Solid State Contactors (New Heat Sink Construction)

G3PB-2N/-3N

Refer to Safety Precautions for All Solid State Relays.

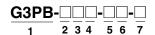
Space and working time saved with new heat sink construction. Series now includes 480-VAC models to allow use in a greater range of applications.

- 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.



Model Number Structure

■ Model Number Legend



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 models3: 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
				2	G3PB-215B-2N-VD
			25 A	3	G3PB-225B-3N-VD
				2	G3PB-225B-2N-VD
			35 A	3	G3PB-235B-3N-VD
				2	G3PB-235B-2N-VD
			45 A	3	G3PB-245B-3N-VD
				2	G3PB-245B-2N-VD
	200 to 480 VAC		15 A	3	G3PB-515B-3N-VD
				2	G3PB-515B-2N-VD
			25 A	3	G3PB-525B-3N-VD
				2	G3PB-525B-2N-VD
			35 A	3	G3PB-535B-3N-VD
				2	G3PB-535B-2N-VD
			45 A	3	G3PB-545B-3N-VD
				2	G3PB-545B-2N-VD

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	G3PB-515B-3H-VD DC12-24
				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

Model Item	215B-	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 2	240 VAC							200 to	480 VA)							
Load voltage range	75 to 26	34 VAC							180 to 528 VAC									
Applicable load current (See note 1.)	15 A (at	t 40°C)	25 A (a	t 40°C)	35 A (a	t 25°C)	45 A (a	t 25°C)	15 A (a	t 40°C)	25 A (a	t 40°C)	35 A (a	t 25°C)	45 A (a	t 25°C)		
Minimum load cur- rent	0.2 A				0.5 A													
Inrush current re- sistance (peak value)	150 A 220 A (60 Hz, 1 cycle) (60 Hz, 1 cycle)			440 A (60 Hz, 1 cycle)				220 A (60 Hz,	1 cycle	·)		440 A (60 Hz, 1 cycle)						
Permissible I ² t (half 60-Hz wave)	121 A ² s 260 A ² s			3	1260 A ² s				260 A ² s				1260 A ² s					
Applicable load (resistive load, AC1) (See note 2.)	5.1 kW (at 200		8.6 kW (at 200		12.1 kV (at 200		15.5 kV (at 200		12.5 kV (at 480		20.7 kV (at 480		29.0 kV (at 480		37.4 kV (at 480			

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.

Maximum load capacity = Load current × Load voltage × /3

Maximum load capacity = Load current \times Load voltage \times $\sqrt{3}$ Example: 15 A \times 200 V \times $\sqrt{3}$ = 5.196 W \cong 5.1 kW Example: 15 A \times 400 V \times $\sqrt{3}$ = 10.392 W \cong 10.3 kW

Main Circuit of Models with Externally Attached Heat Sinks

Model Item	-215B	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 (a	t 40°C)	35 A (at	25°C)	45 A (a	t 25°C)	15 A (a	t 40°C)	25 A (a	t 40°C)	35 A (a	t 25°C)	45 A (a	t 25°C)		
Minimum load current	0.2 A				0.5 A	0.5 A												
Inrush current resistance (peak value)	150 A (6 1 cycle)	60 Hz,	220 A (1 cycle)		440 A (60 Hz, 1 cycle)				220 A (60 Hz, 1	cycle)		440 A (60 Hz, 1 cycle)					
Permissible I ² t (half 60-Hz wave)	121 A ² s		260 A ² s	3	1,260 A	² s			260 A ² s	3			1,260 A ² s					
Applicable load (resistive load, AC1)	Refer to	Engine	ering Da	ata on pa	age 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.

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■ 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 lo	1/2 of load power source cycle + 1 ms max.															
Release time	1/2 of lo	/2 of load power source cycle + 1 ms max.															
Output ON voltage drop	1.6 V (F	RMS) ma	ax.						1.8 V (RMS) max.								
Leakage current (See note.)	10 mA ((at 200 \	VAC)						20 mA (at 480 VAC)								
Insulation resistance	100 MΩ	00 MΩ min. (at 500 VDC)															
Dielectric strength	2,500 V	AC, 50/6	60 Hz fo	r 1 min													
Vibration resistance	Destruc	ction: 10	to 55 to	10 Hz,).175-m	m single	amplitu	de (Mou	unted to	DIN trac	k)						
Shock resis- tance	Destruc	ction: 29	4 m/s² (9	98 m/s ²	with reve	erse mou	unting)										
Ambient operating temperature	Operati Storage			°C (with 0°C (wit													
Ambient operating humidity	Operati	ng: 45%	to 85%														
Weight		Approx. Ap- prox. Ap- prox.								prox.							
Certified standards		CSA22 April 200		4, EN60	947-4-3	(IEC947	-4-3); C	ertified b	y VDE				•	•			
EMC		Emission: EN55011 Group 1 Class B mmunity: 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 G3PB G3PB G3PB G3PB G3PB G3PB G3PB									
Item	-3H-VD -2H-VD -3H-VD -2HVD -3H-VD -2H-VD -3H-VD -3H-									
Operate time	/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, 0.175-mm single amplitude									
Shock resistance	Destruction: 294 m/s² (98 m/s² 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									

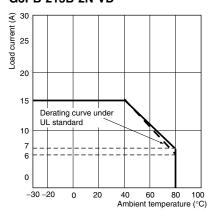
Note: The leakage current of phase S will be approximately $\sqrt{3}$ times larger if the 2-element model is used.

