Solid State Contactors (New Heat Sink Construction)
G3PB

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

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

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

7. Certification
VD: Certified by UL, CSA, and VDE

Ordering Information

■ List of Models (Built-in Heat Sinks)

Applicable phase	Main circuit voltage	Zero cross function	Applicable heater capacity (with Class-1 AC resistive load)	Number of poles	Model
3	100 to 240 VAC	Yes	5.1 kW max. (15 A)	3	G3PB-215B-3N-VD
				2	G3PB-215B-2N-VD
			8.6 kW max. (25 A)	3	G3PB-225B-3N-VD
				2	G3PB-225B-2N-VD
			12.1 kW max. (35 A)	3	G3PB-235B-3N-VD
				2	G3PB-235B-2N-VD
			15.5 kW max. (45 A)	3	G3PB-245B-3N-VD
				2	G3PB-245B-2N-VD
	200 to 480 VAC		12.5 kW max. (15 A)	3	G3PB-515B-3N-VD
				2	G3PB-515B-2N-VD
			20.7 kW max. (25 A)	3	G3PB-525B-3N-VD
				2	G3PB-525B-2N-VD
			29.0 kW max. (35 A)	3	G3PB-535B-3N-VD
				2	G3PB-535B-2N-VD
			37.4 kW max. (45 A)	3	G3PB-545B-3N-VD
				2	G3PB-545B-2N-VD

Note: When ordering, specify the rated input voltage.

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	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
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 I^2t (half 60-Hz wave)	260 A^2s		2,660 A^2s		2,660 A^2s			

Item	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	200 to 480 VAC							
Load voltage range	180 to 528 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 I^2t (half 60-Hz wave)	260 A^2s		1,040 A^2s		1,040 A^2s			

Note: Applicable load current varies depending on 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-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
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, 0.175-mm single amplitude (Mounted to DIN track)							
Shock resistance	Destruction: 294 m/s^2 (98 m/s^2 with reverse mounting)							
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. 1.25 kg		Approx. 1.45 kg		Approx. 1.65 kg		Approx. 2.0 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	ESD	IEC947-4-3, EN61000-4-2 4 kV contact discharge 8 kV air discharge					
	Immunity	Electromagnetic	IEC947-4-3, EN61000-4-3 10 V/m (80 MHz to 1 GHz)					
	Immunity	EFT	IEC947-4-3, EN61000-4-4 2 kV AC power-signal line					
	Immunity	Surge transient	IEC947-4-3, EN61000-4-5 Normal mode ±1 kV, Common mode ±2 kV					
	Immunity	RF disturbance	IEC947-4-3, EN61000-4-6 10 V (0.15 to 80 MHz)					
	Immunity	Dips	IEC947-4-3, EN61000-4-11					

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

Item	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. (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 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 (Mounted to DIN track)							
Shock resistance	Destruction: 294 m/s^2 (98 m/s^2 with reverse mounting)							
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. 1.25 kg		Approx. 1.45 kg		Approx. 1.65 kg		Approx. 2.0 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	ESD	IEC947-4-3, EN61000-4-2 4 kV contact discharge 8 kV air discharge					
	Immunity	Electromagnetic	IEC947-4-3, EN61000-4-3 10 V/m (80 MHz to 1 GHz)					
	Immunity	EFT	IEC947-4-3, EN61000-4-4 2 kV AC power-signal line					
	Immunity	Surge transient	IEC947-4-3, EN61000-4-5 Normal mode ±1 kV, Common mode ±2 kV					
	Immunity	RF disturbance	IEC947-4-3, EN61000-4-6 10 V (0.15 to 80 MHz)					
	Immunity	Dips	IEC947-4-3, EN61000-4-11					

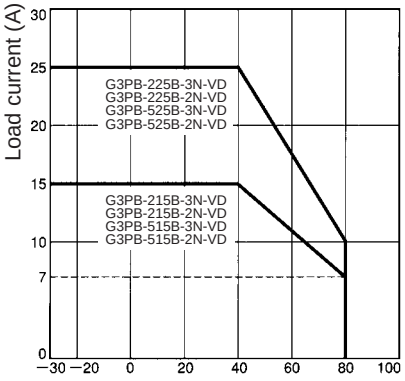
Note: The leakage current of phase S will be approximately $\sqrt{3}$ times larger if the 2-element model is applied.

