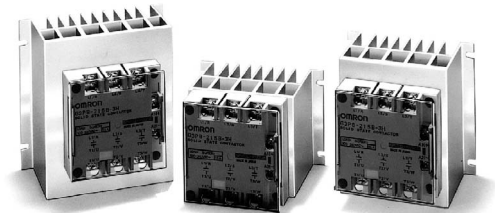


Solid State Contactors (Three-phase) G3PB

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

Compact, Low-cost Solid State Contactors of an Innovative Construction Ideal for Three-phase Heaters

- Slim Units with three-phase output.
- Optimum heat sinks attach to models without built-in heat sinks.
- Compact design achieved by optimizing heat sink shape.
- DIN track mounting possible (when using the Y92B-P50 Heat Sink) in addition to screw mounting.
- Comply with EN60947-4-3 (IEC947-4-3) UL508, and CSA22.2 No. 14, and bear CE marking.



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
4: 400 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**
Blank: Built-in heat sink
H: No heat sink ("hockey puck" type)
- 7. Certification**
VD: Certified by UL, CSA, and VDE

Ordering Information

■ List of Models

Models with Built-in Heat Sinks

Number of phases	Main circuit voltage	Zero cross function	Applicable heater capacity (with Class-1 AC resistive load)	Number of elements	Model
3	100 to 240 VAC	Yes	5.1 kW max. (15 A)	3	G3PB-215B-3-VD
				2	G3PB-215B-2-VD
			8.6 kW max. (25 A)	3	G3PB-225B-3-VD
				2	G3PB-225B-2-VD
			12.1 kW max. (35 A)	3	G3PB-235B-3-VD
				2	G3PB-235B-2-VD
			15.5 kW max. (45 A)	3	G3PB-245B-3-VD
				2	G3PB-245B-2-VD
	200 to 400 VAC		10.3 kW max. (15 A)	3	G3PB-415B-3-VD
				2	G3PB-415B-2-VD
			17.3 kW max. (25 A)	3	G3PB-425B-3-VD
				2	G3PB-425B-2-VD
			24.2 kW max. (35 A)	3	G3PB-435B-3-VD
				2	G3PB-435B-2-VD
			31.1 kW max. (45 A)	3	G3PB-445B-3-VD
				2	G3PB-445B-2-VD

Note: 1. The load current vs. ambient temperature characteristics of the Unit vary with the heat radiation of the Unit. Refer to page 157, *Engineering Data* for details.]

2. When ordering, specify the rated input voltage.

Models without Built-in Heat Sinks

Number of phases	Main circuit voltage	Zero cross function	Rated carry current	Number of elements	Model
3	100 to 240 VAC	Yes	15 A max.	3	G3PB-215B-3H-VD
				2	G3PB-215B-2H-VD
			25 A max.	3	G3PB-225B-3H-VD
				2	G3PB-225B-2H-VD
			35 A max.	3	G3PB-235B-3H-VD
				2	G3PB-235B-2H-VD
			45 A max.	3	G3PB-245B-3H-VD
				2	G3PB-245B-2H-VD
	200 to 400 VAC		15 A max.	3	G3PB-415B-3H-VD
				2	G3PB-415B-2H-VD
			25 A max.	3	G3PB-425B-3H-VD
				2	G3PB-425B-2H-VD
			35 A max.	3	G3PB-435B-3H-VD
				2	G3PB-435B-2H-VD
			45 A max.	3	G3PB-445B-3H-VD
				2	G3PB-445B-2H-VD

Note: 1. The load current vs. ambient temperature characteristics of the Unit vary with the heat radiation of the Unit. Refer to page 157, *Engineering Data* for details.

2. When ordering, specify the rated input voltage.

Heat Sinks

Heat resistance (°C/W)	Model
1.67	Y92B-P50
1.01	Y92B-P100
0.63	Y92B-P150
0.43	Y92B-P200
0.36	Y92B-P250

■ Accessories (Order Separately)

Mounting Track	50 cm (1) x 7.3 mm (t)	PFP-50N
	1 m (1) x 7.3 mm (t)	PFP-100N
	1 m (1) x 16 mm (t)	PFP-100N2

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	10 mA max. (at 24 VDC)
Must operate voltage	9.6 VDC max.
Must release voltage	1 VDC min.
Insulation method	Phototriac
Operation indicator	Yellow LED

Main Circuit of Models with Built-in Heat Sinks

Item	G3PB-215B-3-VD	G3PB-215B-2-VD	G3PB-225B-3-VD	G3PB-225B-2-VD	G3PB-235B-3-VD	G3PB-235B-2-VD	G3PB-245B-3-VD	G3PB-245B-2-VD
Rated load voltage	100 to 240 VAC							
Load voltage range	75 to 264 VAC							
Applicable load current (See note.)	0.2 to 15 A		0.2 to 25 A		0.5 to 35 A		0.5 to 45 A	
Inrush current resistance (peak value)	150 A (60 Hz, 1 cycle)		220 A (60 Hz, 1 cycle)		440 A (60 Hz, 1 cycle)			
Permissible I²t (half 60-Hz wave)	260 A²s		2,660 A²s		2,660 A²s			
Applicable load (with Class-1 AC resistive load)	5.1 kW max. (at 200 VAC)		8.6 kW (at 200 VAC)		12.1 kW max. (at 200 VAC)		15.5 kW max. (at 200 VAC)	

Item	G3PB-415B-3-VD	G3PB-415B-2-VD	G3PB-425B-3-VD	G3PB-425B-2-VD	G3PB-435B-3-VD	G3PB-435B-2-VD	G3PB-445B-3-VD	G3PB-445B-2-VD
Rated load voltage	200 to 400 VAC							
Load voltage range	180 to 440 VAC							
Applicable load current (See note.)	0.5 to 15 A		0.5 to 25 A		0.5 to 35 A		0.5 to 45 A	
Inrush current resistance (peak value)	220 A (60 Hz, 1 cycle)				440 A (60 Hz, 1 cycle)			
Permissible I²t (half 60-Hz wave)	260 A²s		1,040 A²s		2,660 A²s			
Applicable load (with Class-1 AC resistive load)	10.3 kW max. (at 400 VAC)		17.3 kW max. (at 400 VAC)		24.2 kW max. (at 400 VAC)		31.1 kW max. (at 400 VAC)	

Note: Rated carry current varies depending on the ambient temperature. For details, refer to *Load Current vs. Ambient Temperature* in *Engineering Data*.

