

Solid State Relay

G3PA

Ultra-slim Power Relay with Built-in Heat Sink for Heater Control

- Built-in heat sink and linking terminals
- Opto-isolated switching with zero cross function
- Replaceable triac output cartridge increases service life
- Can be surface mounted or DIN-rail mounted
- Dense mounting possible for linking terminals
- UL and CSA, VDE approved



Ordering Information

■ RELAYS

Note: Applicable with 3-phase loads.

Isolation	Zero cross function	Indicator	Applicable output load	Rated input voltage	Part number
Phototriac coupler	Yes	Yes	10 A at 24 to 240 VAC	5 to 24 VDC	G3PA-210B-VD
			20 A at 24 to 240 VAC		G3PA-220B-VD
			40 A at 24 to 240 VAC		G3PA-240B-VD
			60 A at 24 to 240 VAC		G3PA-260B-VD

■ REPLACEMENT PARTS

Item	Carry current	Applicable SSR	Part number
Power Device Cartridge	10 A	G3PA-210B-VD	G32A-A10-VD
	20 A	G3PA-220B-VD	G32A-A20-VD
	40 A	G3PA-240B-VD	G32A-A40-VD
	60 A	G3PA-260B-VD	G32A-A60-VD

Specifications

■ RATINGS (AT 25°C)

Input

Rated voltage	Operating voltage range	Input current	Voltage level	
			Must operate voltage	Must release voltage
5 to 24 VDC	4 to 30 VDC	7 mA max.*	4 VDC max.	1 VDC min.

*G3PA converts the current input into a constant current.

Output

Model	Applicable load		
	Load voltage	Load current	Inrush current
G3PA-210B-VD	19 to 264 VAC (50/60 Hz)	0.1 to 10 A	150 A (60 Hz, 1 cycle)
G3PA-220B-VD		0.1 to 20 A	220 A (60 Hz, 1 cycle)
G3PA-240B-VD		0.5 to 40 A	440 A (60 Hz, 1 cycle)
G3PA-260B-VD		0.5 to 60 A	440 A (60 Hz, 1 cycle)

Refer to the *Engineering Data* Section of this data sheet for further details.

■ CHARACTERISTICS

Item	G3PA-210B-VD	G3PA-220B-VD	G3PA-240B-VD	G3PA-260B-VD
Operate time	1/2 of load power source cycle + 1 ms max. (DC input)			
Release time	1/2 of load power source cycle + 1 ms max. (DC input)			
Output ON voltage drop	1.6 V (RMS) max.			
Leakage current	5 mA max. (at 120 VAC) 10 mA max. (at 230 VAC)		10 mA max. (at 120 VAC) 20 mA max. (at 230 VAC)	
I ² t	121 A ² S	260 A ² S	1,260 A ² S	
Insulation resistance	100 MΩ min. (at 500 VDC)			
Dielectric strength	4,000 VAC, 50/60 Hz for 1 min			
Vibration resistance	Malfun- ction	10 to 55 Hz, 0.75-mm double amplitude (mounted to DIN rail)		
Shock resistance	Malfun- ction	300 m/s ² (approx. 30G) (mounted to DIN rail)		
Ambient temperature	Operating	-30° to 80°C		
	Storage	-30° to 100°C		
Ambient humidity	Operating	45% to 85%		
Weight	Approx. 260 g	Approx. 340 g	Approx. 460 g	Approx. 900 g

■ APPROVED STANDARDS

Conforms to VDE 0160 (with phototriac coupler conforms to VDE 0884, finger protection, dielectric strength of 4,000 V between coil and contacts).

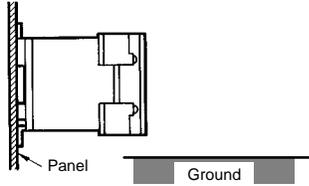
Conforms to VDE 0805.

Conforms to IEC 950.

