

Space and working time saved with new heat sink construction. Series now includes 480-VAC models to allow use in a greater range of applications.

- A comprehensive lineup that now includes 480-VAC models.
- Slim design with 3-phase output and built-in heat sinks.
- New heat sink construction with smaller mounting section.
- DIN track mounting supported as standard. (Screw mounting is also possible.)
- Certified by UL, CSA, and VDE.



Refer to *Safety Precautions for All Solid State Relays*.

## Model Number Structure

### ■ Model Number Legend

G3PB-□□□-□□□-□  
 1      2 3 4    5 6 7

#### 1. Basic Model Name

G3PB: Solid State Relay

#### 2. Rated Load Power Supply Voltage

2: 200 VAC

5: 480 VAC

#### 3. Rated Load Current

15: 15 A

25: 25 A

35: 35 A

45: 45 A

#### 4. Terminal Type

B: Screw terminals

#### 5. Single-phase/3-phase and Number of Elements for 3-phase

2: 3-phase, 2-element models

3: 3-phase, 3-element models

#### 6. 3-phase Type

N: DIN track mounting and built-in heat sink

H: No heat sink ("hockey puck" type)

#### 7. Certification

VD: Certified by UL, CSA, and VDE

# Ordering Information

## ■ Solid State Contactors

### Models with Built-in Heat Sinks

Applicable phase	Main circuit voltage	Zero cross function	Applicable load current (with Class-1 AC resistive load)	Number of poles	Model
3	100 to 240 VAC	Yes	15 A	3	G3PB-215B-3N-VD DC12-24
				2	G3PB-215B-2N-VD DC12-24
			25 A	3	G3PB-225B-3N-VD DC12-24
				2	G3PB-225B-2N-VD DC12-24
			35 A	3	G3PB-235B-3N-VD DC12-24
				2	G3PB-235B-2N-VD DC12-24
			45 A	3	G3PB-245B-3N-VD DC12-24
				2	G3PB-245B-2N-VD DC12-24
			200 to 480 VAC	15 A	3
	2				G3PB-515B-2N-VD DC12-24
	25 A			3	G3PB-525B-3N-VD DC12-24
				2	G3PB-525B-2N-VD DC12-24
	35 A			3	G3PB-535B-3N-VD DC12-24
				2	G3PB-535B-2N-VD DC12-24
	45 A			3	G3PB-545B-3N-VD DC12-24
				2	G3PB-545B-2N-VD DC12-24

**Note:** The applicable load current depends on the ambient temperature. When ordering, specify the rated input voltage.

### Models with Externally Attached Heat Sinks

Applicable phase	Main circuit voltage	Zero cross function	Applicable load current (See note.)	Number of poles	Model
3	100 to 240 VAC	Yes	15 A	3	G3PB-215B-3H-VD DC12-24
				2	G3PB-215B-2H-VD DC12-24
			25 A	3	G3PB-225B-3H-VD DC12-24
				2	G3PB-225B-2H-VD DC12-24
			35 A	3	G3PB-235B-3H-VD DC12-24
				2	G3PB-235B-2H-VD DC12-24
			45 A	3	G3PB-245B-3H-VD DC12-24
				2	G3PB-245B-2H-VD DC12-24
			200 to 480 VAC	15 A	3
	2				G3PB-515B-2H-VD DC12-24
	25 A			3	G3PB-525B-3H-VD DC12-24
				2	G3PB-525B-2H-VD DC12-24
	35 A			3	G3PB-535B-3H-VD DC12-24
				2	G3PB-535B-2H-VD DC12-24
	45 A			3	G3PB-545B-3H-VD DC12-24
				2	G3PB-545B-2H-VD DC12-24

**Note:** The applicable load current depends on the heat sink that is connected and the ambient temperature. For details, refer to *Load Current vs. Ambient Temperature* in *Engineering Data* on page 5.

