxes passing by

It securely detects cardboard boxes regardless of color on them because of the fixed-field sensing.

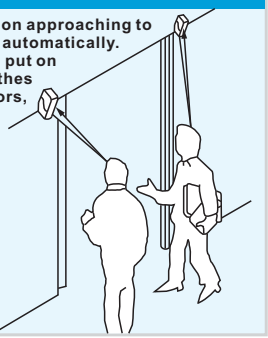


Detecting Gasket on Die-casting

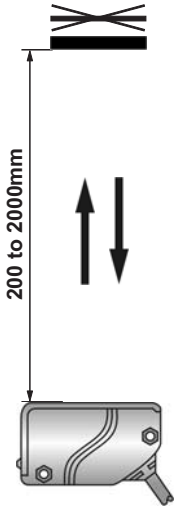


Detecting people in front of automatic door

They detect person approaching to the door to open automatically. Although people put on own-desired clothes with various colors, they perfectly detect people.



Diffuse Mode with Background Suppression (Sn=2000 mm)

Sensing Mode	Connection	Supply Voltage	Output Mode	Part Number
Light Source: Infrared LED	2m Cable 	10-30V DC	NPN	~~CP68-D2000N-CY9C3U2-BS~~
			PNP	~~CP68-D2000P-CY9C3U2-BS~~
			NPN/PNP	~~CP68-D2000D-CY9C4U2-BS~~
		12~240V DC/ 24~240V AC	SPDT Relay L.O./D.O. (4-wire)	CP68-D2000R-CY9C4L2-BS
			SPST Solid-state L.O./D.O. (2-wire)	~~CP68-D2000C-CY9C2U2-BS~~
	Quick Disconnect 	10-30V DC (Euro-style)	NPN	~~CP68-D2000N-CY9Q4UE-BS~~
			PNP	~~CP68-D2000P-CY9Q4UE-BS~~
			NPN/PNP	~~CP68-D2000D-CY9Q4UE-BS~~
		12~240V DC/ 24~240V AC (Micro-style)	SPDT Relay L.O./D.O. (4-wire)	~~CP68-D2000R-CY9Q4LM-BS~~
			SPST Solid-state L.O./D.O. (2-wire)	~~CP68-D2000C-CY9Q3UM-BS~~
Diffuse Mode (with Background Suppression) Sensing Distance: 200 to 2000mm	6" Pigtail 	10-30V DC (Euro-style)	NPN	~~CP68-D2000N-CY9P4UE-BS~~
			PNP	~~CP68-D2000P-CY9P4UE-BS~~
			NPN/PNP	~~CP68-D2000D-CY9P4UE-BS~~
		12~240V DC/ 24~240V AC (Micro-style)	SPDT Relay L.O./D.O. (4-wire)	CP68-D2000R-CY9P4LM-BS
			SPST Solid-state L.O./D.O. (2-wire)	~~CP68-D2000C-CY9P3UM-BS~~

Av: CP68 SERIES

Note:
Coming Soon : Part numbers with underline
In Preparation: Part numbers with a line through the middle

Specifications (DC)

