SUNX

INSTRUCTION MANUAL

Photoelectric Sensor

Fixed-focus Reflective Type

EX-40 Series

Thank you very much for using SUNX products. Please read this Instruction Manual carefully and thoroughly for the correct and optimum use of this product. Kindly keep this manual in a convenient place for quick reference.

WARNING

- **Never use this product as a sensing device for personnel protection.**
- **In case of using sensing devices for personnel protection, use products which meet laws and standards, such as OSHA, ANSI or IEC etc., for personnel protection applicable in each region or country.**

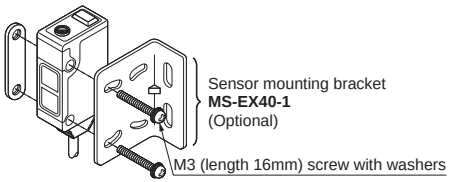
1 SPECIFICATIONS

Item \ Type / Model No. (Note 1)	Diffused beam type		Spot-beam type	
		Long sensing range		With timer
	EX-42	**EX-44**	**EX-43**	**EX-43T**
Sensing range	5 to 38mm (Conv. point: 20mm) with white non-glossy paper (50 × 50mm)	10 to 70mm (Conv. point: 40mm) with white non-glossy paper (50 × 50mm)	20 to 35mm (Conv. point: 30mm) with white non-glossy paper (50 × 50mm)	
Hysteresis	15% or less of operation distance		10% or less of operation distance	
Supply voltage	12 to 24V DC±10% Ripple P-P 10% or less			
Current consumption	35mA or less			
Output	NPN open-collector transistor ・Maximum sink current: 100mA ・Applied voltage: 30V DC or less (between output and 0V) ・Residual voltage: 1.5V or less (at 100mA sink current) 0.4V or less (at 16mA sink current)			
Output operation	Light-ON			
Short-circuit protection	Incorporated			
Response time	0.5ms or less			
Operation indicator	Red LED (lights up when the output is ON)			
Stability indicator	Green LED (lights up under stable light received condition or stable dark condition)			
Sensitivity adjuster	—	Continuously variable adjuster		—
Timer function	—			Variable OFF-delay timer (0.1 to 1 sec. approx.) (Note 2)
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			
Emitting element	Infrared LED (modulated)		Red LED (modulated)	
Material	Polyalylate			
Cable	0.2mm² 3-core cabtyre cable, 2m long			
Weight	45g approx.			
Accessory	—	Adjusting screwdriver: 1 pc.		

Notes: 1) The model No. with suffix '**-C5**' stands for the 5m cable length type.
(e.g.) As for the 5m cable length type of **EX-42** '**EX-42-C5**'
2) The timer is always effective.

2 MOUNTING

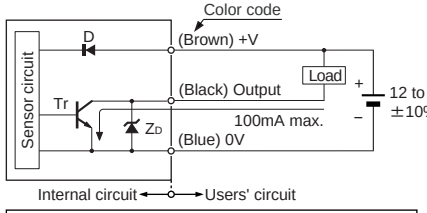
- With the optional sensor mounting bracket, the tightening torque should be 0.5N·m or less.



3 CAUTIONS

- **EX-42** and **EX-43T** are not incorporated with a sensitivity adjuster. For these models, in case there is a reflective object (e.g., a conveyor, etc.) in the background of the sensing object, since it may affect the sensing, use by keeping enough distance from the reflective object.
- Make sure that the power supply is off while wiring.
- Take care that wrong wiring will damage the sensor.
- Verify that the supply voltage variation is within the rating.
- If power is supplied from a commercial switching regulator, ensure that the frame ground (F.G.) terminal of the power supply is connected to an actual ground.
- In case noise generating equipment (switching regulator, inverter motor, etc.) is used in the vicinity of this product, connect the frame ground (F.G.) terminal of the equipment to an actual ground.
- Do not run the wires together with high-voltage lines or power lines or put them in the same raceway. This can cause malfunction due to induction.
- Extension up to total 100m, is possible with 0.3mm², or more, cable. However, in order to reduce noise, make the wiring as short as possible.
- Do not use during the initial transient time (50ms) after the power supply is switched on.
- Take care that the sensor is not directly exposed to fluorescent lamp from a rapid-starter lamp, a high frequency lighting device or sunlight etc., as it may affect the sensing performance.
- Avoid dust, dirt, and steam. Do not use it in places having excessive vapor, dust, etc., or where it may come in direct contact with corrosive gas.
- Take care that the sensor does not come in direct contact with water, oil, grease, organic solvents, such as, thinner etc., or strong acid, and alkaline.
- Make sure that stress by forcible bend or pulling is not applied directly to the sensor cable joint.
- Since the cable end is not waterproof, do not use the sensor in the application where water may seep in from the cable end.

4 I/O CIRCUIT DIAGRAMS

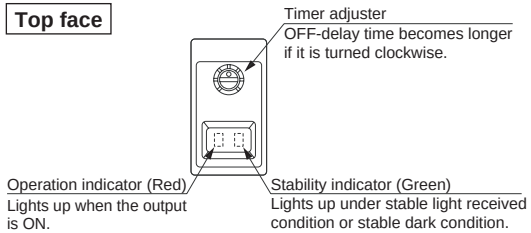


Symbols...D : Reverse supply polarity protection diode
ZD : Surge absorption zener diode
Tr : NPN output transistor

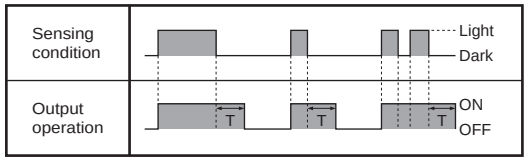
5 TIMER FUNCTION (only for EX-43T)

- **EX-43T** has an approx. 0.1 to 1 sec. variable OFF-delay timer. Since the output is extended for a fixed time interval, it is useful when the response time of the connected device is slow or when the signal width is small due to sensing of small objects.
(The timer is always effective.)

Top face



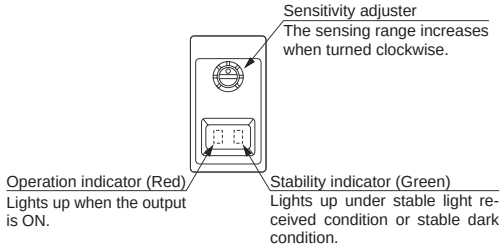
Time chart



Timer period: T = 0.1 to 1 sec. approx.

6 SENSITIVITY ADJUSTMENT (only for EX-43, EX-44)

Top face



Sensitivity adjustment

Step	Sensitivity adjuster	Description
①	MIN. MAX.	Turn the sensitivity adjuster fully counterclockwise to the minimum sensitivity position, MIN.
②	Ⓐ MIN. MAX.	In the light received condition, turn the sensitivity adjuster slowly clockwise and confirm the point Ⓐ where the sensor enters the 'Light' state operation.
③	Ⓐ Ⓑ MIN. MAX.	In the dark condition, turn the sensitivity adjuster further clockwise until the sensor enters the 'Light' state operation and then bring it back to confirm point Ⓑ where the sensor just returns to the 'Dark' state operation. If the sensor does not enter the 'Light' state operation even when the sensitivity adjuster is turned fully clockwise, the position is point Ⓑ.
④	Optimum position Ⓐ Ⓑ MIN. MAX.	The position at the middle of points Ⓐ and Ⓑ is the optimum sensing position.

Note: Use the accessory adjusting screwdriver to turn the adjuster slowly. Turning with excessive strength will cause damage to the adjuster.

'Light' condition	'Dark' condition
Sensor Sensing object	Sensor

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