

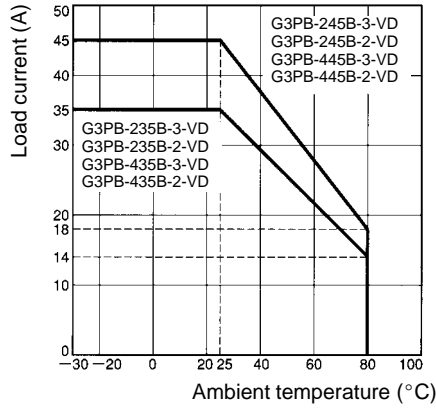
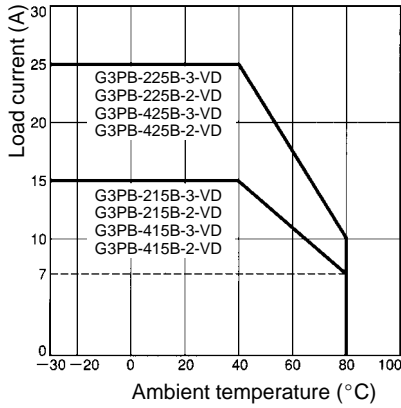
# Engineering Data

## ■ Load Current vs. Ambient Temperature (Continuous Input)

### Models with Built-in Heat Sinks

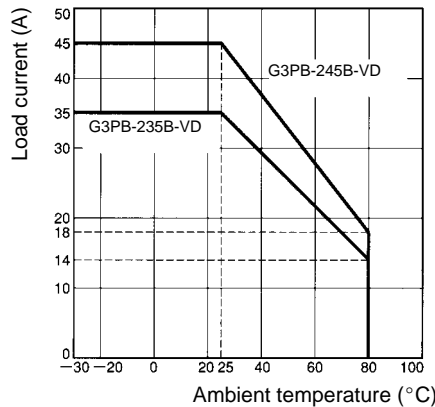
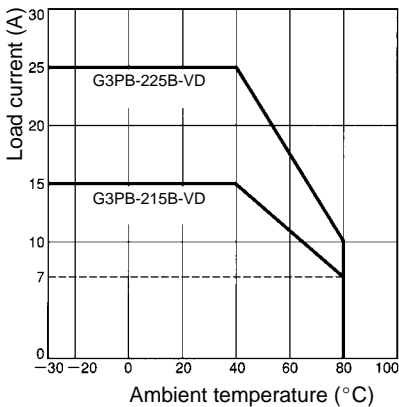
#### Three-phase Models

- |                |                |                |                |
|----------------|----------------|----------------|----------------|
| G3PB-215B-3-VD | G3PB-225B-3-VD | G3PB-235B-3-VD | G3PB-245B-3-VD |
| G3PB-215B-2-VD | G3PB-225B-2-VD | G3PB-235B-2-VD | G3PB-245B-2-VD |
| G3PB-415B-3-VD | G3PB-425B-3-VD | G3PB-435B-3-VD | G3PB-445B-3-VD |
| G3PB-415B-2-VD | G3PB-425B-2-VD | G3PB-435B-2-VD | G3PB-445B-2-VD |



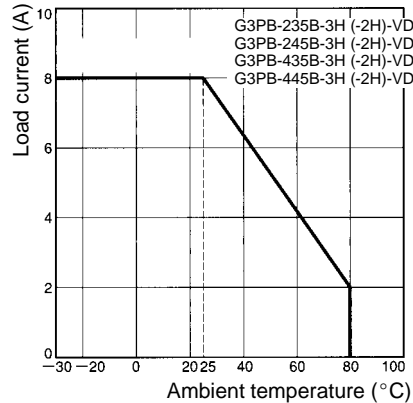
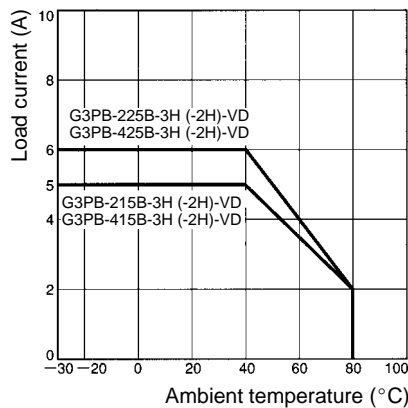
#### Single-phase Models

- |              |              |
|--------------|--------------|
| G3PB-215B-VD | G3PB-235B-VD |
| G3PB-225B-VD | G3PB-245B-VD |



### Models without Built-in Heat Sinks

- |                       |                       |
|-----------------------|-----------------------|
| G3PB-215B-3H (-2H)-VD | G3PB-235B-3H (-2H)-VD |
| G3PB-225B-3H (-2H)-VD | G3PB-245B-3H (-2H)-VD |
| G3PB-415B-3H (-2H)-VD | G3PB-435B-3H (-2H)-VD |
| G3PB-425B-3H (-2H)-VD | G3PB-445B-3H (-2H)-VD |



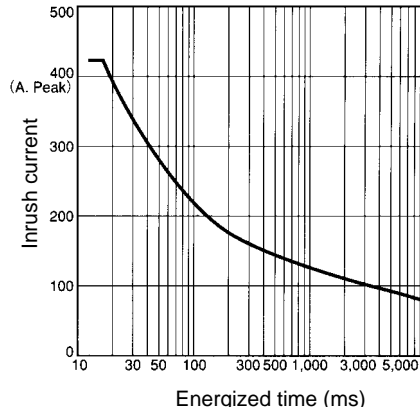
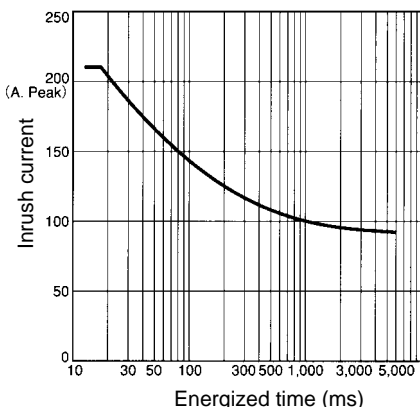
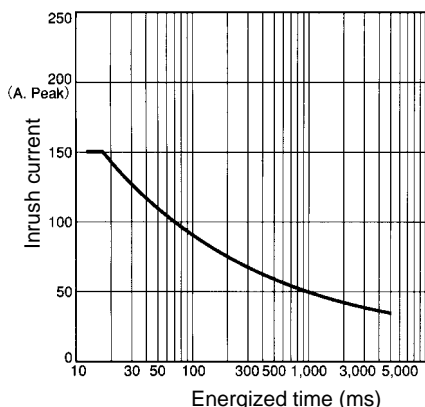
**■ Inrush Current Resistivity: Non-repetitive (Less than Half for Repetitive)**