Item \ Type	Diffuse Mode with Background Suppression	
	NPN output type	PNP output type
Model No.	CP68-D2000N-CY9xxUx-BS	CP68-D2000P-CY9xxUx-BS
Adjustable range	0.2 to 2m	
Sensing range(with white non-glossy paper and adjuster in Max.)	0.1 to 2m	
Hysteresis	10% or less at operation distance	
Repeatability	Beam axial: 10mm or less, Perpendicular to beam axis: 1mm or less	
Supply voltage	10 to 30V DC Ripple P-P: 10% or less	
Current consumption	50mA or less	55mA or less
Sensing output	NPN open-collector transistor Maximum sink current: 100mA Applied voltage: 30V DC or less Residual voltage: 1V or less(at 100mA sink current) 0.4V or less (at 16mA sink current)	PNP open-collector transistor Maximum source current: 100mA Applied voltage: 30V DC or less Residual voltage: 1V or less(at 100mA source current) 0.4V or less (at 16mA source current)
Output operation	Selectable either Normally Open or Normally Closed	
Short-circuit protection	Incorporated	
Response time	2ms or less	
Operation indicator	Red LED (lights up when the output is activated)	
Stability indicator	Green LED (lights up during the stable Light or the stable Dark condition).	
Distance adjuster	Mechanical two-turn adjuster with scale pointer	
Automatic crosstalk prevention function	Incorporated	
Environmental resistance: Protection	IP 67	
Environmental resistance: Ambient temperature	-20 to +55℃(No dew condensation nor icing allowed), storage:-25 to +70℃	
Environmental resistance: Ambient humidity	35 to 85% RH, Storage: 35 to 85% RH	
Environmental resistance: Ambient light	Sunlight: 10000ℓx at the light receiving face, Incandescent light: 3000ℓx at the light-receiving face.	
Environmental resistance: Noise immunity	Power line: 240Vp, 10ms cycle, and 0.5us pulse duration. (With noise simulator) Radiation: 300Vp,10ms cycle, and 0.5us pulse duration	
Environmental resistance: Withstand voltage	AC 1000V for one min. Between all terminals connected and enclosure.	
Environmental resistance: Insulation resistivity	20MΩ or more at 250V Megger between all terminals connected and enclosure.	
Environmental resistance: Vibration-proof	10 to 55Hz frequency, 0.75mm amplitude, and X, Y, and Z directions each for two hours (unenergized)	
Environmental resistance: Shock-proof	500m/s² acceleration (approx.50G), and X, Y, and Z directions each for three times(unenergized)	
Emitting element	Infrared LED (modulated)	
Material	Polyarilate	
Connections	**Cable type:** 2m long PVC , **Connector type:** M12(Euro-style) connector, **Pigtail type:** See **Pigtail Series** or our **Cables & Connectors** catalogue.	
Cable extension	Extendable up to 100m long with equivalent cable of which core is 0.3mm² or more	
Weight	Approx. 150g	

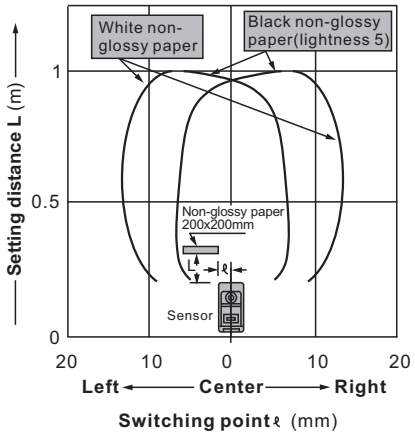
Specifications (AC/DC)

Item \ Type / Model No.	Diffuse Mode with Background Suppression
	RP68-D2000R-CY9C4L2-BS (Relay Type) **RP68-D2000C-CY9C2U2-BS** (2-wire type)
Sensing range	0.2 to 2m
Sensing object	Opaque, translucent or transparent object
Hysteresis	10% or less of sensing distance
Repeatability	0.3mm or less
Supply voltage	12 to 240V DC 10% or 24 to 240V AC 10% Ripple P-P 10% or less
Switching Current Max.	3 VA
Current consumption	< 30mA (no load)
Output	**Relay contact 1c** • Switching capacity:250V AC 1A (resistive load) 30V DC 2A (resistive load) • Electrical life:100,000 or more operations (at rated AC load) 500,000 or more operations (at rated DC load) • Mechanical life:100,000,000 or more operations
Light/Dark Operation	Light-ON/Dark-ON selectable via switch
Response time/Frequency	< 20ms / 25 Hz
Operation indicator	Red LED (lights up under stable light received condition or stable dark condition)
Stability indicator	Green LED (lights up under stable light received condition or stable dark condition)
Sensitivity adjuster	Continuously variable adjuster
Interference immunity	Incorporated (Two units of sensors can be mounted closely.)
Pollution degree	3 (Industrial environment)
Enclose category	IP 66 (IEC)
Ambient temperature	-20 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: 11,000 x at the light receiving face, Incandescent light: 3000 x 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	IEC 60947-5-2 Parts 8.3.3.4, or 500V DC for one min between all supply terminals connected together and enclosure
Insulation resistance	20MΩ ,or more, with 500V DC megger between all supply terminals
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)
Material	Enclosure: Acrylonitrile Butadine Styrene (ABS), Lens: Polycarbonate, Cover: Acrylonitrile Butadine Styrene (ABS), Front cover: Acrylic (retroreflective type sensor only)
Connections	**Cable type:** 2m long PVC cable , **Connector type:** M12(Micro-style) connector, **Pigtail type:** See **Pigtail Series** or our **Cables & Connectors** catalogue.
Cable extension	Extendable up to 100m long with equivalent cable of which core is 0.3mm² or more
Weight	150g approx.

