

### Slim Safety Relays Conforming to EN Standards

- The forcibly guided contact in the G7SA assures safe operation (EN50205 Class A, approved by VDE.)
- Ideal for use in safety circuits in press machinery, machine tools, and other production machinery.
- Four-pole and six-pole Relays are available.
- The Relay's terminal arrangement simplifies PWB pattern design.
- Reinforced insulation between inputs and outputs. Reinforced insulation between some poles.
- UL, CSA approval.
- CE marking.



**Note:** Be sure to refer to the *Precautions* on page 131.

### Ordering Information

#### Safety Relays

Type	Sealing	Poles	Contacts	Rated voltage	Model
Standard	Flux-tight	4 poles	3PST-NO, SPST-NC	24 VDC	G7SA-3A1B
			DPST-NO, DPST-NC		G7SA-2A2B
		6 poles	5PST-NO, SPST-NC		G7SA-5A1B
			4PST-NO, DPST-NC		G7SA-4A2B
			3PST-NO, 3PST-NC		G7SA-3A3B

#### Safety Relay Sockets

Type		LED indicator	Poles	Rated voltage	Model
Track-mounting	Track mounting and screw mounting possible	No	4 poles	---	P7SA-10F
			6 poles		P7SA-14F
		Yes	4 poles	24 VDC	P7SA-10F-ND
			6 poles		P7SA-14F-ND
Back-mounting	PCB terminals	No	4 poles	---	P7SA-10P
			6 poles		P7SA-14P

#### Model Number Legend

**G7SA-□A□B**

1      2

1. **NO Contact Poles**
  - 2: DPST-NO
  - 3: 3PST-NO
  - 4: 4PST-NO
  - 5: 5PST-NO
2. **NC Contact Poles**
  - 1: SPST-NC
  - 2: DPST-NC
  - 3: 3PST-NC

# Specifications

## ■ Ratings

### Coil

Rated voltage	Rated current	Coil resistance	Must-operate voltage	Must-release voltage	Max. voltage	Power consumption
24 VDC	4 poles: 15 mA 6 poles: 20.8 mA	4 poles: 1,600 Ω 6 poles: 1,152 Ω	75% max. (V)	10% min. (V)	110% (V)	4 poles: Approx. 360 mW 6 poles: Approx. 500 mW

- Note:**
1. The rated current and coil resistance are measured at a coil temperature of 23°C with tolerances of ±15%.
  2. Performance characteristics are based on a coil temperature of 23°C.
  3. The value given for the maximum voltage is for voltages applied instantaneously to the Relay coil (at an ambient temperature of 23°C) and not continuously.

### Contacts

Load	Resistive load (cos φ =1)
Rated load	6 A at 250 VAC, 6 A at 30 VDC
Rated carry current	6 A
Max. switching voltage	250 VAC, 125 VDC
Max. switching current	6 A
Max. switching capacity (reference value)	1,500 VA, 180 W

## ■ Characteristics

### Safety Relay Sockets

Model	Continuous current	Dielectric strength	Insulation resistance
P7SA-14□	6 A (see note 1)	2,500 VAC for 1 min. between poles	100 MΩ min. (see note 2)

- Note:**
1. If the P7SA-1□F is used between 55 and 85°C, reduce the continuous current (from 6A) by 0.1 A for every degree.
  2. Measurement conditions: Measurement of the same points as for the dielectric strength at 500 VDC.
  3. When using the P7SA-1□F-ND at 24 VDC, use at an ambient operating temperature from -25 to 55°C.

