

Solid State Relays

G3PA

Refer to *Warranty and Application Considerations* (page 1), *Safety Precautions* (page 4), and *Technical and Safety Information* (page 6).

Extremely Thin Relays Integrated with Heat Sinks

- Downsizing achieved through optimum design of heat sink.
- Mounting possible via screws or via DIN track.
- Close mounting possible for linking terminals. (Except for G3PA-260B-VD and G3PA-450B-VD-2.)
- Applicable with 3-phase loads.
- Replaceable power element cartridges.
- Comply with VDE 0160 (finger protection), with a dielectric strength of 4,000 V between input and load.
- Comply with VDE 0805, IEC 950.
- Certified by UL, CSA, and VDE (reinforced insulation).



Model Number Structure

■ Model Number Legend

G3PA-□□□□-□-□
 1 2 3 4 5 6 7

1. Basic Model Name

G3PA: Solid State Relay

2. Rated Load Power Supply Voltage

2: 200 VAC

4: 400 VAC

3. Rated Load Current

10: 10 A

20: 20 A

30: 30 A

40: 40 A

50: 50 A

60: 60 A

4. Terminal Type

B: Screw terminals

5. Zero Cross Function

Blank: Equipped with zero cross function

L: Not equipped with zero cross function

6. Certification

VD: Certified by UL, CSA, and VDE

7. Special Specifications

Blank: Standard models

2: 480-V models

Ordering Information

List of Models

| Model | Isolation | Zero cross function | Indicator | Rated output load | Rated input voltage | |
|----------------|--------------------|---------------------|------------------------|-----------------------|---------------------|--------|
| G3PA-210B-VD | Phototriac coupler | Yes | Yes | 10 A at 24 to 240 VAC | 5 to 24 VDC | |
| G3PA-220B-VD | | | | 20 A at 24 to 240 VAC | | |
| G3PA-240B-VD | | | | 40 A at 24 to 240 VAC | | |
| G3PA-260B-VD | | | | 60 A at 24 to 240 VAC | | |
| G3PA-210BL-VD | | No | | 10 A at 24 to 240 VAC | | 24 VAC |
| G3PA-220BL-VD | | | | 20 A at 24 to 240 VAC | | |
| G3PA-240BL-VD | | | | 40 A at 24 to 240 VAC | | |
| G3PA-260BL-VD | | | | 60 A at 24 to 240 VAC | | |
| G3PA-210B-VD | Yes | Yes | 10 A at 24 to 240 VAC | 12 to 24 VDC | | |
| G3PA-220B-VD | | | 20 A at 24 to 240 VAC | | | |
| G3PA-240B-VD | | | 40 A at 24 to 240 VAC | | | |
| G3PA-260B-VD | | | 60 A at 24 to 240 VAC | | | |
| G3PA-420B-VD | | | 20 A at 180 to 400 VAC | | | |
| G3PA-430B-VD | | | 30 A at 180 to 400 VAC | | | |
| G3PA-420B-VD-2 | | | 20 A at 200 to 480 VAC | | | |
| G3PA-430B-VD-2 | | | 30 A at 200 to 480 VAC | | | |
| G3PA-450B-VD-2 | | | 50 A at 200 to 480 VAC | | | |

Note: When ordering, specify the rated input voltage.

Replacement Parts

| Name | Carry current | Load voltage range | Model | Applicable SSR | VDE certification | |
|------------------------|------------------------|--------------------|----------------------|------------------------|-------------------|------------------------|
| Power Device Cartridge | 10 A | 19 to 264 VAC | G32A-A10-VD DC5-24 | G3PA-210B-VD DC5-24 | Yes | |
| | | | G32A-A10L-VD DC5-24 | G3PA-210BL-VD DC5-24 | | |
| | | | G32A-A10-VD AC24 | G3PA-210B-VD AC24 | | |
| | | | G32A-A20-VD DC5-24 | G3PA-220B-VD DC5-24 | | |
| | G32A-A20L-VD DC5-24 | | G3PA-220BL-VD DC5-24 | | | |
| | G32A-A20-VD AC24 | | G3PA-220B-VD AC24 | | | |
| | 20 A | | G32A-A40-VD DC5-24 | G3PA-240B-VD DC5-24 | | |
| | | | | G32A-A40L-VD DC5-24 | | G3PA-240BL-VD DC5-24 |
| | | | | G32A-A40-VD AC24 | | G3PA-240B-VD AC24 |
| | | | | 40 A | | G32A-A60-VD DC5-24 |
| | G32A-A60L-VD DC5-24 | | G3PA-260BL-VD DC5-24 | | | |
| | G32A-A60-VD AC24 | | G3PA-260B-VD AC24 | | | |
| | 60 A | 150 to 440 VAC | G32A-A420-VD DC12-24 | | | |
| | | | G32A-A430-VD DC12-24 | G3PA-430B-VD DC12-24 | | |
| | | | 180 to 528 VAC | G32A-A420-VD-2 DC12-24 | | G3PA-420B-VD-2 DC12-24 |
| | | | | | | G32A-A430-VD-2 DC12-24 |
| G32A-A450-VD-2 DC12-24 | G3PA-450B-VD-2 DC12-24 | | | | | |
| | | | | | | |

Other Units (Order Separately)

Units that Enable 2-line Switching of 3-phase Power

| Name | Current flow | Model | Applicable SSR |
|--------------------|--------------|-----------------------------|---|
| Short-circuit Unit | 10 A | G32A-D20 | G3PA-210B-VD, G3PA-210BL-VD |
| | 20 A | | G3PA-220B-VD, G3PA-220BL-VD G3PA-420B-VD, G3PA-420B-VD-2 |
| | 30 A | | G32A-D40 |
| | 40 A | G3PA-240B-VD, G3PA-240BL-VD | |