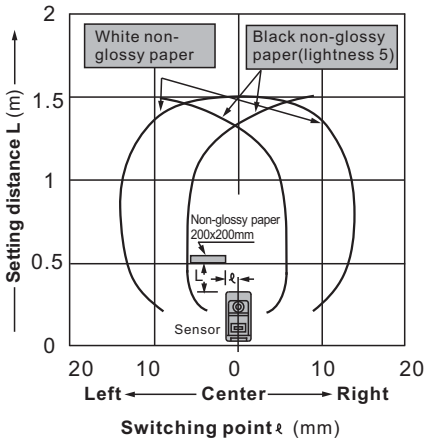
Sensing Characteristics (Typical)

Sensing Fields

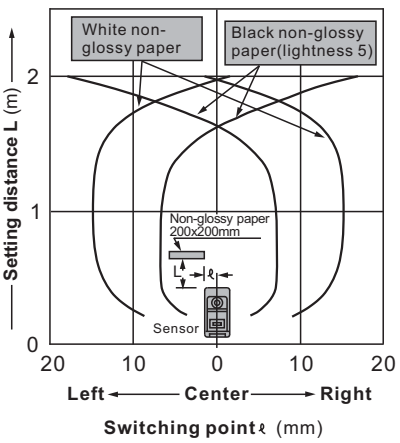
• Setting distance: 1m



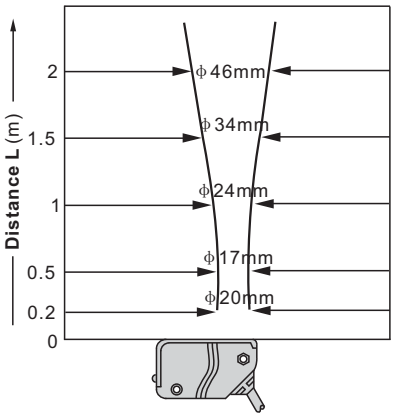
• Setting distance: 1.5m



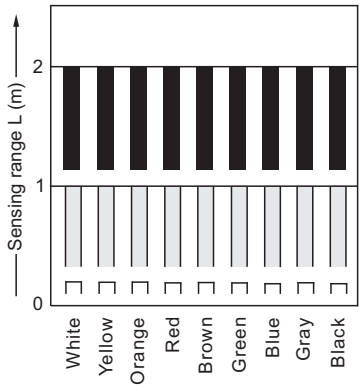
• Setting distance: 2m



Emitting Beam



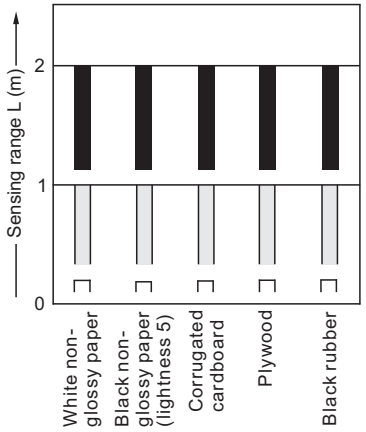
Correlation between color (200x200mm non-glossy paper) and sensing range



...2m
...1m
...0.2m

These bars indicate the sensing range with the respective colors when the distance adjuster is set at the sensing range of **2m**,**1m** and **0.2m** long, each, with white color. The sensing distance varies depending also on material.

Correlation between material (200x200mm) and sensing range

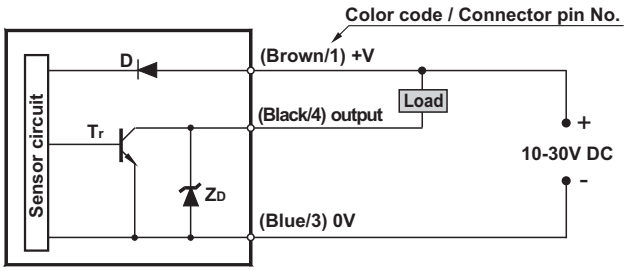


...2m
...1m
...0.2m

Thes bars indicate the sensing range with respective objects when the distance adjuster is set at the sensing range of **2m**, **1m** and **0.2m** lon, each, with white non-glossy paper.