**Three-phase Models**

G3PB-215B-3 (H)-VD  
G3PB-215B-2 (H)-VD

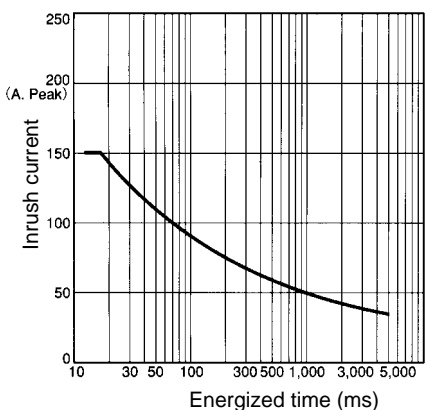
G3PB-225B-3 (H)-VD G3PB-425B-3 (H)-VD  
G3PB-225B-2 (H)-VD  
G3PB-415B-3 (H)-VD G3PB-425B-2 (H)-VD  
G3PB-415B-2 (H)-VD

G3PB-235B-3 (H)-VD G3PB-435B-3 (H)-VD  
G3PB-235B-2 (H)-VD G3PB-435B-2 (H)-VD  
G3PB-245B-3 (H)-VD G3PB-445B-3 (H)-VD  
G3PB-245B-2 (H)-VD G3PB-445B-2 (H)-VD

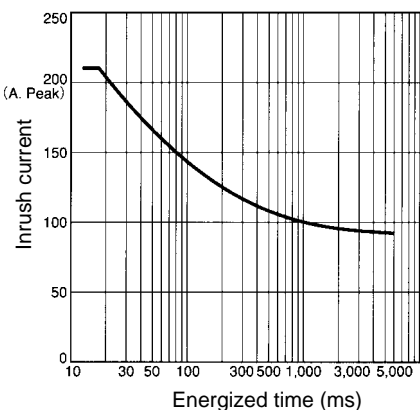


**Single-phase Models**

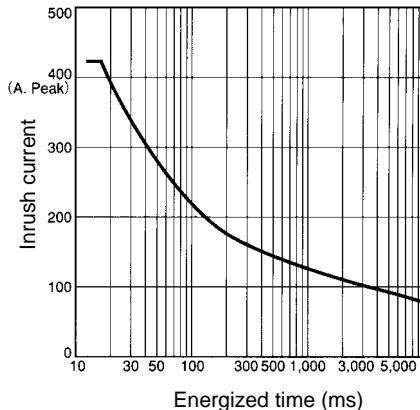
G3PB-215B-VD



G3PB-225B-VD



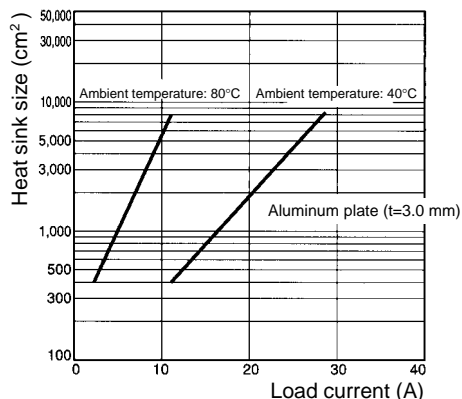
G3PB-235B-VD  
G3PB-245B-VD



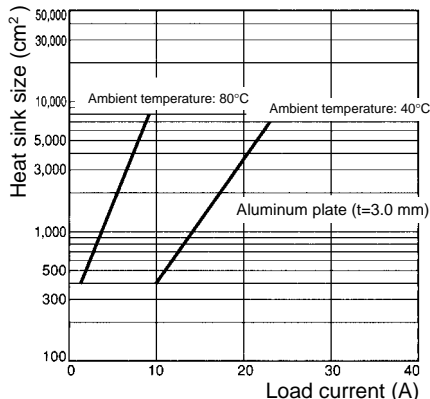
**■ Heat Sink Size vs. Load Current**

**Three-phase Models**

G3PB-225B-3H-VD

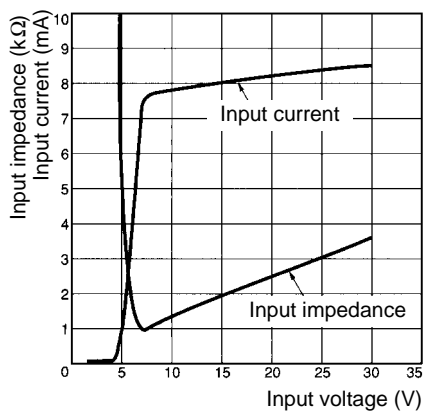


G3PB-425B-3H-VD

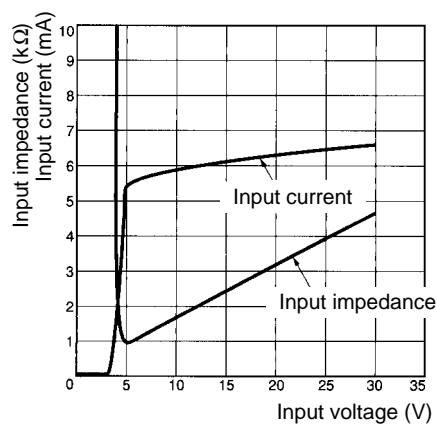


**Note:** The heat sink size refers to the combined area of the sides of the heat sink that radiate heat. In the case of G3PB-425B-3H-VD, when a current of 18 A is allowed to flow through the SSR at 40°C, the graph shows that the heat sink size is about 2,500 cm<sup>2</sup>. Therefore, if the heat sink is square, one side of the heat sink must be 36 cm (36<sup>2</sup> × 2 = 2,592) or longer.