Specifications

■ Ratings (at an Ambient Temperature of 25°C)

Input

| Model | Rated voltage | Operating Voltage range | Input current impedance | Voltage level | |
|----------------|---------------|-------------------------|-------------------------|----------------------|----------------------|
| | | | | Must operate voltage | Must release voltage |
| G3PA-210B-VD | 5 to 24 VDC | 4 to 30 VDC | 7 mA max. | 4 VDC max. | 1 VDC min. |
| G3PA-220B-VD | | | | | |
| G3PA-240B-VD | | | | | |
| G3PA-260B-VD | | | | | |
| G3PA-210BL-VD | 5 to 24 VDC | 4 to 30 VDC | 20 mA max. | 4 VDC max. | 1 VDC min. |
| G3PA-220BL-VD | | | | | |
| G3PA-240BL-VD | | | | | |
| G3PA-260BL-VD | | | | | |
| G3PA-210B-VD | 24 VAC | 19.2 to 26.4 VAC | 1.4 kΩ±20% | 19.2 VAC max. | 4.8 VAC min. |
| G3PA-220B-VD | | | | | |
| G3PA-240B-VD | | | | | |
| G3PA-260B-VD | | | | | |
| G3PA-420B-VD | 12 to 24 VDC | 9.6 to 30 VDC | 7 mA max. | 9.2 VDC max. | 1 VDC min. |
| G3PA-430B-VD | | | | | |
| G3PA-420B-VD-2 | | | | | |
| G3PA-430B-VD-2 | | | | | |
| G3PA-450B-VD-2 | | | | | |

Output

| Model | Applicable load | | | |
|-----------------|---------------------------|---------------------------|--------------|------------------------|
| | Rated load voltage | Load voltage range | Load current | Inrush current |
| G3PA-210B(L)-VD | 24 to 240 VAC (50/60 Hz) | 19 to 264 VAC (50/60 Hz) | 0.1 to 10 A | 150 A (60 Hz, 1 cycle) |
| G3PA-220B(L)-VD | | | 0.1 to 20 A | 220 A (60 Hz, 1 cycle) |
| G3PA-240B(L)-VD | | | 0.5 to 40 A | 440 A (60 Hz, 1 cycle) |
| G3PA-260B(L)-VD | | | 0.5 to 60 A | 440 A (60 Hz, 1 cycle) |
| G3PA-420B-VD | 180 to 400 VAC (50/60 Hz) | 150 to 440 VAC (50/60 Hz) | 0.5 to 20 A | 220 A (60 Hz, 1 cycle) |
| G3PA-430B-VD | | | 0.5 to 30 A | 440 A (60 Hz, 1 cycle) |
| G3PA-420B-VD-2 | 200 to 480 VAC (50/60 Hz) | 180 to 528 VAC (50/60 Hz) | 0.5 to 20 A | 220 A (60 Hz, 1 cycle) |
| G3PA-430B-VD-2 | | | 0.5 to 30 A | 440 A (60 Hz, 1 cycle) |
| G3PA-450B-VD-2 | | | 0.5 to 50 A | 440 A (60 Hz, 1 cycle) |

Refer to *Engineering Data* for further details.

■ Characteristics

| Item | G3PA-210B(L)-VD | G3PA-220B(L)-VD | G3PA-240B(L)-VD | G3PA-260B(L)-VD | G3PA-420B-VD | G3PA-420B-VD-2 | G3PA-430B-VD | G3PA-430B-VD-2 | G3PA-450B-VD-2 |
|------------------------|---|--|------------------------|-------------------------|---|---|---|---|------------------------|
| Operate time | 1/2 of load power source cycle + 1 ms max. (DC Input, -B models) 1 1/2 of load power source cycle + 1 ms max. (AC Input) 1 ms max. (-BL models) | | | | | | | | |
| Release time | 1/2 of load power source cycle + 1 ms max. (DC Input) 1 1/2 of load power source cycle + 1 ms max. (AC Input) | | | | | | | | |
| Output ON voltage drop | 1.6 V (RMS) max. | | | | 1.8 V (RMS) max. | | | | |
| Leakage current | 5 mA max. (at 100 VAC) 10 mA max. (at 200 VAC) | 10 mA max. (at 100 VAC) 20 mA max. (at 200 VAC) | | 20 mA max. (at 400 VAC) | 20 mA max. (at 480 VAC) | 20 mA max. (at 400 VAC) | 20 mA max. (at 480 VAC) | | |
| I ² t | 260 A ² s | | 1,260 A ² s | | 260 A ² s | 1,800 A ² s | 1,800 A ² s | | 1,800 A ² s |
| Insulation resistance | 100 MΩ min. (at 500 VDC) | | | | | | | | |
| Dielectric strength | 4,000 VAC, 50/60 Hz for 1 min | | | | | | | | |
| Vibration resistance | Destruction: 10 to 55 to 10 Hz, 0.375–mm single amplitude (Mounted to DIN track) | | | | | | | | |
| Shock resistance | Destruction: 300 m/s ² (mounted to DIN track) | | | | | | | | |
| Ambient temperature | Operating: –30°C to 80°C (with no icing or condensation) Storage: –30°C to 100°C (with no icing or condensation) | | | | | | | | |
| Certified standards | UL508, CSA C22.2 (No.14, No.950), EN60950 File No. 5915ÜG | | | | UL508, CSA C22.2 (No.14), EN60947-4-3 File No. 6642ÜG | UL508, CSA C22.2 (No.14), EN60947-4-3 File No. 133127ÜG | UL508, CSA C22.2 (No.14), EN60947-4-3 File No. 6642ÜG | UL508, CSA C22.2 (No.14), EN60947-4-3 File No. 133127ÜG | |
| Ambient humidity | Operating: 45% to 85% | | | | | | | | |
| Weight | Approx. 260 g | Approx. 340 g | Approx. 460 g | Approx. 900 g | Approx. 290 g | Approx. 290 g | Approx. 410 g | Approx. 410 g | Approx. 900 g |