Engineering Data

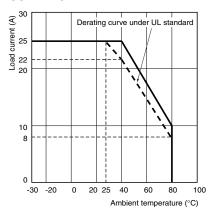
Load Current vs. Ambient Temperature

Models with Built-in Heat Sinks

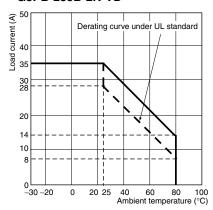
G3PB-215B-3N-VD G3PB-215B-2N-VD



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

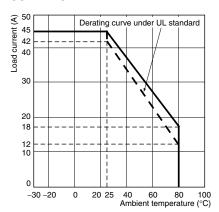


G3PB-235B-3N-VD G3PB-235B-2N-VD



- 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.

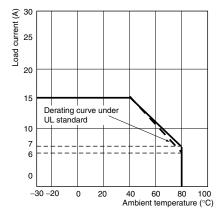
G3PB-245B-3N-VD G3PB-245B-2N-VD



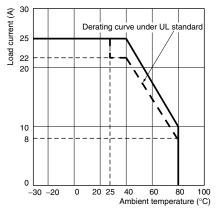
Note: 1. Please use proper ventilation and cooling.

 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



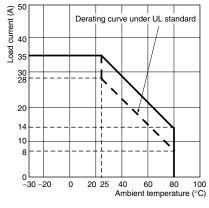
G3PB-525B-3N-VD G3PB-525B-2N-VD



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

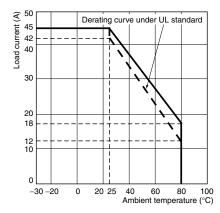


Note: 1. Please use proper ventilation and cooling.

2. Please note that the derating curve above 28 A is applicable under the UL standard only with forced air cooling by fan.

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



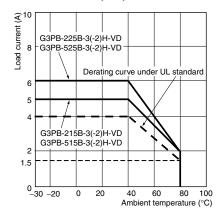
Note: 1. Please use proper ventilation and cooling.

2. Please note that the derating curve above 42 A is applicable under the UL standard only with forced air cooling by fan.

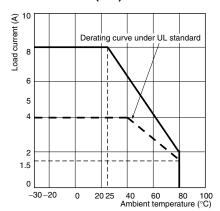
Load Current vs. Ambient Temperature

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



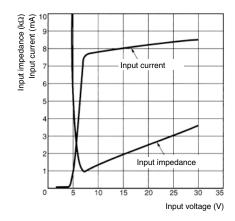
G3PB-235B-3H(-2H)-VD G3PB-245B-3H(-2H)-VD G3PB-535B-3H(-2H)-VD G3PB-545B-3H(-2H)-VD



Note: Please use proper ventilation and cooling.

Note: Please use proper ventilation and cooling.

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

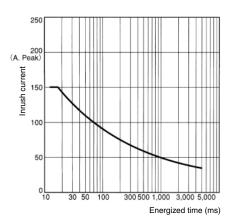


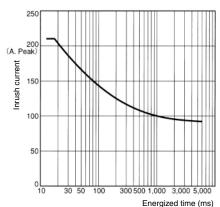
One Cycle Surge Current: Non-repetitive

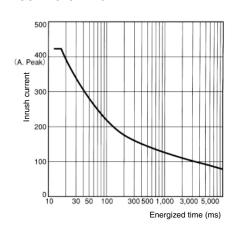
Note: Keep the inrush current to half the rated value if it occurs repetitively.

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





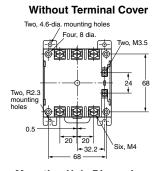


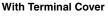
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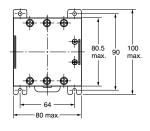
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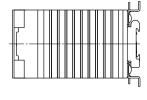
Note: All units are in millimeters unless otherwise indicated.