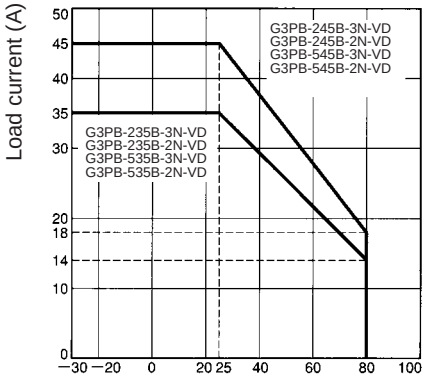
Engineering Data

Load Current vs. Ambient Temperature

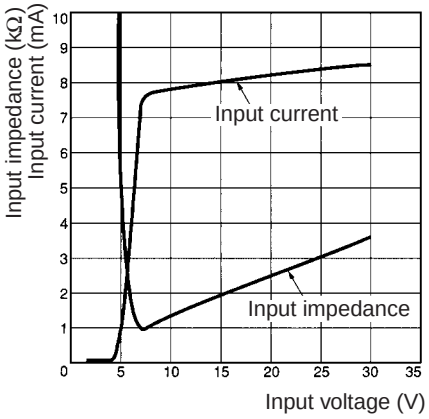
Models with Built-in Heat Sinks

G3PB-215B-3N-VD G3PB-225B-3N-VD G3PB-235B-3N-VD G3PB-245B-3N-VD
G3PB-215B-2N-VD G3PB-225B-2N-VD G3PB-235B-2N-VD G3PB-245B-2N-VD
G3PB-515B-3N-VD G3PB-525B-3N-VD G3PB-535B-3N-VD G3PB-545B-3N-VD
G3PB-515B-2N-VD G3PB-525B-2N-VD G3PB-535B-2N-VD G3PB-545B-2N-VD





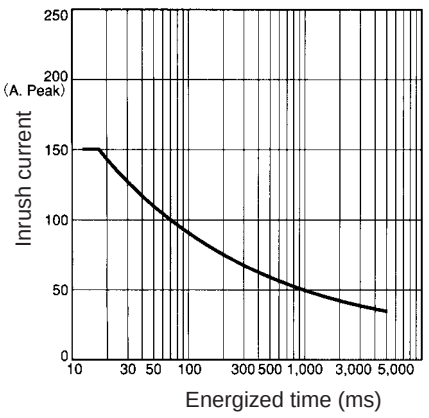
Input Voltage vs. Input Current and Input Voltage vs. Input Impedance