Operation

■ Replacement Parts

G32A-A Power Device Cartridge

The G32A-A Power Device Cartridge (a Triac Unit) can be replaced with a new one. When the temperature indicator has changed from pink to red, the triac circuitry may have malfunctioned possibly by an excessive flow of current, in which case, dismount the damaged cartridge for replacement.

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

Improve the heat radiation efficiency of the G3PA before replacing the cartridge.

The G32A-A Power Device Cartridge can withstand an excessive current for a short period of time, such as may be caused accidentally by the short circuiting of the load, in which case the temperature indicator will not turn red.

Be sure to turn OFF the power supply when replacing the Cartridge. Supplying power with the Cartridge removed may result in malfunction.

Appearance

G32A-A10(L)-VD



G32A-A20(L)-VD



G32A-A40(L)-VD



G32A-A60(L)-VD



G32A-A420-VD(-2)



G32A-A430-VD(-2)



G32A-A450-VD-2



Replacing Power Device Cartridges

When replacing Power Device Cartridges, use the specified model. Using a Power Device Cartridge other than the specified one will result in faulty operation and destruction of the elements.

■ Replacement Procedure

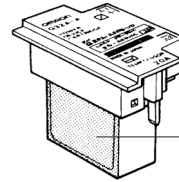
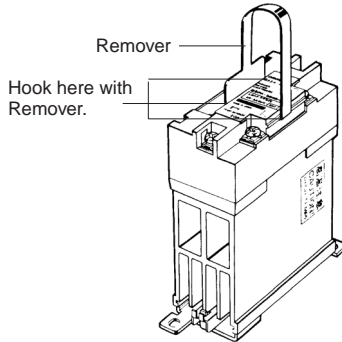
G32A-A10(L)-VD/G32A-A20(L)-VD/G32A-A420-VD(-2)

Use the special tool (provided) to extract the cartridge for replacement with a new one.

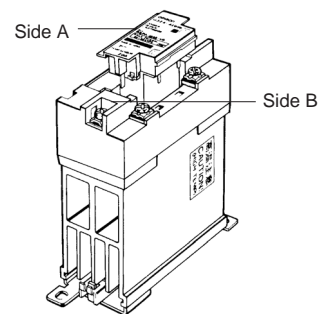
Extraction

Follow the procedures below to dismount the Power Device Cartridge from the G3PA.

1. **Switch off the power.**
2. Remove the terminal cover.
3. Hook the indented part of the cartridge with the tool and pull up on the cartridge to remove it.



2. Make sure that there is no dust or pieces of wire on the heat sink of the G32A-A or the G3PA.
3. Insert the cartridge into the opening of the G3PA so that the letters on the cartridge and those on the G3PA are in the same direction and side A and side B are even.



Mounting

Follow the procedures below to mount the Power Device Cartridge on the G3PA.

1. Apply silicone grease (provided with the G32A-A) to the entire surface of the heat sink.

4. Attach the terminal cover.
5. Switch on the power and check the G3PA to be sure it works properly.

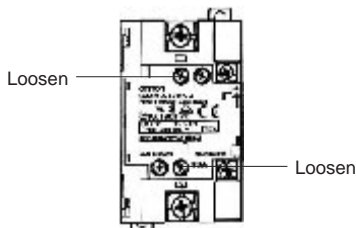
G32A-A40(L)-VD/G32A-A60(L)-VD/G32A-A430-VD(-2)/G32A-A450-VD-2

The G32A Power Device Cartridge is mounted and secured with screws to the G3PA Unit.

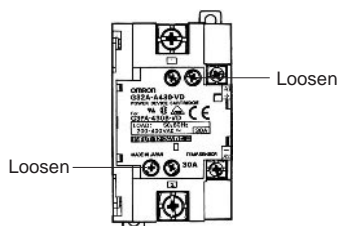
Extraction

Follow the procedures below to dismount the G32A-A Power Device Cartridge from the G3PA.

1. **Switch off the power.**
2. Remove the terminal cover.
3. Loosen the two centered screws on the sides to dismount the cartridge. The screws are connected to terminals 1 and 2.



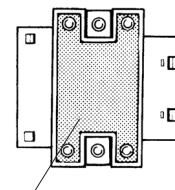
4. Loosen the screws on both the corners.