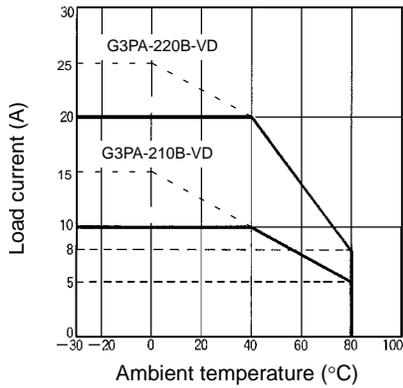
Engineering Data

LOAD CURRENT VS. AMBIENT TEMPERATURE CHARACTERISTICS

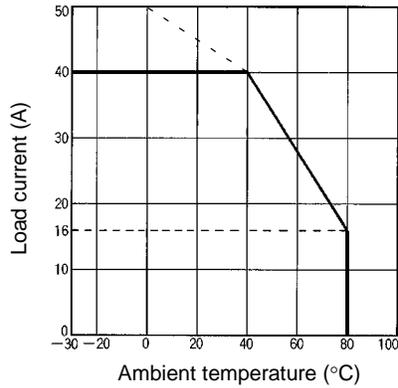
Horizontal Mounting (to Ground)



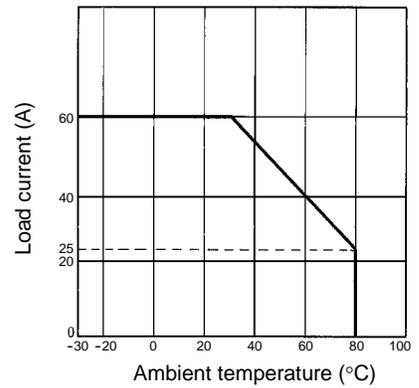
G3PA-210B-VD, G3PA-220B-VD



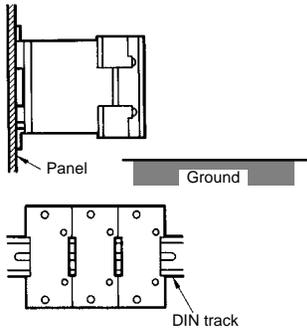
G3PA-240B-VD



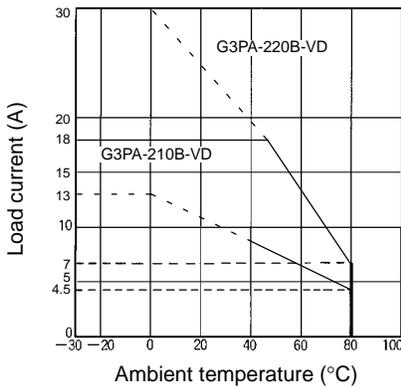
G3PA-260B-VD



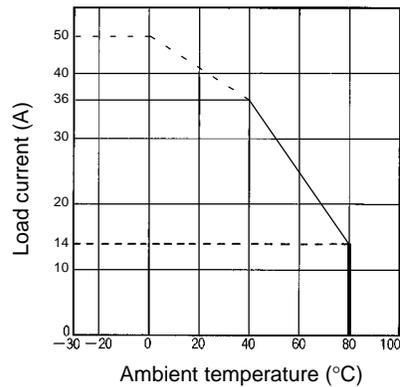
Close, Side-by-Side Mounting (Up to Three)



