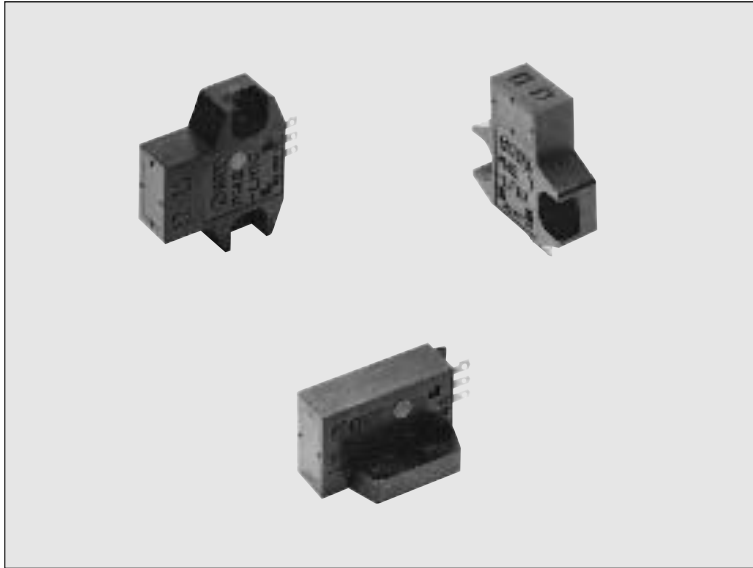


# PM2 SERIES

## Convergent Reflective Micro Photoelectric Sensor

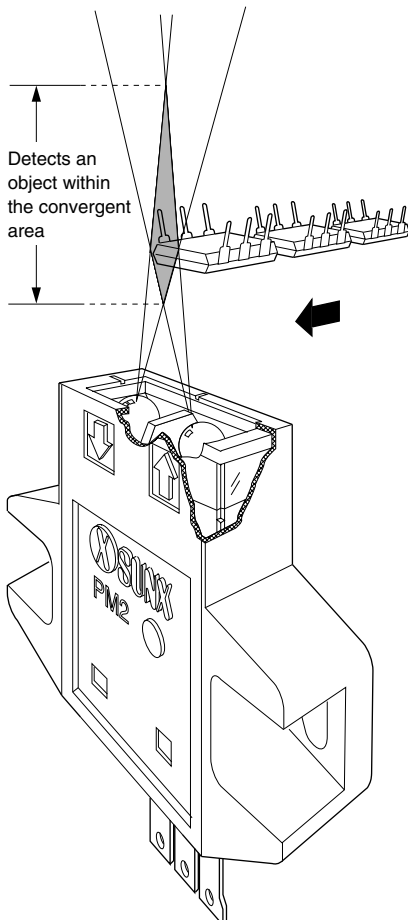


**Convergent Reflection Sensing Ensures Stable Detection**

**CE Marked**  
Conforming to EMC Directive

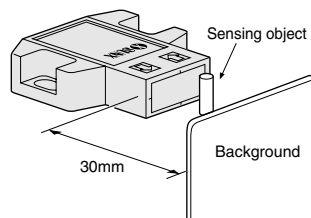
### Stable Detection by Convergent Reflective Mode

Stable detection characteristics are obtained since it is convergent reflective type and senses a limited area.



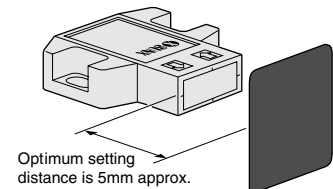
### Not Affected by Background

Even a specular background does not affect the sensing performance if the sensor is located 30mm away from it (when directly opposite).



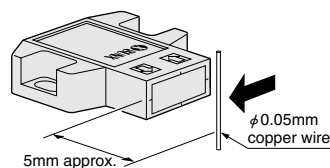
### Dark Object Detectable

Since the sensor is very sensitive, it can detect even a dark object of low reflectivity.



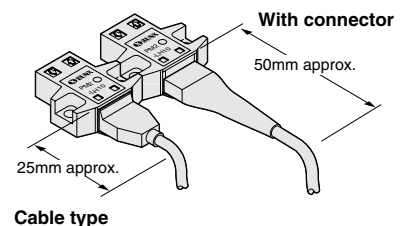
### Minute Object Detectable

A  $\phi 0.05\text{mm}$  copper wire can be detected at a distance of 5mm.



