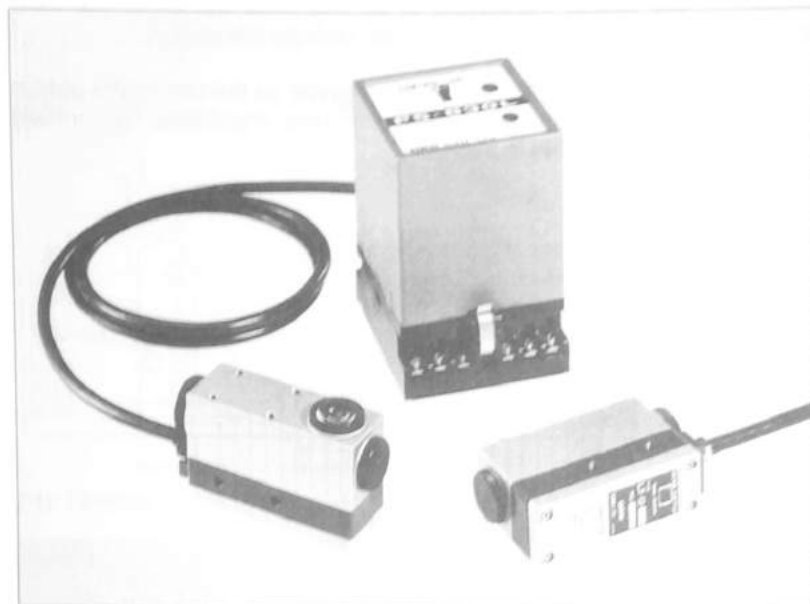


LX-12N

SERIES

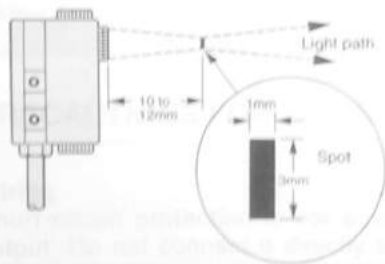
Color Mark Sensor



**Color Sensing
Capability Close to the
Human Eyes**

High Sensitivity for Color Detection

Sunx's unique circuit technology and optical system achieved color sensing which was as close to the human eyes as possible.

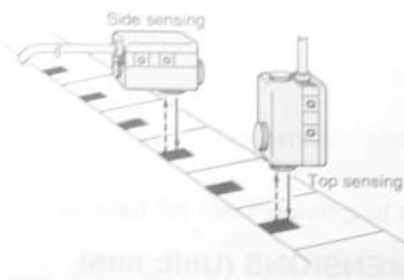


High-speed Response Time

A high-speed travelling object is reliably detected due to the response time is $10\mu\text{s}$.
(Max. frequency: 100kHz)

Selectable Sensing Direction

Top sensing or side sensing is easily selected by changing the mounting position of the lens unit.

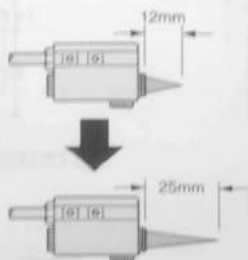


Equipped with Multi-turn Optical Adjuster

A multi-turn optical adjuster for a sharp sensitivity adjustment provides strong resistance against a supply voltage fluctuation and a temperature drift.

Two Types of Sensing Ranges

The standard sensing range is 12mm and it can be extended to 25mm by applying an optional lens unit.

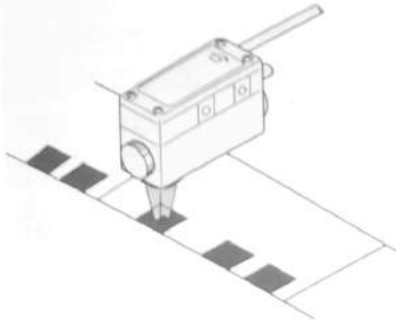


Long Life

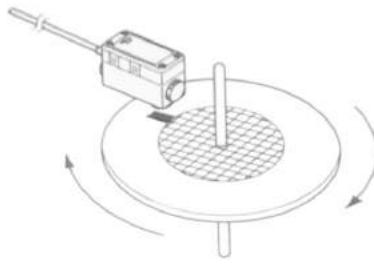
A life is 10,000 hours even with an optical tungsten-filament lamp.