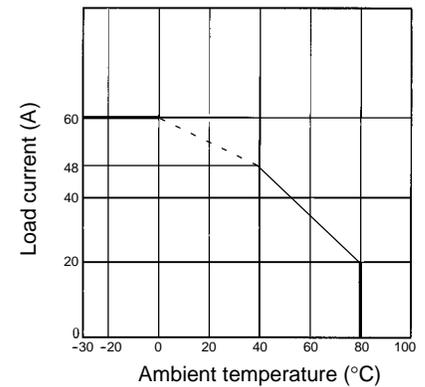
G3PA-210B-VD, G3PA-220B-VD



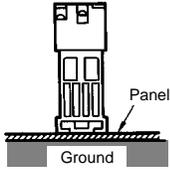
G3PA-240B-VD



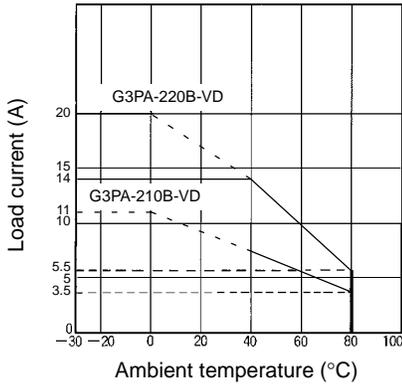
G3PA-260B-VD



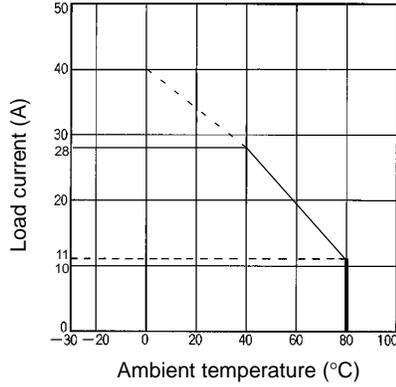
Vertical Mounting (to Ground)



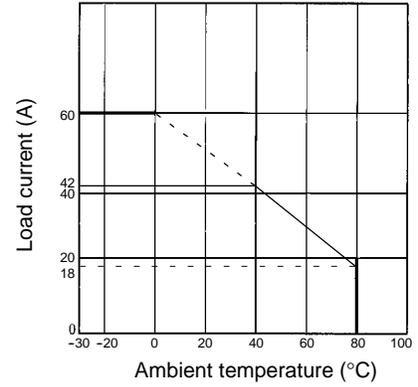
G3PA-210B-VD, G3PA-220B-VD



G3PA-240B-VD



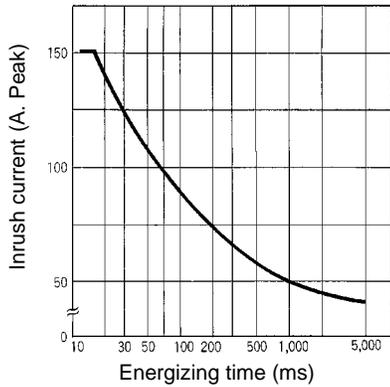
G3PA-260B-VD



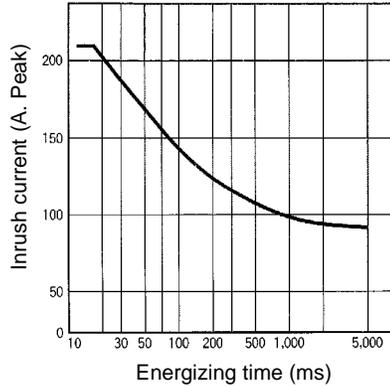
■ INRUSH CURRENT RESISTANCE

Non-repetitive (Keep the inrush current to half the rated value if it occurs repetitively.)