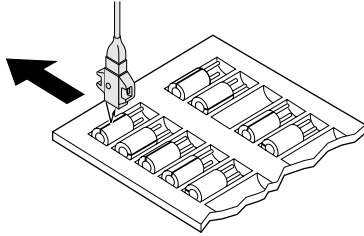
### Cable Type is also Available

Cumbersome soldering is not required. It saves space and improves reliability.

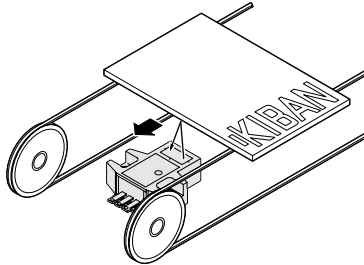


## APPLICATIONS

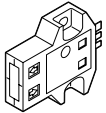
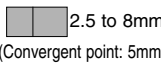
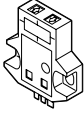
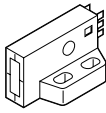
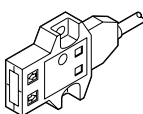
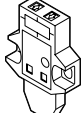
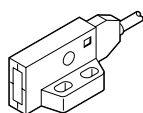
Sensing capacitors in a tray



Sensing printed circuit boards



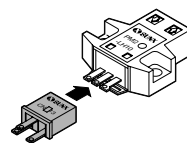
## ORDER GUIDE

Type	Appearance	Sensing range	Model No.	Output operation
Connector type		 2.5 to 8mm (Convergent point: 5mm)	<b>PM2-LH10</b>	Light-ON
			<b>PM2-LH10B</b>	Dark-ON
			<b>PM2-LF10</b>	Light-ON
			<b>PM2-LF10B</b>	Dark-ON
			<b>PM2-LL10</b>	Light-ON
			<b>PM2-LL10B</b>	Dark-ON
Cable type		<b>PM2-LH10-C1</b>	Light-ON	
		<b>PM2-LH10B-C1</b>	Dark-ON	
		<b>PM2-LF10-C1</b>	Light-ON	
		<b>PM2-LF10B-C1</b>	Dark-ON	
		<b>PM2-LL10-C1</b>	Light-ON	
		<b>PM2-LL10B-C1</b>	Dark-ON	

## OPTIONS

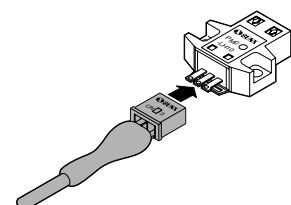
Designation	Model No.	Description
Connector	<b>CN-13</b>	Dedicated connector
Mating cable	<b>CN-13-C1</b>	0.2mm <sup>2</sup> 3-core cabtyre cable, 1m long
	<b>CN-13-C3</b>	0.2mm <sup>2</sup> 3-core cabtyre cable, 3m long