### Safety Relays

<b>Contact resistance</b>		100 mΩ max. (The contact resistance was measured with 1 A at 5 VDC using the voltage-drop method.)
<b>Operating time (see note 2)</b>		20 ms max.
<b>Response time (see note 2)</b>		10 ms max. (The response time is the time it takes for the normally open contacts to open after the coil voltage is turned OFF.)
<b>Release time (see note 2)</b>		20 ms max.
<b>Maximum operating frequency</b>	<b>Mechanical</b>	36,000 operations/hr
	<b>Rated load</b>	1,800 operations/hr
<b>Insulation resistance</b>		100 MΩ min. (at 500 VDC) (The insulation resistance was measured with a 500-VDC megger at the same places that the dielectric strength was measured.)
<b>Dielectric strength (see notes 3, 4)</b>		Between coil contacts/different poles: 4,000 VAC, 50/60 Hz for 1 min (2,500 VAC between poles 3-4 in 4-pole Relays or poles 3-5, 4-6, and 5-6 in 6-pole Relays.) Between contacts of same polarity: 1,500 VAC, 50/60 Hz for 1 min
<b>Vibration resistance</b>		10 to 55 Hz, 1.5-mm double amplitude
<b>Shock resistance</b>	<b>Destruction</b>	1,000 m/s <sup>2</sup>
	<b>Malfunction</b>	100 m/s <sup>2</sup>
<b>Life expectancy</b>	<b>Mechanical</b>	10,000,000 operations min. (at approx. 36,000 operations/hr)
	<b>Electrical</b>	100,000 operations min. (at the rated load and approx. 1,800 operations/hr)
<b>Min. permissible load (see note 5) (reference value)</b>		5 VDC, 1 mA
<b>Ambient temperature (see note 6)</b>		Operating: -40°C to 85°C (with no icing or condensation) Storage: -40°C to 85°C (with no icing or condensation)
<b>Ambient humidity</b>		Operating: 35% to 85% Storage: 35% to 85%
<b>Weight</b>		4 poles: Approx. 22 g 6 poles: Approx. 25 g
<b>Approved standards</b>		EN61810-1 (IEC61810-1), EN50205, UL508, CSA22.2 No. 14

- Note:** 1. The values listed above are initial values.

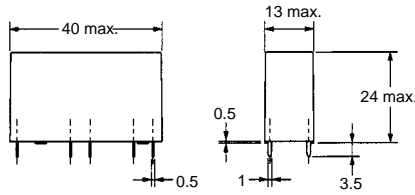
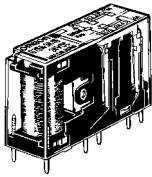
2. These times were measured at the rated voltage and an ambient temperature of 23°C. Contact bounce time is not included.
3. Pole 3 refers to terminals 31–32 or 33–34, pole 4 refers to terminals 43–44, pole 5 refers to terminals 53–54, and pole 6 refers to terminals 63–64.
4. When using a P7SA Socket, the dielectric strength between coil contacts/different poles is 2,500 VAC, 50/60 Hz for 1 min.
5. Min. permissible load is for a switching frequency of 300 operations/min.
6. When operating at a temperature between 70°C and 85°C, reduce the rated carry current (6 A at 70°C or less) by 0.1 A for each degree above 70°C.

## Dimensions

**Note:** All units are in millimeters unless otherwise indicated. The diagrams are drawn in perspective.

### ■ Safety Relays

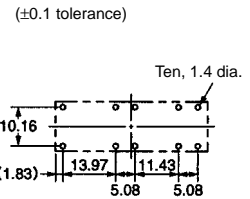
**G7SA-3A1B**  
**G7SA-2A2B**



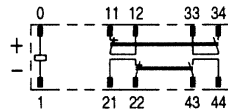
**Terminal Arrangement/  
Internal Connection Diagram  
(Bottom View)**



**Printed Circuit Board  
Design Diagram  
(Bottom View)**

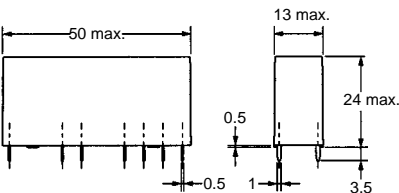
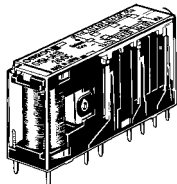


**G7SA-2A2B**



**Note:** Terminals 23-24, 33-34, and 43-44 are normally open. Terminals 11-12 and 21-22 are normally closed.

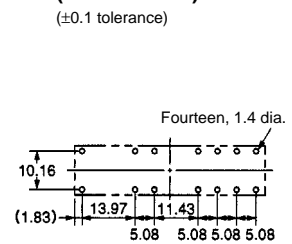
**G7SA-5A1B**  
**G7SA-4A2B**  
**G7SA-3A3B**