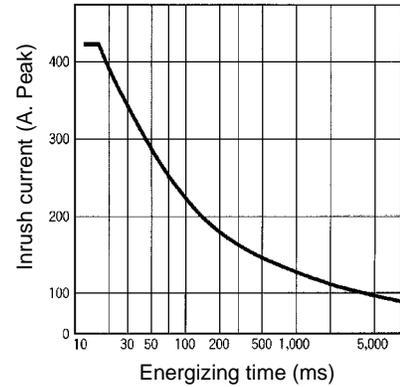
G3PA-210B-VD



G3PA-220B-VD

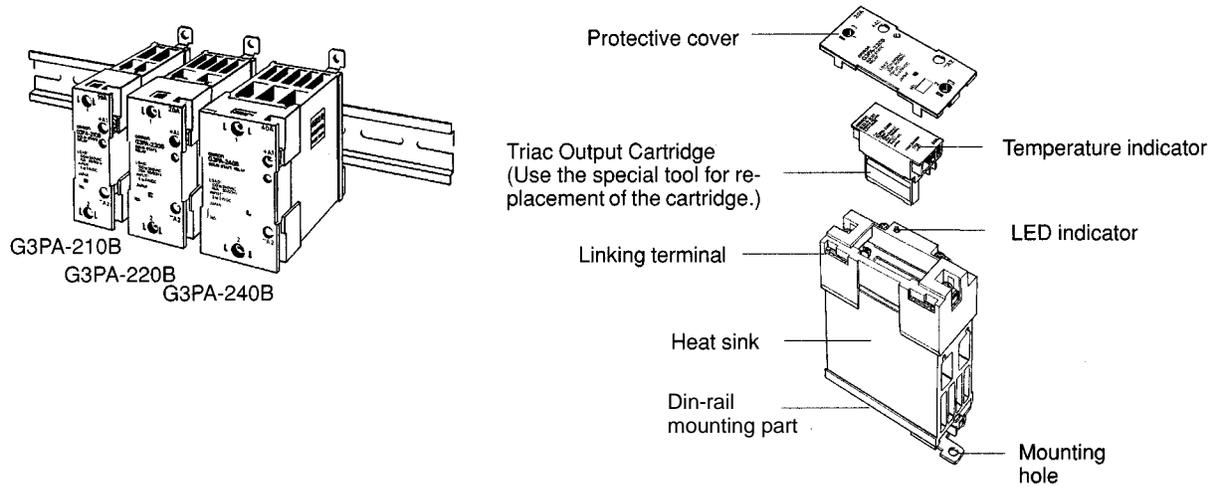


G3PA-240B-VD/260B-VD



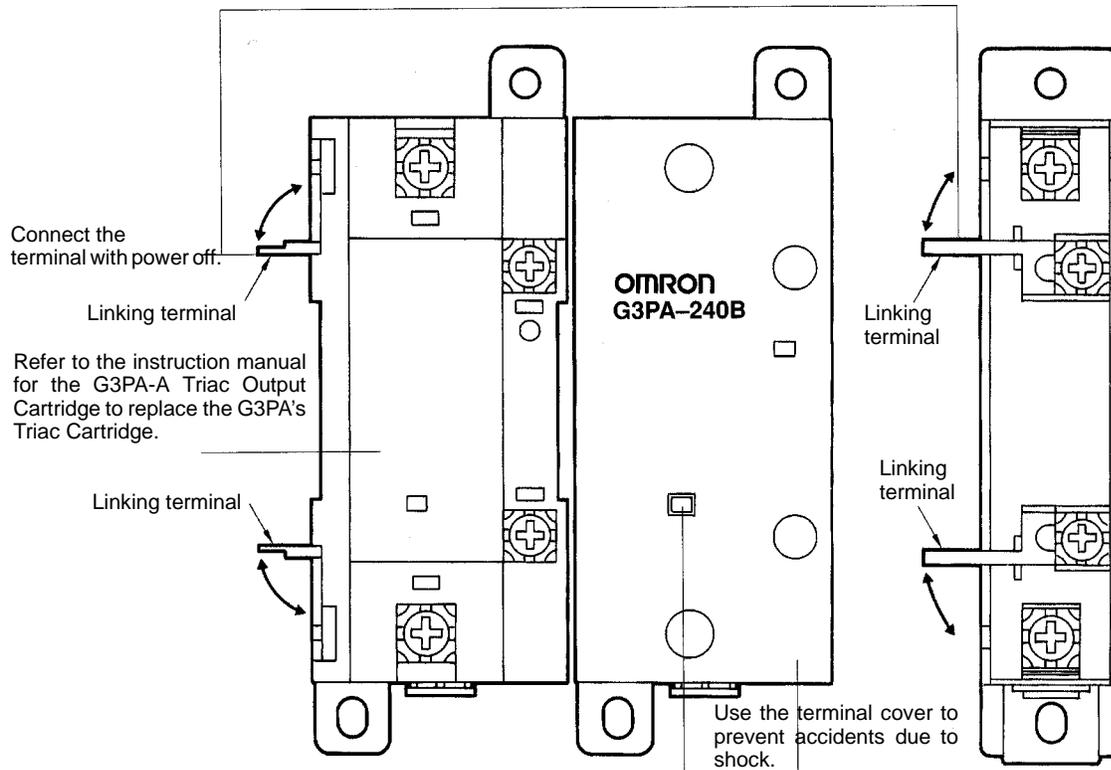
Nomenclature

■ G3PA COMPONENTS



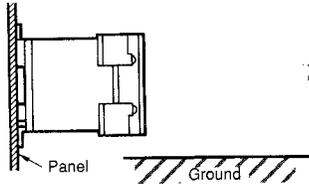
Installation

■ MOUNTING



If the temperature indicator has turned from pink to red, the G32-A-A Triac Output Cartridge may have malfunctioned. Replace the cartridge.

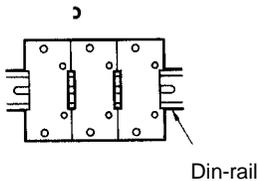
Surface Mount or DIN-rail Mount



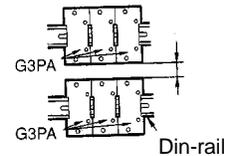
Screw or DIN-rail mounting is possible. Mount perpendicular to the ground.

Close Mounting

Up to three G3PA SSRs can be mounted closely, side-by-side using the Linking Terminal built into each G3PA. When installing *more* than three G3PA SSRs closely, side-by-side, keep a distance of 10 mm (0.39 in) between each SSR to ensure proper ventilation.

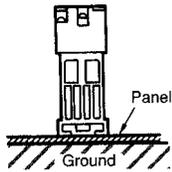


For two or more rows of SSRs, keep a distance of 80 mm (3.15 in) between the upper SSR and the lower rows of SSRs (at a rated ambient temperature of 40° C).



Keep a distance of 3 cm (1.18 in) or more between the G3PA and the duct (especially when the SSR is on the upper side.)

Vertical Mounting



For vertical mounting, the load current must be 30% lower than the rated one (refer to the *Engineering Data* section in this data sheet.