5. Hold the indented part of both the corners to dismount the cartridge.

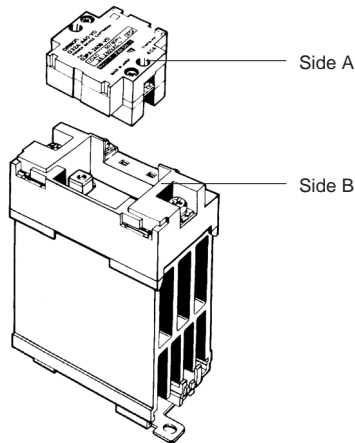
Mounting

1. Apply silicone grease to the entire surface of the heat sink.



2. Make sure that there is no dust or pieces of wire on the heat sink of the G32A-A or the G3PA.

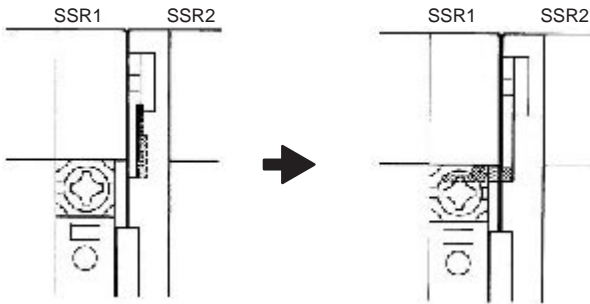
3. Insert the cartridge into the opening of the G3PA so that side A and side B are even.



4. Tighten the screws on both the corners with a tightening torque of 0.59 to 0.78 N-m.
5. Tighten the screws on both the sides with a tightening torque of 0.59 to 0.78 N-m.
6. Attach the terminal cover.
7. Switch on the power and check the G3PA to be sure it works properly.

■ Linking Terminal Connection

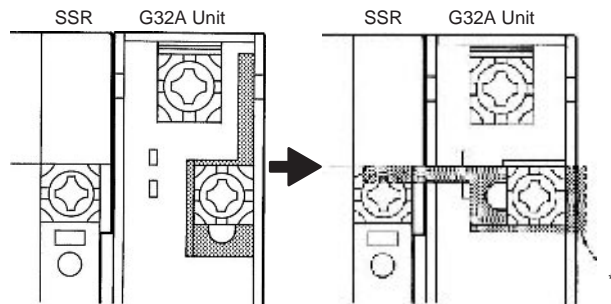
- Connecting with linking terminal for G3PA-210B(L)-VD, -220B(L)-VD, -240B(L)-VD and G3PA-420B-VD(-2), G3PA-430B-VD(-2).



1. When SSRs are close mounted, loosen the M3.5 Sems screw and flip the linking terminal down.

2. Insert the linking terminal securely into the center of the screw and tighten the screw.

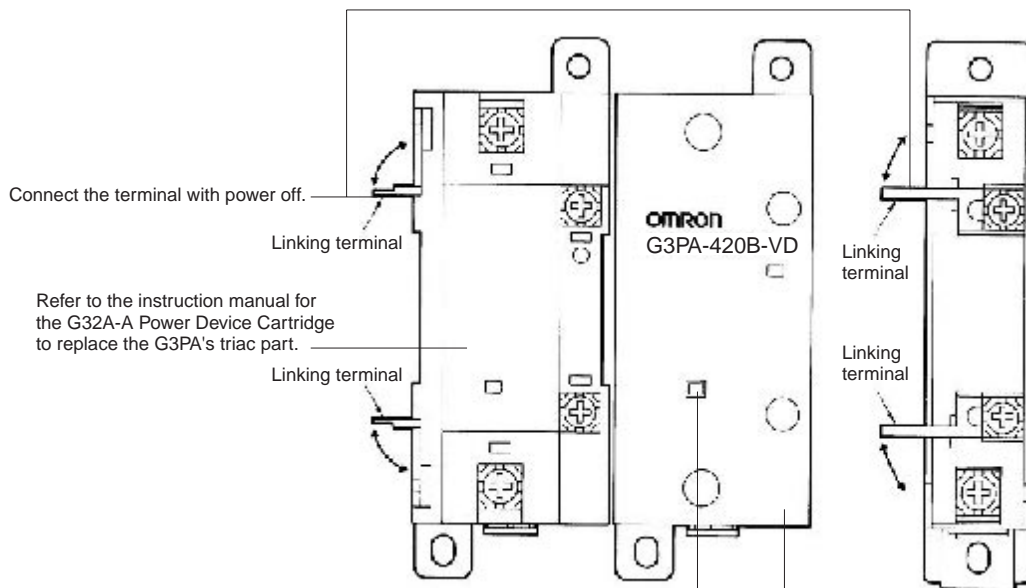
- Connecting with linking terminal for G32A.



1. When SSR are close mounted, loosen the M3.5 Sems screw on the G32A and flip the linking terminal down.

* The cover will not fit if the terminal protrudes.

2. Insert the linking terminal securely into the center of the screw and tighten the screw. Ensure that the linking terminal does not protrude.



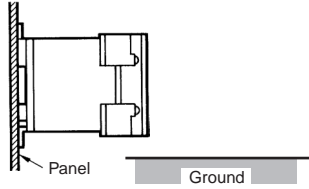
When the temperature indicator has turned from pink to red, the G32A-A Power Device Cartridge may have malfunctioned, in which case the cartridge must be replaced with a new one.

Use the terminal cover to prevent accidents due to electric shock.