Main Circuit of Models without Built-in Heat Sinks

Item	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
Rated load voltage	100 to 240 VAC							
Load voltage range	75 to 264 VAC							
Applicable load current (See note.)	0.2 to 15 A		0.2 to 25 A		0.2 to 35 A		0.2 to 45 A	
Inrush current resistance (peak value)	150 A (60 Hz, 1 cycle)		220 A (60 Hz, 1 cycle)		440 A (60 Hz, 1 cycle)			
Permissible I²t (half 60-Hz wave)	260 A²s		2,260 A²s		2,260 A²s			
Applicable load (with Class-1 AC resistive load)	The applicable load varies with the heat radiation of the Unit. Refer to page 157, <i>Engineering Data</i> for details.							

Item	G3PB-415B-3H-VD	G3PB-415B-2H-VD	G3PB-425B-3H-VD	G3PB-425B-2H-VD	G3PB-435B-3H-VD	G3PB-435B-2H-VD	G3PB-445B-3H-VD	G3PB-445B-2H-VD
Rated load voltage	200 to 400 VAC							
Load voltage range	180 to 440 VAC							
Applicable load current (See note.)	0.5 to 15 A		0.5 to 25 A		0.5 to 35 A		0.5 to 45 A	
Inrush current resistance (peak value)	220 A (60 Hz, 1 cycle)				440 A (60 Hz, 1 cycle)			
Permissible I²t (half 60-Hz wave)	260 A²s		1,040 A²s		2,660 A²s			
Applicable load (with Class-1 AC resistive load)	Refer to page 157, <i>Engineering Data</i> for details.							

Note: The applicable load current varies depending on the radiation device or radiation plate to be connected and the ambient temperature. For details, refer to *Load Current vs. Ambient Temperature* in *Engineering Data*.

■ Characteristics

Models with Built-in Heat Sinks

Item	G3PB-215B-3-VD	G3PB-215B-2-VD	G3PB-225B-3-VD	G3PB-225B-2-VD	G3PB-235B-3-VD	G3PB-235B-2-VD	G3PB-245B-3-VD	G3PB-245B-2-VD
Operate time	1/2 of load power source cycle + 1 ms max. (DC input)							
Release time	1/2 of load power source cycle + 1 ms max. (DC input)							
Output ON voltage drop	1.6 V (RMS) max.							
Leakage current (See note.)	10 mA (at 200 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 (Mounted to DIN track)							
Shock resistance	Destruction: 294 m/s ²							
Ambient temperature	Operating: –30°C to 80°C (with no icing or condensation) Storage: –30°C to 100°C (with no icing or condensation)							
Ambient humidity	Operating: 45% to 85%							
Weight	Approx. 750 g	Approx. 750 g	Approx. 900 g	Approx. 750 g	Approx. 1,150 g	Approx. 900 g	Approx. 1,500 g	Approx. 1,150 g
Certified standards	UL508, CSA22.2 No. 14, EN60947-4-3 (IEC947-4-3) (From April 1999)							
EMC	Emission	AC mains	EN55011 Group 1 Class B					
	Emission	Electromagnetic	EN55011 Group 1 Class B					
	Immunity	ESD	IEC947-4-3					
			4 kV contact discharge					
			8 kV air discharge					
	Immunity	Electromagnetic	IEC947-4-3					
			10 V/m (80 MHz to 1 GHz)					
	Immunity	EFT	IEC947-4-3					
			2 kV AC power-signal line					
	Immunity	Surge transient	IEC947-4-3					
			2 kV					
	Immunity	RF disturbance	IEC947-4-3, EN50082-2					
			10 V (0.15 to 80 MHz)					

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

Item	G3PB-415B-3-VD	G3PB-415B-2-VD	G3PB-425B-3-VD	G3PB-425B-2-VD	G3PB-435B-3-VD	G3PB-435B-2-VD	G3PB-445B-3-VD	G3PB-445B-2-VD
Operate time	1/2 of load power source cycle + 1 ms max. (DC input)							
Release time	1/2 of load power source cycle + 1 ms max. (DC input)							
Output ON voltage drop	1.8 V (RMS) max.							
Leakage current (See note.)	20 mA (at 400 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 (Mounted to DIN track)							
Shock resistance	Destruction: 294 m/s ²							
Ambient temperature	Operating: -30°C to 80°C (with no icing or condensation) Storage: -30°C to 100°C (with no icing or condensation)							
Ambient humidity	Operating: 45% to 85%							
Weight	Approx. 750 g	Approx. 750 g	Approx. 900 g	Approx. 750 g	Approx. 1,150 g	Approx. 900 g	Approx. 1,500 g	Approx. 1,150 g
Certified standards	UL508, CSA22.2 No. 14, EN60947-4-3 (IEC947-4-3)							
EMC	Emission	AC mains	EN55011 Group 1 Class B					
	Emission	Electromagnetic	EN55011 Group 1 Class B					
	Immunity	ESD	IEC947-4-3					
			4 kV contact discharge					
			8 kV air discharge					
	Immunity	Electromagnetic	IEC947-4-3					
			10 V/m (80 MHz to 1 GHz)					
	Immunity	EFT	IEC947-4-3					
			2 kV AC power-signal line					
	Immunity	Surge transient	IEC947-4-3					
			2 kV					
	Immunity	RF disturbance	IEC947-4-3, EN50082-2					
			10 V (0.15 to 80 MHz)					

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

Models without Built-in Heat Sinks

Item	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
Operate time	1/2 of load power source cycle + 1 ms max. (DC input)							
Release time	1/2 of load power source cycle + 1 ms max. (DC input)							
Output ON voltage drop	1.6 V (RMS) max.							
Leakage current (See note.)	10 mA (at 200 VAC)							
Insulation resistance	100 M Ω 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							
Shock resistance	Destruction: 294 m/s ²							
Ambient temperature	Operating: -30°C to 80°C (with no icing or condensation) Storage: -30°C to 100°C (with no icing or condensation)							
Ambient humidity	Operating: 45% to 85%							
Certified standards	UL508, CSA22.2 No. 14, EN60947-4-3 (IEC947-4-3)							
Weight (Max.)	300 g max.							
EMC	Emission Emission Immunity	AC mains Electromagnetic ESD	EN55011 Group 1 Class B EN55011 Group 1 Class B IEC947-4-3 4 kV contact discharge 8 kV air discharge IEC947-4-3 10 V/m (80 MHz to 1 GHz) IEC947-4-3 2 kV AC power-signal line IEC947-4-3 2 kV IEC947-4-3, EN50082-2 10 V (0.15 to 80 MHz)					
	Immunity	Electromagnetic						
	Immunity	EFT						
	Immunity	Surge transient						
	Immunity	RF disturbance						