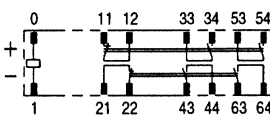
**Terminal Arrangement/  
Internal Connection Diagram  
(Bottom View)**



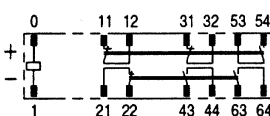
**Printed Circuit Board  
Design Diagram  
(Bottom View)**



**G7SA-4A2B**



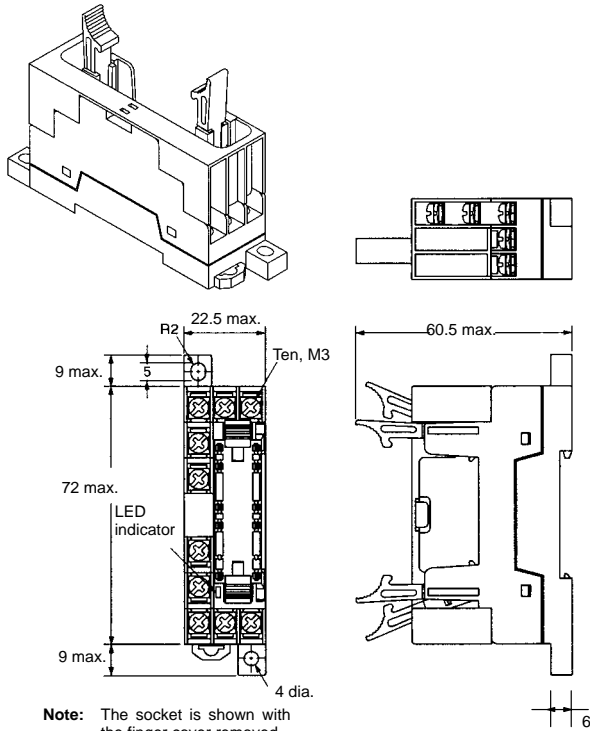
**G7SA-3A3B**



**Note:** Terminals 23-24, 33-34, 53-54, and 63-64 are normally open. Terminals 11-12, 21-22, and 31-32 are normally closed.