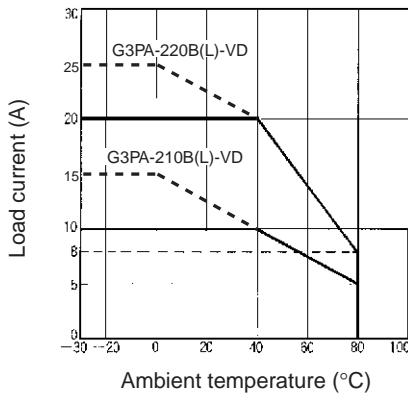
Engineering Data

Load Current vs. Ambient Temperature

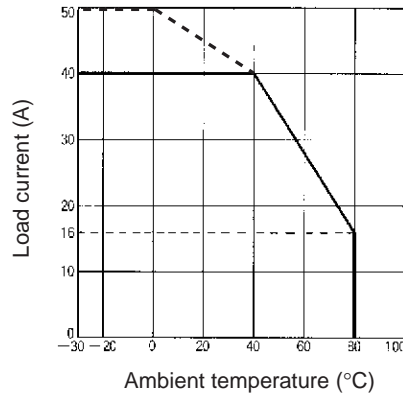
Vertical Mounting



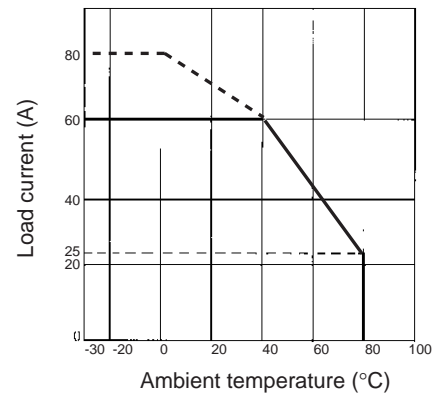
G3PA-210B(L)-VD, G3PA-220B(L)-VD



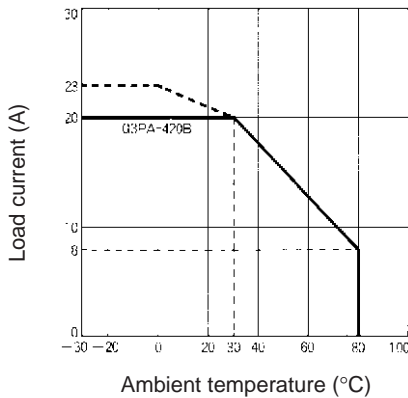
G3PA-240B(L)-VD



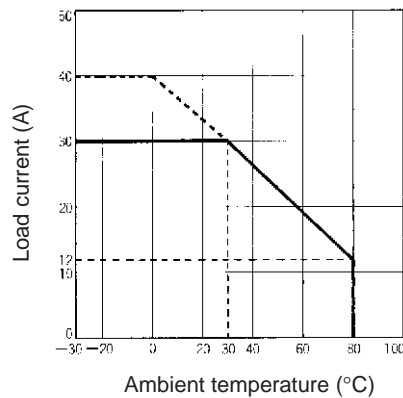
G3PA-260B(L)-VD



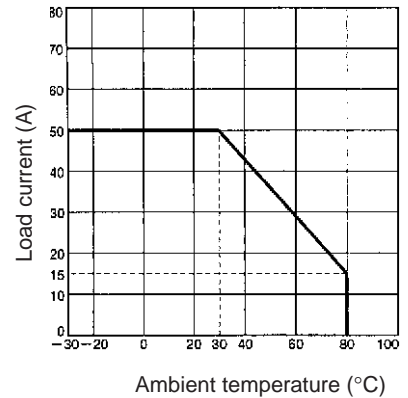
G3PA-420B-VD, G3PA-420B-VD-2



G3PA-430B-VD, G3PA-430B-VD-2



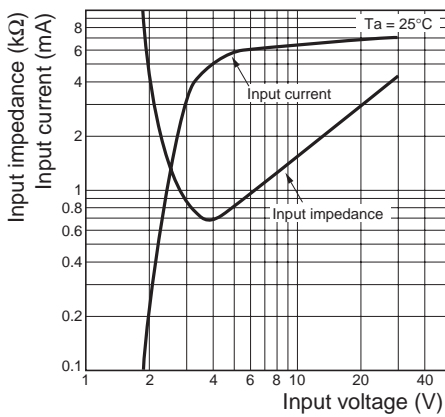
G3PA-450B-VD-2



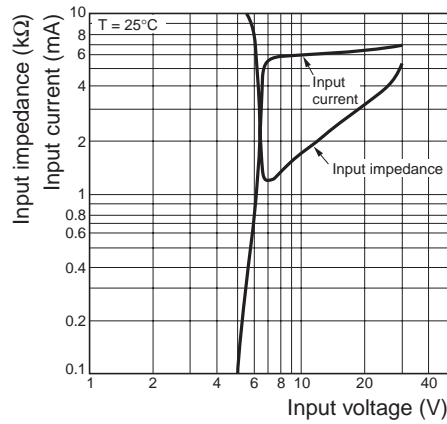
Note: Close mounting is possible for a maximum of three Units by reducing the load current by 20%. (A minimum clearance of 10 mm must be provided when mounting four or more Units.)