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

Item	G3PB-415B-3H-VD	G3PB-415B-2H-VD	G3PB-425B-3H-VD	G3PB-425B-2H-VD	G3PB-435B-3H-VD	G3PB-435B-2H-VD	G3PB-445B-3H-VD	G3PB-445B-2H-VD
Operate time	1/2 of load power source cycle + 1 ms max. (DC input)							
Release time	1/2 of load power source cycle + 1 ms max. (DC input)							
Output ON voltage drop	1.8 V (RMS) max.							
Leakage current (See note.)	20 mA (at 400 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							
Shock resistance	Destruction: 294 m/s ²							
Ambient temperature	Operating: -30°C to 80°C (with no icing or condensation) Storage: -30°C to 100°C (with no icing or condensation)							
Ambient humidity	Operating: 45% to 85%							
Certified standards	UL508, CSA22.2 No. 14, EN60947-4-3 (IEC947-4-3)							
Weight	Approx. 300 g							
EMC	Emission	AC mains	EN55011 Group 1 Class B					
	Emission	Electromagnetic	EN55011 Group 1 Class B					
	Immunity	ESD	IEC947-4-3					
			4 kV contact discharge					
			8 kV air discharge					
	Immunity	Electromagnetic	IEC947-4-3					
			10 V/m (80 MHz to 1 GHz)					
	Immunity	EFT	IEC947-4-3					
			2 kV AC power-signal line					
	Immunity	Surge transient	IEC947-4-3					
			2 kV					
	Immunity	RF disturbance	IEC947-4-3, EN50082-2					
			10 V (0.15 to 80 MHz)					

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

Heat Sinks

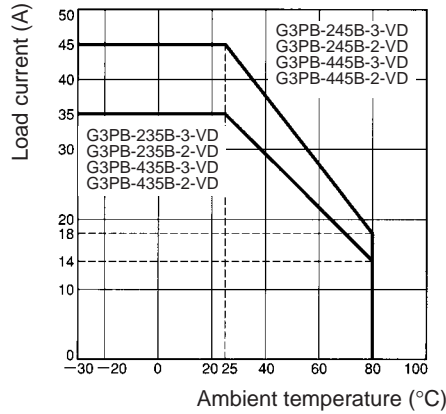
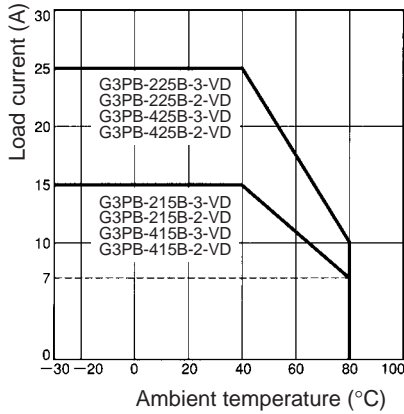
Model	Weight
Y92B-P50	Approx. 450 g
Y92B-P100	Approx. 450 g
Y92B-P150	Approx. 600 g
Y92B-P200	Approx. 850 g
Y92B-P250	Approx. 1,200 g

Engineering Data

Load Current vs. Ambient Temperature

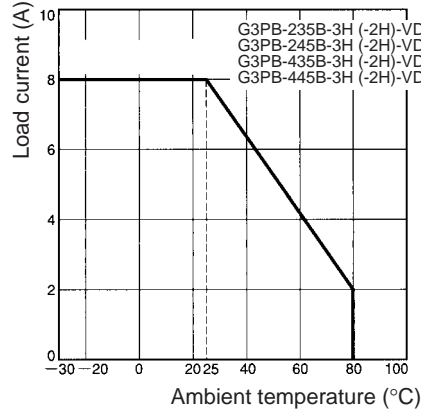
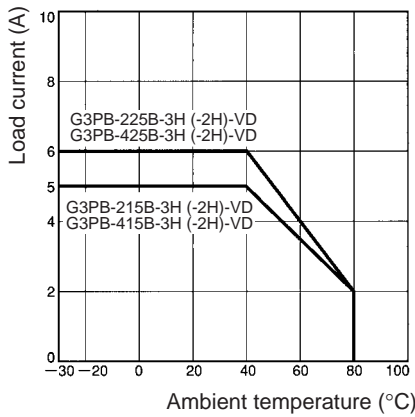
Models with Built-in Heat Sinks

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

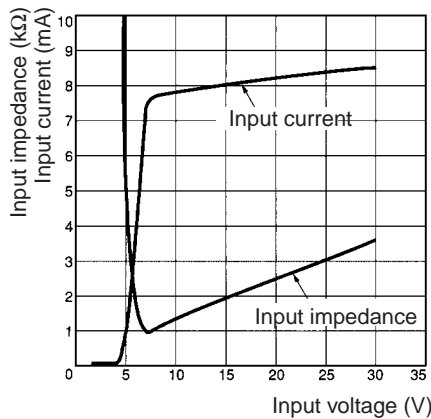


Models without Built-in Heat Sinks

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



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



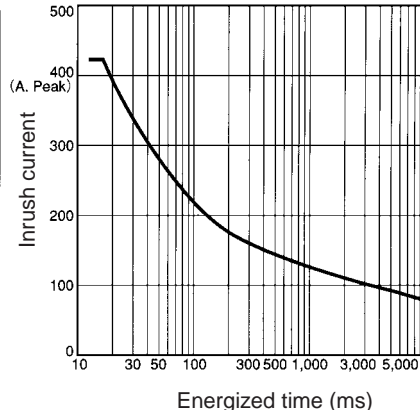
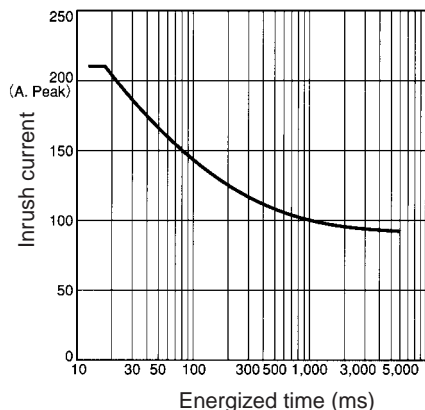
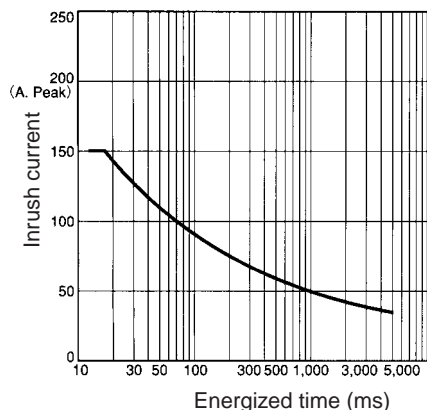
One Cycle Surge Current: Non-repetitive