# Specifications

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

### Operating Circuit (Common)

Item	Common
Rated voltage	12 to 24 VDC
Operating voltage range	9.6 to 30 VDC
Rated input current (Impedance)	10 mA max. (at 24 VDC)
Must operate voltage	9.6 VDC max.
Must release voltage	1 VDC min.
Insulation method	Phototriac coupler
Operation indicator	Yellow LED

### Main Circuit of Models with Built-in Heat Sinks

Item	Model	G3PB-215B-3N-VD	G3PB-215B-2N-VD	G3PB-225B-3N-VD	G3PB-225B-2N-VD	G3PB-235B-3N-VD	G3PB-235B-2N-VD	G3PB-245B-3N-VD	G3PB-245B-2N-VD	G3PB-515B-3N-VD	G3PB-515B-2N-VD	G3PB-525B-3N-VD	G3PB-525B-2N-VD	G3PB-535B-3N-VD	G3PB-535B-2N-VD	G3PB-545B-3N-VD	G3PB-545B-2N-VD	
Rated load voltage		100 to 240 VAC								200 to 480 VAC								
Load voltage range		75 to 264 VAC								180 to 528 VAC								
Applicable load current (See note 1.)		15 A (at 40°C)	25 A (at 40°C)	35 A (at 25°C)	45 A (at 25°C)	15 A (at 40°C)	25 A (at 40°C)	35 A (at 25°C)	45 A (at 25°C)	15 A (at 40°C)	25 A (at 40°C)	35 A (at 25°C)	45 A (at 25°C)	15 A (at 40°C)	25 A (at 40°C)	35 A (at 25°C)	45 A (at 25°C)	
Minimum load current		0.2 A				0.5 A												
Inrush current resistance (peak value)		150 A (60 Hz, 1 cycle)	220 A (60 Hz, 1 cycle)	440 A (60 Hz, 1 cycle)				220 A (60 Hz, 1 cycle)				440 A (60 Hz, 1 cycle)						
Permissible I <sup>2</sup> t (half 60-Hz wave)		121 A <sup>2</sup> s	260 A <sup>2</sup> s	1260 A <sup>2</sup> s				260 A <sup>2</sup> s				1260 A <sup>2</sup> s						
Applicable load (resistive load, AC1) (See note 2.)		5.1 kW max. (at 200 VAC)	8.6 kW max. (at 200 VAC)	12.1 kW max. (at 200 VAC)	15.5 kW max. (at 200 VAC)	12.5 kW max. (at 480 VAC)	20.7 kW max. (at 480 VAC)	29.0 kW max. (at 480 VAC)	37.4 kW max. (at 480 VAC)	12.5 kW max. (at 480 VAC)	20.7 kW max. (at 480 VAC)	29.0 kW max. (at 480 VAC)	37.4 kW max. (at 480 VAC)	12.5 kW max. (at 480 VAC)	20.7 kW max. (at 480 VAC)	29.0 kW max. (at 480 VAC)	37.4 kW max. (at 480 VAC)	

**Note:** 1. The applicable load current depends on the ambient temperature. For details, refer to *Load Current vs. Ambient Temperature* in *Engineering Data* on page 5.

2. Applicable Load

Use the following formula to calculate the maximum total capacity of a heater load for a three-phase balanced load with delta connections.

$$\text{Maximum load capacity} = \text{Load current} \times \text{Load voltage} \times \sqrt{3}$$

$$\text{Example: } 15 \text{ A} \times 200 \text{ V} \times \sqrt{3} = 5.196 \text{ W} \approx 5.1 \text{ kW}$$

$$\text{Example: } 15 \text{ A} \times 400 \text{ V} \times \sqrt{3} = 10.392 \text{ W} \approx 10.3 \text{ kW}$$

### Main Circuit of Models with Externally Attached Heat Sinks

Item	Model	G3PB-215B-3H-VD	G3PB-215B-2H-VD	G3PB-225B-3H-VD	G3PB-225B-2H-VD	G3PB-235B-3H-VD	G3PB-235B-2H-VD	G3PB-245B-3H-VD	G3PB-245B-2H-VD	G3PB-515B-3H-VD	G3PB-515B-2H-VD	G3PB-525B-3H-VD	G3PB-525B-2H-VD	G3PB-535B-3H-VD	G3PB-535B-2H-VD	G3PB-545B-3H-VD	G3PB-545B-2H-VD	
Rated load voltage		100 to 240 VAC								200 to 480 VAC								
Load voltage range		75 to 264 VAC								180 to 528 VAC								
Applicable load current (See note.)		15 A (at 40°C)	25 A (at 40°C)	35 A (at 25°C)	45 A (at 25°C)	15 A (at 40°C)	25 A (at 40°C)	35 A (at 25°C)	45 A (at 25°C)	15 A (at 40°C)	25 A (at 40°C)	35 A (at 25°C)	45 A (at 25°C)	15 A (at 40°C)	25 A (at 40°C)	35 A (at 25°C)	45 A (at 25°C)	
Minimum load current		0.2 A				0.5 A												
Inrush current resistance (peak value)		150 A (60 Hz, 1 cycle)	220 A (60 Hz, 1 cycle)	440 A (60 Hz, 1 cycle)				220 A (60 Hz, 1 cycle)				440 A (60 Hz, 1 cycle)						
Permissible I <sup>2</sup> t (half 60-Hz wave)		121 A <sup>2</sup> s	260 A <sup>2</sup> s	1,260 A <sup>2</sup> s				260 A <sup>2</sup> s				1,260 A <sup>2</sup> s						
Applicable load (resistive load, AC1)		Refer to <i>Engineering Data</i> on page 5.																