Connector



Mating cable

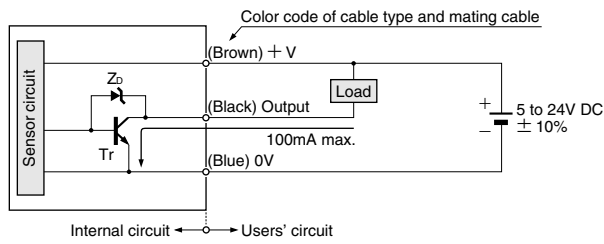
- CN-13-C1
- CN-13-C3



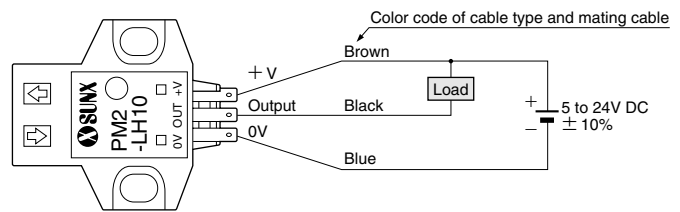


## I/O CIRCUIT AND WIRING DIAGRAMS

### I/O circuit diagram



### Wiring diagram

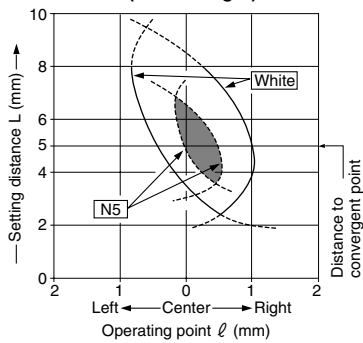


Symbols ... Zb: Surge absorption zener diode  
Tr: NPN output transistor

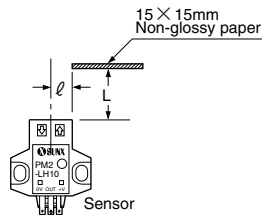
## SENSING CHARACTERISTICS (TYPICAL)

### Sensing fields

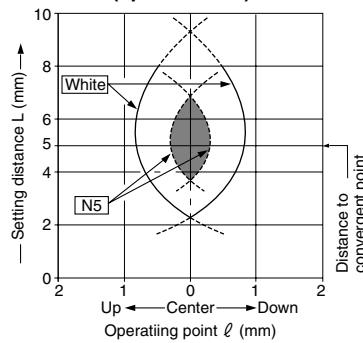
#### • Horizontal (left and right) direction



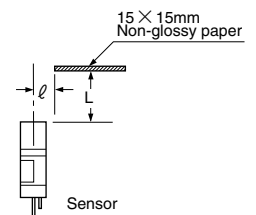
#### Horizontal direction



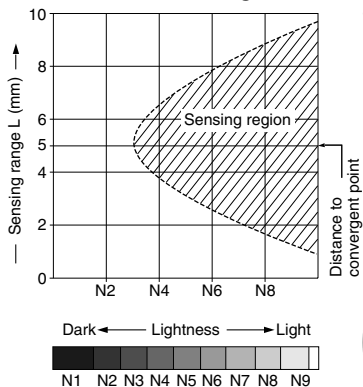
#### • Vertical (up and down) direction



#### Vertical direction

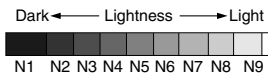


### Correlation between lightness and sensing range

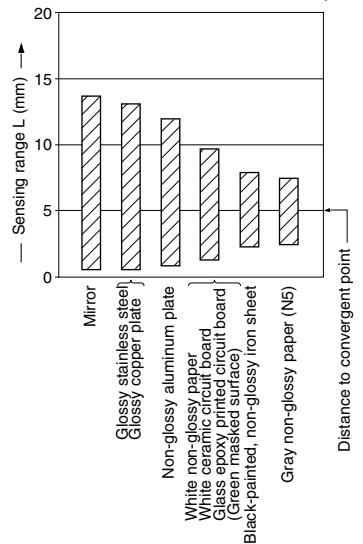


The sensing region is represented by oblique lines in the left figure. However, the sensitivity should be set with enough margin because of slight variation in products.

(Lightness shown on the left may differ slightly from the actual object condition.)



### Correlation between material (15x15mm) and sensing range



The bars in the graph indicate the sensing range for the respective material. However, there is a slight variation in the sensing range depending on the product. Further, if there is a reflective object (conveyer, etc.) in the background of the sensing object, since it affects the sensing, separate it by more than twice the sensing range shown in the left graph.

# PM2

## PRECAUTIONS FOR PROPER USE

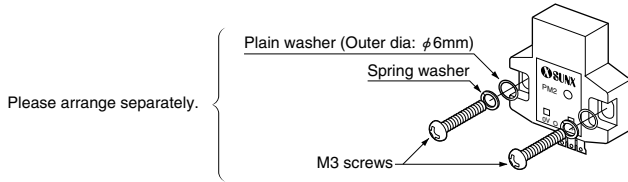
### All models



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

- When fixing the sensor with screws, use M3 screws and the tightening torque should be 0.49 N·m or less. Further, use small, round type plain washers ( $\phi$  6mm).

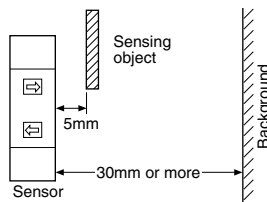


### Wiring

- Make sure to connect terminals correctly as the sensor does not incorporate a reverse polarity protection circuit.
- If the sensor is being used in a noisy environment, examine the extent of noise. Further, if equipment, such as motor, solenoid or electromagnetic valve, which generates a large surge, is present near the sensor, connect a surge absorber to the equipment.