REPLACEMENT PARTS

G32A-A Triac Output Cartridge

The G32A-A Triac Output Cartridge is a replaceable part of the G3PA. When the temperature indicator changes from pink to red, the triac circuitry may have malfunctioned due to an excessive flow of current.

The damaged cartridge can be replaced with a new one without disconnecting the wires from the G3PA.

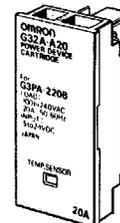
Before replacing the cartridge, improve the heat radiation efficiency of the G3PA by using a fan or increasing the ventilation.

The G32A-A Triac Output Cartridge can withstand an excessive current for a short period of time, such as might be caused by a short circuit of the load. In that case, the temperature indicator will not turn red.

G32A-A10



G32A-A20



G32A-A40



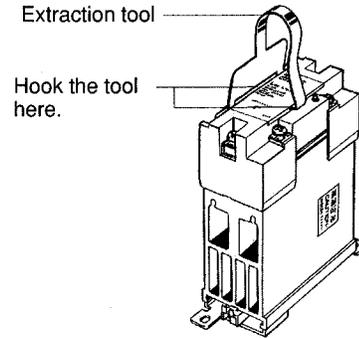
G32A-A10/G32A-A20 Cartridge Removal and Replacement

To remove the G32A-A10/G32A-A20 Cartridge for replacement with a new one, use the special extraction tool provided.

Extraction

Follow these steps to remove the G32A-A10/G32A-A20 Cartridge from the G3PA.

1. Switch off the power.
2. Remove the terminal cover.
3. Hook the indented part of the Cartridge with the extraction tool and pull up on the tool until the Cartridge is loosened. Remove the Cartridge.