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

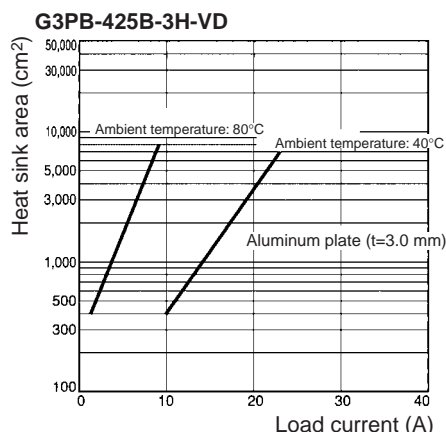
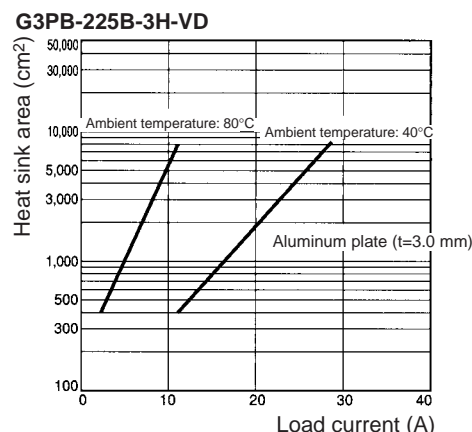
G3PB-215B-3 (H)-VD
G3PB-215B-2 (H)-VD

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



Heat Sink Area vs. Load Current



Note: The heat sink area 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 area is about 2,500 cm². Therefore, if the heat sink is square, one side of the heat sink must be 36 cm ($36^2 \times 2 = 2,592$) or longer.

Thermal Resistance Rth (Junction/SSR Back Surface)

Three-phase Models without Heat Sink

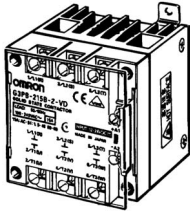
Model	Rth (°C/W)
G3PB-215B-3H-VD	1.05
G3PB-225B-3H-VD	0.57
G3PB-235B-3H-VD	0.57
G3PB-245B-3H-VD	0.57

Dimensions

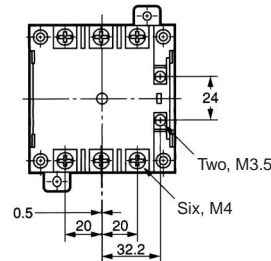
Note: All units are in millimeters unless otherwise indicated.

Models with Built-in Heat Sinks

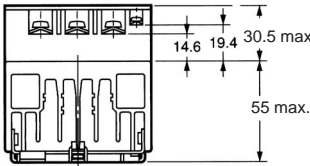
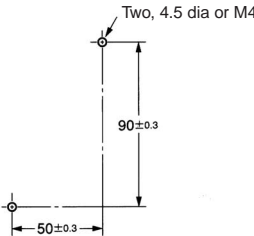
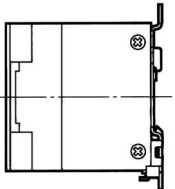
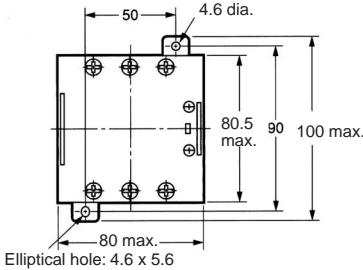
G3PB-215B-2-VD
G3PB-415B-2-VD



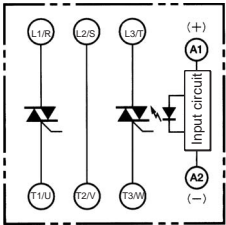
Without Terminal Cover



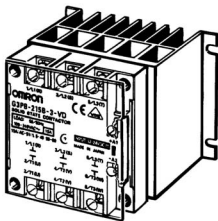
With Terminal Cover



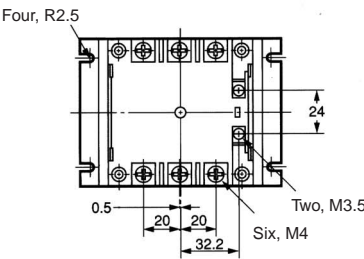
Terminal Arrangement/
Internal Circuit Diagram



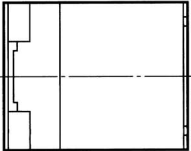
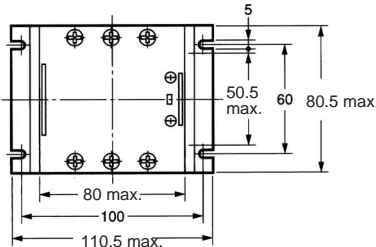
G3PB-215B-3-VD
G3PB-225B-2-VD
G3PB-415B-3-VD
G3PB-425B-2-VD



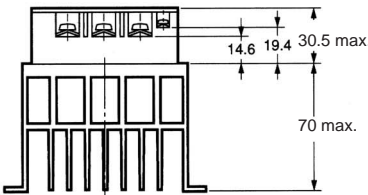
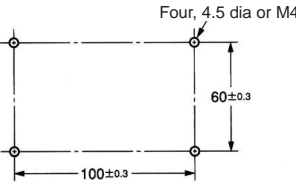
Without Terminal Cover



With Terminal Cover

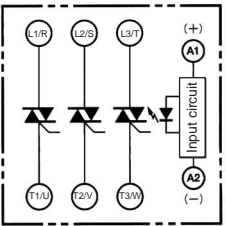


Mounting Holes

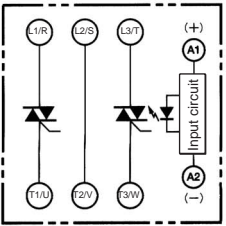


Terminal Arrangement/
Internal Circuit Diagram

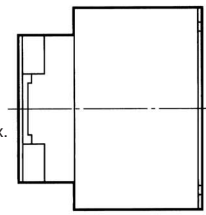
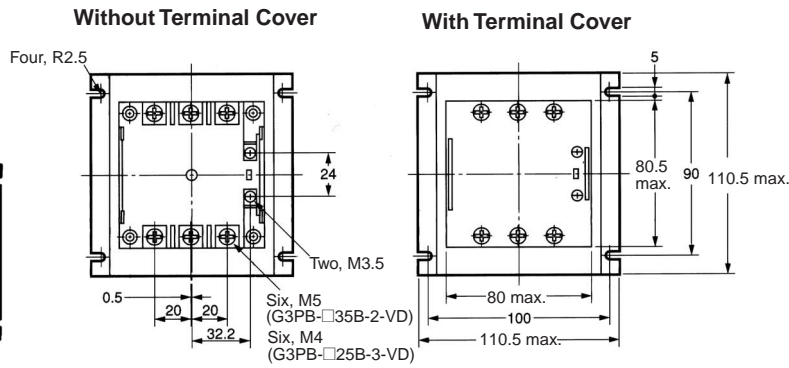
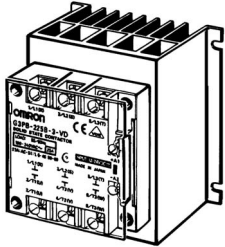
G3PB-□□□B-3-VD