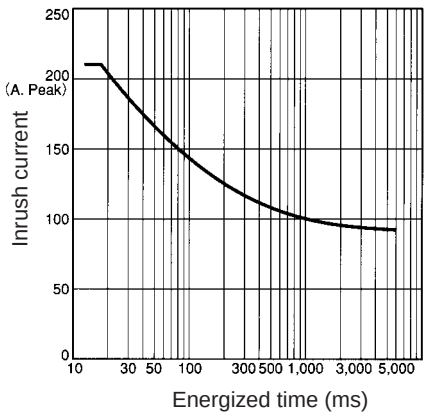
One Cycle Surge Current: Non-repetitive

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

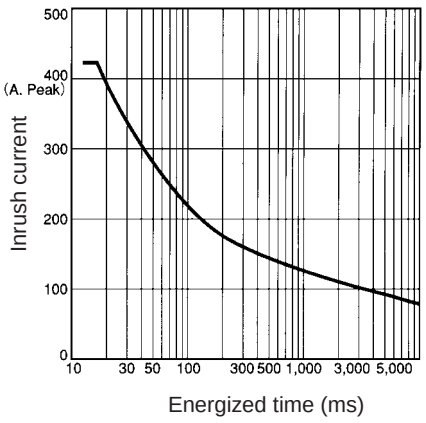
G3PB-215B-3N-VD
G3PB-215B-2N-VD



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



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

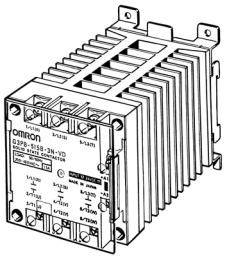


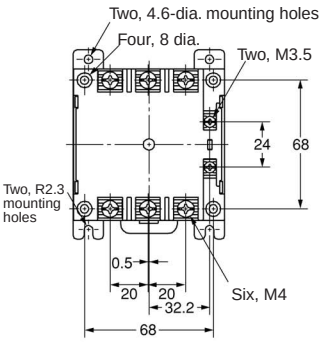
Dimensions

Note: All units are in millimeters unless otherwise indicated.

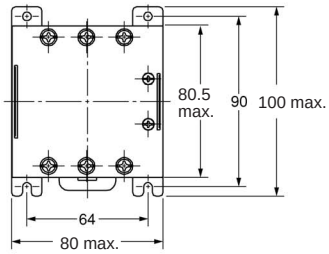
G3PB-215B-3N-VD G3PB-515B-3N-VD
G3PB-215B-2N-VD G3PB-515B-2N-VD
G3PB-225B-2N-VD G3PB-525B-2N-VD

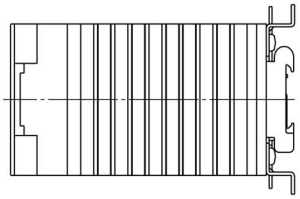
Without Terminal Cover





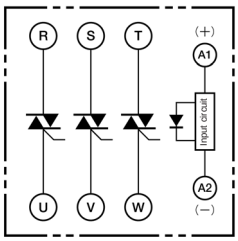
With Terminal Cover



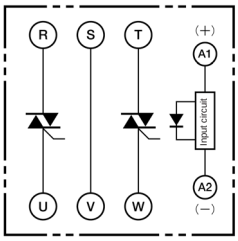


Terminal Arrangement/ Internal Connections

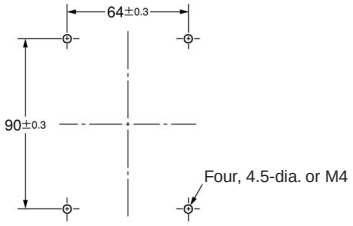
G3PB-□□□B-3N-VD

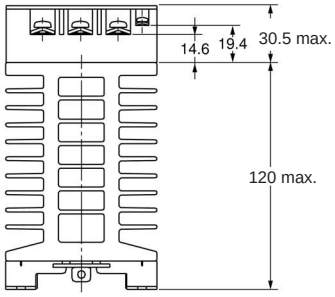


G3PB-□□□B-2N-VD

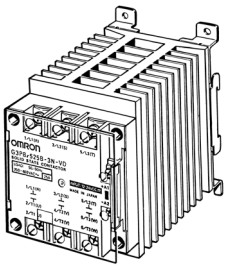


Mounting Hole Dimensions

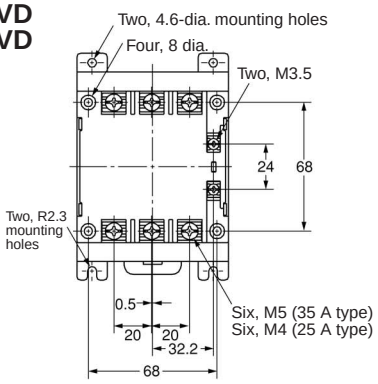




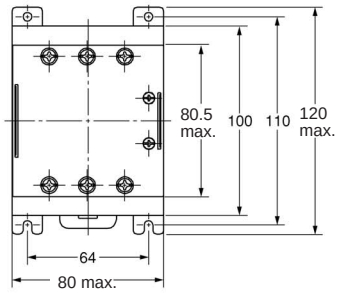
G3PB-225B-3N-VD
G3PB-235B-2N-VD
G3PB-525B-3N-VD
G3PB-535B-2N-VD