APPLICATIONS

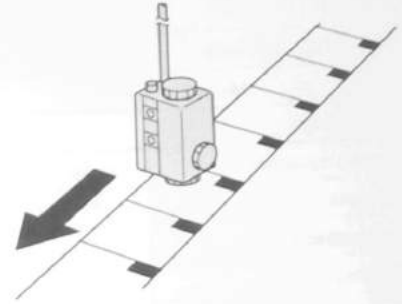
Sensing of color mark defects



Disc mark sensing



Resistor mark sensing



ORDER GUIDE

Sensor

Appearance	Sensing range	Model No.
	<p>Center 10 to 12mm</p>	LX-12N
		LX-12NS (Equipped with an operation mode selection switch)

Controller

Appearance	Model No.	Timer function (*1)
	PS-830L	—
	PS-830L-OND-5S	Equipped with an ON-delay timer
	PS-830L-OFD-5S	Equipped with an OFF-delay timer
	PS-830L-OSD-5S	Equipped with an ONE-SHOT timer

(*1) : T = 0.05 to 5sec.

OPTIONAL

Component	Model No.	Description
Lens unit	LE-25	Center of sensing is 25mm.

LX-12N

SPECIFICATIONS

Sensor

Data		Type	Color mark sensor
			Equipped with an operation mode selection switch
Model No.		LX-12N	LX-12NS
Sensing range		Center : 10 to 12mm	
Min. sensing object		Width of 0.1mm for a black line on a white paper	
Hysteresis		0.1mm (Vertical direction for light axis at the central sensing range)	
Supply voltage		Amplifier part : 10 to 30V DC, Lamp part : 4.0V AC \pm 10%	
Consumption		Amplifier part : Max. 30mA, Lamp part : Max. 1.3A	
Output		NPN transistor Non-contact Current sink : Max. 80mA Residual voltage : Max. 1V (at 80mA current sink)	
Output operation		Light-ON	Selection of Light-ON / Dark-ON by a switch
Response time		10 μ s (Response frequency : Max. 100kHz)	
Operation indicator		Red LED (turns on at the light-receiving condition)	
Sensitivity adjuster		Equipped with a multi-turn optical adjuster	
Environmental resistance	Protection	IP66 (IEC 144)	
	Ambient temperature	- 10 to + 40°C (with no dew nor ice condensation), Storage : - 10 to + 40°C	
	Ambient humidity	35 to 85%RH, Storage : 35 to 85%RH	
	Ambient light	1,000 lx (Ambient light intensity varying in value so that the sensor is capable of discriminating 63% to 88% of the white reflection)	
	Vibration	1.5mm amplitude at the frequency of 10 to 55Hz in each of X, Y and Z directions for 2 hours each in the power OFF state	
Shock	100m/s ² (approx. 10G) impulse in each of X, Y and Z directions for 3 times each in the power OFF state		
Light emitting source		Optical tungsten-filament lamp (Average life : approx. 10,000 hours)	
Grounding method		C (capacitor) grounding	
Material		Enclosure : Zinc alloy die casting, Lens : Glass	
Cable		5 cores (0.4mm ² \times 2, 0.3mm ² \times 3) with 2m of cabtyre cable	
Cable extension		Extensible up to 15m by using the same cable as above and 50m by using a min. 1.25mm ² cable.	
Weight		Approx. 450g	
Accessories		L-12 (hood) : 1 pc.	