G3PB-□□□B-2-VD

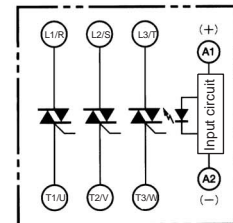


G3PB-225B-3-VD
G3PB-235B-2-VD
G3PB-425B-3-VD
G3PB-435B-2-VD

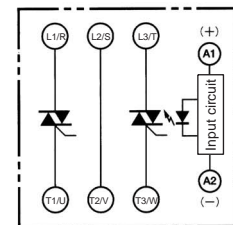


**Terminal Arrangement/
Internal Circuit Diagram**

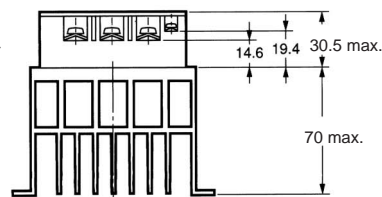
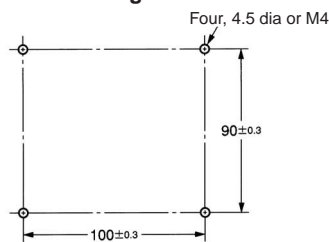
G3PB-□□□B-3-VD



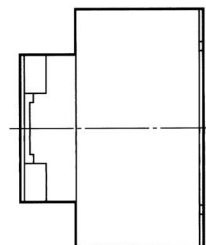
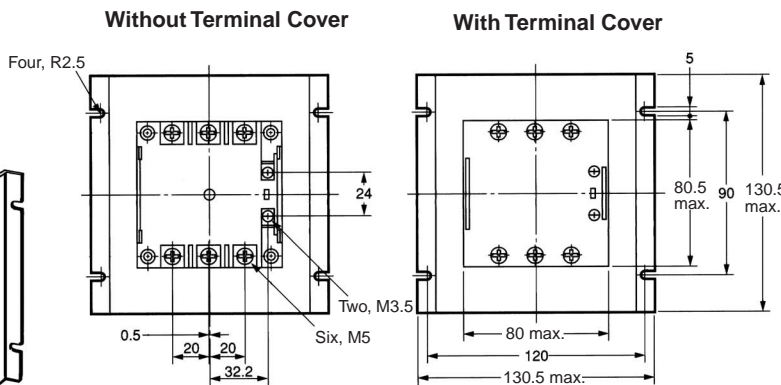
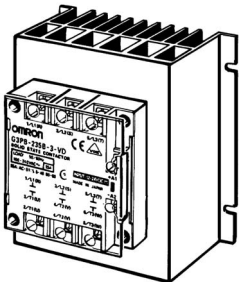
G3PB-□□□B-2-VD



Mounting Holes

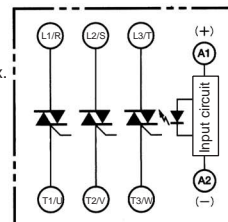


G3PB-235B-3-VD
G3PB-245B-2-VD
G3PB-435B-3-VD
G3PB-445B-2-VD

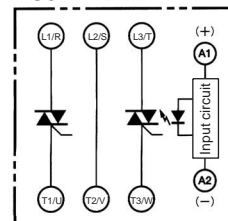


**Terminal Arrangement/
Internal Circuit Diagram**

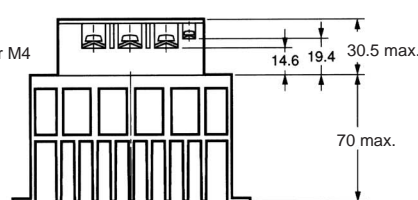
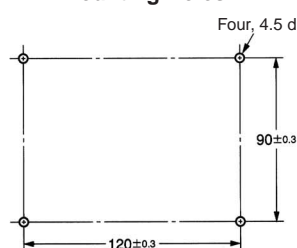
G3PB-□□□B-3-VD



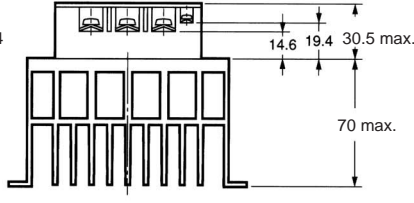
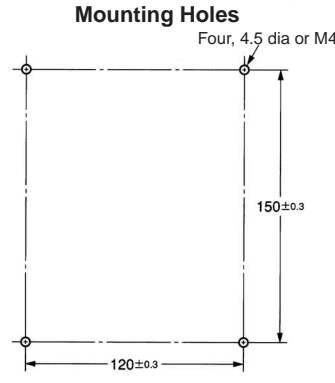
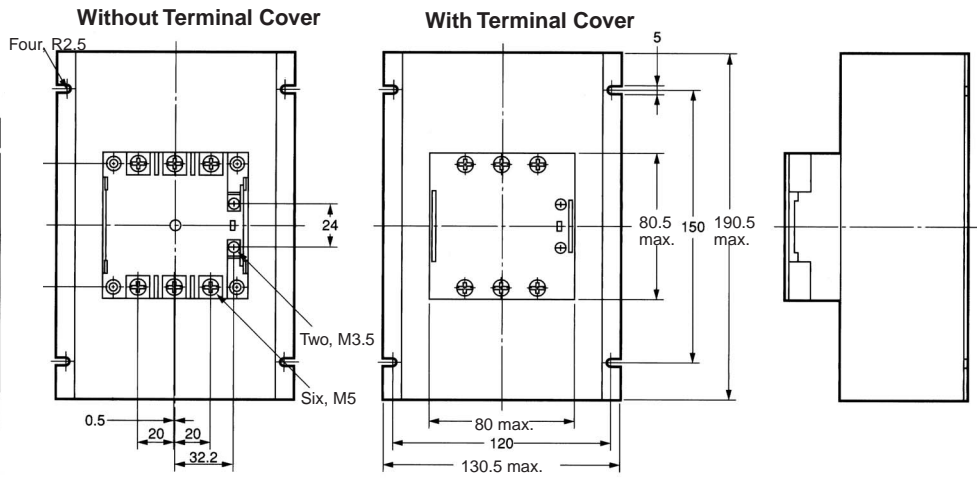
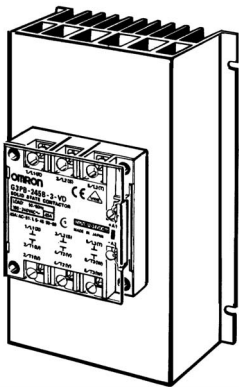
G3PB-□□□B-2-VD



