

3-Phase Solid-state Contactor G3PB

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.
- DIN track mounting supported as standard. (Screw mounting is also possible.)
- Conforms to international standards (IEC, UL, and CSA).



Ordering Information

■ Models with Built-in Heat Sinks

Stock Note: Shaded models are normally stocked.

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

Specifications

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

Operating Circuit (Common)

Item	Common
Rated operating 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.
Reset voltage	1 VDC min.
Insulation method	Phototriac coupler
Operation indicator	Yellow LED

Main Circuit of Models with Built-in Heat Sinks

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 voltage	200 to 480 VAC							
Operating voltage range	180 to 528 VAC							
Rated carry current (see note)	15 A		25 A		35 A		45 A	
Minimum load current	0.5 A							
Inrush current resistance (peak value)	220 A (60 Hz, 1 cycle)				440 A (60 Hz, 1 cycle)			
Permissible I ² t (half 60-Hz wave)	260 A ² s				1,260 A ² s			

Note: Rated carry 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-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	10 to 55 Hz, 0.175-mm single amplitude							
Shock resistance	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	
Approved standards	UL508, CSA22.2 No. 14, EN60947-4-3 (IEC947-4-3) approved by VDE (From April 2001)							
EMC	Emission	ESD		EN55011 Group 1 Class B				
	Immunity	Electromagnetic		IEC947-4-3, EN61000-4-2				
				4 kV contact discharge				
				8 kV air discharge				
	Immunity	EFT		IEC947-4-3, EN61000-4-3				
				10 V/m (80 MHz to 1 GHz)				
	Immunity	Surge transient		IEC947-4-3, EN61000-4-4				
				2 kV AC power-signal line				
	Immunity	RF disturbance		IEC947-4-3, EN61000-4-5				
				Normal mode ±1 kV, Common mode ±2 kV				
	Immunity	Dips		IEC947-4-3, EN61000-4-6				
				10 V (0.15 to 80 MHz)				
				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.

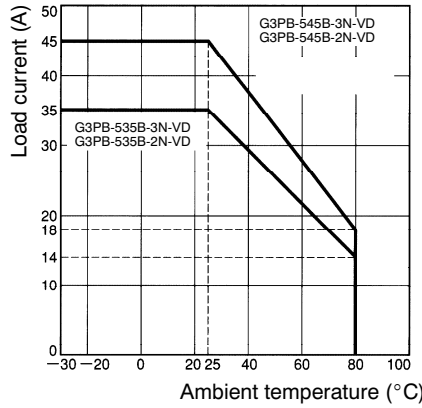
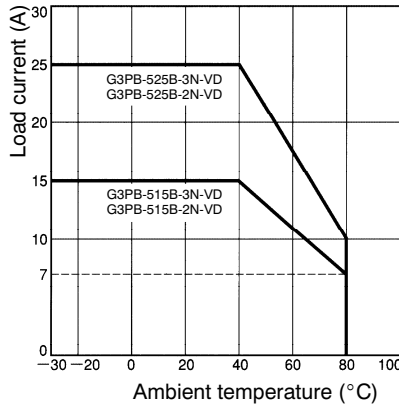
Engineering Data

Load Current vs. Ambient Temperature (Continuous Input)

Models with Built-in Heat Sinks

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

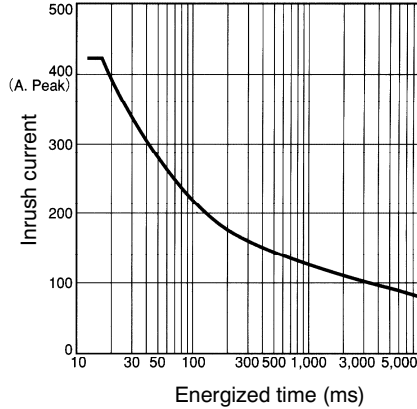
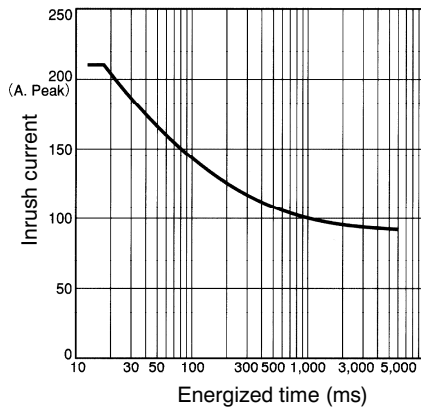
G3PB-535B-3N-VD
 G3PB-535B-2N-VD
 G3PB-545B-3N-VD
 G3PB-545B-2N-VD



