

# Relays with Forcibly Guided Contacts G7SA

## Compact, Slim Relays Conforming to EN Standards

- Relays with forcibly guided contacts (EN50205 Class A, approved by VDE).
- Supports the CE marking of machinery (Machinery Directive).
- Helps avoid hazardous machine status when used as part of an interlocking circuit.
- 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 of different polarity.



## Ordering Information

### Relays with Forcibly Guided Contacts

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

### Sockets

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

## Model Number Structure

### 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

## ■ Approved Standards

G7SA

- EN Standards, VDE Approved
  - EN61810-1 (Electromechanical non-specified time all-or-nothing relays)
  - EN50205 (Relays with forcibly guided (linked) contacts)
- UL standard UL508 Industrial Control Devices
- CSA standard CSA C22.2 No. 14 Industrial Control Devices

## ■ 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
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

## ■ Characteristics

### Sockets

Model	Continuous current	Dielectric strength	Insulation resistance
P7SA-14□	6 A (See note 1.)	2,500 VAC for 1 min. between poles	1,000 MΩ min. (See note 2.)

- Note:**
1. If the P7SA-1□F is used between 55 and 85°C, reduce the continuous current (from 6 A) 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.

### Relays with Forcibly Guided Contacts

Contact resistance (See note 2.)		100 mΩ max.
Operating time (See note 3.)		20 ms max.
Response time (See note 4.)		10 ms max.
Release time (See note 3.)		20 ms max.
Maximum operating frequency	Mechanical	36,000 operations/hr
	Rated load	1,800 operations/hr
Insulation resistance (See note 5.)		1,000 MΩ min. (at 500 VDC)
Dielectric strength (see notes 6, 7)		Between coil contacts/different poles (except for poles 3-4 in 4-pole Relays and poles 3-5, 4-6, and 5-6 in 6-pole Relays): 4,000 VAC, 50/60 Hz for 1 min. Between between poles 3-4 in 4-pole Relays and poles 3-5, 4-6, and 5-6 in 6-pole Relays: 2,500 VAC, 50/60 Hz for 1 min. Between contacts of same polarity: 1,500 VAC, 50/60 Hz for 1 min.
Vibration resistance		10 to 55 Hz, 0.75-mm single amplitude (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>Durability (see note 8)</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>Failure rate (P level) (see note 9) (reference value)</b>	5 VDC, 1 mA	
<b>Ambient temperature (see note 10)</b>	Operating: -40°C to 85°C (with no icing or condensation)	
<b>Ambient humidity</b>	Operating: 5% to 85%RH	
<b>Weight</b>	4 poles: Approx. 22 g 6 poles: Approx. 25 g	

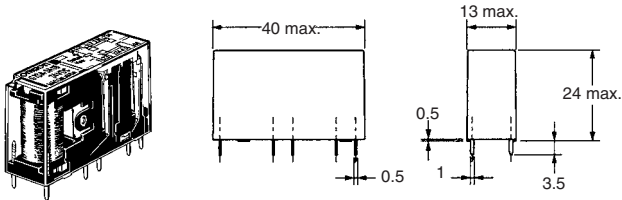
- Note:**
1. The values listed above are initial values.
  2. The contact resistance was measured with 1 A at 5 VDC using the voltage-drop method.
  3. These times were measured at the rated voltage and an ambient temperature of 23°C. Contact bounce time is included.
  4. The response time is the time it takes for the normally open contacts to open after the coil voltage is turned OFF. Contact bounce time is included. Measurement conditions: Rated voltage operation, Ambient temperature: 23°C
  5. The insulation resistance was measured with a 500-VDC megohmmeter at the same locations as the dielectric strength was measured.
  6. 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.
  7. When using a P7SA Socket, the dielectric strength between coil contacts/different poles is 2,500 VAC, 50/60 Hz for 1 min.
  8. The durability is for an ambient temperature of 15°C to 35°C and an ambient humidity of 25% to 75%.
  9. The failure rate is based on an operating frequency of 300 operations/min.
  10. 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

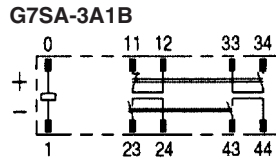
Note: All units are in millimeters unless otherwise indicated. The diagrams are drawn in perspective.