## ■ Input Voltage vs. Input Current and Input Voltage vs. Input Impedance Three-phase Models



## Single-phase Models

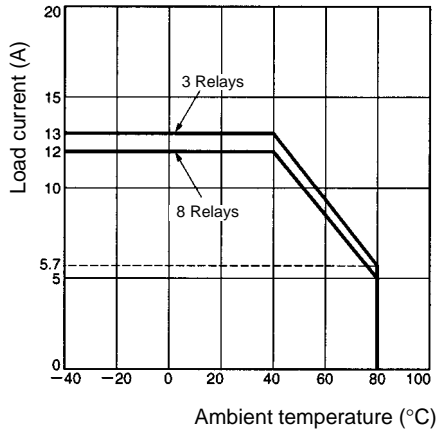


## ■ Thermal Resistance Rth (Junction/SSR Back Surface) Three-phase Models without Heat Sink

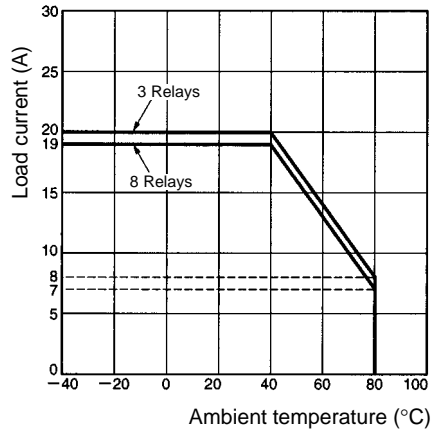
Model	Rth (°C/W)
G3PB-215B-3H-VD	1.05
G3PB-225B-3H-VD	0.57
G3PB-235B-3H-VD	0.57
G3PB-245B-3H-VD	0.57

Close Mounting (3 Relays, 8 Relays)

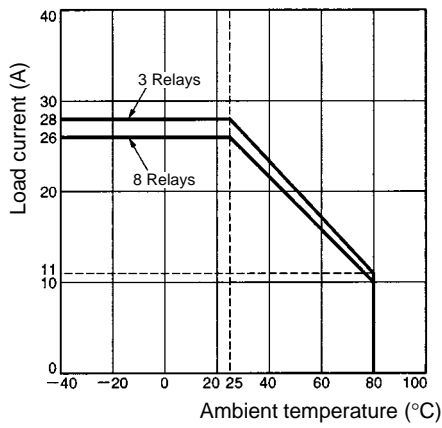
G3PB-215B-VD



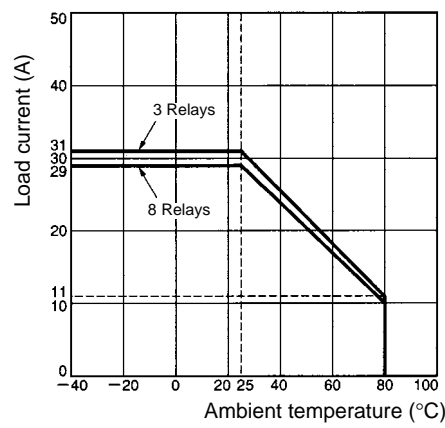
G3PB-225B-VD



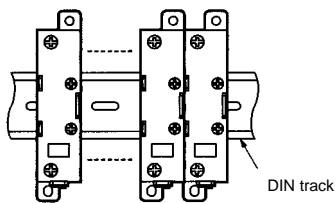
G3PB-235B-VD



G3PB-245B-VD



Close Mounting Example



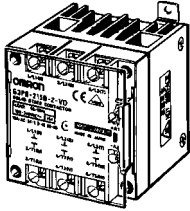
# Dimensions

Note: All units are in millimeters unless otherwise indicated.

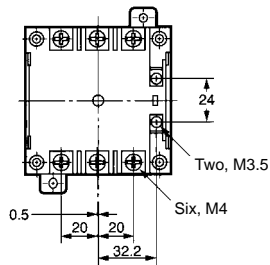
## Models with Built-in Heat Sinks

### Three-phase Models

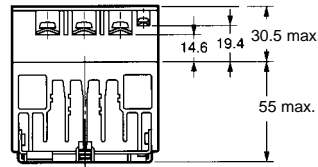
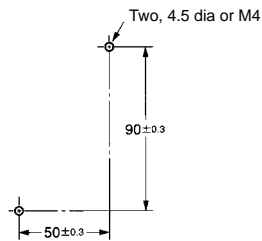
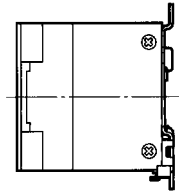
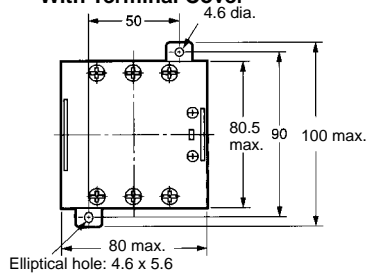
G3PB-215B-2-VD  
G3PB-415B-2-VD



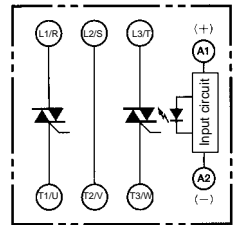
Without Terminal Cover



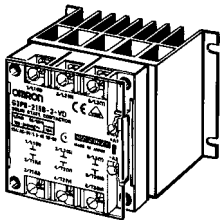
With Terminal Cover



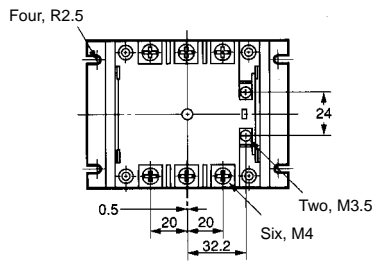
Terminal Arrangement/  
Internal Circuit Diagram



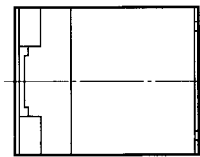
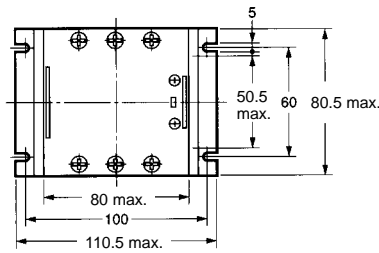
G3PB-215B-3-VD  
G3PB-225B-2-VD  
G3PB-415B-3-VD  
G3PB-425B-2-VD