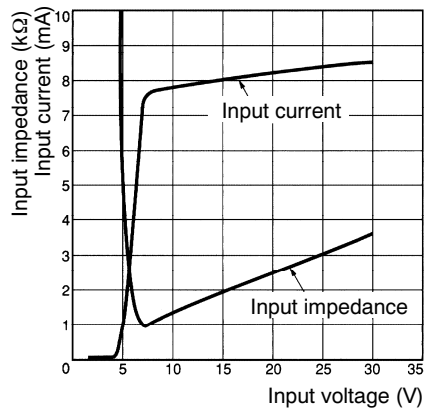
Inrush Current Resistivity: Non-repetitive (Less than Half for Repetitive)

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



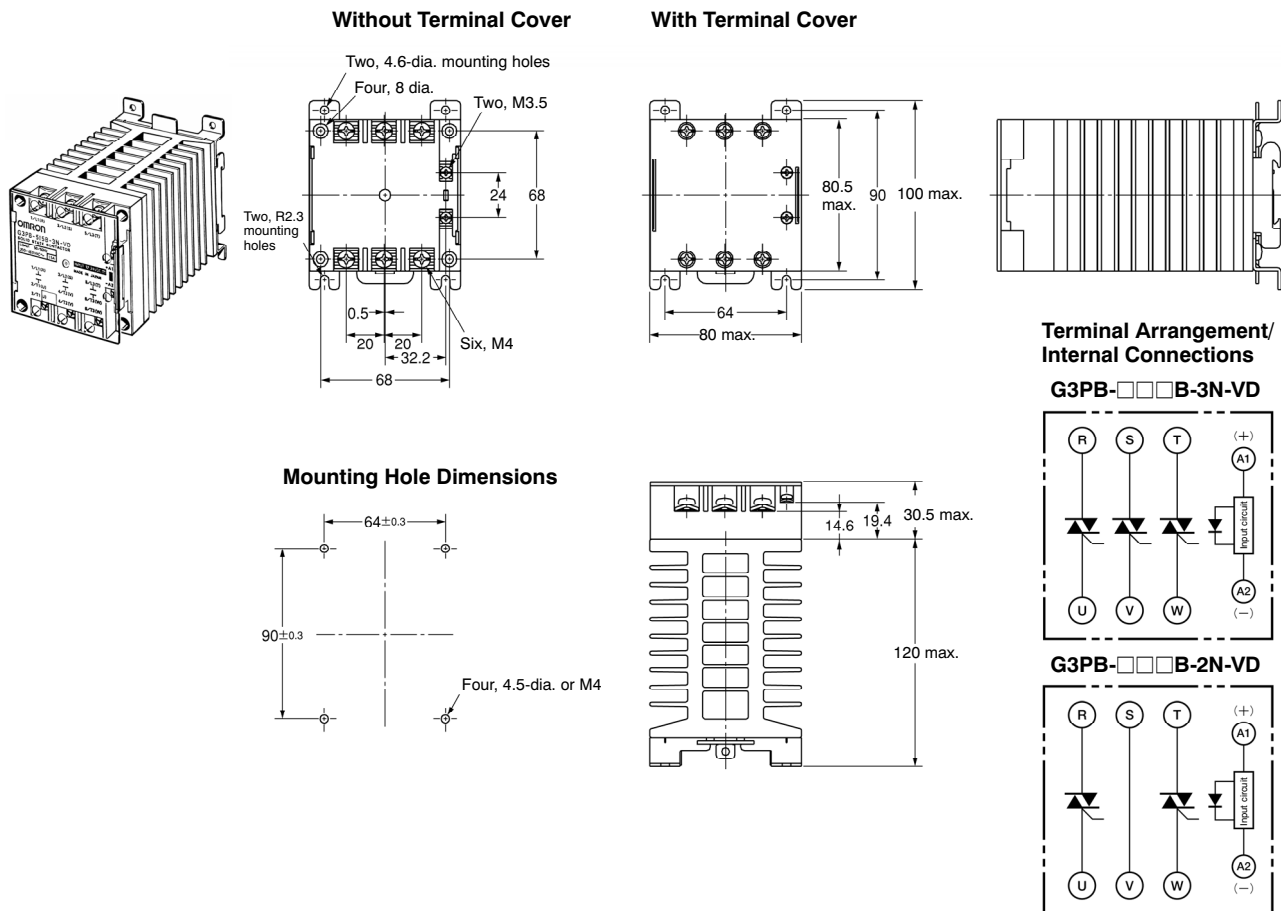
Input Voltage vs. Input Current and Input Voltage vs. Input Impedance



Dimensions

Note: All units are in millimeters unless otherwise indicated.