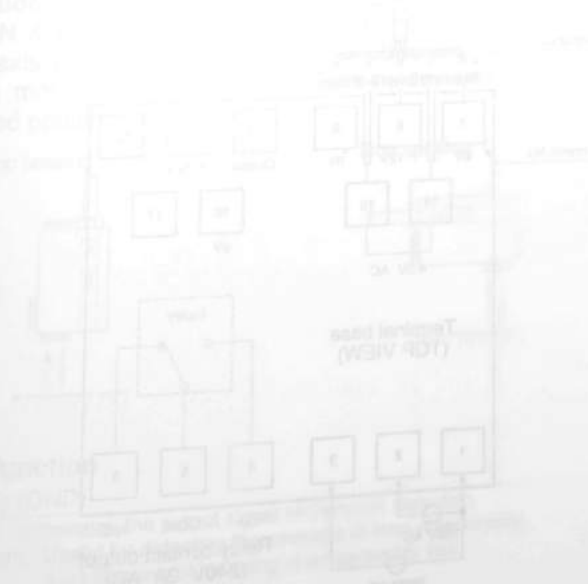
OPTIONAL

SPECIFICATIONS

Controller

Data	Type	Controller			
	Model No.	PS-830L	PS-830L-OND-5S	PS-830L-OFD-5S	PS-830L-OSD-5S
Supply voltage		100-200V AC \pm 10%			
Consumption		Max. 12VA			
Supply voltage for sensor		12V DC 100mA, 4.0V AC 1.3A (for lamp part) supplied			
Output		Relay contact 1c Switching capacity : 240V 2A AC (resistive load) Response time : Max. 20ms Rated load life : Min. 500,000 operations		NPN transistor · Non-contact Current sink : Max. 80mA Residual voltage : Max. 1V (at 80mA current sink) Response time : Max. 100 μ s	
	Output operation	Normal operation (Relay output is in the ON state and non-contact output is in the OFF state when the sensor input is in the ON state) / Reverse operation Selected by a switch			
Power indicator		Red LED (turns on when the power is in the ON state)			
Operation indicator		Red LED (turns on when the output is in the ON state)			
Timer function (0.05 to 5sec.)		—	Equipped with ON-delay timer	Equipped with OFF-delay timer	Equipped with ONE-SHOT timer
Ambient temperature		- 10 to + 50 °C (with no dew nor ice condensation), Storage : - 10 to + 50 °C			
Ambient humidity		35 to 85%RH, Storage : 35 to 85%RH			
Material		Enclosure : ABS, Terminal part : phenol			
Weight		Approx. 740g (including the terminal base)			
Accessories		TB-83 (Terminal base, supplied with a clamp bracket) : 1 pc.			

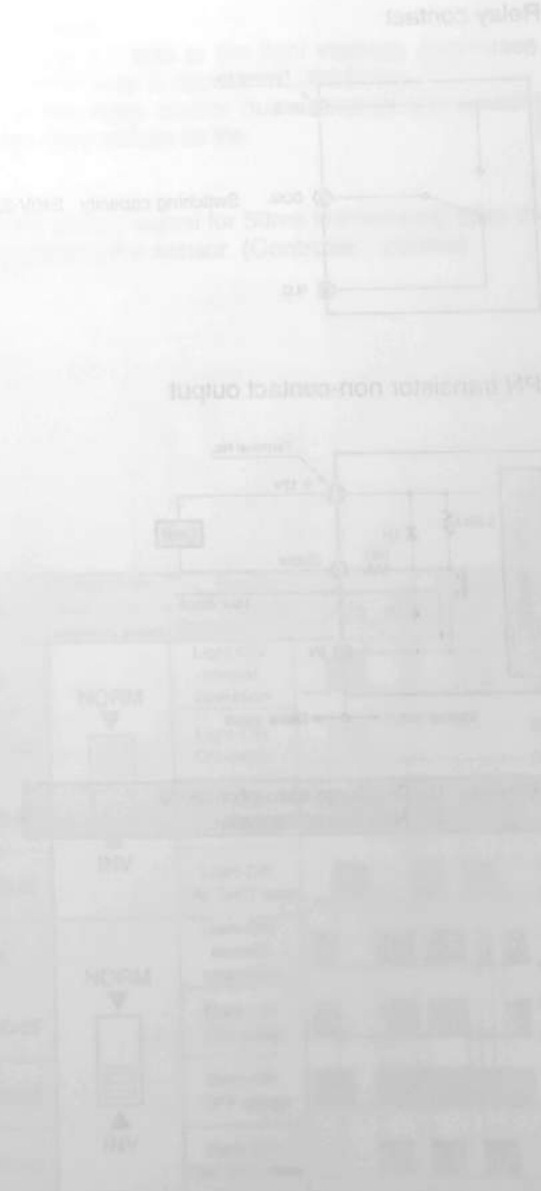
Selection
LX-12N
light sub.
on the top
required part



