

# Precautions

## ■ Correct Use

**Use the product within the rated voltage range.**

Applying voltages beyond the rated voltage ranges may result in damage or malfunction to the product.

**Wire the product correctly and be careful with the power supply polarities.**

Incorrect wiring may result in damage or malfunction to the product.

**Connect the loads to the power supply. Do not short-circuit the loads.**

Short-circuiting the loads may result in damage or malfunction to the product.

## ■ Structure and Materials

The emitter and detector elements of conventional Photomicrosensors are fixed with transparent epoxy resin and the main bodies are made of polycarbonate. Unlike ICs and transistors, which are covered with black epoxy resin, Photomicrosensors are subject to the following restrictions.

### 1. Low Heat Resistivity

The storage temperature of standard ICs and transistors is approximately 150°C. On the other hand, the storage temperature of highly resistant Photomicrosensors is 100°C maximum.

### 2. Low Mechanical Strength

Black epoxy resin, which is used for the main bodies of ICs and transistors, contains additive agents including glass fiber to increase the heat resistivity and mechanical strength of the main bodies. Materials with additive agents cannot be used for the bodies of Photomicrosensors because Photomicrosensors must maintain good optical permeability. Unlike ICs and transistors, Photomicrosensors must be handled with utmost care because Photomicrosensors are not as heat or mechanically resistant as ICs and transistors. No excessive force must be imposed on the lead wires of Photomicrosensors.

## ■ Mounting

### Screw Mounting

If Photomicrosensors have screw mounting holes, the Photomicrosensors can be mounted with screws. Unless otherwise specified, refer to the following when tighten the screws.

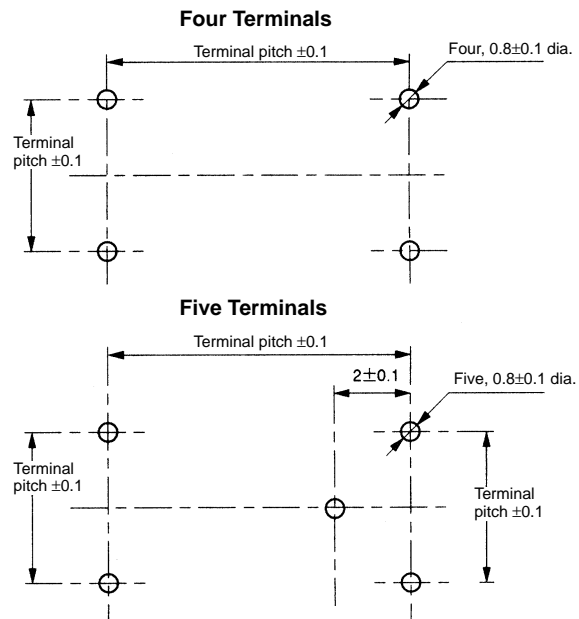
Hole diameter	Screw size	Tightening torque
1.5 dia.	M1.4	0.20 N • m
2.1 dia.	M2	0.34 N • m
3.2 dia.	M3	0.54 N • m
4.2 dia.	M4	0.54 N • m

Read the following before tightening the screws.

1. The use of a torque screwdriver is recommended to tighten each of the screws so that the screws can be tightened to the tightening torque required.
2. The use of a screw with a spring washer and flat washer for the mounting holes of a Photomicrosensor is recommended. If a screw with a spring washer but without a flat washer is used for any mounting hole, the part around the mounting hole may crack.
3. Do not mount Photomicrosensors to plates stained with machining oil, otherwise the machining oil may cause cracks on the Photomicrosensors.
4. Do not impose excessive forces on Photomicrosensors mounted to PCBs. Make sure that no continuous or instantaneous external force exceeding 500 g (4.9 N) is imposed on any lead wire of the Photomicrosensors.

## PCB Mounting Holes

Unless otherwise specified, the PCB to which a Photomicrosensor is mounted must have the following mounting holes.