**Note:** The applicable load current depends on the heat sink that is connected and the ambient temperature. For details, refer to *Load Current vs. Ambient Temperature* in *Engineering Data* on page 5.

## ■ Characteristics

### Models with Built-in Heat Sinks

Item	G3PB-215B-3N-VD	G3PB-215B-2N-VD	G3PB-225B-3N-VD	G3PB-225B-2N-VD	G3PB-235B-3N-VD	G3PB-235B-2N-VD	G3PB-245B-3N-VD	G3PB-245B-2N-VD	G3PB-515B-3N-VD	G3PB-515B-2N-VD	G3PB-525B-3N-VD	G3PB-525B-2N-VD	G3PB-535B-3N-VD	G3PB-535B-2N-VD	G3PB-545B-3N-VD	G3PB-545B-2N-VD
Operate time	1/2 of load power source cycle + 1 ms max.															
Release time	1/2 of load power source cycle + 1 ms max.															
Output ON voltage drop	1.6 V (RMS) max.								1.8 V (RMS) max.							
Leakage current (See note.)	10 mA (at 200 VAC)								20 mA (at 480 VAC)							
Insulation resistance	100 MΩ min. (at 500 VDC)															
Dielectric strength	2,500 VAC, 50/60 Hz for 1 min															
Vibration resistance	Destruction: 10 to 55 to 10 Hz, 0.375-mm single amplitude (0.75-mm double amplitude) (Mounted to DIN track)															
Shock resistance	Destruction: 294 m/s <sup>2</sup> (98 m/s <sup>2</sup> with reverse mounting)															
Ambient operating temperature	Operating: -30°C to 80°C (with no icing or condensation) Storage: -30°C to 100°C (with no icing or condensation)															
Ambient operating humidity	Operating: 45% to 85%															
Weight	Approx. 1.25 kg	Ap-prox. 1.45 kg	Ap-prox. 1.25 kg	Ap-prox. 1.65 kg	Ap-prox. 1.45 kg	Ap-prox. 2.0 kg	Ap-prox. 1.65 kg	Approx. 1.25 kg	Ap-prox. 1.45 kg	Ap-prox. 1.25 kg	Ap-prox. 1.65 kg	Ap-prox. 1.45 kg	Ap-prox. 2.0 kg	Ap-prox. 1.65 kg		
Certified standards	UL508, CSA22.2 No. 14, EN60947-4-3 (IEC947-4-3); Certified by VDE (From April 2001)															
EMC	Emission: EN55011 Group 1 Class B Immunity: EN61000-6-2															

**Note:** The leakage current of phase S will be approximately  $\sqrt{3}$  times larger if the 2-element model is applied.