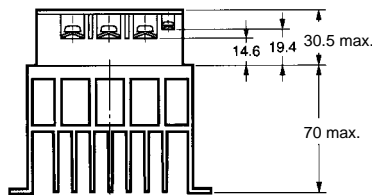
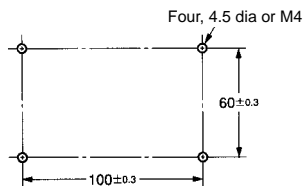
Without Terminal Cover



With Terminal Cover

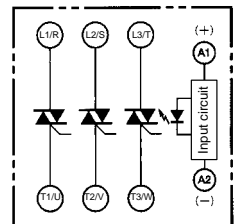


Mounting Holes

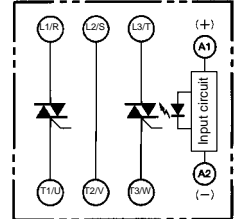


Terminal Arrangement/  
Internal Circuit Diagram

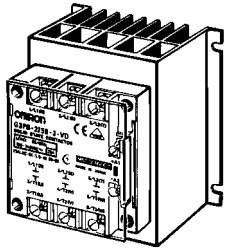
G3PB-□□□B-3-VD



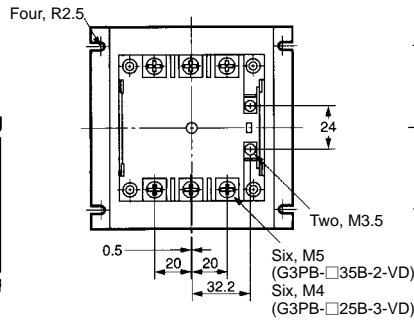
G3PB-□□□B-2-VD



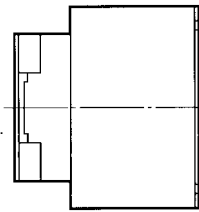
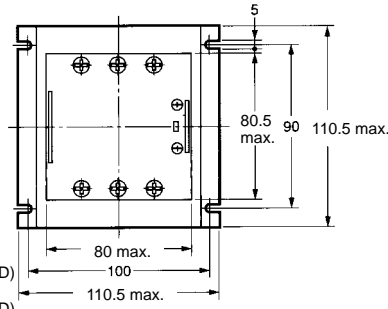
G3PB-225B-3-VD  
 G3PB-235B-2-VD  
 G3PB-425B-3-VD  
 G3PB-435B-2-VD



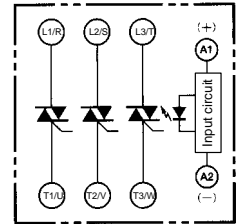
Without Terminal Cover



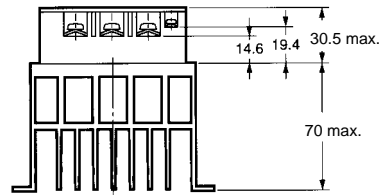
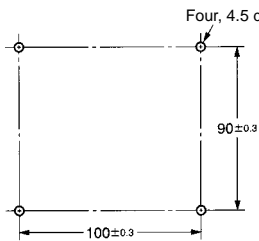
With Terminal Cover



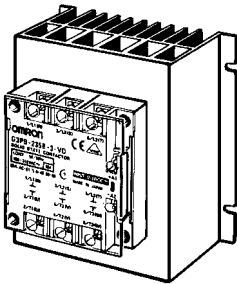
Terminal Arrangement/  
Internal Circuit Diagram



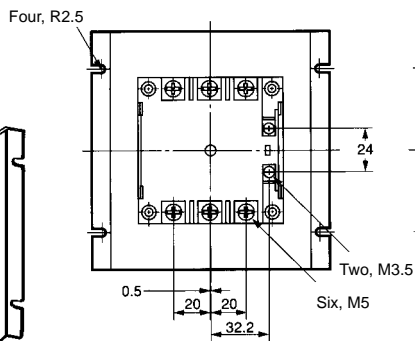
Mounting Holes



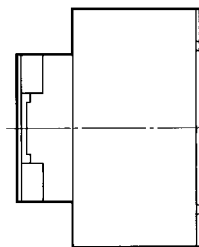
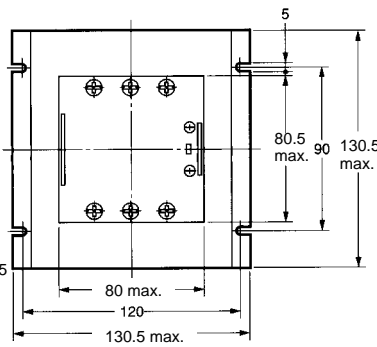
G3PB-235B-3-VD  
 G3PB-245B-2-VD  
 G3PB-435B-3-VD  
 G3PB-445B-2-VD



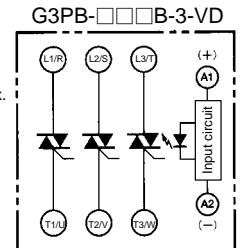
Without Terminal Cover



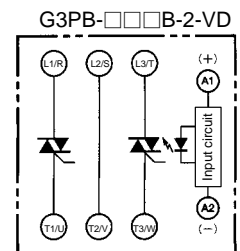
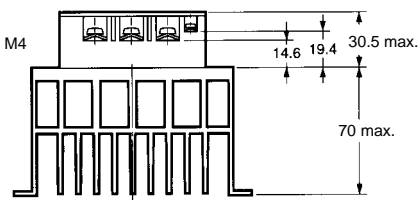
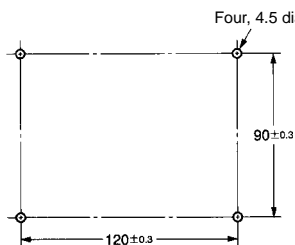
With Terminal Cover