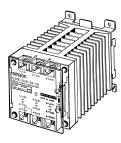
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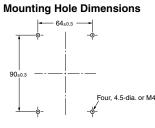


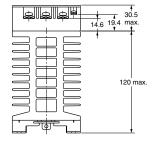




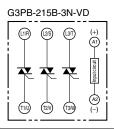


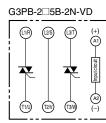


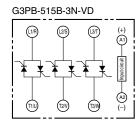


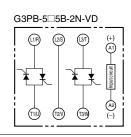


Terminal Arrangement/Internal Connections

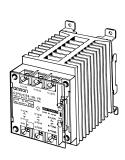




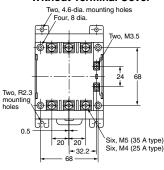




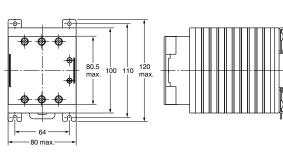
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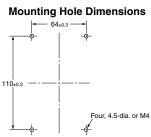


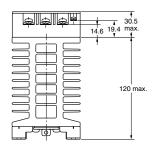
Without Terminal Cover



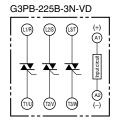
With Terminal Cover

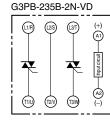


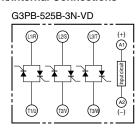


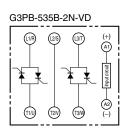


Terminal Arrangement/Internal Connections

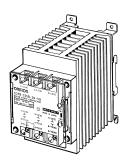




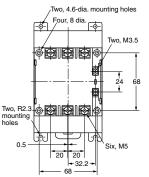




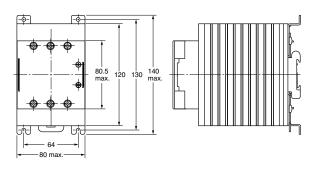
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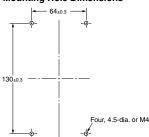
Without Terminal Cover

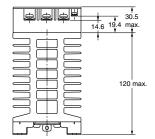


With Terminal Cover

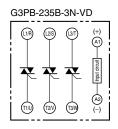


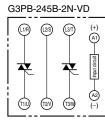
Mounting Hole Dimensions

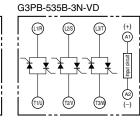


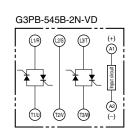


Terminal Arrangement/Internal Connections

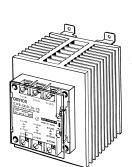




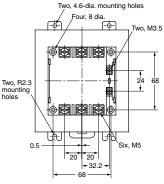




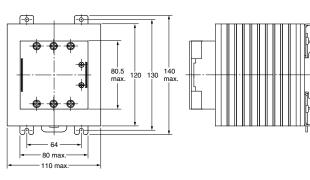
G3PB-245B-3N-VD G3PB-545B-3N-VD



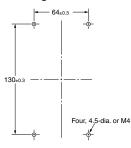
Without Terminal Cover

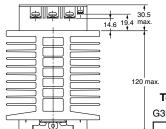


With Terminal Cover

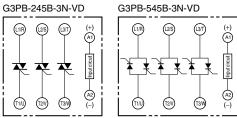


Mounting Hole Dimensions





Terminal Arrangement/Internal Connections



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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.

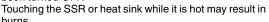


Safety Precautions for All Solid State Relays

Refer to the Safety Precautions section for each SSR for specific precautions applicable to that SSR.

/ CAUTION

Do not touch the SSR or the heat sink while the power is being supplied or immediately after the power supply has been turned OFF.





Do not touch the LOAD terminals on the SSR immediately after the power supply has been turned OFF. Shock may result due to the electrical charge stored in the built-in snubber circuit.



Always attach the cover terminal if the SSR has one. Contact with current-carrying parts may result in shock.



Always turn OFF the power supply before performing wiring.

Not doing so may result in shock.



Do not allow short-circuit current to flow to the load side of the SSR.

The SSR may explode if short-circuit current flows.



■ Precautions for Safe Use

OMRON constantly strives to improve quality and reliability. SSRs, however, use semiconductors, and semiconductors may commonly malfunction or fail. In particular, it may not be possible to ensure safety if the SSRs are used outside the rated ranges. Therefore, always use the SSRs within the ratings. When using an SSR, always design the system to ensure safety and prevent human accidents, fires, and social harm in the event of SSR failure. System design must include measures such as system redundancy, measures to prevent fires from spreading, and designs to prevent malfunction.

- Do not apply voltage or current in excess of the ratings to the terminals of the SSR.
 - Doing so may result in failure or burn damage.
- 2. Do not use the SSR with loose terminal screws.

 Doing so may result in burn damage due to abnormal heat produced by the terminals.
- Do not block the movement of the air surrounding the SSR or heat sink.
 - Abnormal heating of the SSR may result in shorting failures of the elements or burn damage.
- Follow the Precautions for Correct Use when performing wiring or tightening the screws.
 - If the SSR is used with the wiring or screw tightening performed improperly, burn damage may occur due to abnormal heat generated when the power is being applied.

■ Precautions for Correct Use

For details, refer to Technical Guide for Solid State Relays.

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Read and Understand This Catalog

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