### Models with Externally Attached Heat Sinks

Model	G3PB-215B-3H-VD	G3PB-215B-2H-VD	G3PB-225B-3H-VD	G3PB-225B-2HVD	G3PB-235B-3H-VD	G3PB-235B-2H-VD	G3PB-245B-3H-VD	G3PB-245B-2H-VD	G3PB-515B-3H-VD	G3PB-515B-2H-VD	G3PB-525B-3H-VD	G3PB-525B-2H-VD	G3PB-535B-3H-VD	G3PB-535B-2H-VD	G3PB-545B-3H-VD	G3PB-545B-2H-VD
Operate time	1/2 of load power source cycle + 1 ms max.															
Release time	1/2 of load power source cycle + 1 ms max.															
Output ON voltage drop	1.6 V (RMS) max.								1.8 V (RMS) max.							
Leakage current (See note.)	10 mA (at 200 VAC)								20 mA (at 480 VAC)							
Insulation resistance	100 MΩ min. (at 500 VDC)															
Dielectric strength	2,500 VAC, 50/60 Hz for 1 min															
Vibration resistance	Destruction: 10 to 55 to 10 Hz, 0.375-mm single amplitude (0.75-mm double amplitude)															
Shock resistance	Destruction: 294 m/s <sup>2</sup> (98 m/s <sup>2</sup> with reverse mounting)															
Storage temperature	-30°C to 100°C (with no icing or condensation)															
Ambient operating temperature	-30°C to 80°C (with no icing or condensation)															
Ambient storage humidity	45% to 85%															
Weight	Approx. 300 g															

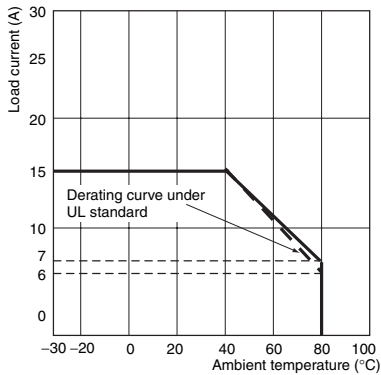
**Note:** The leakage current of phase S will be approximately  $\sqrt{3}$  times larger if the 2-element model is used.

# Engineering Data

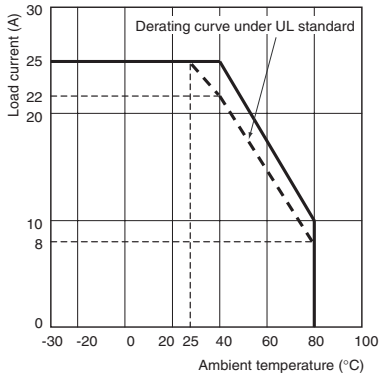
## Load Current vs. Ambient Temperature

### Models with Built-in Heat Sinks

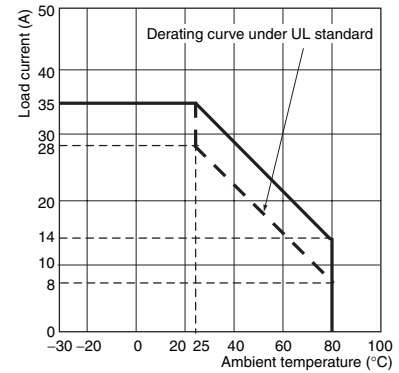
**G3PB-215B-3N-VD**  
**G3PB-215B-2N-VD**



**G3PB-225B-3N-VD**  
**G3PB-225B-2N-VD**

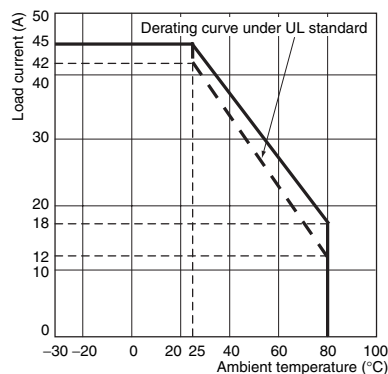


**G3PB-235B-3N-VD**  
**G3PB-235B-2N-VD**



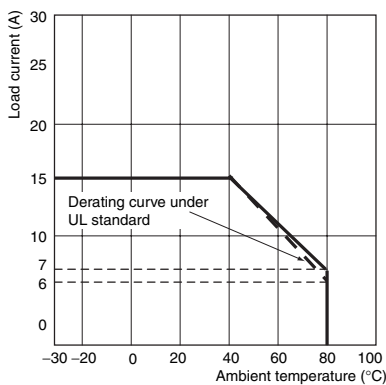
Note: 1. Please use proper ventilation and cooling.  
2. Please note that the derating curve above 28 A is applicable under the UL standard only with forced air cooling by fan.