## Relays with Forcibly Guided Contacts

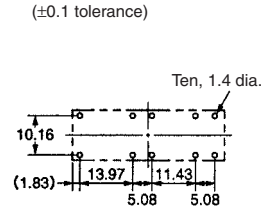
G7SA-3A1B  
G7SA-2A2B



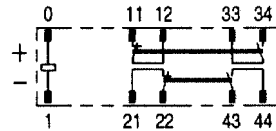
Terminal Arrangement/  
Internal Connection Diagram  
(Bottom View)



Printed Circuit Board  
Design Diagram  
(Bottom View)

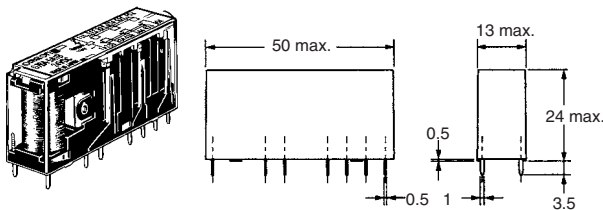


G7SA-2A2B

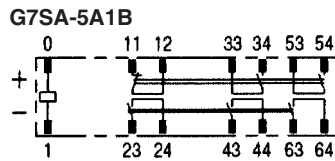


- Note: 1. Terminals 23-24, 33-34, and 43-44 are normally open. Terminals 11-12 and 21-22 are normally closed.  
2. The colors of the cards inside the Relays are as follows:  
G7SA-3A1B: Blue and G7SA-2A2B: White.

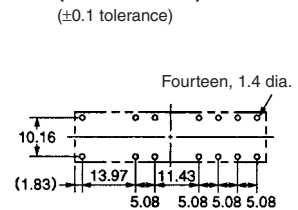
G7SA-5A1B  
G7SA-4A2B  
G7SA-3A3B



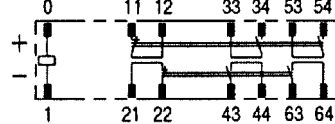
Terminal Arrangement/  
Internal Connection Diagram  
(Bottom View)



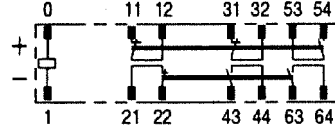
Printed Circuit Board  
Design Diagram  
(Bottom View)



G7SA-4A2B



G7SA-3A3B



- Note: 1. Terminals 23-24, 33-34, 53-54, and 63-64 are normally open. Terminals 11-12, 21-22, and 31-32 are normally closed.  
2. The colors of the cards inside the Relays are as follows:  
G7SA-5A1B: Blue, G7SA-4A2B: White, and G7SA-3A3B: Yellow.