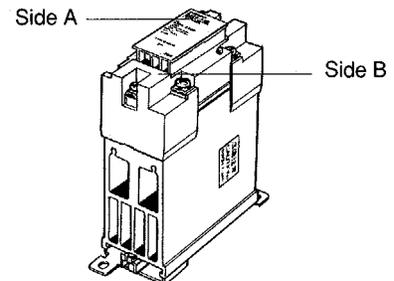
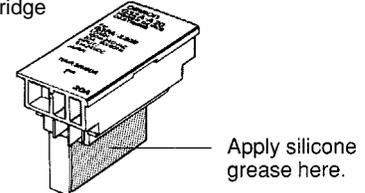


Installation

Follow these steps to install a new G32A-A Triac Output Cartridge:

1. Apply silicone grease (provided with the G32A).
2. Make sure that there are no dust particles or pieces of wire on the heat sinks of the G32A-A or on the G3PA.
3. Insert the Cartridge into the opening of the G3PA so the letters on the Cartridge and those on the G3PA are in the same direction and sides A and B are even.
4. Attach the terminal cover.
5. Switch on the power and check the G3PA to be sure it works correctly.

G32A-A10/G32A-A20 Cartridge



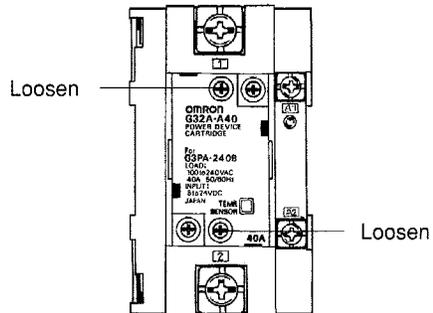
G32A-A40 Cartridge Removal and Replacement

Extraction

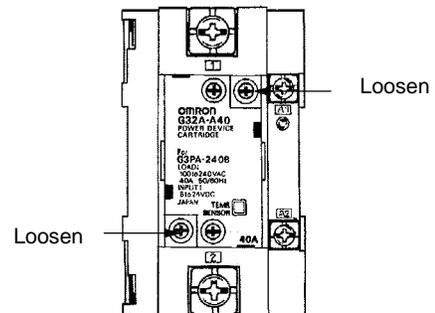
Follow these steps to remove and replace the G32A-A40 Cartridge:

1. Switch off the power.
2. Remove the terminal cover.
3. Loosen the two center screws on the Cartridge ace. The screws are connected to terminals 1 and 2. (Refer to View A.)
4. Loosen the screws at both corners of the Cartridge. (Refer to View B.)
5. Hold the indented part of both corners to remove the Cartridge.

View A: Two center screws



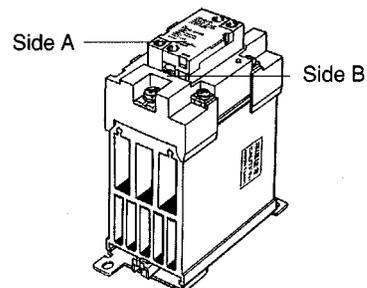
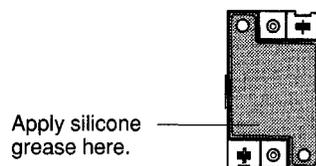
View B: Two outside screws



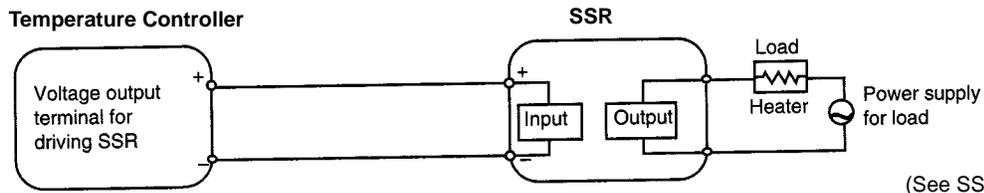
Installation

Follow these steps to install the G32A-A40 cartridge.

1. Apply silicone grease
2. Tighten the screws on both corners with a tightening torque of 6 to 8 kgf/cm (5.2 to 6.9 in-lbs).
3. Tighten the screws on both sides with a tightening torque of 6 to 8 kgf/cm (5.2 to 6.9 in-lbs).
4. Attach the terminal cover.
5. Switch on the power and check the G3PA to be sure it works correctly.