**G3PB-245B-3N-VD**  
**G3PB-245B-2N-VD**

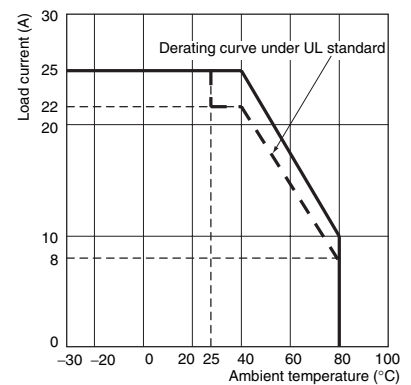


Note: 1. Please use proper ventilation and cooling.  
2. Please note that the derating curve above 42 A is applicable under the UL standard only with forced air cooling by fan.

**G3PB-515B-3N-VD**  
**G3PB-515B-2N-VD**

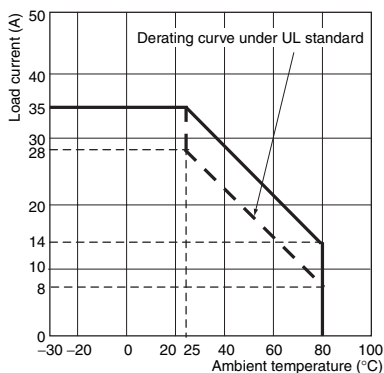


**G3PB-525B-3N-VD**  
**G3PB-525B-2N-VD**



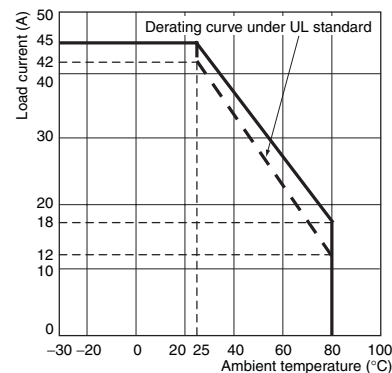
Note: 1. Please use proper ventilation and cooling.  
2. Please note that the derating curve above 22 A is applicable under the UL standard only with forced air cooling by fan.

**G3PB-535B-3N-VD**  
**G3PB-535B-2N-VD**



Note: 1. Please use proper ventilation and cooling.  
2. Please note that the derating curve above 28 A is applicable under the UL standard only with forced air cooling by fan.

**G3PB-545B-3N-VD**  
**G3PB-545B-2N-VD**

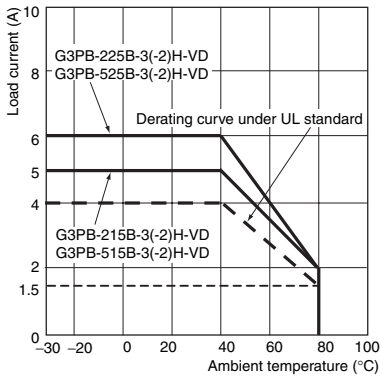


Note: 1. Please use proper ventilation and cooling.  
2. Please note that the derating curve above 42 A is applicable under the UL standard only with forced air cooling by fan.

## Load Current vs. Ambient Temperature

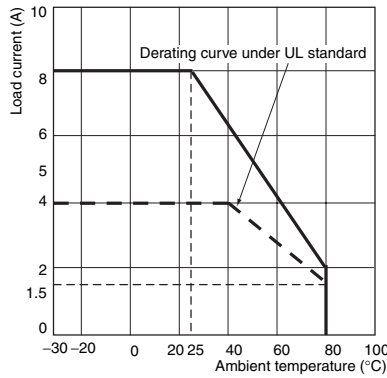
### Models without Built-in Heat Sinks

G3PB-215B-3H(-2H)-VD  
 G3PB-225B-3H(-2H)-VD  
 G3PB-515B-3H(-2H)-VD  
 G3PB-525B-3H(-2H)-VD



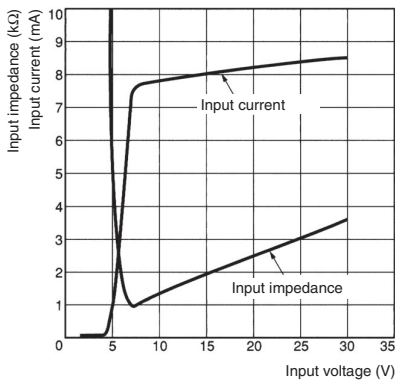
Note: Please use proper ventilation and cooling.

G3PB-235B-3H(-2H)-VD  
 G3PB-245B-3H(-2H)-VD  
 G3PB-535B-3H(-2H)-VD  
 G3PB-545B-3H(-2H)-VD



Note: Please use proper ventilation and cooling.