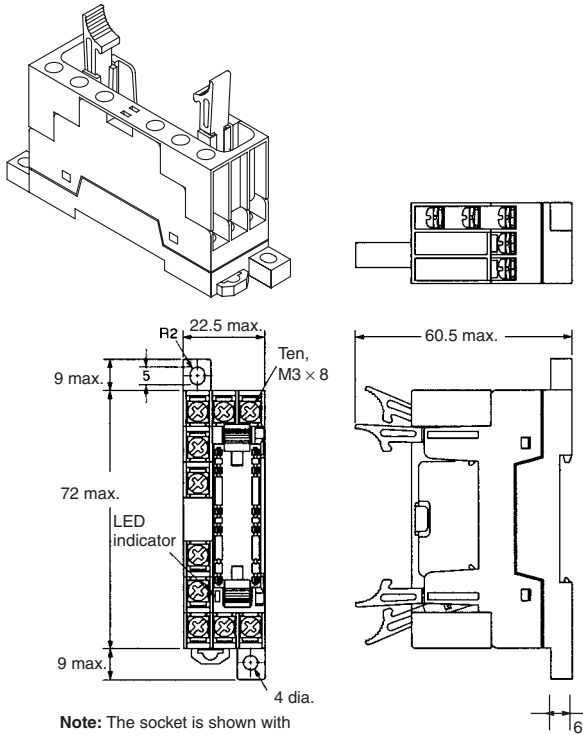
Relays with Forcibly Guided Contacts

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■ Sockets

Track-mounting Socket

P7SA-10F, P7SA-10F-ND

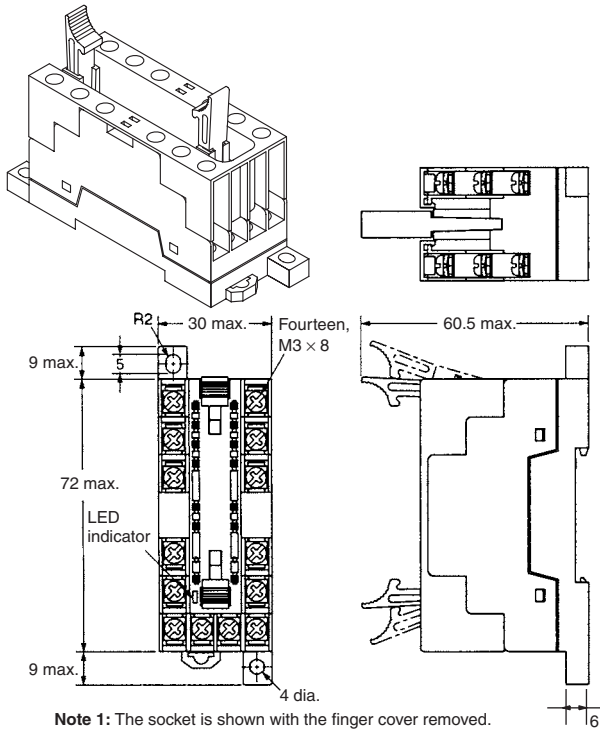


Note: The socket is shown with the finger cover removed.

Note: Only the -ND Sockets have LED indicators (orange)

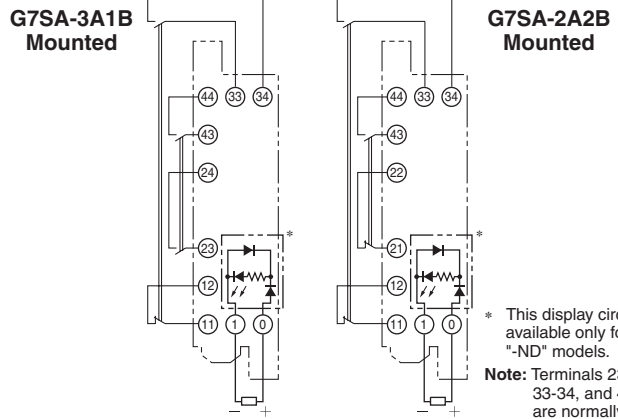
Track-mounting Socket

P7SA-14F, P7SA-14F-ND



Note 1: The socket is shown with the finger cover removed.  
 Note 2: Only the -ND Sockets have LED indicators (orange).

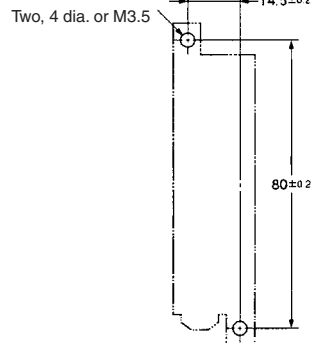
Terminal Installation/Internal Connection Diagram (Top View)



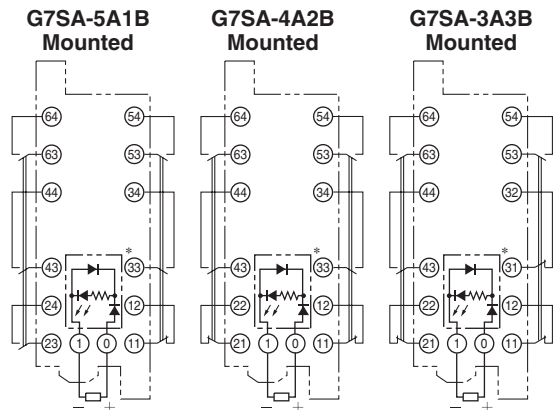
\* This display circuit is available only for "-ND" models.