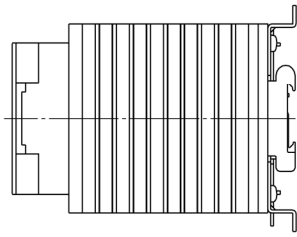
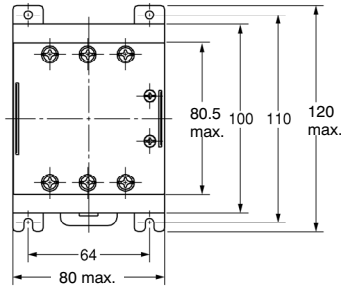
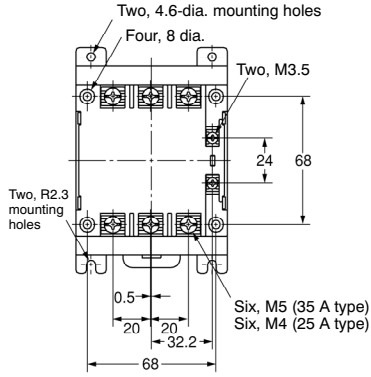
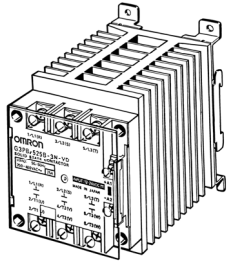
G3PB-515B-3N-VD
 G3PB-515B-2N-VD
 G3PB-525B-2N-VD



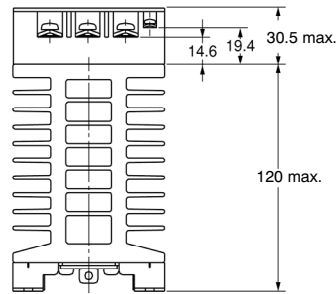
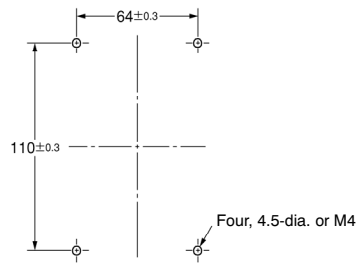
G3PB-525B-3N-VD
G3PB-535B-2N-VD

Without Terminal Cover

With Terminal Cover

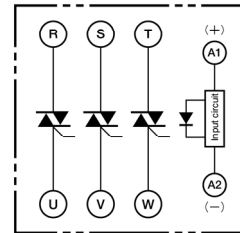


Mounting Hole Dimensions

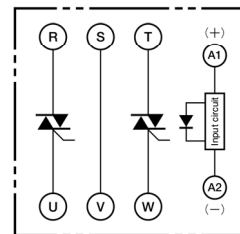


**Terminal Arrangement/
 Internal Connections**

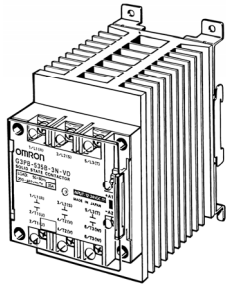
G3PB-□□□B-3N-VD



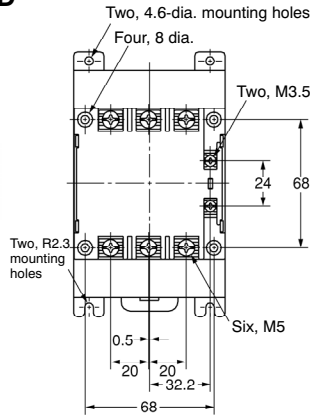
G3PB-□□□B-2N-VD



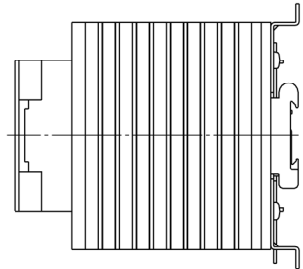
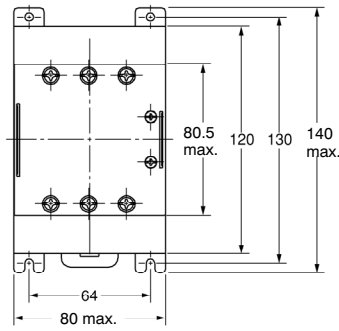
**G3PB-535B-3N-VD
G3PB-545B-2N-VD**