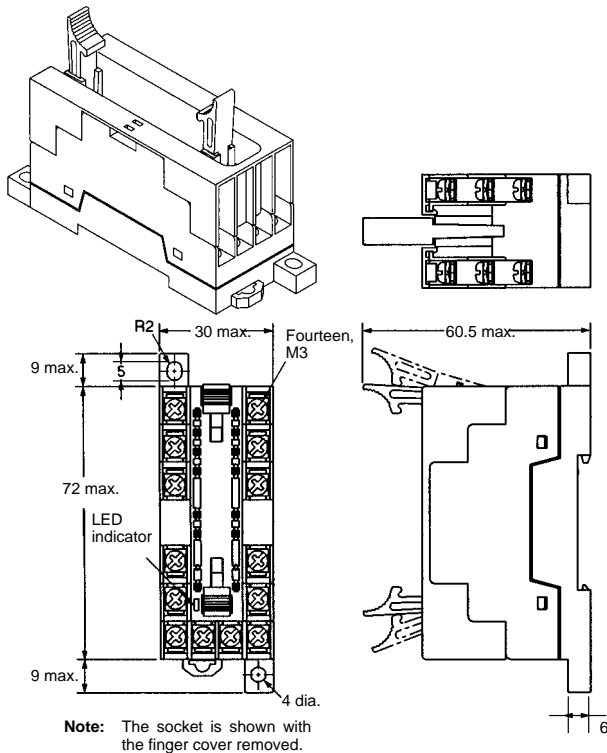
■ Safety Relay Sockets

Track-mounting Socket  
P7SA-10F, P7SA-10F-ND



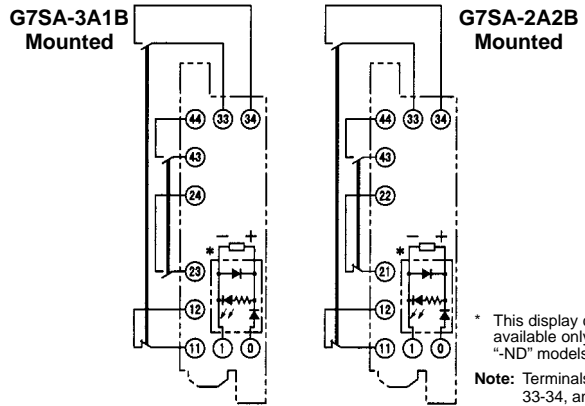
Note: Only the -ND Sockets have LED indicators.

Track-mounting Socket  
P7SA-14F, P7SA-14F-ND



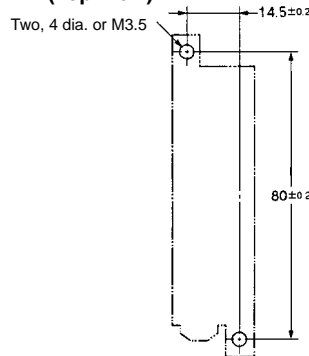
Note: Only the -ND Sockets have LED indicators.

Terminal Installation/Internal Connection Diagram  
(Top View)

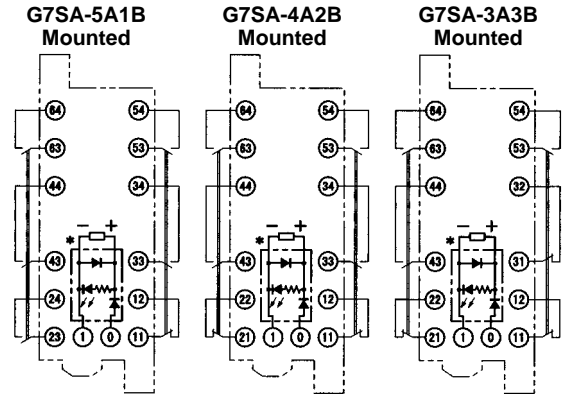


Note: Terminals 23-24, 33-34, and 43-44 are normally open. Terminals 11-12 and 21-22 are normally closed.

Mounting Hole Placement Diagram  
(Top View)

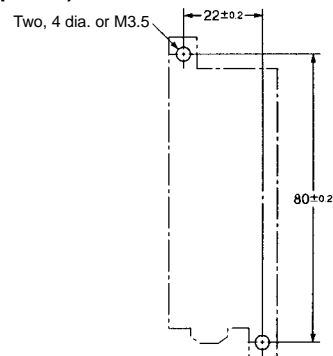


Terminal Arrangement/Internal Connection Diagram  
(Top View)

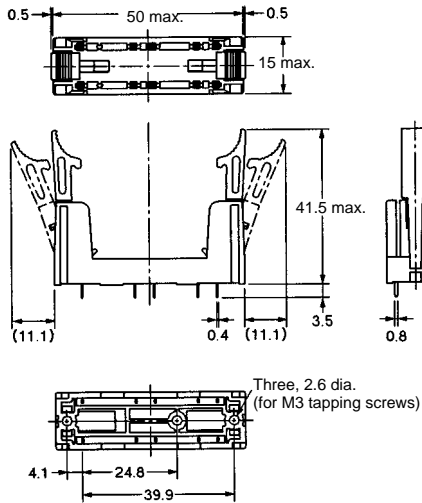
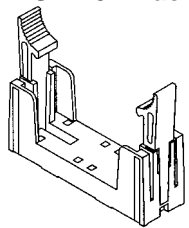


Note: Terminals 23-24, 33-34, 43-44, 53-54, and 63-64 are normally open. Terminals 11-12, 21-22, and 31-32 are normally closed.