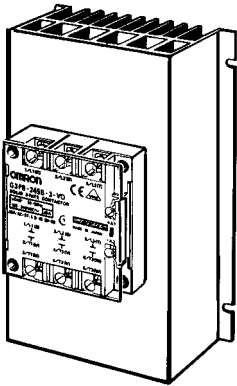
Terminal Arrangement/  
Internal Circuit Diagram



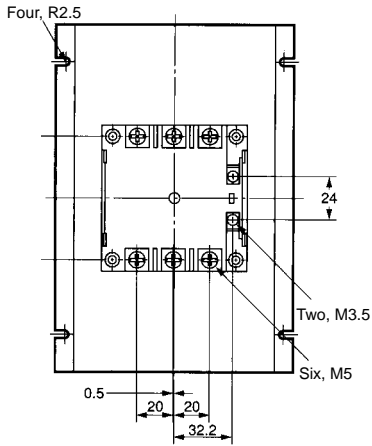
Mounting Holes



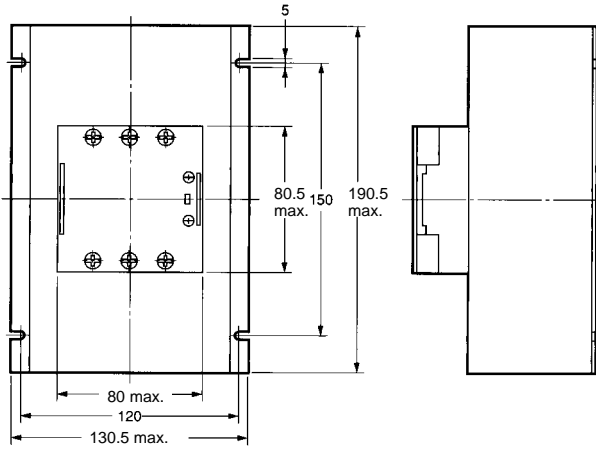
G3PB-245B-3-VD  
G3PB-445B-3-VD



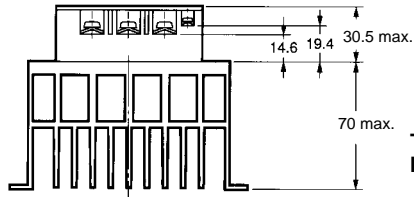
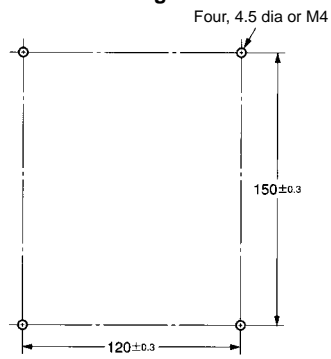
Without Terminal Cover



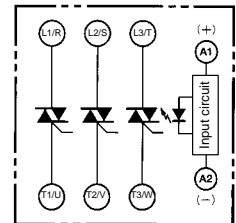
With Terminal Cover



Mounting Holes

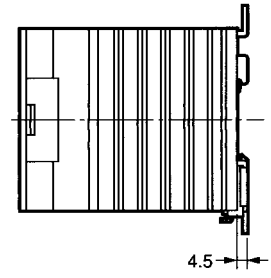
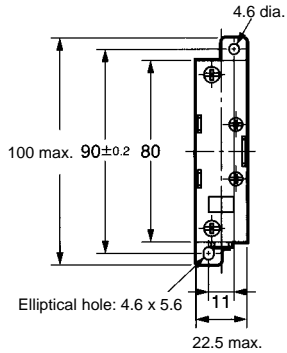
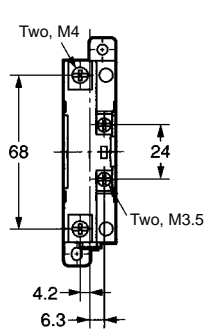
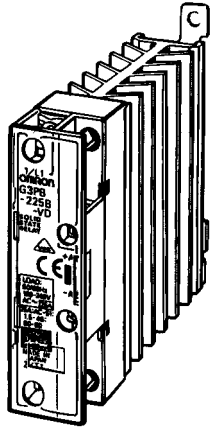


Terminal Arrangement/  
Internal Circuit Diagram

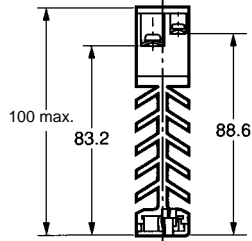
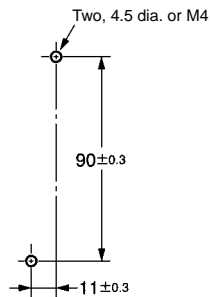


Single-phase Models

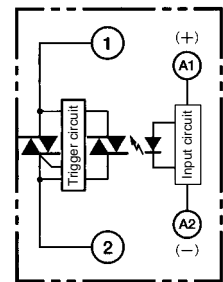
G3PB-215B-VD  
G3PB-225B-VD



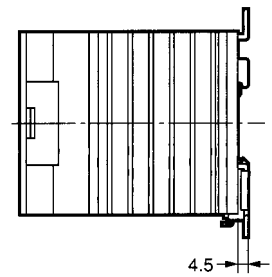
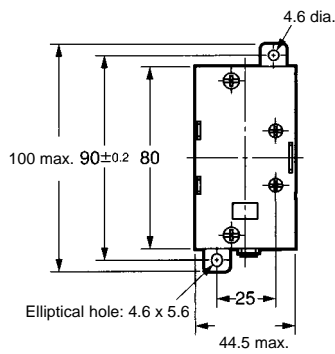
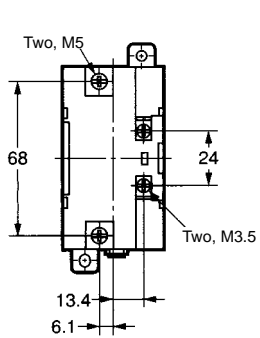
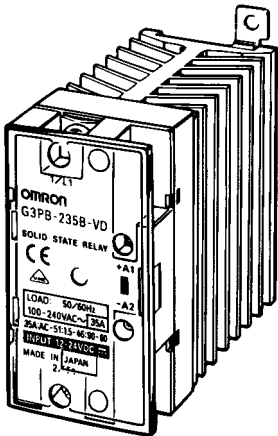
Mounting Holes