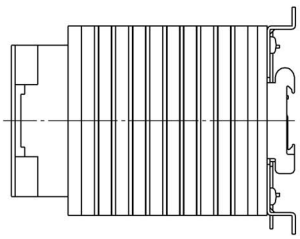


Without Terminal Cover

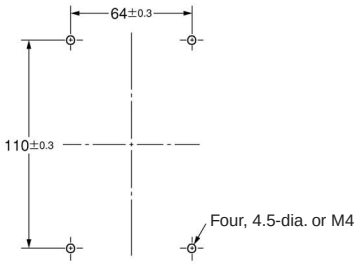


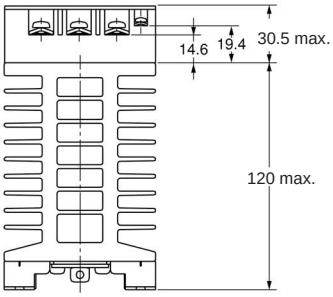
With Terminal Cover





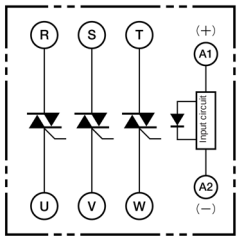
Mounting Hole Dimensions



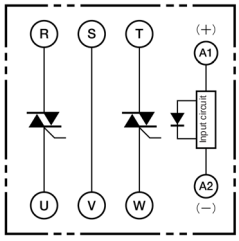


Terminal Arrangement/ Internal Connections

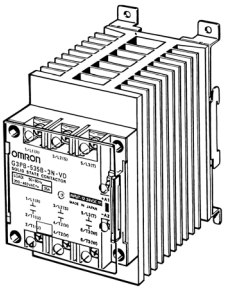
G3PB-□□□B-3N-VD



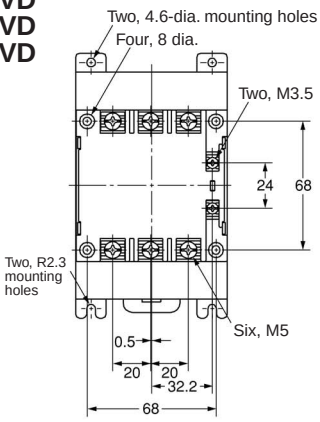
G3PB-□□□B-2N-VD



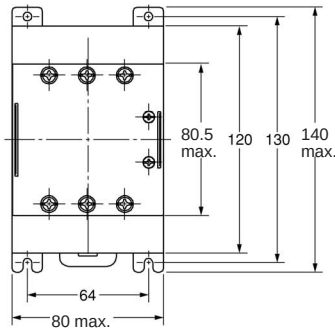
G3PB-235B-3N-VD
G3PB-245B-2N-VD
G3PB-535B-3N-VD
G3PB-545B-2N-VD