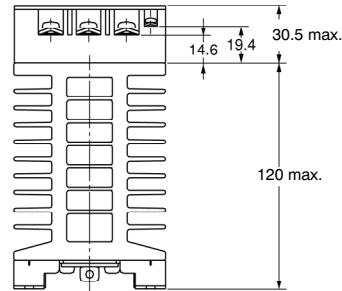
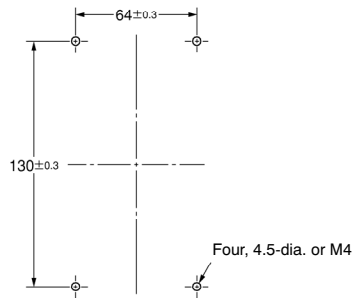
Without Terminal Cover



With Terminal Cover

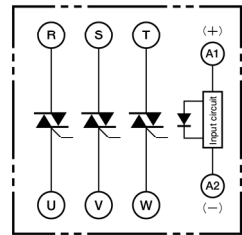


Mounting Hole Dimensions

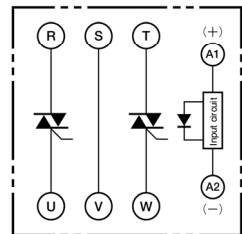


**Terminal Arrangement/
Internal Connections**

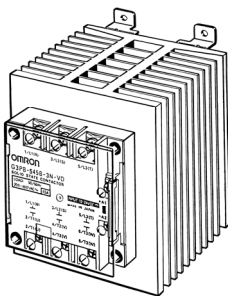
G3PB-□□□B-3N-VD



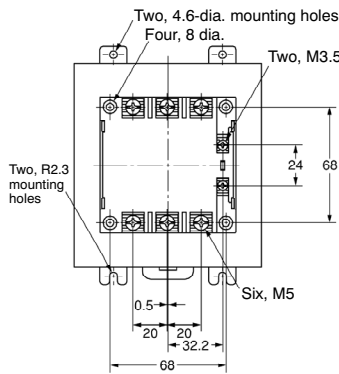
G3PB-□□□B-2N-VD



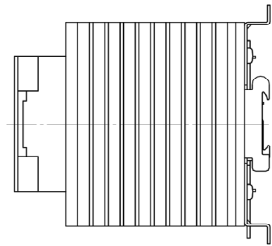
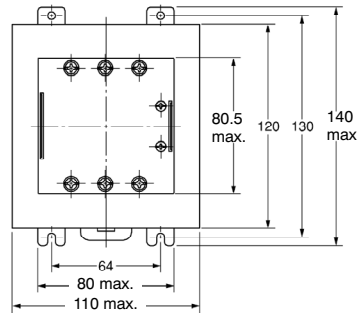
G3PB-545B-3N-VD



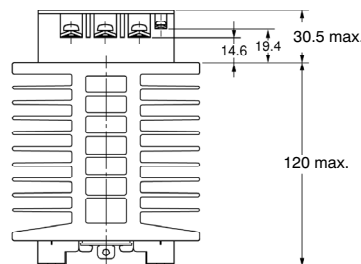
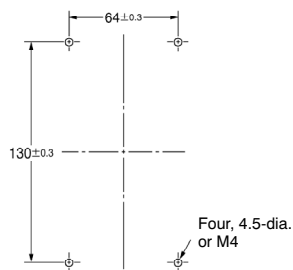
Without Terminal Cover



With Terminal Cover

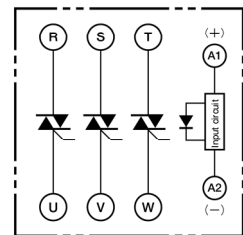


Mounting Hole Dimensions



**Terminal Arrangement/
Internal Connections**

G3PB-□□□B-3N-VD



Precautions

! WARNING

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

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

! WARNING

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

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

! WARNING

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

! WARNING

Be sure to turn OFF the power supply to the G3PB before wiring, otherwise an electric shock may be received. Mount the terminal cover to the G3PB after wiring. Do not touch the terminals of the G3PB while power is supplied, otherwise an electric shock may be received.