## Input Voltage vs. Input Current and Input Voltage vs. Input Impedance



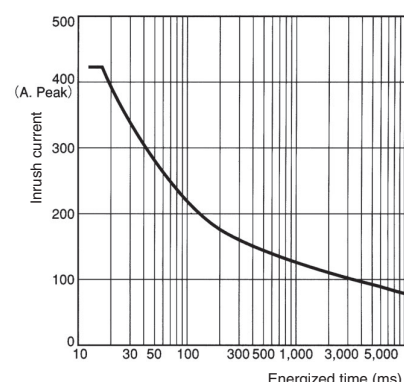
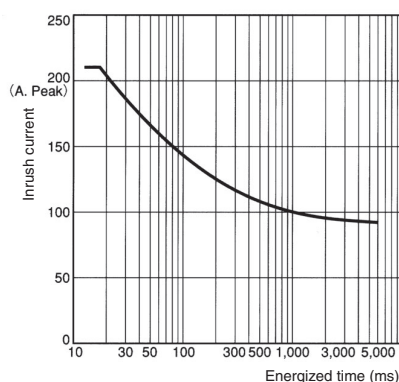
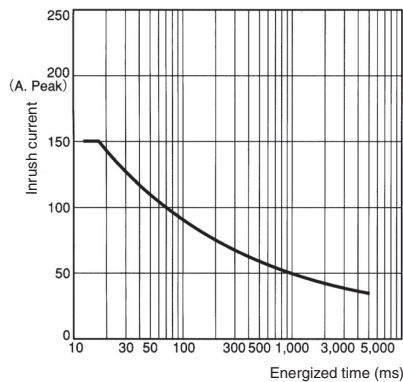
## One Cycle Surge Current: Non-repetitive

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

G3PB-215B-3N/3H-VD  
 G3PB-215B-2N/2H-VD

G3PB-225B-3N/3H-VD  
 G3PB-225B-2N/2H-VD  
 G3PB-515B-3N/3H-VD  
 G3PB-515B-2N/2H-VD  
 G3PB-525B-3N/3H-VD  
 G3PB-525B-2N/2H-VD

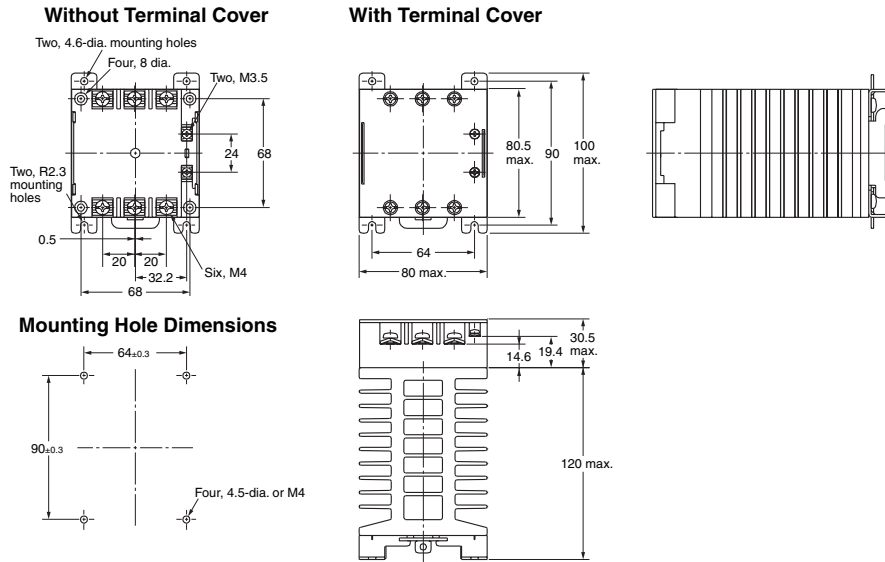
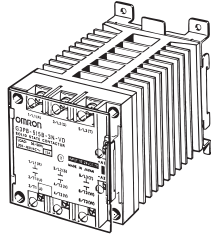
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 G3PB-235B-2N/2H-VD  
 G3PB-245B-3N/3H-VD  
 G3PB-245B-2N/2H-VD  
 G3PB-535B-3N/3H-VD  
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 G3PB-545B-3N/3H-VD  
 G3PB-545B-2N/2H-VD