Timer function
ON-delay (OND)

OFF-delay (OFD)

ONE-SHOT (OSD)

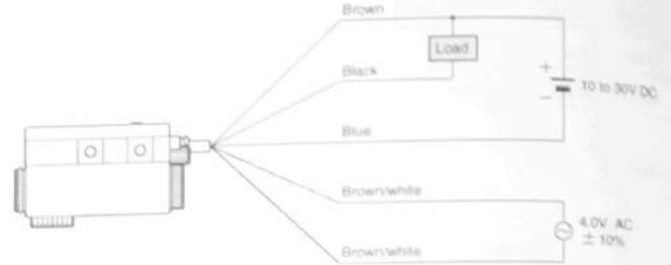
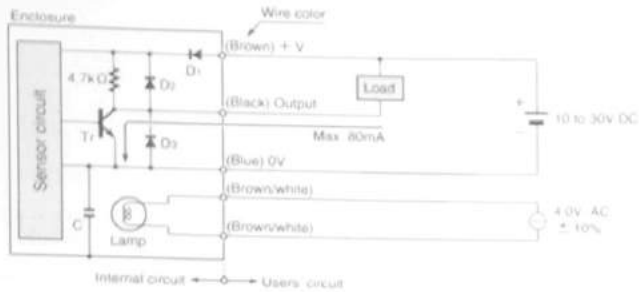


LX-12N

TYPICAL WIRING DIAGRAMS

Wire color has been changed in accordance with the IEC standard.

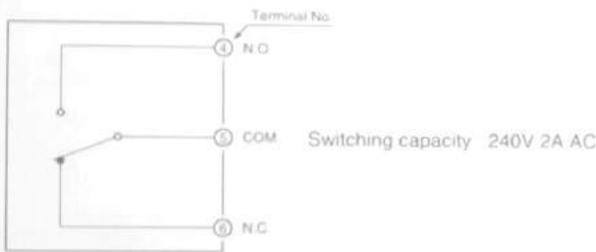
Sensor



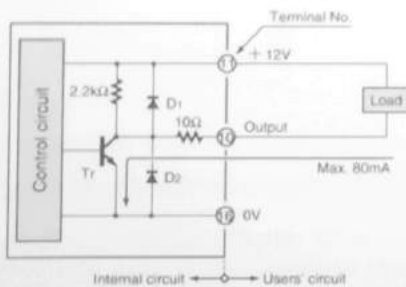
Symbol ... D₁ : Reverse polarity protection diode
 D₂, D₃ : Surge absorption diode
 C : Capacitor
 Tr : NPN output transistor