! WARNING

Ensure that a short-circuit current does not flow on the load side of the SSR, otherwise the G3PB may be damaged.

General Precautions

At OMRON, we are constantly working to improve the quality and reliability of our products. SSRs, however, use semiconductors, which are prone to malfunction. Be sure to use SSRs within their rated values.

Use the SSR only in systems that are designed with redundancies, flame protection, counter measures to prevent operation errors, and other countermeasures to prevent accidents involving human life or fires.

1. Do not apply voltages or currents to the G3PB's terminals in excess of the rated values. Doing so may result in malfunction or burning.
2. Do not use the G3PB with terminal screws not properly tightened. Abnormal heating of the terminals may result in burning.
3. Do not obstruct the flow of air around the G3PB and the radiator. Abnormal heating of the G3PB may result short-circuiting of output elements and burning.
4. Perform wiring and tighten screws according to the instructions given under *Correct Use*. Using the G3PB with incorrect wiring or with the screws not tightened properly may result in burning due to abnormal heating of the G3PB during use.

Correct Use

Before Actual Operation

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

Mounting Method

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

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

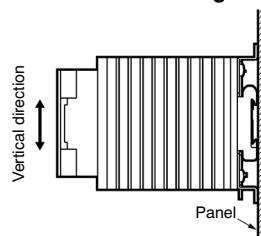
When mounting directly onto a panel, mount securely under the following conditions.

Screw diameter: M4

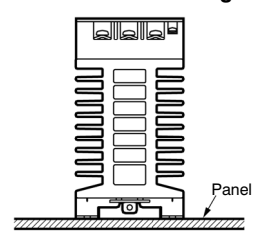
Tightening torque: 0.98 to 1.47 N • m

Mounted State

Vertical Mounting



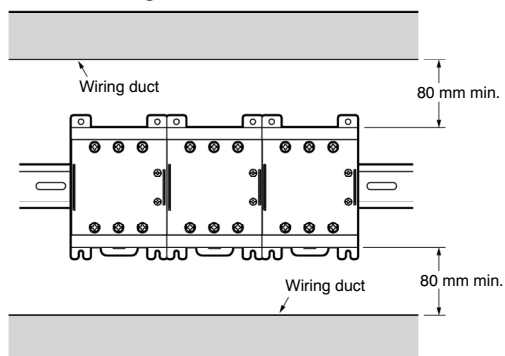
Horizontal Mounting



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

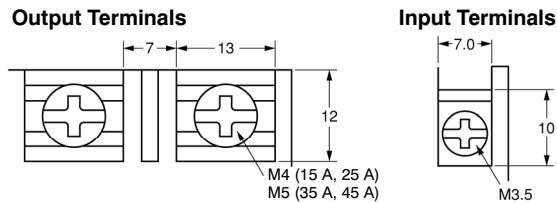
Note: When the G3PB is mounted horizontally, use at 50% of the rated load current.

Close Mounting



Wiring

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



- Be sure that all lead wires are thick enough according to the current.
- Output terminals T1, T2, and T3 are charged regardless of whether the Unit is a 2- or 3-element model that is turned on or off. Do not touch these terminals, otherwise an electric shock may be received.
To isolate the Unit from the power supply, install an appropriate circuit breaker between the power supply and Unit.
Be sure to turn off the power supply before wiring the Unit.
- Terminal L2 and terminal T2 of the 2-element model are internally short-circuited to each other. Therefore, connect terminal L2 to the ground terminal 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

Operating Conditions

- Do not apply current exceeding the rated current otherwise, the temperature of the G3PB may rise excessively.
- Be sure to prevent the ambient temperature rising due to the heat radiation of the G3PB. If the G3PB is mounted inside a panel, install a fan so that the interior of the panel is fully ventilated.
- Do not use the G3PB if heat dissipation fins have been bent as a result of, for example, dropping the G3PB. If used in this state, the G3PB may be damaged due to the decreased heat dissipation capacity.
- Only use the G3PB with loads that are within the rated values. Using the G3PB with loads outside the rated values may result in malfunction, damage, or burning.
- Use a power supply within the rated frequency range. Using a power supply outside the rated frequency range may result in malfunction, damage, or burning.
- Keep wiring separate from high-voltage power lines and use wires of an appropriate length, otherwise malfunction and damage may result due to induction.
- As protection against accidents due to short-circuiting, be sure to install protective devices, such as fuses and no-fuse breakers on the power supply side.