Input Voltage vs. Input Current

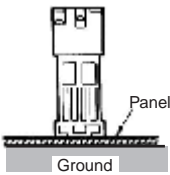
G3PA-2□0B-VD



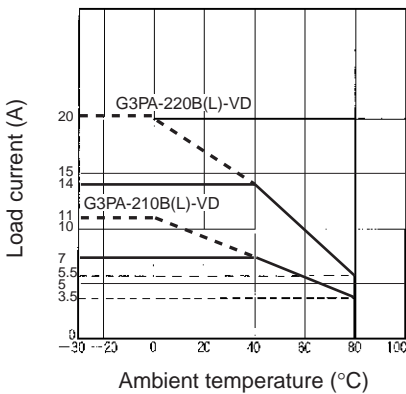
G3PA-4□0-VD, G3PA-4□-VD-2



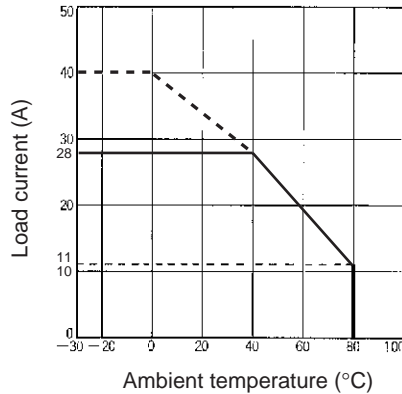
Horizontal Mounting



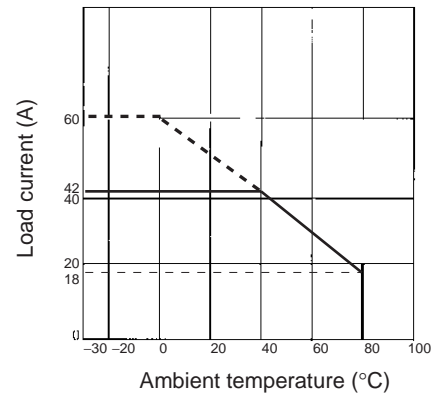
G3PA-210B(L)-VD, G3PA-220B(L)-VD



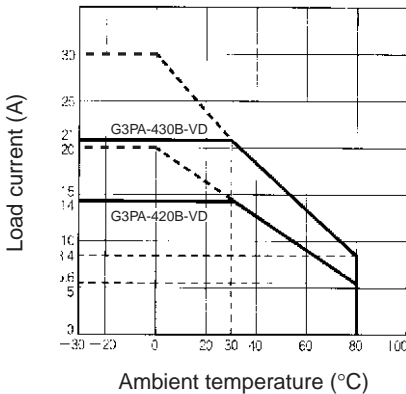
G3PA-240B(L)-VD



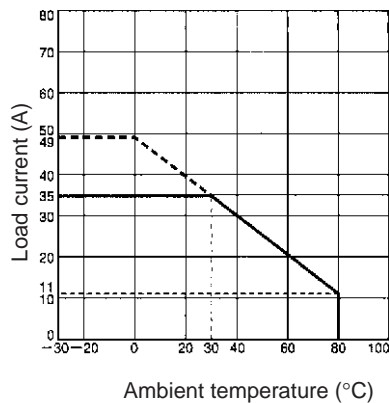
G3PA-260B(L)-VD



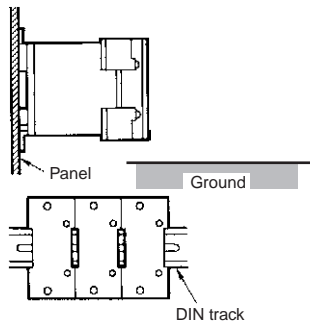
G3PA-420B-VD, G3PA-430B-VD
G3PA-420B-VD-2, G3PA-430B-VD-2



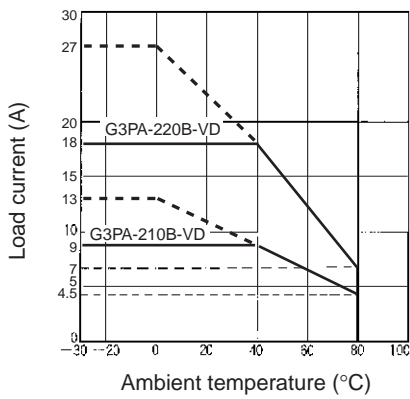
G3PA-450B-VD-2



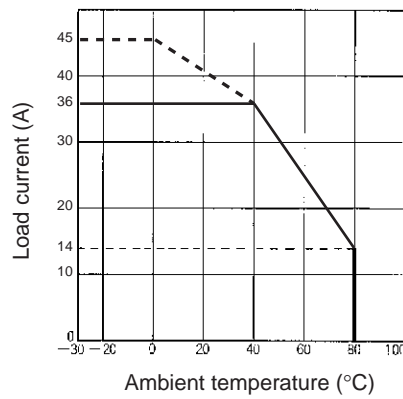
Close Mounting (Up to Three)