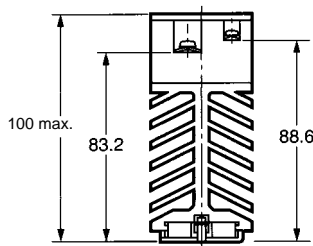
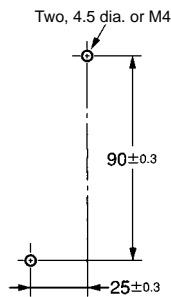
Terminal Arrangement/  
Internal Circuit Diagram



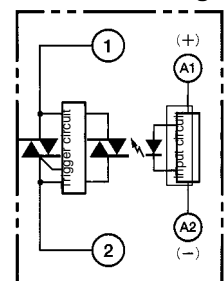
G3PB-235B-VD  
G3PB-245B-VD



Mounting Holes



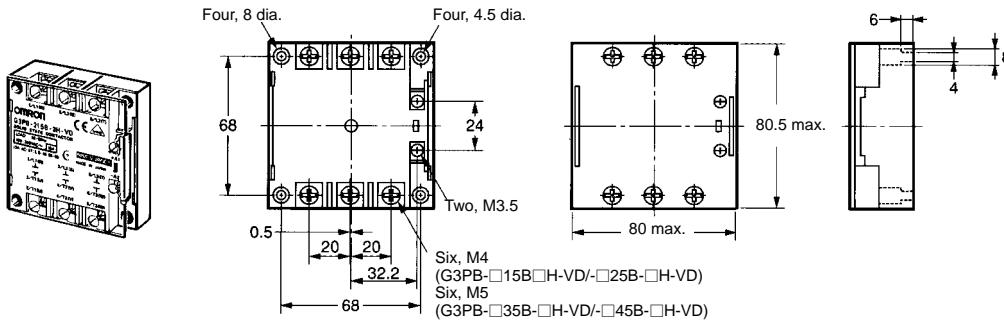
Terminal Arrangement/  
Internal Circuit Diagram



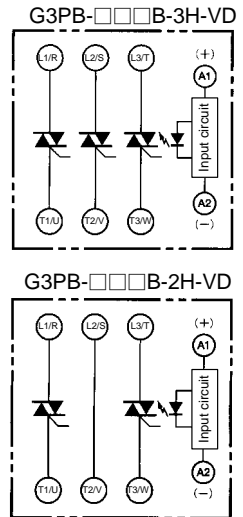


Models without Built-in Heat Sinks

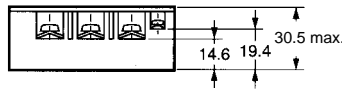
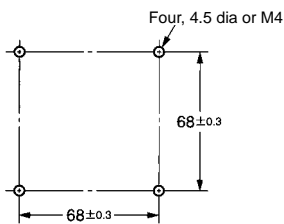
- G3PB-215B-3H-VD   G3PB-235B-3H-VD   G3PB-415B-3H-VD   G3PB-435B-3H-VD
- G3PB-215B-2H-VD   G3PB-235B-2H-VD   G3PB-415B-2H-VD   G3PB-435B-2H-VD
- G3PB-225B-3H-VD   G3PB-245B-3H-VD   G3PB-425B-3H-VD   G3PB-445B-3H-VD
- G3PB-225B-2H-VD   G3PB-245B-2H-VD   G3PB-425B-2H-VD   G3PB-445B-2H-VD



Terminal Arrangement/  
Internal Circuit Diagram

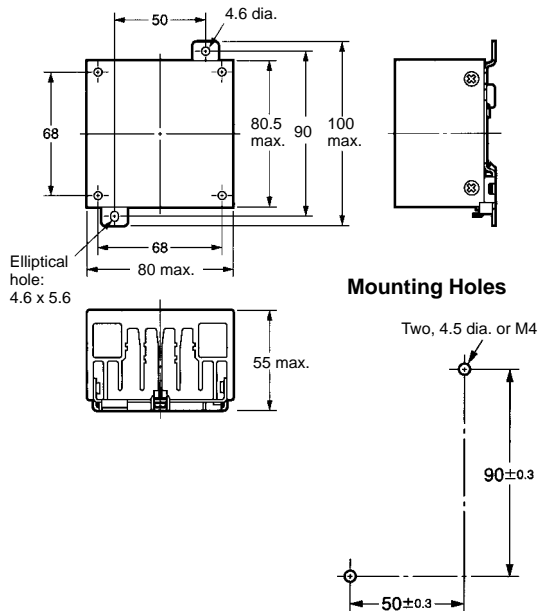


Mounting Holes

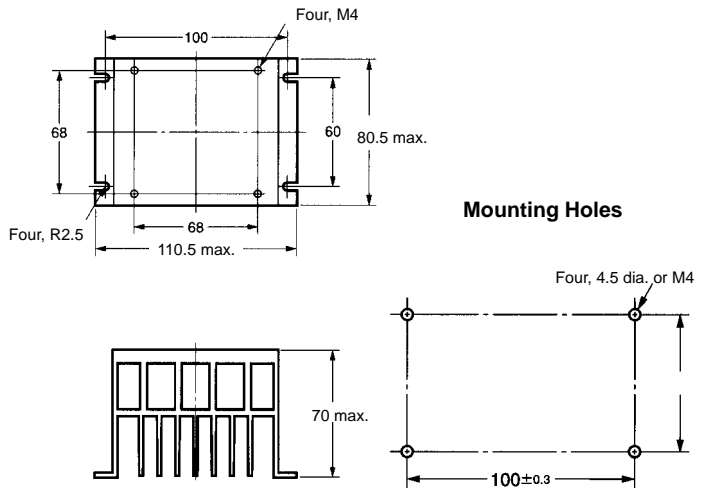


Heat Sinks

- Y92B-P50**  
For model **G3PB-215B-2H-VD**  
**G3PB-415B-2H-VD**

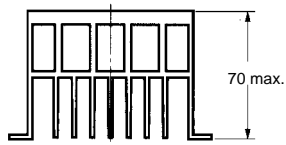
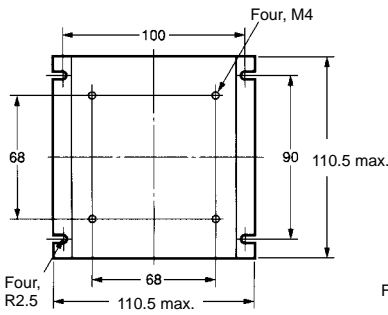