Connection Diagrams

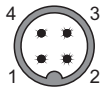
NPN output type



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

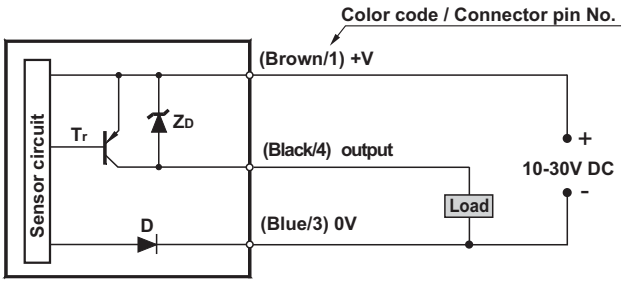
Connector pin position

Euro-style



1.Brown (+)
2.Not used
3.Blue (-)
4.Black (Output)

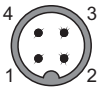
PNP output type



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

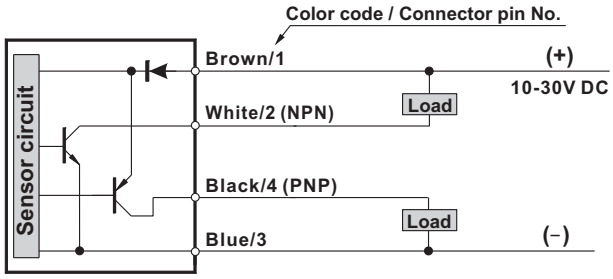
Connector pin position

Euro-style



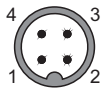
1.Brown (+)
2.Not used
3.Blue (-)
4.Black (Output)

NPN/PNP output type



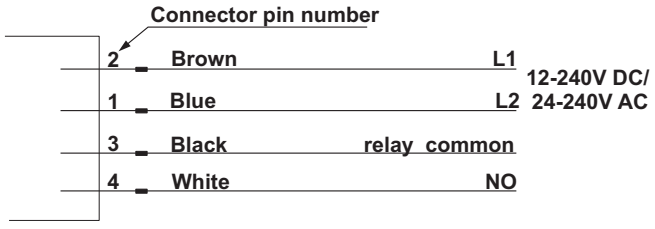
Connector pin position

Euro-style



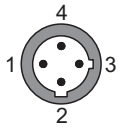
1.Brown (+)
2.White (NPN output)
3.Blue (-)
4.Black (PNP output)

Relay output (AC/DC)



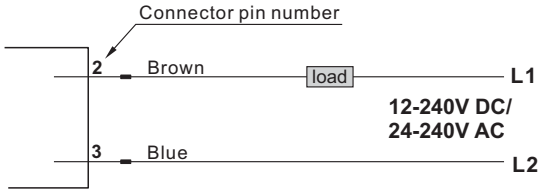
Connector pin position

Micro-style



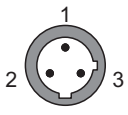
1.Red/black(L2)
2.Red/white (L1)
3.Red (relay common)
4.Green (N.O.)

SPST Solid-state output type (AC/DC)



Connector face view

Micro-style



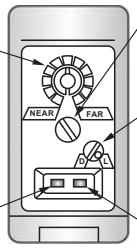
1.Not used
2.Red/black (L1)
3.Red/white (L2)

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.

Distance adjustment

<Adjusters' top view>



Distance adjuster (two-turn)
(As it is turned more clockwise, the sensing range increases.)

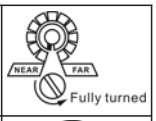
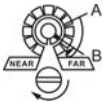
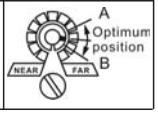
Adjuster indicator
(Shows how much the distance adjuster is rotated)

Operation mode switch
L:Normally Open
D:Normally Closed
(turn the switch up to either end.)