Controller

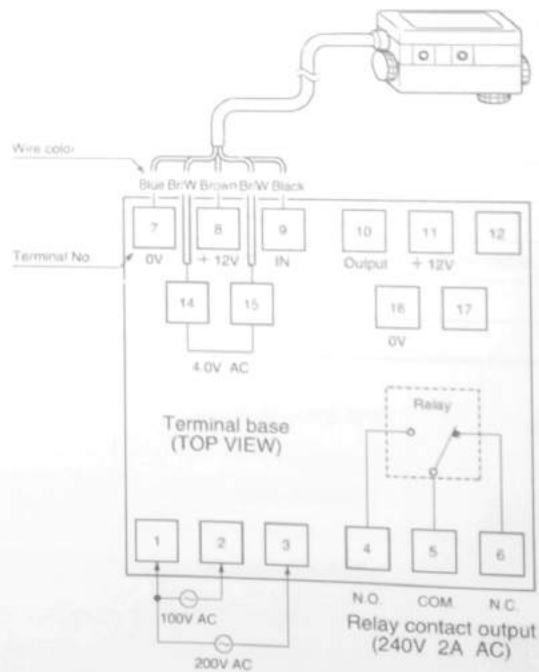
• Relay contact



• NPN transistor non-contact output



Symbol ... D₁, D₂ : Surge absorption diode
 Tr : NPN output transistor

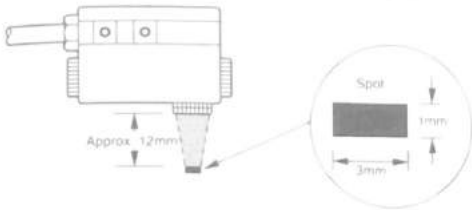


PRECAUTIONS FOR PROPER USE

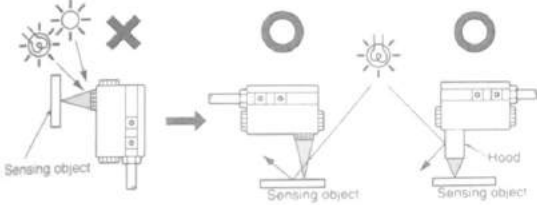
Refer to P. 467 for general cautions

Setting
LX-12N & LX-12NS have C (capacitor) grounding for improving noise resistance. When equipments and machines, such as ultrasonic welding machines, etc., which generate high-frequency noises are placed near the sensor, or the mounting base is of conductive material, insulate the sensor and mounting base.

Optimum setting distance between the lens face and sensing object surface is approx. 12mm. (Spot size approx. 1 × 3mm)



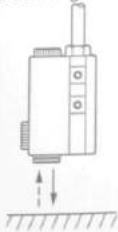
In case the sensor is exposed to the ambient light, be aware of the mounting direction of the sensor. If such ambient light cannot be avoided, put the accessory hood on the sensor.



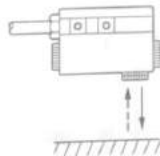
Selection of the light axis direction

LX-12N & LX-12NS is of a coaxial reflective type and the light axis direction is changed by 90 degrees. Depending on the mounting space, shift the lens holder and cap to the required position.

• Top sensing

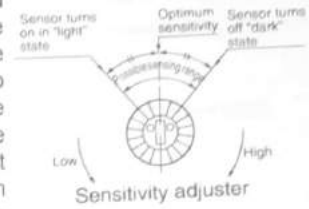


• Side sensing



Sensitivity adjustment

Set the sensitivity adjuster to the min. position. Turn the adjuster clockwise slowly, and reach the point where the sensor turns on in "light" state by a high reflective object. To reach the point where the sensor turns off in "dark" state by a low reflective object. Set the adjuster halfway between these two points for the optimum sensitivity. (Adjuster can be turned approx. eight times.)



When sensing a delicate and slight color difference such as light yellow on a white paper, warm up the sensor for 30 to 60 minutes prior to the sensitivity adjustment. (Especially when the possible sensitivity adjustment is max. 1/6 of one turn.)

Connection

Short-circuit protection is not equipped for the Non-contact output of **LX-12N**, **LX-12NS** and **PS-830L**. Do not connect if directly to the power supply or capacitive load.

Lamp replacement

Replace the lamp if it fails or the light intensity decreases. Average life of the lamp is approx. 10,000 hours. (Vibration of the lamp and/or fluctuation of the power) input voltage may reduce its life.

Others

Do not use the sensor signal for 50ms immediately after the power is supplied to the sensor. (Controller : 250ms)

Timer function

ON-delay (OND)

(Function) : Eliminates the output signal of transient detection.
 (Application) : Useful for detecting the passage of long objects only. e.g.) Sensing of jamming in an assembly line

OFF-delay (OFD)

(Function) : Prolongs the actual device signal for a predetermined period of time.
 (Application) : Useful if the connecting device has a slow response speed and cannot be activated by a short signal from the sensor.

ONE SHOT-delay (OSD)

(Function) : Makes all output signals to have a same predetermined period of time.
 (Application) : Suitable for the connecting device which requires an input signal consistent period of time. Also effective to make the individual short signals to have a required period of time.

Other various applications are possible with these timer functions.