Operating and Storage Environments

1. Operating Ambient Temperature

The rated value for the ambient operating temperature of the G3PB is for when there is no built-up heat. For this reason, under conditions where heat dissipation is not good due to poor ventilation, and where heat may build up easily, the actual temperature of the G3PB may exceed the rated value resulting in malfunction on burning.

When using the G3PB, design the system to allow heat dissipation sufficient to stay below the *Load Current vs. Ambient Temperature* characteristic curve. Note also that the ambient temperature of the G3PB may increase as a result of environmental conditions (e.g., climate, air-conditioning) and operating conditions (e.g., mounting in an airtight panel).

2. Operating and Storage Locations

Do not use or store the G3PB in the following locations. Doing so may result in damage, malfunction, or deterioration of performance characteristics.

- Do not use or store in locations subject to direct sunlight.
- Do not use in locations subject to ambient temperatures outside the range -20 to 60°C.
- Do not use in locations subject to relative humidity outside the range 45% to 85% or locations subject to condensation as the result of severe changes in temperature.
- Do not store in locations subject to ambient temperatures outside the range -30 to 70°C.
- Do not use or store in locations subject to corrosive or flammable gases.
- Do not use or store in locations subject to dust (especially iron dust) or salts.
- Do not use or store in locations subject to shock or vibration.
- Do not use or store in locations subject to exposure to water, oil, or chemicals.

3. Transportation

When transporting the G3PB, observe the following points. Not doing so may result in damage, malfunction, or deterioration of performance characteristics.

- Do not drop the G3PB or subject it to severe vibrations or shock.
- Do not transport the product if it is wet.

4. Vibration and Shock

Do not subject the SSR to excessive vibration or shock. Otherwise the SSR may malfunction and internal components may be damaged.

To prevent the SSR from abnormal vibration, do not install the G3PB in locations or by means that will subject it to the vibrations from other devices, such as motors.

5. Solvents

Do not allow the G3PB to come in contact with solvents such as thinners or gasoline. Doing so will dissolve the markings on the SSR.

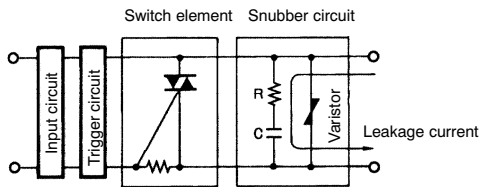
6. Oil

Do not allow the G3PB terminal cover to come in contact with oil. Doing so will cause the cover to crack and become cloudy.

■ Operation

1. Leakage Current

A leakage current flows through a snubber circuit in the G3PB even when there is no input. Therefore, always turn OFF the power to the input or load and check that it is safe before replacing or wiring the G3PB.



2. Screw Tightening Torque

Tighten the G3PB terminal screws properly. If the screws are not tight, the G3PB will be damaged by heat generated when the power is ON.

3. Mounting

Do not perform mounting with oil or metal powder on your hands. Doing so may result in damage to the G3PB.

4. Dropping

Be careful not to drop the G3PB during mounting. The G3PB weighs approximately 1.25 to 2.0 kg and could cause injury if dropped on any part of your body.