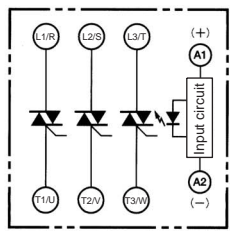
Mounting Holes



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

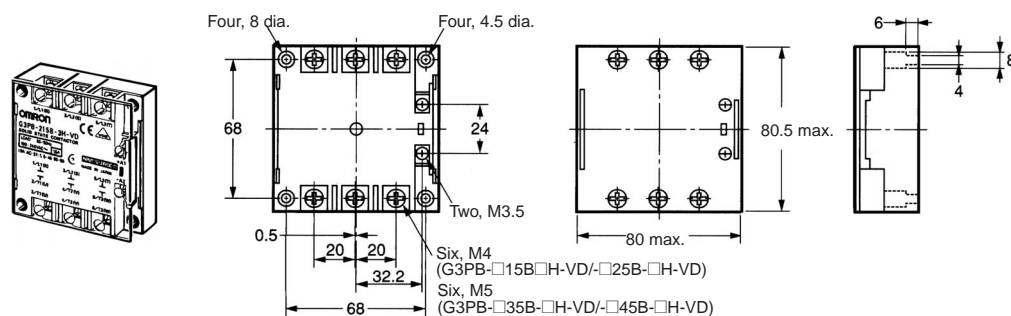


Terminal Arrangement/
Internal Circuit Diagram

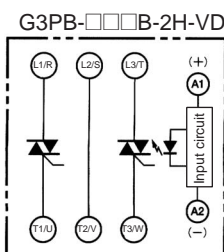
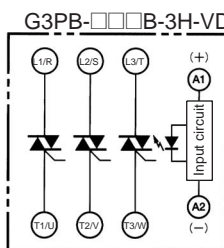


Models without Built-in Heat Sinks

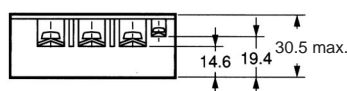
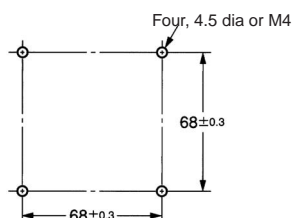
G3PB-215B-3H-VD G3PB-235B-3H-VD G3PB-415B-3H-VD G3PB-435B-3H-VD
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 G3PB-225B-3H-VD G3PB-245B-3H-VD G3PB-425B-3H-VD G3PB-445B-3H-VD
 G3PB-225B-2H-VD G3PB-245B-2H-VD G3PB-425B-2H-VD G3PB-445B-2H-VD



Terminal Arrangement/
Internal Circuit Diagram



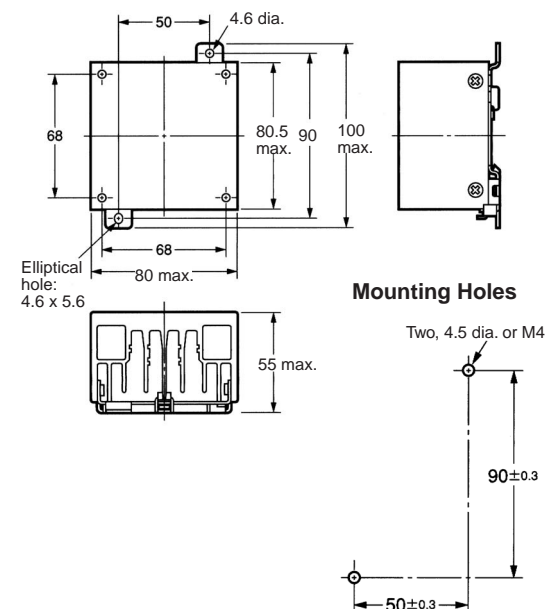
Mounting Holes



Heat Sinks

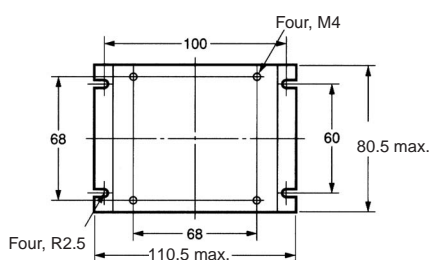
Y92B-P50

For model G3PB-215B-2H-VD
 G3PB-415B-2H-VD

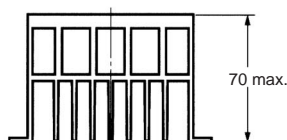
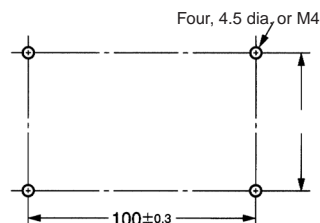


Y92B-P100

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

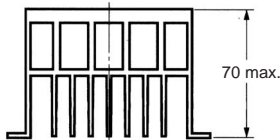
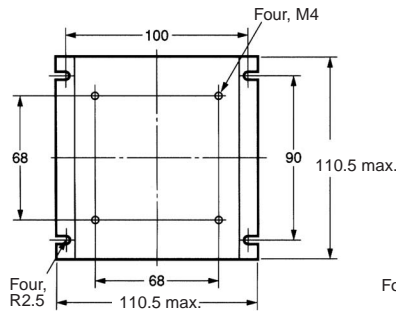