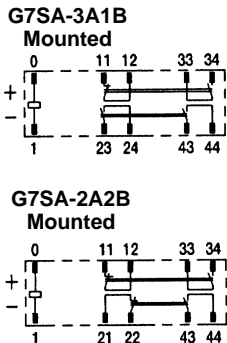
Mounting Hole Placement Diagram  
(Top View)



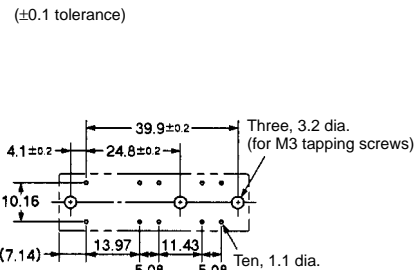
**P7SA-10P Back-mounting Socket (for PCB)**



**Terminal Arrangement/Internal Connection Diagram (Bottom View)**

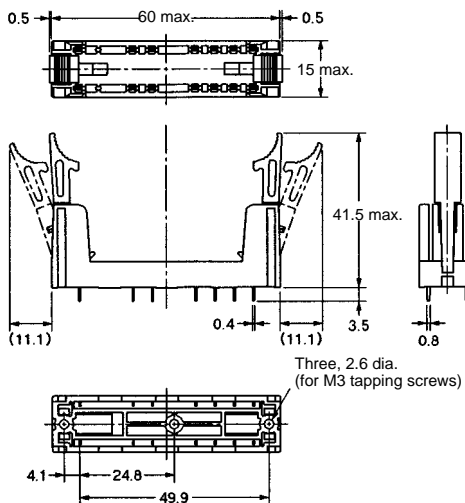
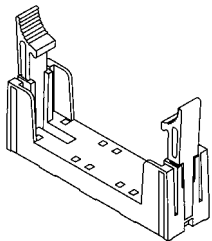


**Mounting Hole Placement (Bottom View)**

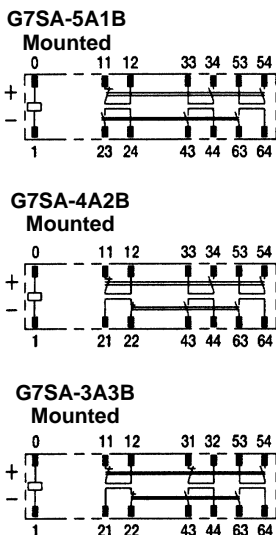


**Note:** Terminals 23-24, 33-34, and 43-44 are normally open. Terminals 11-12 and 21-22 are normally closed.

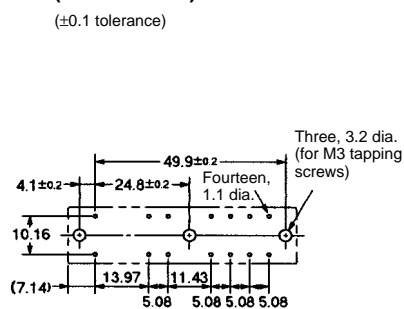
**P7SA-14P Back-mounting Socket (for PCB)**



**Terminal Arrangement/Internal Connection Diagram (Bottom View)**



**Mounting Hole Placement (Bottom View)**



**Note:** Terminals 23-24, 33-34, 43-44, 53-54, and 63-64 are normally open. Terminals 11-12, 21-22, and 31-32 are normally closed.

## Precautions

### Safety Relays

A Safety Relay is a Relay with which a safety circuit can be configured.

### Wiring

Use one of the following wires to connect to the P7SA-10F/10F-ND/14F/14F-ND.

Stranded wire:	0.75 to 1.5 mm <sup>2</sup>
Solid wire:	1.0 to 1.5 mm <sup>2</sup>

Tighten each screw of the P7SA-10F/10F-ND/14F/14F-ND to a torque of 0.98 N • m securely.

Wire the terminals correctly with no mistakes in coil polarity, otherwise the G7SA will not operate.

### Cleaning

The G7SA is not of enclosed construction. Therefore, do not wash the G7SA with water or detergent.

### Forcibly Guided Contacts (from EN50205)

If an NO contact becomes welded, all NC contacts will maintain a minimum distance of 0.5 mm when the coil is not energized. Likewise if an NC contact becomes welded, all NO contacts will maintain a minimum distance of 0.5 mm when the coil is energized.

**ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.**

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. J120-E1-1A