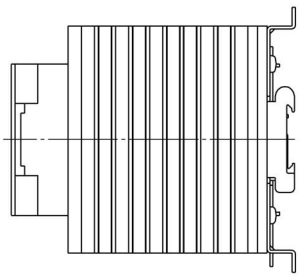


Without Terminal Cover

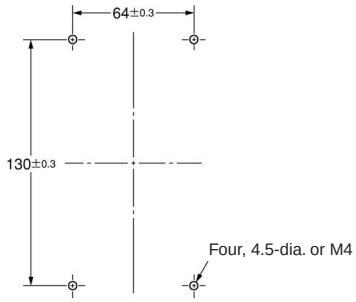


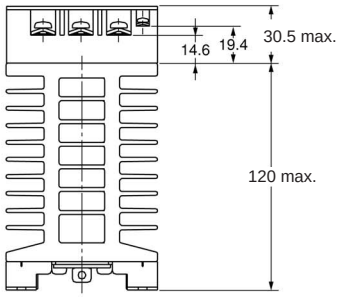
With Terminal Cover





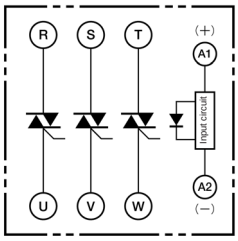
Mounting Hole Dimensions



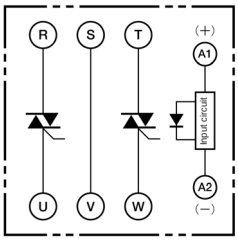


Terminal Arrangement/ Internal Connections

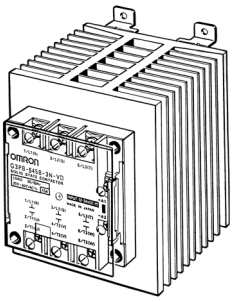
G3PB-□□□B-3N-VD



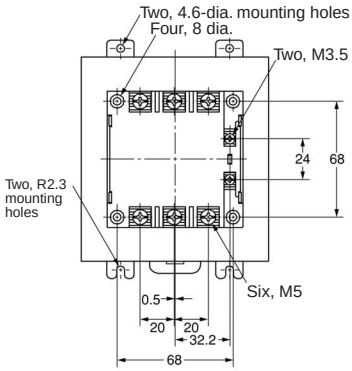
G3PB-□□□B-2N-VD



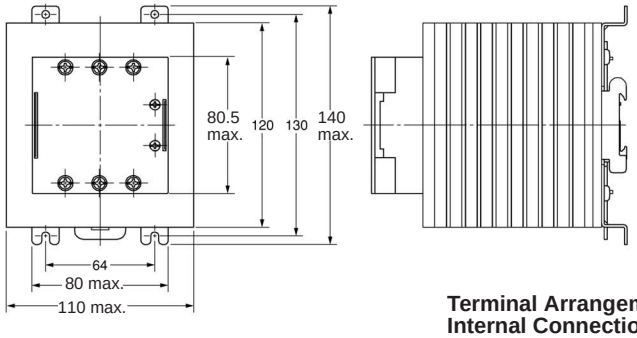
G3PB-245B-3N-VD
G3PB-545B-3N-VD



Without Terminal Cover

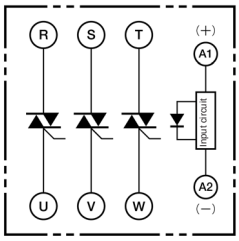


With Terminal Cover

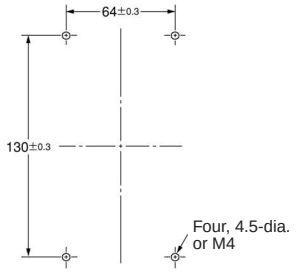


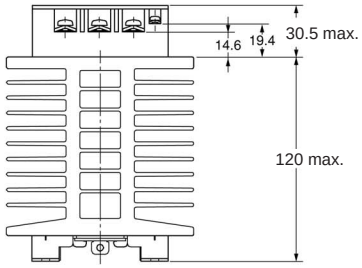
Terminal Arrangement/ Internal Connections

G3PB-□□□B-3N-VD



Mounting Hole Dimensions





Safety Precautions

■ Precautions for Correct Use

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

Mounting Method

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

Applicable DIN Tracks

The G3PB can be mounted to TH35-15Fe (IEC60715) DIN tracks. The manufacturers and models of DIN tracks to which mounting is possible are shown in the following table.

Manufacturer	Thickness	
	1.5 mm	2.3 mm
Schneider	AM1-DE200	---
WAGO	210-114, 210-197	210-118
PHOENIX	NS35/15	NS35/15-2.3

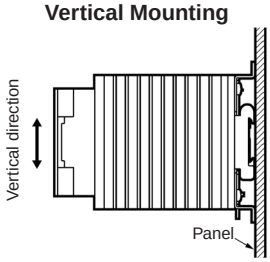
Direct Mounting

When mounting directly onto a panel, mount securely under the following conditions.

Screw diameter: M4
Tightening torque: 0.98 to 1.47 N·m

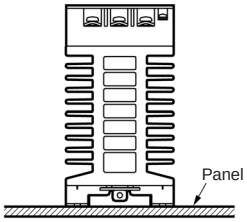
Mounted State

Vertical Mounting



Note: Mount the G3PB so that the markings can be read.