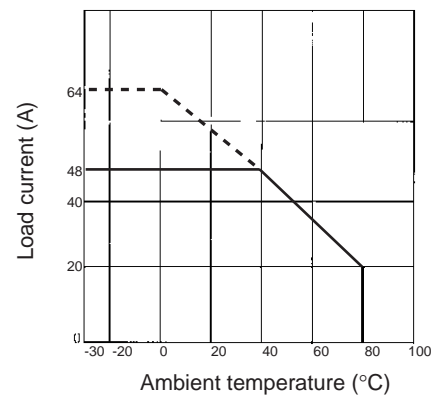
G3PA-210B(L)-VD, G3PA-220B(L)-VD



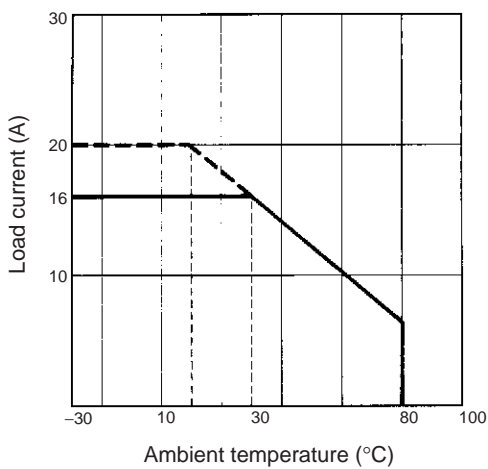
G3PA-240B(L)-VD



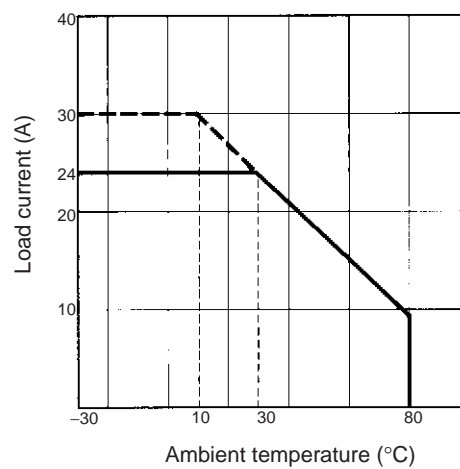
G3PA-260B(L)-VD



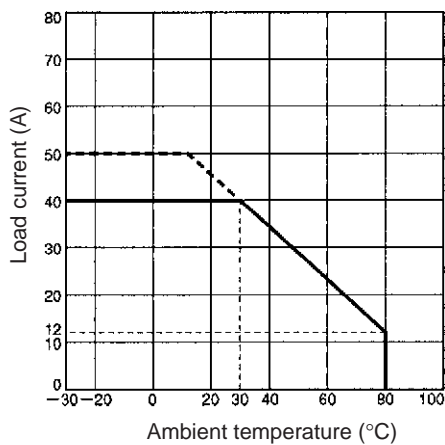
G3PA-420B-VD, G3PA-420B-VD-2



G3PA-430B-VD, G3PA-430B-VD-2



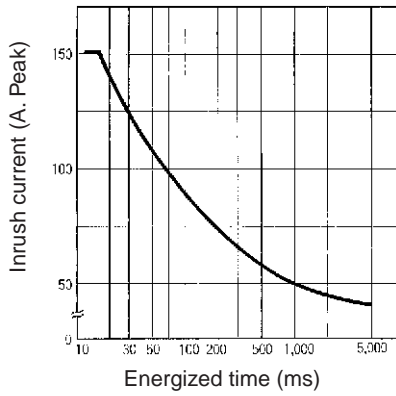
G3PA-450B-VD-2



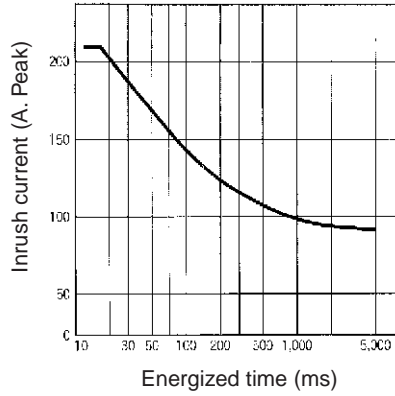
One Cycle Surge Current: Non-repetitive

Note: Keep the inrush current to half the rated value if it occurs repetitively.

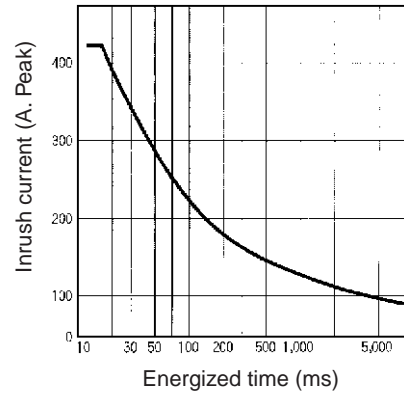
G3PA-210B(L)-VD



**G3PA-220B(L)-VD, G3PA-420B-VD,
G3PA-420B-VD-2**



**G3PA-240B(L)-VD/260B(L)-VD,
G3PA-430B-VD, G3PA-430B-VD-2,
G3PA-450B-VD-2**



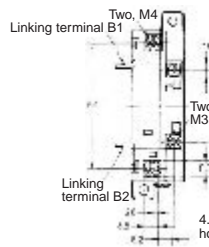
Dimensions

Note: All units are in millimeters unless otherwise indicated.

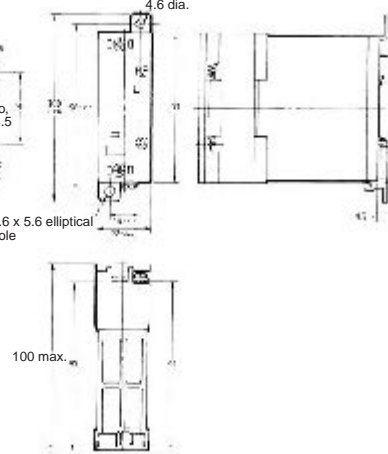
G3PA-210B(L)-VD



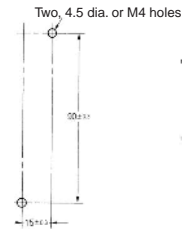
Without Terminal Cover



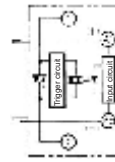
With Terminal Cover



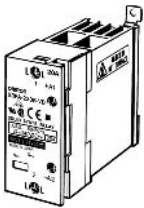
Mounting Holes



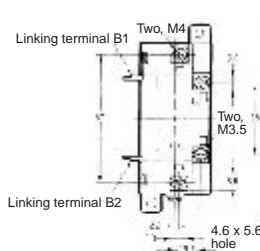
Terminal Arrangement/ Internal Connections