## ■ Soldering

### Lead Wires

Make sure to solder the lead wires of Photomicrosensors so that no excessive force will be imposed on the lead wires. If an excessive force is likely to be imposed on the lead wires, hold the bases of the lead wires.

### Soldering Temperature

#### 1. Manual Soldering

Unless otherwise specified, the lead wires of Photomicrosensors can be soldered manually under the following conditions.

Soldering temperature: 350°C max. (The temperature of the tip of a 30-W soldering iron is approximately 320°C when the soldering iron is heated up.)

Soldering time: 3 s max.

Soldering position: At least 1.5 mm away from the bases of the lead wires.

The temperature of the tip of any soldering iron depends on the shape of the tip. Check the temperature with a thermometer before soldering the lead wires. A highly resistive soldering iron incorporating a ceramic heater is recommended for soldering the lead wires.

#### 2. Dip Soldering

The lead wires of Photomicrosensors can be dip-soldered under the following conditions unless otherwise specified.

Preheating temperature: Must not exceed the storage temperature of the Photomicrosensors.

Soldering temperature: 260°C.

Soldering time: 10 s max.

Soldering position: At least 1.5 mm away from the bases of the lead wires.

Do not use non-washable flux when soldering EE-SA-series Photomicrosensors, otherwise the Photomicrosensors will have operational problems.

### 3. Reflow Soldering

The reflow soldering of Photomicrosensors is not possible except for the EE-SX1102. The reflow soldering of the EE-SX1102 must be performed carefully under the conditions specified in the datasheet of the EE-SX1102. Before performing the reflow soldering of the EE-SX1102, make sure that the reflow soldering equipment satisfies the conditions.

#### External Forces

The heat resistivity and mechanical strength of Photomicrosensors are lower than those of ICs or transistors. Do not impose external force on Photomicrosensors immediately after the Photomicrosensors are soldered. Especially, do not impose external force on Photomicrosensors immediately after the Photomicrosensors are dip-soldered.

## ■ Cleaning Precautions

### Cleaning

Photomicrosensors except the EE-SA105 can be cleaned subject to the following restrictions.

#### 1. Types of Detergent

Polycarbonate is used for the bodies of most Photomicrosensors. Some types of detergent dissolve or crack polycarbonate. Before cleaning Photomicrosensors, refer to the following results of experiments, which indicate what types of detergent are suitable for cleaning Photomicrosensors other than the EE-SA105.

Observe the law and prevent against any environmental damage when using any detergent.

#### Results of Experiments

Ethyl alcohol:	OK
Methyl alcohol:	OK
Isopropyl alcohol:	OK
Chlorofluorocarbon:	Depends on the additive agents (see note)
Trichlene:	NG
Acetone:	NG
Methylbenzene:	NG
Water (hot water):	The lead wires corrode depending on the conditions

**Note:** Chlorofluorocarbon containing ethyl alcohol or methyl alcohol as an additive agent can be used to clean Photomicrosensors except the EE-SA105. Chlorofluorocarbon containing acetone as an additive agent must not be used to clean any Photomicrosensor. For reasons of environmental protection, refrain from using any detergent containing chlorofluorocarbon.

### 2. Cleaning Method

Unless otherwise specified, Photomicrosensors other than the EE-SA105 can be cleaned under the following conditions. Do not apply an unclean detergent to the Photomicrosensors.

DIP cleaning: OK

Ultrasonic cleaning: Depends on the equipment and the PCB size. Before cleaning Photomicrosensors, conduct a cleaning test with a single Photomicrosensor and make sure that the Photomicrosensor has no broken lead wires after the Photomicrosensor is cleaned.

Brushing: The marks on Photomicrosensors may be brushed off. The emitters and detectors of reflective Photomicrosensors may have scratches and deteriorate when they are brushed. Before brushing Photomicrosensors, conduct a brushing test with a single Photomicrosensor and make sure that the Photomicrosensor is not damaged after it is brushed.