Horizontal Mounting

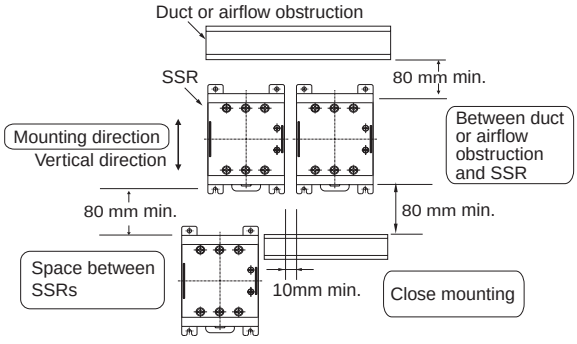


Note: When the G3PB is mounted horizontally, use at 50% of the rated load current.

Close Mounting

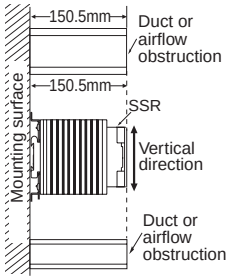
SSR Mounting Pitch

Panel Mounting



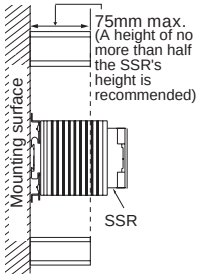
Relationship between SSRs and Ducts

Duct Height



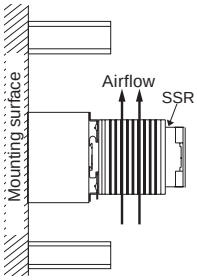
Do not surround the SSR with ducts, otherwise the heat radiation of the SSR will be adversely affected.

Countermeasure 1



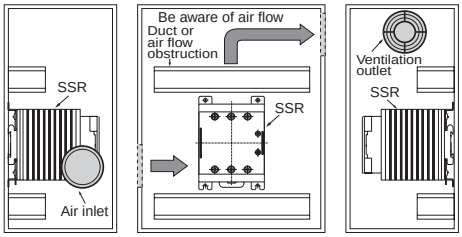
Use short ducts.

Countermeasure 2



If the ducts cannot be shortened, place the SSR on a metal base so that it is not surrounded by the 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 may 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 x 10 = 16.3
Thus, 17 fans would be required.

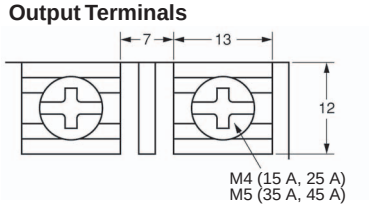
Size of fans: 92 mm^2, Air volume: 0.7 m^3/min,
Ambient temperature of control panel: 30 °C

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

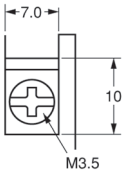
Wiring

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

Output Terminals



Input Terminals



- Make sure that all lead wires are thick enough for 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 side 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	0.59 to 1.18 N·m
Output terminal	M4	0.98 to 1.47 N·m
	M5	1.47 to 2.45 N·m