Certain Terms and Conditions of Sale

1. **Offer; Acceptance.** These terms and conditions (these "Terms") are deemed part of all catalogs, manuals or other documents, whether electronic or in writing, relating to the sale of goods or services (collectively, the "Goods") by Omron Electronics LLC and its subsidiary companies ("Seller"). Seller hereby 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. Please contact your Omron representative to confirm any additional terms for sales from your Omron company.
2. **Prices.** All prices stated are current, subject to change without notice by Seller. Buyer agrees to pay the price in effect at time of shipment.
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 Seller's payment terms and (ii) Buyer has no past due amounts owing to Seller.
4. **Orders.** Seller will accept no order less than \$200 net billing.
5. **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 Goods.
6. **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 Seller or required to be collected directly or indirectly by Seller for the manufacture, production, sale, delivery, importation, consumption or use of the Goods sold hereunder (including customs duties and sales, excise, use, turnover and license taxes) shall be charged to and remitted by Buyer to Seller.
7. **Financial.** If the financial position of Buyer at any time becomes unsatisfactory to Seller, Seller 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, Seller may (without liability and in addition to other remedies) cancel any unshipped portion of Goods sold hereunder and stop any Goods 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.
8. **Cancellation; Etc.** Orders are not subject to rescheduling or cancellation unless Buyer indemnifies Seller fully against all costs or expenses arising in connection therewith.
9. **Force Majeure.** Seller 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.
10. **Shipping; Delivery.** Unless otherwise expressly agreed in writing by Seller:
 - a. Shipments shall be by a carrier selected by Seller;
 - 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 Goods shall be FOB shipping point (unless otherwise stated in writing by Seller), at which point title to and all risk of loss of the Goods shall pass from Seller to Buyer, provided that Seller shall retain a security interest in the Goods until the full purchase price is paid by Buyer;
 - d. Delivery and shipping dates are estimates only.
 - e. Seller will package Goods as it deems proper for protection against normal handling and extra charges apply to special conditions.
11. **Claims.** Any claim by Buyer against Seller for shortage or damage to the Goods occurring before delivery to the carrier must be presented in writing to Seller within 30 days of receipt of shipment and include the original transportation bill signed by the carrier noting that the carrier received the Goods from Seller in the condition claimed.
12. **Warranties.** (a) **Exclusive Warranty.** Seller's exclusive warranty is that the Goods will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Seller (or such other period expressed in writing by Seller). Seller disclaims all other warranties, express or implied. (b) **Limitations.** SELLER MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE GOODS. BUYER ACKNOWLEDGES THAT IT ALONE HAS DETERMINED THAT THE GOODS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. Seller further disclaims all warranties and responsibility of any type for claims or expenses based on infringement by the Goods or otherwise of any intellectual property right. (c) **Buyer Remedy.** Seller's sole obligation hereunder shall be to replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Good or, at Seller's election, to repay or credit Buyer an amount equal to the purchase price of the Good; provided that in no event shall Seller be responsible for warranty, repair, indemnity or any other claims or expenses regarding the Goods unless Seller's analysis confirms that the Goods were properly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification. Return of any goods by Buyer must be approved in writing by Seller before shipment. Seller shall not be liable for the suitability or unsuitability or the results from the use of Goods 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.
13. **Damage Limits; Etc.** SELLER SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE GOODS, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE OR STRICT LIABILITY. Further, in no event shall liability of Seller exceed the individual price of the Good on which liability is asserted.
14. **Indemnities.** Buyer shall indemnify and hold harmless Seller, its affiliates and its 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 Seller 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 Goods. Without limiting the foregoing, Buyer (at its own expense) shall indemnify and hold harmless Seller and defend or settle any action brought against Seller to the extent that it is based on a claim that any Good made to Buyer specifications infringed intellectual property rights of another party.
15. **Property; Confidentiality.** The intellectual property embodied in the Goods is the exclusive property of Seller and its affiliates and Buyer shall not attempt to duplicate it in any way without the written permission of Seller. Notwithstanding any charges to Buyer for engineering or tooling, all engineering and tooling shall remain the exclusive property of Seller. All information and materials supplied by Seller to Buyer relating to the Goods are confidential and proprietary, and Buyer shall limit distribution thereof to its trusted employees and strictly prevent disclosure to any third party.
16. **Miscellaneous.** (a) **Waiver.** No failure or delay by Seller in exercising any right and no course of dealing between Buyer and Seller shall operate as a waiver of rights by Seller. (b) **Assignment.** Buyer may not assign its rights hereunder without Seller's written consent. (c) **Amendment.** These Terms constitute the entire agreement between Buyer and Seller relating to the Goods, and no provision may be changed or waived unless in writing signed by the parties. (d) **Severability.** If any provision hereof is rendered ineffective or invalid, such provision shall not invalidate any other provision. (e) **Setoff.** Buyer shall have no right to set off any amounts against the amount owing in respect of this invoice. (f) As used herein, "including" means "including without limitation".

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1. **Suitability of Use.** Seller shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Good in the Buyer's application or use of the Good. At Buyer's request, Seller will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Good. This information by itself is not sufficient for a complete determination of the suitability of the Good in combination with the end product, machine, system, or other application or use. The following are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible uses of this Good, nor is it intended to imply that the uses listed may be suitable for this Good:
 - (i) Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this document.
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2. **Programmable Products.** Seller shall not be responsible for the user's programming of a programmable Good, or any consequence thereof.
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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 Good 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 Seller's representative at any time to confirm actual specifications of purchased Good.
5. **Errors and Omissions.** The information in this catalog has been carefully checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors, or omissions.

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

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