- Y92B-P100**  
For **G3PB-215B-3H-VD**  
**G3PB-225B-2H-VD**  
**G3PB-415B-3H-VD**  
**G3PB-425B-2H-VD**

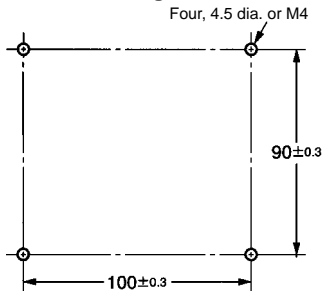


**Y92B-P150**

For model G3PB-225B-3H-VD  
G3PB-235B-2H-VD  
G3PB-425B-3H-VD  
G3PB-435B-2H-VD

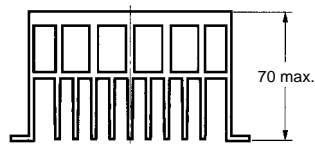
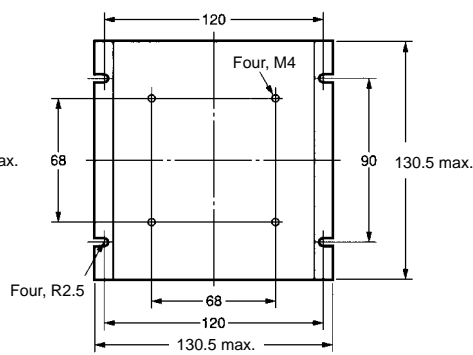


**Mounting Holes**

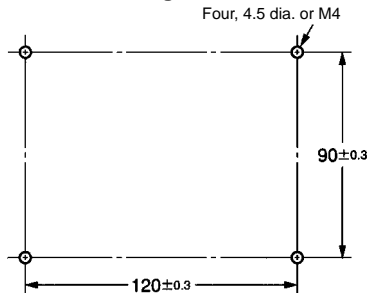


**Y92B-P200**

For model G3PB-235B-3H-VD  
G3PB-245B-2H-VD  
G3PB-435B-3H-VD  
G3PB-445B-2H-VD

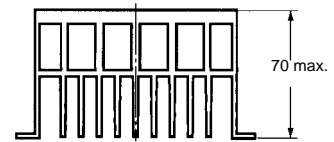
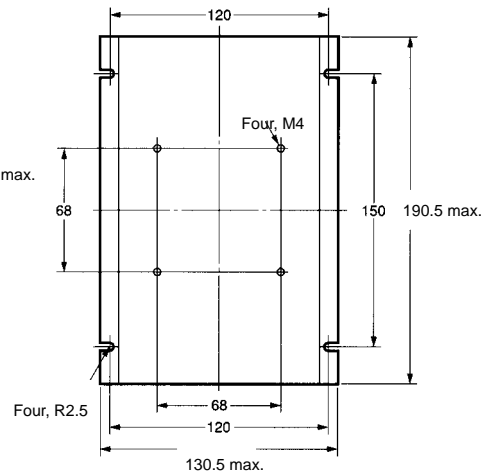


**Mounting Holes**

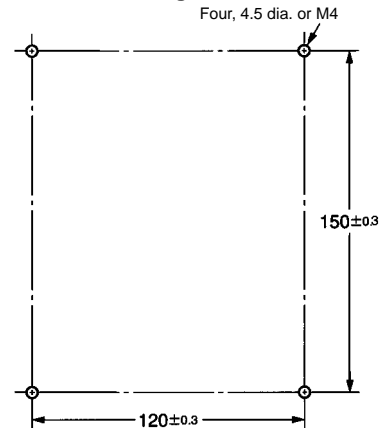


**Y92B-P250**

For model G3PB-245B-3-VD  
G3PB-445B-3-VD



**Mounting Holes**

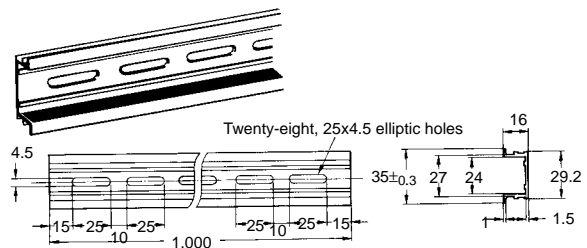
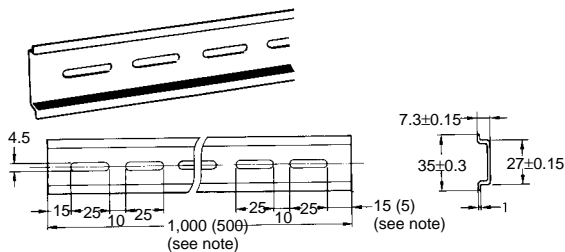


**Accessories (Order Separately)**

**Mounting Tracks**

PFP-100N, PFP-50N

PFP-100N2



**Note:** Values in parentheses indicate dimensions for the PFP-50N.

# Precautions

## ! WARNING

Do not touch the terminals (i.e., charged parts) of the G3PB while power is supplied, otherwise an electric shock may be received.

If the G3PB is provided with a terminal cover, be sure to attach the terminal cover to the G3PB before operating the G3PB.

The G3PB and radiator are very hot while power is supplied to the G3PB.

Do not touch the G3PB or the radiator while power is supplied to the G3PB or immediately after the G3PB is turned OFF, otherwise a burn may result.

Do not touch the load terminal of the G3PB immediately after the G3PB is turned OFF, otherwise an electric shock may be received due to the residual charge of the built-in snubber circuit.

Be sure to turn OFF the power supply to the G3PB before wiring, otherwise an electric shock may be received.

Mount the terminal cover to the G3PB after wiring.

Do not touch the terminals of the G3PB while power is supplied, otherwise an electric shock may be received.

The built-in capacitor will be charged as long as power is supplied. Do not touch the terminals of the G3PB unless the G3PB is turned OFF and the built-in capacitor discharges all of its residual voltage, otherwise an electric shock may result.