Operation indicator(red)
Lights up when the outputs is activated

Stability indicator (green)
(Lights up under the stable Light or the stable Dark condition)

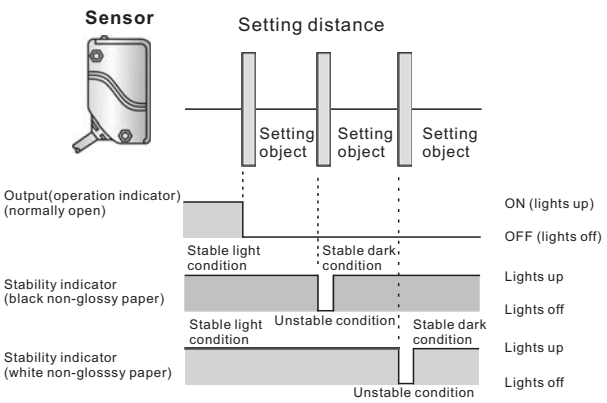
<Adjusting procedure>

1	Turn the distance adjuster counterclockwise fully to the minimum distance of approx. 0.2m.	 Fully turned
2	Locate your sample object at the place that you expect the sensor to detect. Turn the adjuster gradually clockwise and find out the point A where the sensor goes into the light condition.	 A
3	Remove the object. Turn the adjuster clockwise until the sensor goes into the light condition again. Once it switches on, turn the adjuster back a little until the sensor goes into the dark condition where called the point B . (If the sensor does not go into the light condition over the scale without the object, the point B shall be identified as the maximum point in the scale.)	 A B
4	Settle the adjuster at the center between the point A and B that should be the optimum setting point to detect you object.	 A Optimum position B

(*1): Turn the distance adjuster gradually and lightly with the attached screwdriver. If the distance adjuster is over-turned or pressed heavily, it may be damaged.

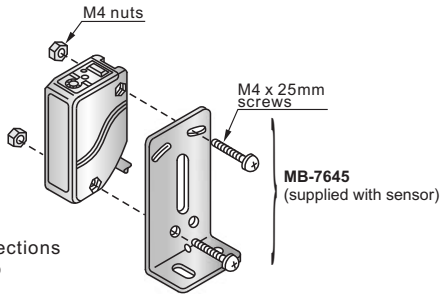
Stability indicator

CP68 series incorporates the two-divided photo-diode as the receiving element. The sensor compares two parts of it; which one receives incident beam reflected by an object more intensely to the other. Because this optical system is based on the angle of incident beam, the sensor generates output relating to the distance between the sensor and the object. However, the stability indicator signifies the sufficiency of incident beam, not the distance operating. As an object is approaching to the sensor, the unstable condition that the indicator light off and immediately on again arises before the maximum operating point that the operation indicator lights up. It also shifts according to the difference of reflection ratio among objects. Make sure that the stability indicator always lights up while the sensor is detecting your object.

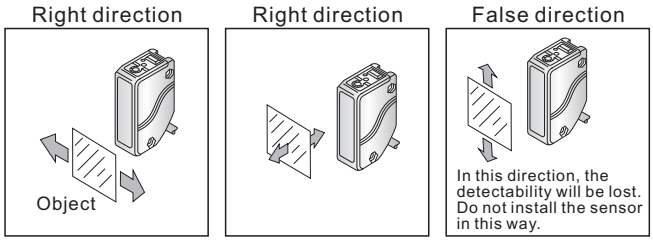


Mounting

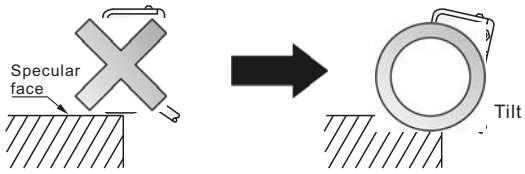
- Tightening torque should be 0.8N m {8.2kgf cm} or less



- Make sure which directions your objects move to the sensor.



- If your object is specular such as aluminum foil or copper foil, or its surface is painted or coated glossily, the sensor may not detect it by wrinkle on it or the severity of the sensing angle.
- Tilt the sensor slightly upwards to prevent the irregular reflection where the sensor is placed on a specular substance.



- If there is a specular substance or the like beyond the sensing field, the sensor may lose the detectability by slight angle change or motion of it. In such case, angle the sensor not to be affected and test the detectability in actual.
- Some object may produce the dead zone right in front of the sensor.