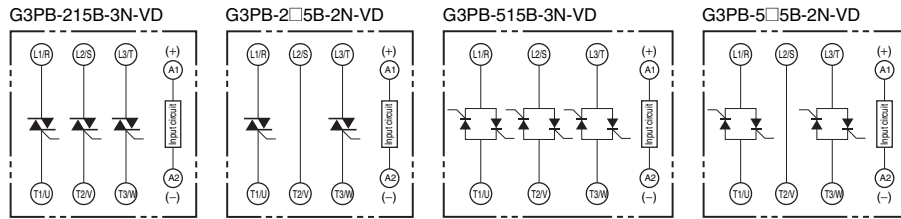
# Dimensions

Note: All units are in millimeters unless otherwise indicated.

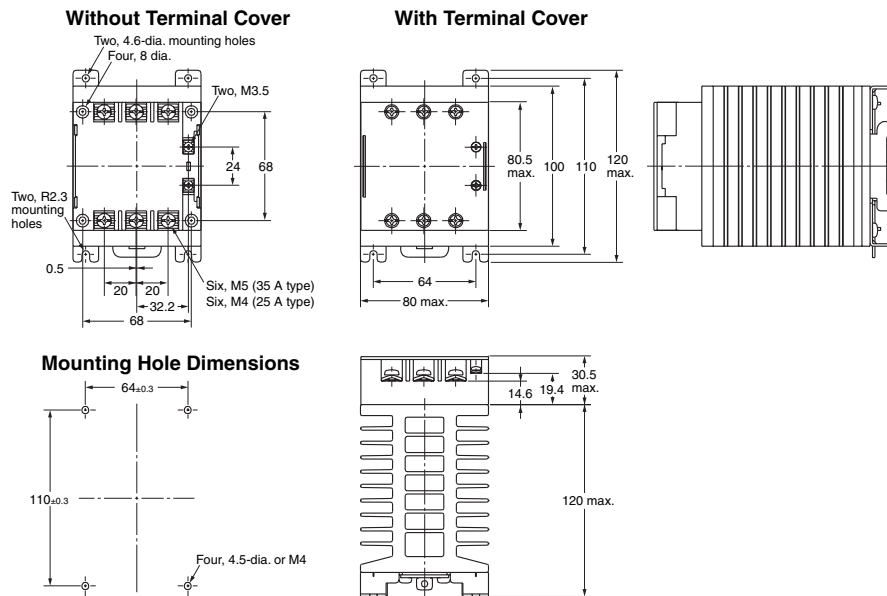
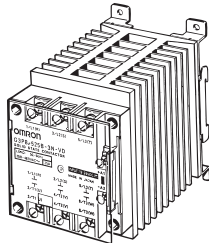
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- G3PB-215B-2N-VD
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- G3PB-515B-3N-VD
- G3PB-515B-2N-VD
- G3PB-525B-2N-VD



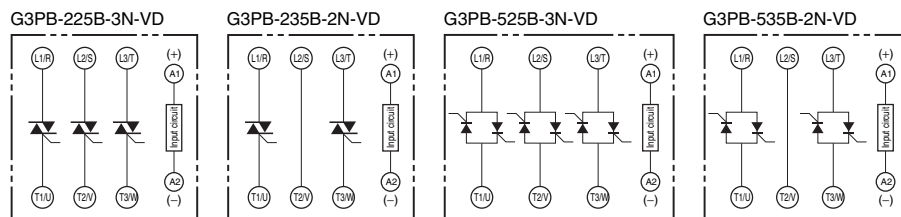
**Terminal Arrangement/Internal Connections**



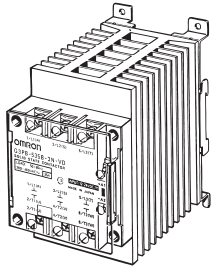
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- G3PB-535B-2N-VD



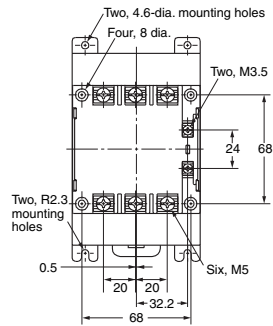
**Terminal Arrangement/Internal Connections**