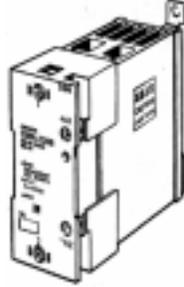
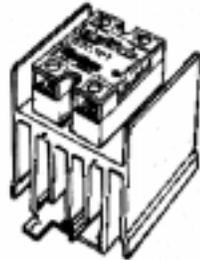
■ CONNECTING SOLID-STATE RELAYS (SSR) TO TEMPERATURE CONTROLLERS



- Use Temperature Controller E5AJ, E5CJ, E5EJ; E5AK, E5CK, E5EK.
- Use optional E53-Q voltage output rated 40 mA, 12 VDC.

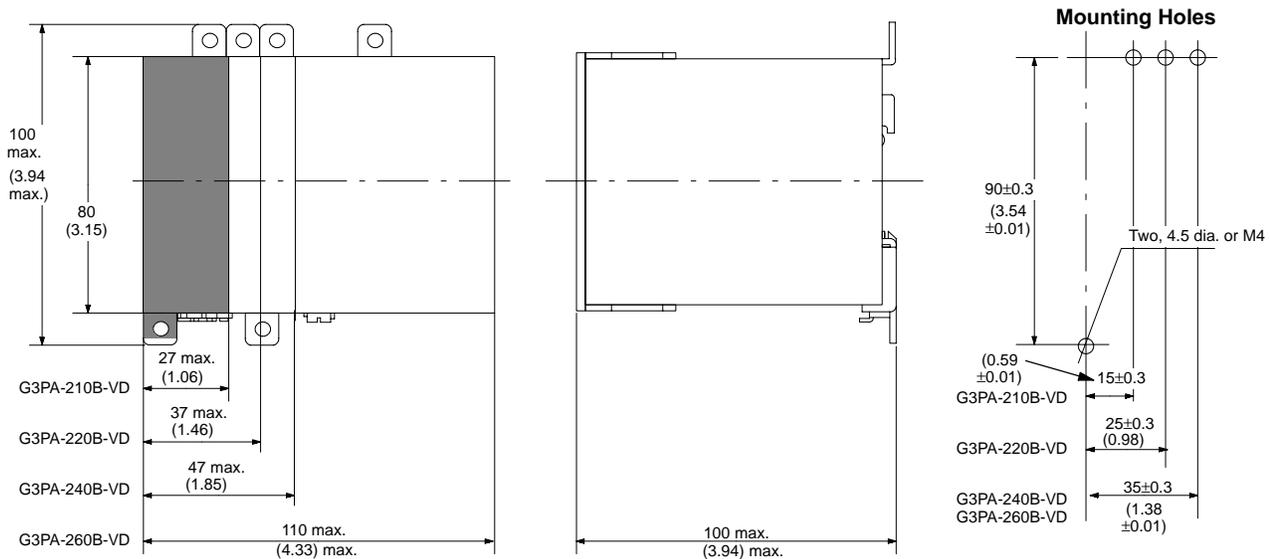
Note: E5CJ has built-in voltage output rated 20 mA, 12 VDC.

■ SELECTING SOLID-STATE RELAYS

SRR model	G3PA	G3NA
Appearance		
Features	Slim, track-mount SSR with built-in heat sink	Standard SSR style requires Y92B-series heat sink
Output rating	10 A, 75-264 VAC 20 A, 75-264 VAC 40 A, 75-264 VAC	5 A, 24-240 VAC 10 A, 24-240 VAC 10 A, 200-480 VAC 10 A, 5-200 VDC 20 A, 24-240 VAC 20 A, 200-480 VAC 25 A, 24-240 VAC 25 A, 200-480 VAC 40 A, 24-240 VAC 40 A, 200-480 VAC
Rated input voltage	5 to 24 VDC	5 to 24 VDC 100 to 120 VDC 200 to 240 VDC
Number of SSRs connected in parallel	E5A□/E5E□: 8 SSRs E5C□: 4 SSRs	E5A□/E5E□: 8 SSRs E5C□: 4 SSRs

Dimensions

Unit: mm (inch)



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