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

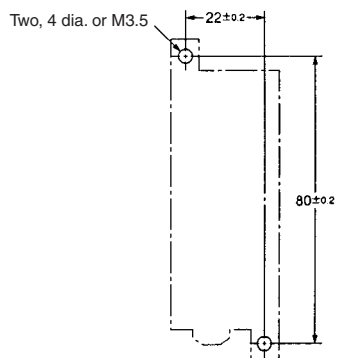
Mounting Hole Placement Diagram (Top View)



Terminal Arrangement/Internal Connection Diagram (Top View)



Mounting Hole Placement Diagram (Top View)



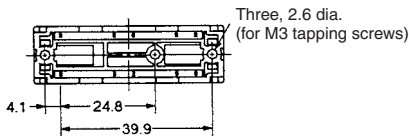
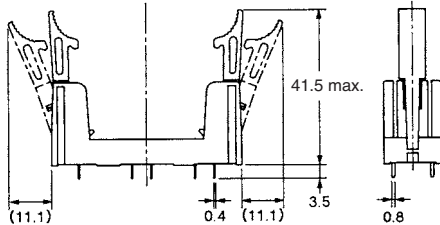
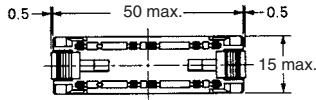
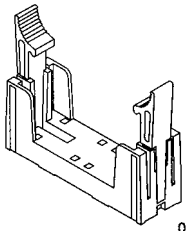
\* This display circuit is available only for "-ND" models.

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.

Relays with Forcibly Guided Contacts

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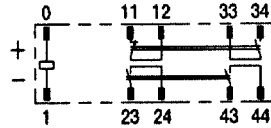
**P7SA-10P Back-mounting Socket (for PCB)**



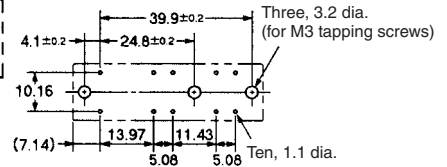
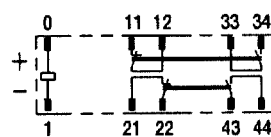
**Terminal Arrangement/Internal Connection Diagram (Bottom View)**

**Mounting Hole Placement (Bottom View)**  
(±0.1 tolerance)

**G7SA-3A1B Mounted**

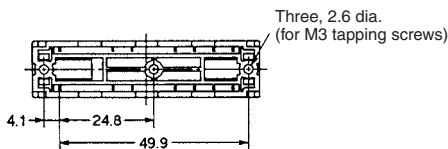
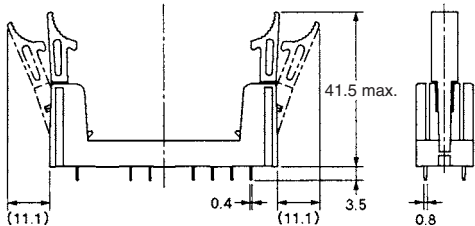
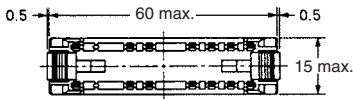
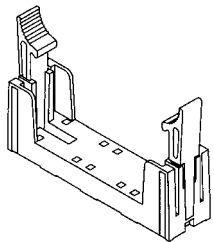


**G7SA-2A2B Mounted**



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

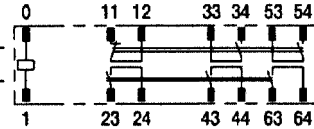
**P7SA-14P Back-mounting Socket (for PCB)**



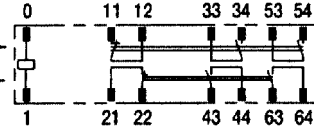
**Terminal Arrangement/Internal Connection Diagram (Bottom View)**

**Mounting Hole Placement (Bottom View)**  
(±0.1 tolerance)

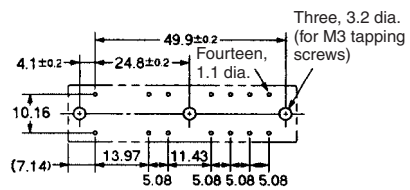
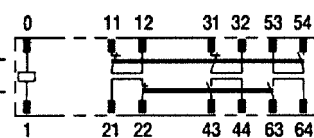
**G7SA-5A1B Mounted**



**G7SA-4A2B Mounted**



**G7SA-3A3B Mounted**



**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.

Relays with Forcibly Guided Contacts  
**G7SA**

# Safety Precautions

Refer to the "Precautions for All Relays" on page I-9 and "Precautions for All Relays with Forcibly Guided Contacts" on page G-2.

## ■ Precautions for Correct Use

### ⚠ CAUTION

Do not touch the terminal area of the Relays or the socket terminal area (charged area) while power is ON. Electric shock will result.

## 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-E1-03

In the interest of product improvement, specifications are subject to change without notice.