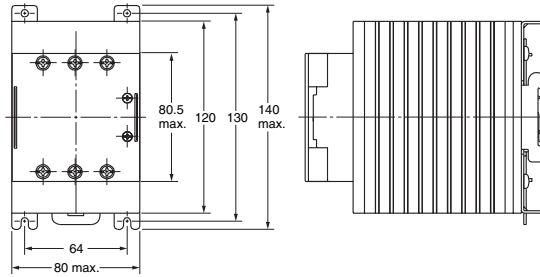
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 G3PB-535B-3N-VD  
 G3PB-545B-2N-VD



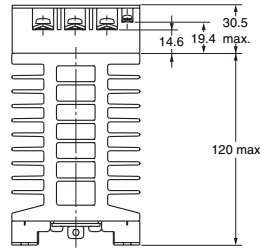
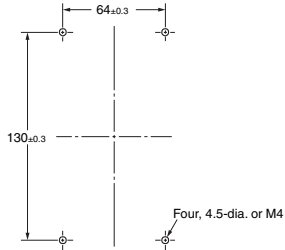
### Without Terminal Cover



### With Terminal Cover

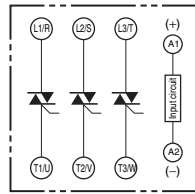


### Mounting Hole Dimensions

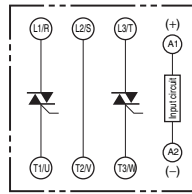


### Terminal Arrangement/Internal Connections

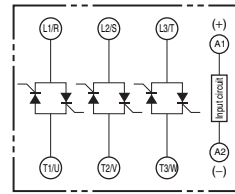
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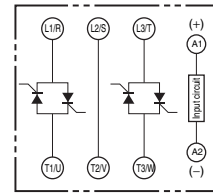
G3PB-245B-2N-VD



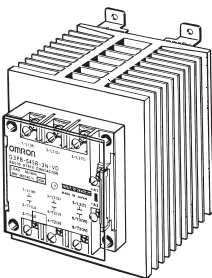
G3PB-535B-3N-VD



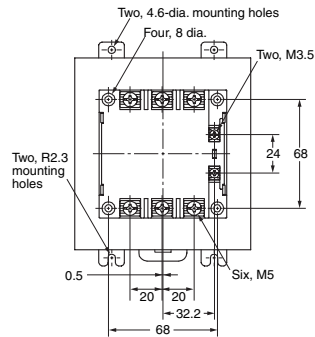
G3PB-545B-2N-VD



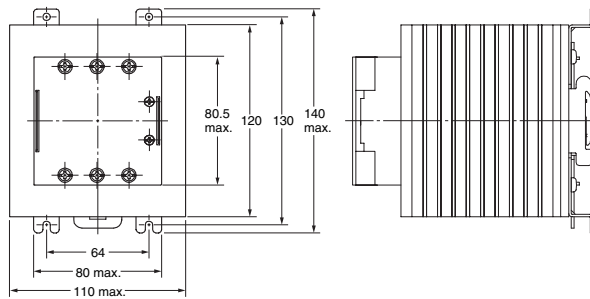
G3PB-245B-3N-VD  
 G3PB-545B-3N-VD



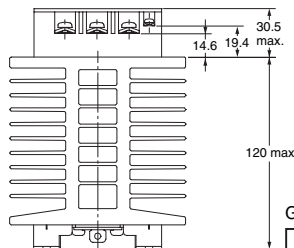
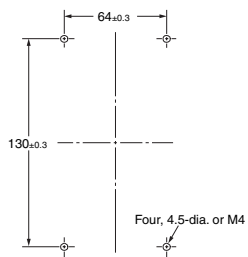
### Without Terminal Cover



### With Terminal Cover

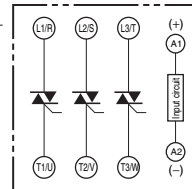


### Mounting Hole Dimensions

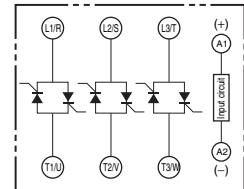


### Terminal Arrangement/Internal Connections

G3PB-245B-3N-VD



G3PB-545B-3N-VD





ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.  
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

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

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- Systems, machines, and equipment that could present a risk to life or property.

Please know and observe all prohibitions of use applicable to the products.

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2008.11

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