### Setting

- The optimum setting distance (distance to convergent point) is 5mm. The sensor is not affected even by a specular background if it is located 30mm, or more, away from the sensor (when directly opposite).



### Others

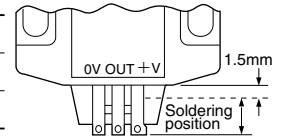
- Do not use during the initial transient time (50ms) after the power supply is switched on.
- Take care that the product does not come in direct contact with oil, grease, or organic solvents, such as, thinner, etc.

### Connector type

#### Soldering

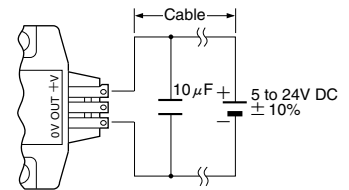
- Solder the terminals under the following conditions.

Soldering temperature	260°C or less
Soldering time	10 sec. or less
Soldering position	Refer to the figure on the right



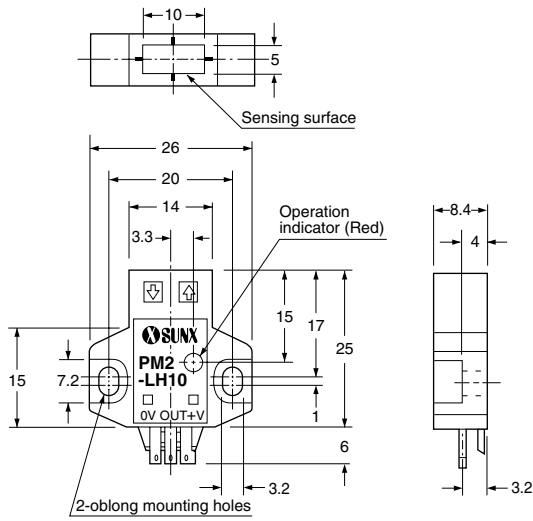
#### Wiring

- The cable length must be 2m, or less, with 0.3mm<sup>2</sup>, or more, cable. If the cable is extended for more than 2m, connect a capacitor of 10 $\mu$ F approx. between +V and 0V terminals.