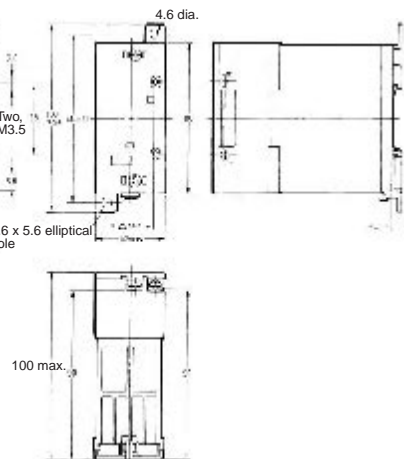
G3PA-220B(L)-VD



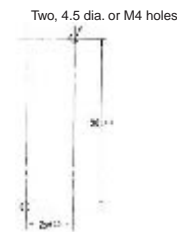
Without Terminal Cover



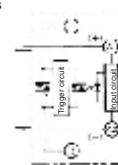
With Terminal Cover



Mounting Holes



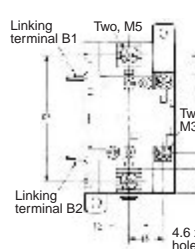
Terminal Arrangement/ Internal Connections



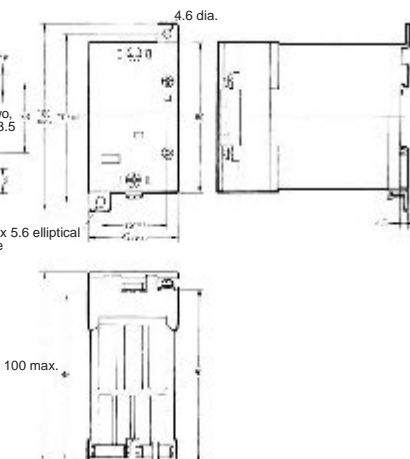
G3PA-240B(L)-VD



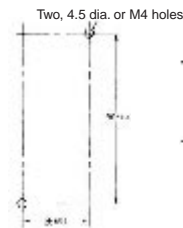
Without Terminal Cover



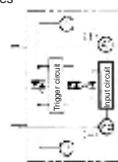
With Terminal Cover



Mounting Holes



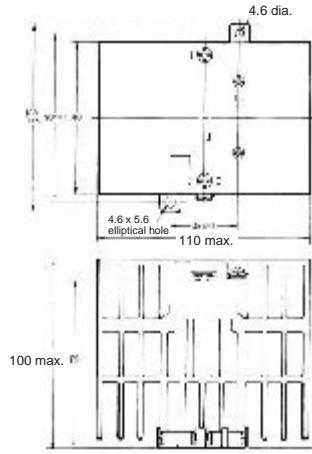
Terminal Arrangement/ Internal Connections



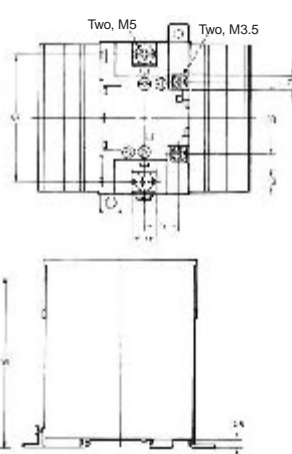
**G3PA-260B(L)-VD
G3PA-450B-VD-2**



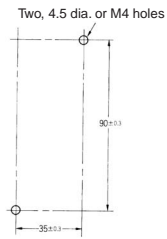
With Terminal Cover



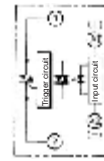
Without Terminal Cover



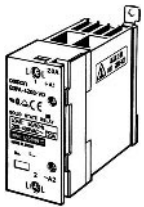
Mounting Holes



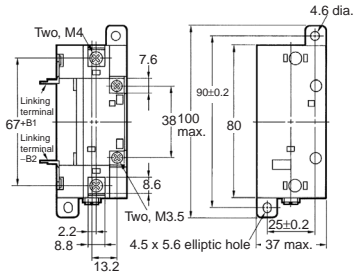
**Terminal Arrangement/
Internal Connections**



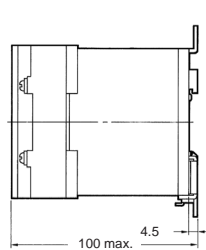
G3PA-420B-VD, G3PA-420B-VD-2



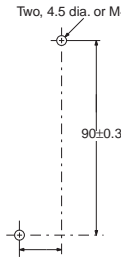
Without Terminal Cover



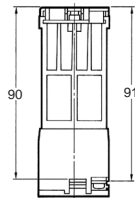
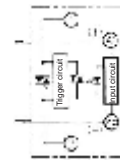
With Terminal Cover



Mounting Holes



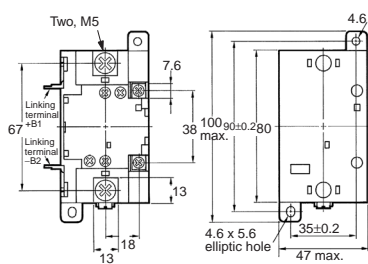
**Terminal Arrangement/
Internal Connections**



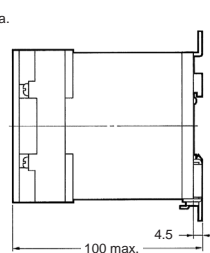
G3PA-430B-VD, G3PA-430B-VD-2



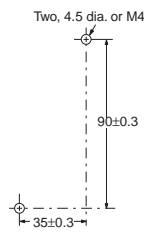
Without Terminal Cover



With Terminal Cover



Mounting Holes



**Terminal Arrangement/
Internal Connections**