Model No.	Setting of operation mode selection switch	Sensing state	
		Operation	Light / Dark
PS-830L	NORM ▼ [Switch] ▲ INV	Light-ON normal operation	ON / OFF
PS-830L-OND-5S		Light-ON ON-delay	ON / OFF
PS-830L-OFD-5S		Light-ON OFF-delay	ON / OFF
PS-830L-OSD-5S		Light-ON ONE SHOT-delay	ON / OFF
PS-830L	NORM ▼ [Switch] ▲ INV	Dark-ON normal operation	ON / OFF
PS-830L-OND-5S		Dark-ON ON-delay	ON / OFF
PS-830L-OFD-5S		Dark-ON OFF-delay	ON / OFF
PS-830L-OSD-5S		Dark-ON ONE SHOT-delay	ON / OFF

T = 0.05 to 5sec

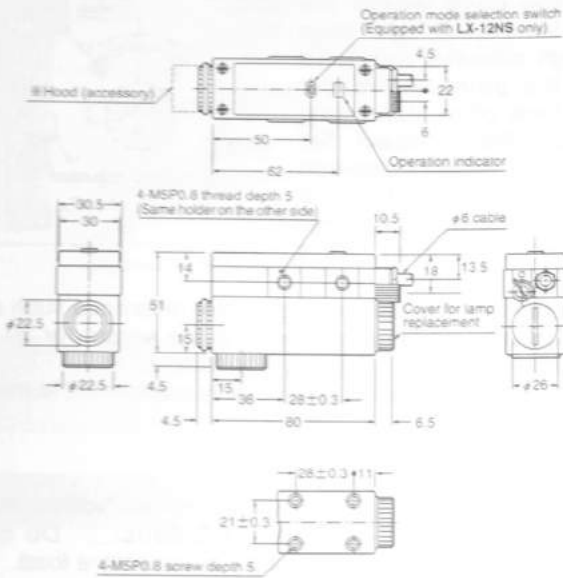
(*1) : The output operation of the above list is for the relay output. Note that the output operation is reverse for the non-contact output.
 (*2) : PS-830L-OND-5S and PS-830L-OFD-5S are operated normally by setting the timer adjuster to the minimum (50ms delay is engaged).

LX-12N

DIMENSIONS (Unit : mm)

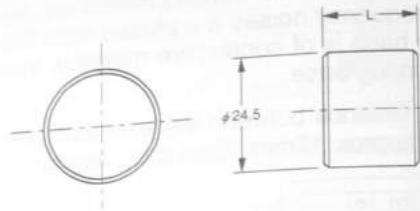
LX-12N
LX-12NS

Sensor



Hood

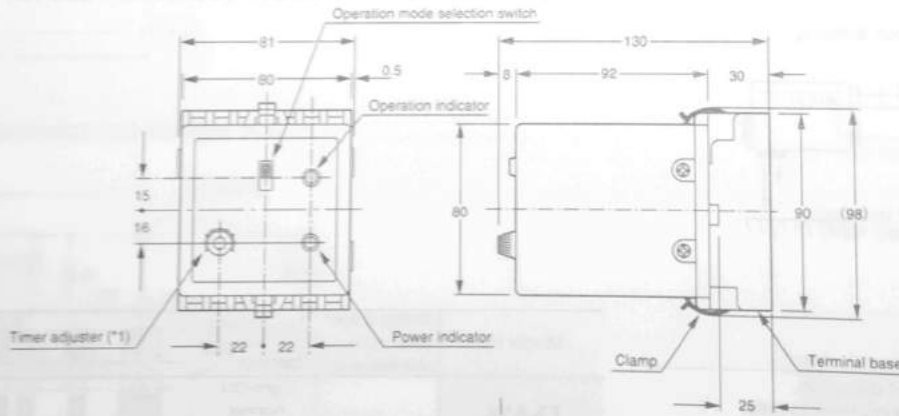
Accessories for the lens unit



※Hood length
L-12 hood (Accessories for LE-12)11.5mm
L-25 hood (Accessories for LE-25)19.5mm

PS-830L

Controller



Dimension of mounting hole

(*1) : Equipped with timer function type only