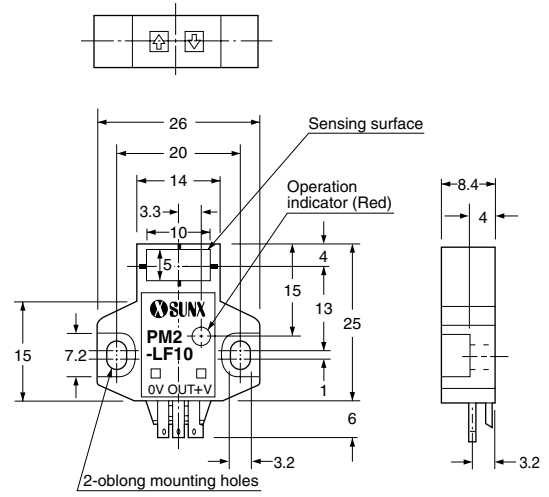


## DIMENSIONS (Unit: mm)

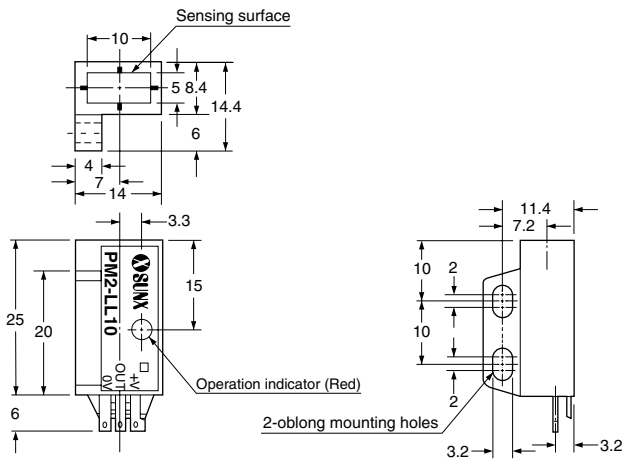
**PM2-LH10**  
**PM2-LH10B** Sensor



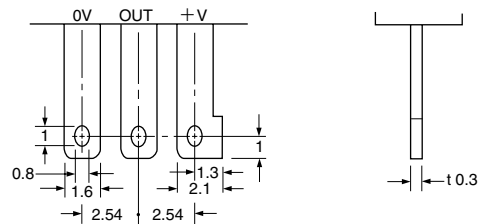
**PM2-LF10**  
**PM2-LF10B** Sensor



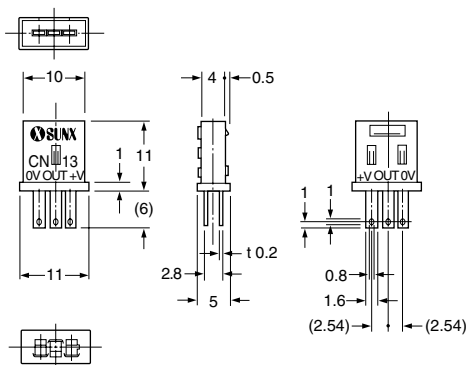
**PM2-LL10**  
**PM2-LL10B** Sensor



※ Terminal part (Connector type)



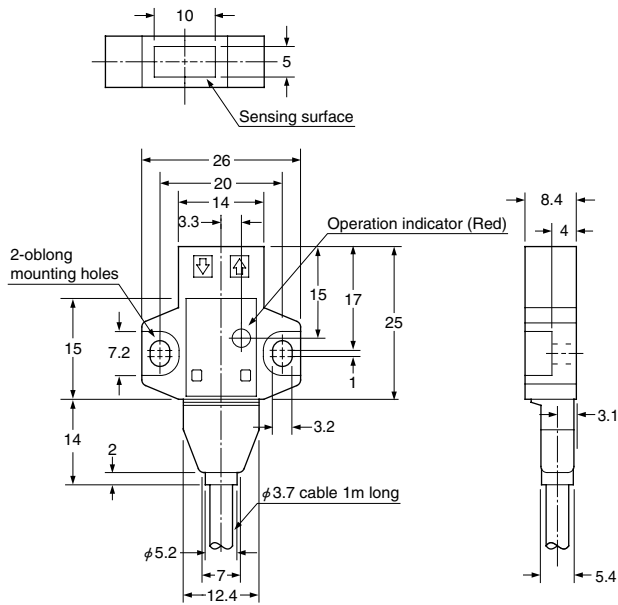
**CN-13** Connector



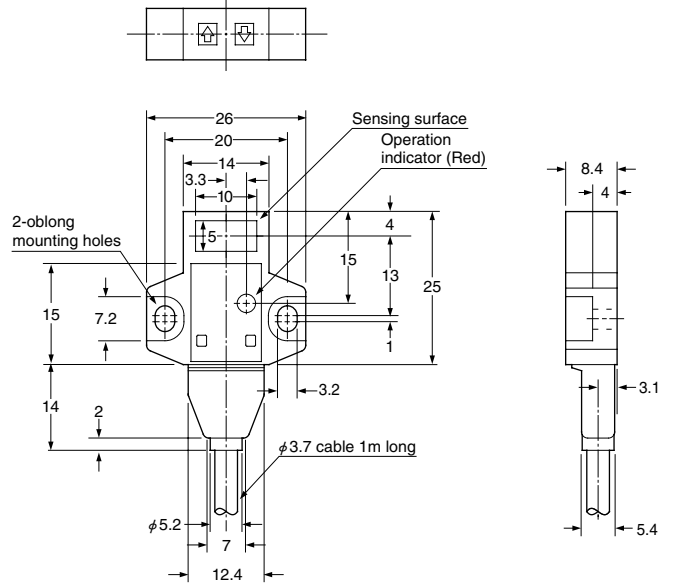
# PM2

## DIMENSIONS (Unit: mm)

**PM2-LH10-C1**  
**PM2-LH10B-C1** Sensor



**PM2-LF10-C1**  
**PM2-LF10B-C1** Sensor



**PM2-LL10-C1**  
**PM2-LL10B-C1** Sensor