Wiring

- Do not supply power while wiring.
- Verify that supply voltage ripple is within the rating.
- With a commercial switching regulator, ground the F.G. Terminal.
- Where equipment generating noise such as a switching regulator or an inverter motor is placed around the sensor, ground its F.G. Terminal.
- Do not run the sensor cable along any high-voltage or power cable in parallel or in a same raceway. It may cause a malfunction by induction.

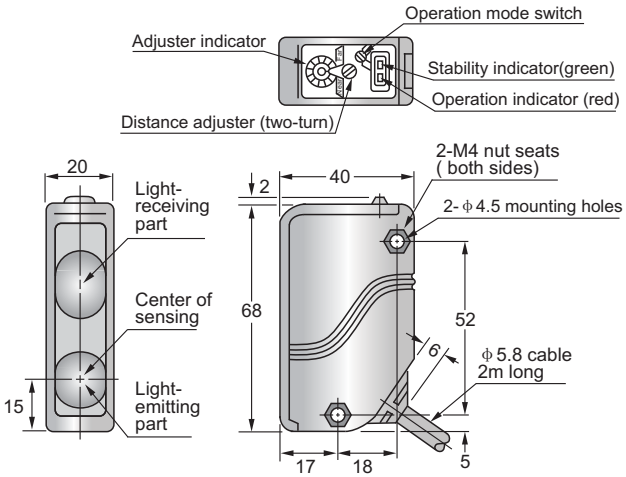
Other

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

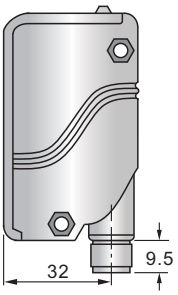
Avoid places where the sensor will be directly exposed to fluorescent lamp of rapid starter or high frequency lighting as it may affect the sensing performance.

Dimensions (Unit: mm)

Sensor Type

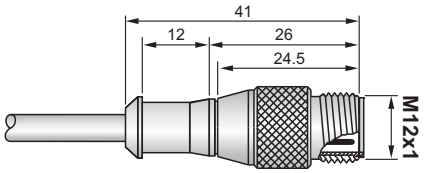


Cable Type



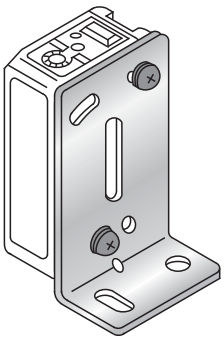
Connector Type

Pigtail* Type

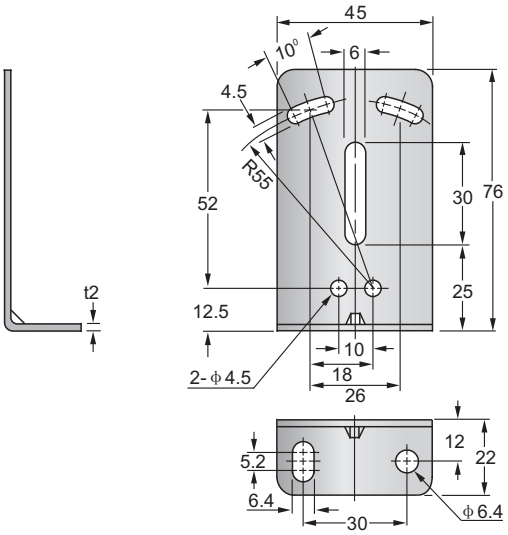


*: Please see **Pigtail Series** or our **Cables & Connectors** catalogue for more information.

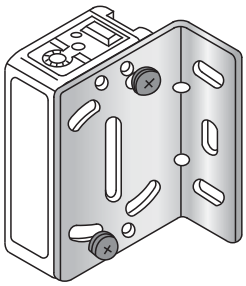
MB-7645 (Sensor mounting bracket-supplied with sensor)



Material: Cold rolled carbon steel (SPCC)
Two M4 (length 25mm) screws with washers and two M4 nuts are attached.



MB-6954 (Sensor mounting bracket-optional)



Material: Cold rolled carbon steel (SPCC)
Two M4 (length 25mm) screws with washers and two M4 nuts are attached.