Terms and Conditions of Sale

1. Offer; Acceptance. These terms and conditions (these "Terms") are deemed part of all quotes, agreements, purchase orders, acknowledgments, price lists, catalogs, manuals, brochures and other documents, whether electronic or in writing, relating to the sale of products or services (collectively, the "Products") by Omron Electronics LLC and its subsidiary companies ("Omron"). Omron objects to any terms or conditions proposed in Buyer's purchase order or other documents which are inconsistent with, or in addition to, these Terms.
2. Prices; Payment Terms. All prices stated are current, subject to change without notice by Omron. Omron reserves the right to increase or decrease prices on any unshipped portions of outstanding orders. Payments for Products are due net 30 days unless otherwise stated in the invoice.
3. Discounts. Cash discounts, if any, will apply only on the net amount of invoices sent to Buyer after deducting transportation charges, taxes and duties, and will be allowed only if (i) the invoice is paid according to Omron's payment terms and (ii) Buyer has no past due amounts.
4. Interest. Omron, at its option, may charge Buyer 1-1/2% interest per month or the maximum legal rate, whichever is less, on any balance not paid within the stated terms.
5. Orders. Omron will accept no order less than $200 net billing.
6. Governmental Approvals. Buyer shall be responsible for, and shall bear all costs involved in, obtaining any government approvals required for the importation or sale of the Products.
7. Taxes. All taxes, duties and other governmental charges (other than general real property and income taxes), including any interest or penalties thereon, imposed directly or indirectly on Omron or required to be collected directly or indirectly by Omron for the manufacture, production, sale, delivery, importation, consumption or use of the Products sold hereunder (including customs duties and sales, excise, use, turnover and license taxes) shall be charged to and remitted by Buyer to Omron.
8. Financial. If the financial position of Buyer at any time becomes unsatisfactory to Omron, Omron reserves the right to stop shipments or require satisfactory security or payment in advance. If Buyer fails to make payment or otherwise comply with these Terms or any related agreement, Omron may (without liability and in addition to other remedies) cancel any unshipped portion of Products sold hereunder and stop any Products in transit until Buyer pays all amounts, including amounts payable hereunder, whether or not then due, which are owing to it by Buyer. Buyer shall in any event remain liable for all unpaid accounts.
9. Cancellation; Etc. Orders are not subject to rescheduling or cancellation unless Buyer indemnifies Omron against all related costs or expenses.
10. Force Majeure. Omron shall not be liable for any delay or failure in delivery resulting from causes beyond its control, including earthquakes, fires, floods, strikes or other labor disputes, shortage of labor or materials, accidents to machinery, acts of sabotage, riots, delay in or lack of transportation or the requirements of any government authority.
11. Shipping; Delivery. Unless otherwise expressly agreed in writing by Omron:
    a. Shipments shall be by a carrier selected by Omron; Omron will not drop ship except in "break down" situations.
    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.
12. Claims. Any claim by Buyer against Omron for shortage or damage to the Products occurring before delivery to the carrier must be presented in writing to Omron within 30 days of receipt of shipment and include the original transportation bill signed by the carrier noting that the carrier received the Products from Omron in the condition claimed.
13. Warranties. (a) Exclusive Warranty. Omron's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Omron (or such other period expressed in writing by Omron). Omron disclaims all other warranties, express or implied. (b) Limitations. OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCTS. BUYER ACKNOWLEDGES THAT IT ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. Omron further disclaims all warranties and responsibility of any type for claims or expenses based on infringement by the Products or otherwise of any intellectual property right. (c) Buyer Remedy. Omron's sole obligation hereunder shall be, at Omron's election, to (i) replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product, (ii) repair the non-complying Product, or (iii) repay or credit Buyer an amount equal to the purchase price of the non-complying Product; provided that in no event shall Omron be responsible for warranty, repair, indemnity or any other claims or expenses regarding the Products unless Omron's analysis confirms that the Products were properly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be approved in writing by Omron before shipment. Omron Companies shall not be liable for the suitability or unsuitability or the results from the use of Products in combination with any electrical or electronic components, circuits, system assemblies or any other materials or substances or environments. Any advice, recommendations or information given orally or in writing, are not to be construed as an amendment or addition to the above warranty. See http://oeweb.omron.com or contact your Omron representative for published information.
14. Limitation on Liability; Etc. OMRON COMPANIES SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE OR STRICT LIABILITY. Further, in no event shall liability of Omron Companies exceed the individual price of the Product on which liability is asserted.
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; (iii) sale of products to "forbidden" or other proscribed persons; and (ii) 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.

OMRON

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.

OMRON

OMRON ELECTRONICS LLC
One Commerce Drive
Schaumburg, IL 60173
847-843-7900
For US technical support or other inquiries:
800-556-6766

OMRON CANADA, INC.
885 Milner Avenue
Toronto, Ontario M1B 5V8
416-286-6465

OMRON ON-LINE
Global - http://www.omron.com
USA - http://www.omron.com/oei
Canada - http://www.omron.ca

Cat. No. J135A-E1-03 2/06 Specifications subject to change without notice Printed in USA