## ! Caution

Do not apply excessive voltage or current to the input or output circuit of the G3PB, otherwise the G3PB may malfunction or burn.

Do not use the G3PB unless all the output terminal screws are tightened securely, otherwise the terminals may generate excessive heat and the G3PB may burn.

Be sure to provide enough ventilation to the G3PB and the radiator, otherwise the G3PB may generate excessive heat and the G3PB may burn or the output element may short-circuit.

Be sure to turn OFF the power supply to the G3PB before wiring, otherwise an electric shock may be received.

Be sure to wire or solder the terminals of the G3PB properly, otherwise the G3PB may generate excessive heat and burn.

If the G3PB is mounted directly to a control panel that is used as a radiator as well, the control panel must be made of aluminum or a steel plate with low thermal resistance.

Do not use any material with high thermal resistance, such as a wooden plate, otherwise the G3PB may catch on fire or burn.

## ■ Correct Use

### Before Actual Operation

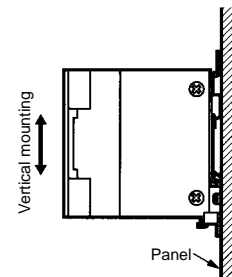
- The G3PB in operation may cause an unexpected accident. Therefore it is necessary to test the G3PB under a variety of conditions that are possible. As for the characteristics of the G3PB, it is necessary to take into consideration the dispersion of the characteristics between G3PB Units.
- The ratings in this datasheet are tested values in a temperature range between 15°C and 30°C, a relative humidity range between 25% and 85%, and an atmospheric pressure range between 88 and 106 kPa. It will be necessary to provide the above conditions as well as the load conditions if the user wants to confirm the ratings of actual G3PB Units.

### Mounting Method

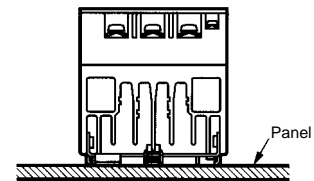
Since the Relay is heavy, firmly mount the DIN track and fix both ends with End Plates for DIN-track-mounting models.

For direct mounting, firmly mount the Relay on the panel.

#### Vertical Mounting

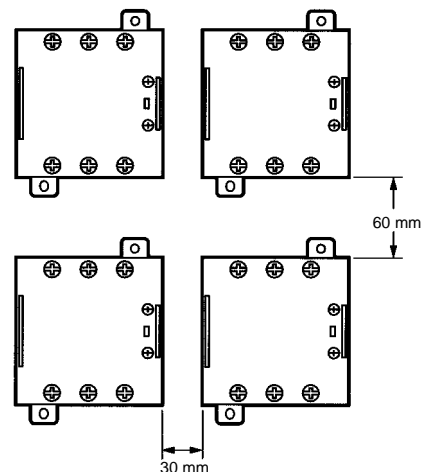


#### Horizontal Mounting



**Note:** Make sure that the load current is 50% of the rated load current when the G3PB is mounted horizontally.

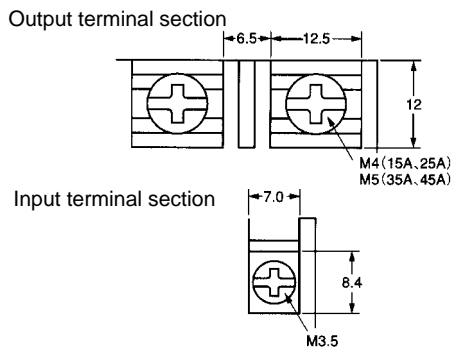
#### Close Mounting



**Note:** Be sure to provide a minimum space of 30 mm horizontally and 60 mm vertically between adjacent Units.

## Wiring

When using crimp terminals, refer to the terminal clearances shown below.



Be sure that all lead wires are thick enough according to the current.

Output terminals T1, T2, and T3 are charged regardless of whether the Unit is a 2- or 3-element model that is turned on or off. Do not touch these terminals, otherwise an electric shock may be received.

To isolate the Unit from the power supply, install an appropriate circuit breaker between the power supply and Unit.

Be sure to turn off the power supply before wiring the Unit.

Terminal L2 and terminal T2 of the 2-element model are internally short-circuited to each other. Therefore, connect terminal L2 to the ground terminal of the power supply. If terminal L2 is connected to a terminal other than the ground terminal, cover all the charged terminals, such as heater terminals, for the prevention of electric shock accidents and ground faults.

## Tightening Torque

Refer to the following and be sure to tighten each screw of the Unit to the specified torque in order to prevent the Unit from malfunctioning.

Item	Screw terminal diameter	Tightening torque
Input terminal	M3.5	0.8 N • m
Output terminal	M4	1.2 N • m
	M5	2.0 N • m

## Mounting Models without Built-in Heat Sink

Before attaching an external radiator or Heat Sink to the Unit, be sure to apply silicone grease for heat radiation, such as Toshiba's YG6260 or Sinetsu Silicone's G746, to the surface where the radiator or Heat Sink is attached.

Be sure to apply the following torque to secure the Unit and external radiator or Heat Sink for proper heat radiation.

Tightening torque: 2.0 N • m

## Operating Conditions

Do not apply current exceeding the rated current. Otherwise the temperature of the Unit may rise excessively.

Be sure to prevent ambient temperature rising due to the heat radiation of the Unit. In the case of enclosed mounting, install a fan so that the interior of the panel can be fully ventilated.

## Operating and Storage Environments

Do not use or store the Unit in the following places, otherwise the Unit may malfunction or the characteristics of the Unit may deteriorate.

- Locations subject to direct sunlight.
- Locations subject to ambient operating temperatures outside the range of  $-30^{\circ}\text{C}$  to  $80^{\circ}\text{C}$ .
- Locations subject to ambient operating humidity outside the range of 45% to 85%.
- Locations subject to condensation as the result of severe changes in temperature.
- Locations subject to ambient storage temperatures outside the range of  $-30^{\circ}\text{C}$  to  $100^{\circ}\text{C}$ .
- Locations subject to corrosive or flammable gases.
- Locations subject to dust (especially iron dust) or salts.
- Locations subject to shock or vibration.
- Locations subject to exposure to water, oil, or chemicals.

**ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.**

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