Mounting Holes

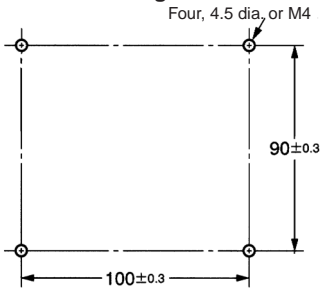


Y92B-P150

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

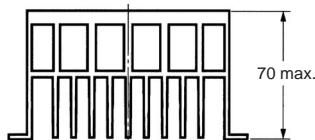
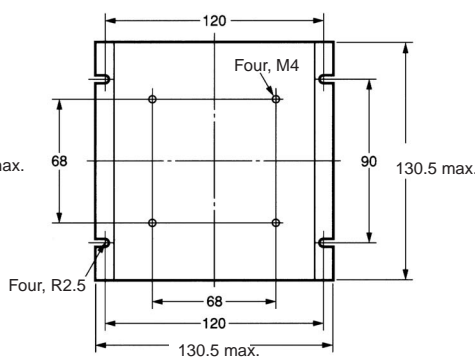


Mounting Holes

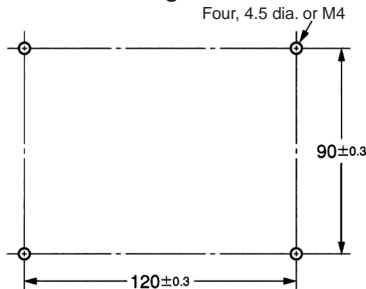


Y92B-P200

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

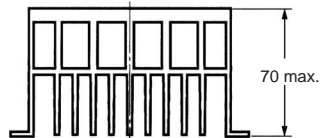
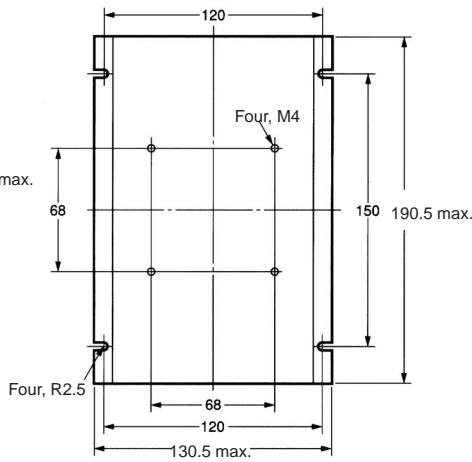


Mounting Holes

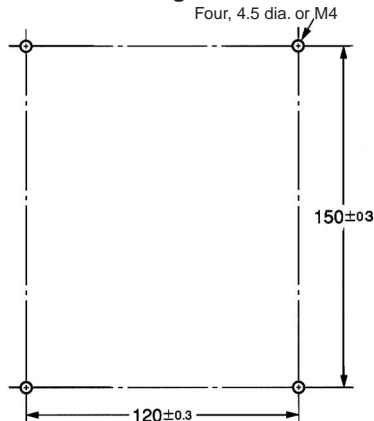


Y92B-P250

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



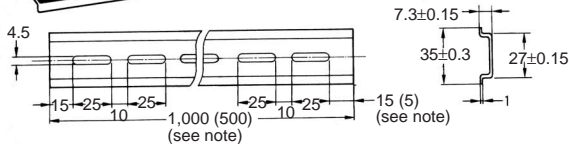
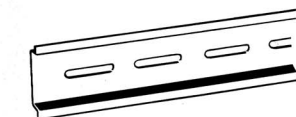
Mounting Holes



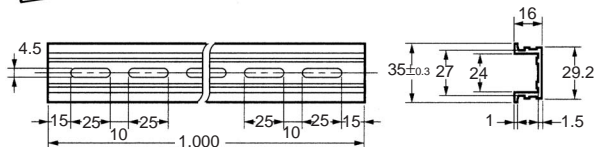
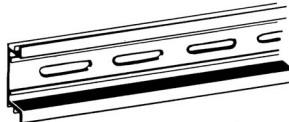
Accessories (Order Separately)

Mounting Tracks

PFP-100N, PFP-50N



PFP-100N2



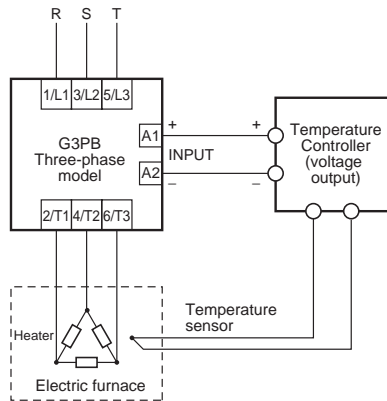
Note: Values in parentheses indicate dimensions for the PFP-50N.

Safety Precautions

■ Precautions for Correct Use

Please observe the following precautions to prevent failure to operate, malfunction, or undesirable effect on product performance.

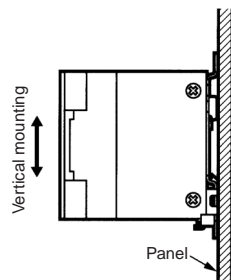
Connection Circuit Example



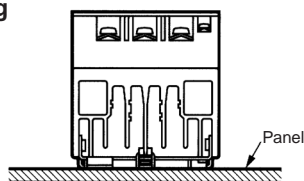
Mounting Method

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

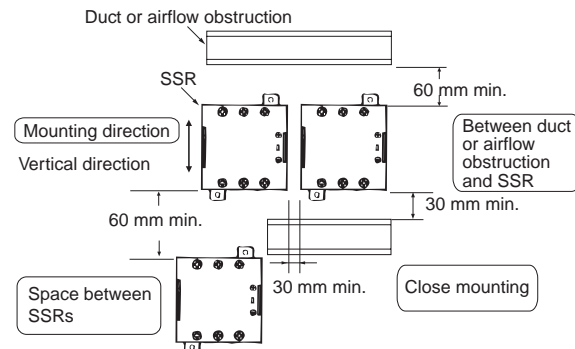


Note: Make sure that the load current is 50% of the rated load current when the G3PB is mounted horizontally.

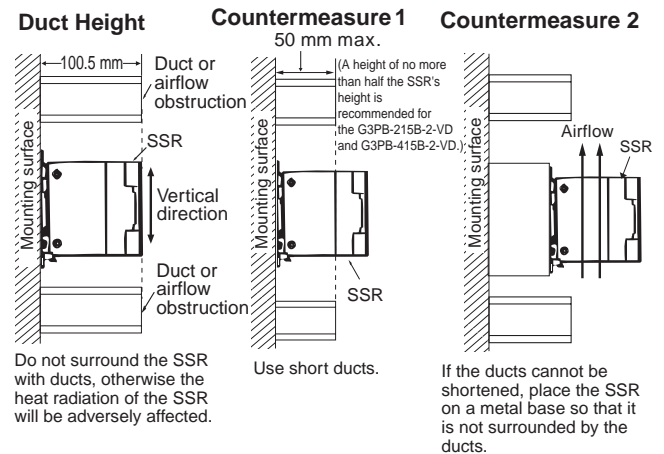
Close Mounting

SSR Mounting Pitch

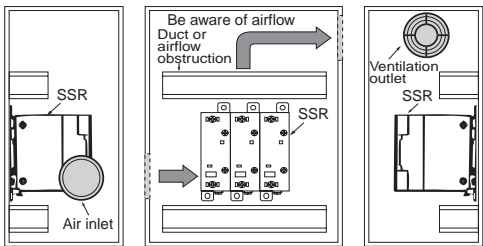
Panel Mounting



Relationship between SSRs and Ducts



Ventilation



If the air inlet or air outlet has a filter, clean the filter regularly to prevent it from clogging and ensure an efficient flow of air.

Do not locate any objects around the air inlet or air outlet, otherwise the objects will obstruct the proper ventilation of the control panel.

A heat exchanger, if used, should be located in front of the SSR Units to ensure the efficiency of the heat exchanger.

Please reduce the ambient temperature of SSRs.

The rated load current of an SSR is measured at an ambient temperature of 25 or 40 °C.

An SSR uses a semiconductor in the output element. This causes the temperature inside the control panel to increase due to heating resulting from the passage of electrical current through the load. To restrict heating, attach a fan to the ventilation outlet or air inlet of the control panel to ventilate the panel. This will reduce the ambient temperature of the SSRs and thus increase reliability. (Generally, each 10 °C reduction in temperature will double the expected life.)

Three-element Devices

Load current (A)	15 A	25 A	35 A	45 A
Required number of fans per SSR	0.70	1.06	1.63	2.09

Two-element Devices

Load current (A)	15 A	25 A	35 A	45 A
Required number of fans per SSR	0.47	0.78	1.09	1.40

Example: For 10 SSRs with load currents of 11 A (3-element devices,

$$1.63 \times 10 = 16.3$$

Thus, 17 fans would be required.

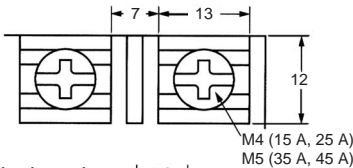
Size of fans: 92 mm², Air volume: 0.7 m³/min,
Ambient temperature of control panel: 30 °C

If there are other instruments that generate heat in the control panel other than SSRs, additional ventilation will be required.

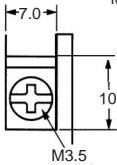
Wiring

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

Output terminal section



Input terminal section



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

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

Tightening torque: 2.0 N·m

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 - b. Such carrier shall act as the agent of Buyer and delivery to such carrier shall constitute delivery to Buyer;
 - c. All sales and shipments of Products shall be FOB shipping point (unless otherwise stated in writing by Omron), at which point title and risk of loss shall pass from Omron to Buyer; provided that Omron shall retain a security interest in the Products until the full purchase price is paid;
 - d. Delivery and shipping dates are estimates only; and
 - e. Omron will package Products as it deems proper for protection against normal handling and extra charges apply to special conditions.
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15. **Indemnities.** Buyer shall indemnify and hold harmless Omron Companies and their employees from and against all liabilities, losses, claims, costs and expenses (including attorney's fees and expenses) related to any claim, investigation, litigation or proceeding (whether or not Omron is a party) which arises or is alleged to arise from Buyer's acts or omissions under these Terms or in any way with respect to the Products. Without limiting the foregoing, Buyer (at its own expense) shall indemnify and hold harmless Omron and defend or settle any action brought against such Companies to the extent based on a claim that any Product made to Buyer specifications infringed intellectual property rights of another party.
16. **Property; Confidentiality.** Any intellectual property in the Products is the exclusive property of Omron Companies and Buyer shall not attempt to duplicate it in any way without the written permission of Omron. Notwithstanding any charges to Buyer for engineering or tooling, all engineering and tooling shall remain the exclusive property of Omron. All information and materials supplied by Omron to Buyer relating to the Products are confidential and proprietary, and Buyer shall limit distribution thereof to its trusted employees and strictly prevent disclosure to any third party.
17. **Export Controls.** Buyer shall comply with all applicable laws, regulations and licenses regarding (i) export of products or information; (ii) sale of products to "forbidden" or other proscribed persons; and (iii) disclosure to non-citizens of regulated technology or information.
18. **Miscellaneous.** (a) **Waiver.** No failure or delay by Omron in exercising any right and no course of dealing between Buyer and Omron shall operate as a waiver of rights by Omron. (b) **Assignment.** Buyer may not assign its rights hereunder without Omron's written consent. (c) **Law.** These Terms are governed by the law of the jurisdiction of the home office of the Omron company from which Buyer is purchasing the Products (without regard to conflict of law principles). (d) **Amendment.** These Terms constitute the entire agreement between Buyer and Omron relating to the Products, and no provision may be changed or waived unless in writing signed by the parties. (e) **Severability.** If any provision hereof is rendered ineffective or invalid, such provision shall not invalidate any other provision. (f) **Setoff.** Buyer shall have no right to set off any amounts against the amount owing in respect of this invoice. (g) **Definitions.** As used herein, "including" means "including without limitation"; and "Omron Companies" (or similar words) mean Omron Corporation and any direct or indirect subsidiary or affiliate thereof.

Certain Precautions on Specifications and Use

1. **Suitability of Use.** Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases but the following is a non-exhaustive list of applications for which particular attention must be given:
 - (i) Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this document.
 - (ii) Use in consumer products or any use in significant quantities.
 - (iii) Energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
 - (iv) Systems, machines and equipment that could present a risk to life or property. Please know and observe all prohibitions of use applicable to this Product.
 NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY OR IN LARGE QUANTITIES WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON'S PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.
2. **Programmable Products.** Omron Companies shall not be responsible for the user's programming of a programmable Product, or any consequence thereof.
3. **Performance Data.** Data presented in Omron Company websites, catalogs and other materials is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of Omron's test conditions, and the user must correlate it to actual application requirements. Actual performance is subject to the Omron's Warranty and Limitations of Liability.
4. **Change in Specifications.** Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without any notice. When in doubt, special part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Omron's representative at any time to confirm actual specifications of purchased Product.
5. **Errors and Omissions.** Information presented by Omron Companies has been checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.

Complete "Terms and Conditions of Sale" for product purchase and use are on Omron's website at www.omron.com/oei – under the "About Us" tab, in the Legal Matters section.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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



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